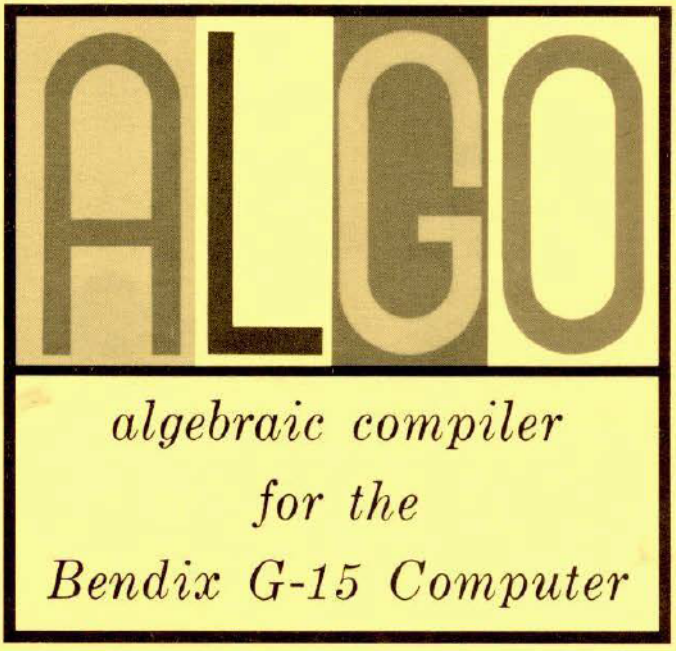
Technical Manual



THE Bendix CORPORATION
BENDIX COMPUTER DIVISION Los Angeles 45, California

PROJECT NO. ASP 165

TITLE:

TECHNICAL MANUAL
FOR THE BENDIX G-15 ALGO
PROGRAMMING SYSTEM

APPLICATION SECTION

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TABLE OF CONTENTS

1.0 INTRODUCTION

The technical manual describes in detail the structure and coding of the Bendix ALGO Programming System. Complete description of the ALGO language, and the operating instructions are contained in the other manuals pertaining to the ALGO System. Knowledge of the contents of this manual is not necessary to learn or use the system. This technical manual is provided for reference purposes primarily. The information contained herein is sufficient for G-15 machine language programmers to understand the details and make any special changes to the system for their own special purposes. The user is cautioned, however, that any modifications which are made by an installation and which are not suggested or required by Bendix may lead to incompatability with the Standard ALGO System.

This manual contains three primary sections. The first is a narrative description of the logic and flow of the ALGO System. The second is a set of flow charts for each package, and finally, listings of the commands and constants in standard PPR format. Cross reference among the sections of this manual, and among the other manuals of the ALGO System is necessary for complete understanding of the details.

Additions and improvements are a continuing service that Bendix provides to constantly increase the power of ALGO. Therefore, it is necessary to periodically insert new and changed information in the command and constant listings to insure current documentation. The new information is provided by Bendix together with instructions for making the change.

2.0 EDITOR PRE-LOADER

Magazine one is the Editor for the ALGO System. The pre-loader of this magazine prepares the memory of the G-15 for the actual Editor program. The pre-loader is read into lines 04, 03, 00 and 02. Line 02, word 00 is the program starting location.

After the pre-loader is read into memory, the computer types out MODE? This query is answered from the keyboard by a 1 tab (S), 1 tab DDD tab (S) or a 2 tab (S).

A 2 tab (S) indicates that the scratch pad will be paper tape. Line 04, which is the loader to the Editor, is then transferred to Line 05, word 00 and the Editor program is then read into memory. Upon type-out of a 1. TITLE the computer is ready to accept instructions from the keyboard.

A 1 tab (S) indicates a magnetic tape scratch pad. At the termination of the type-in there is a type-out of SET MAG SW = 1 and the computer halts. After the compute switch is cycled a search for clean tape begins. The search routine uses lines 00 and 02 and searches in the following manner. It looks forward for file codes. A counter is kept and decremented until it goes to zero. Each time a file is detected the counter is reset to its initial value. When the counter is zero a reverse search is initiated. As soon as a file is found there is a delay, a new counter set and a read magnetic tape started. When the counter becomes zero a file code is written followed by an ID block which is in line three. This ID block is compatible with the Magnetic Tape Service Routine. See Applications Project 61.

At the conclusion of the writing of the ID block, a file number is typed out indicating the file of the Editor's output. A file number of one is typed out unless one of the following occurs.

A) The last information on the magnetic tape was an ID block and no other information followed it. In this instance a file number of the existing ID block will be typed out.

B) If the operator types a 1 tab DDD tab (S) when the DDD is the number the operator wishes to have in the ID block, the DDD takes precedence over (A).

At the conclusion of the above the Editor will be loaded,

1. TITLE will type out and the computer is ready to accept instructions from the keyboard.

3.0 EDITOR (Package 1)

General Description of Editor

The function of the Editor is to process declarations and portions of statements as they are entered by the typist. In addition, obvious input errors are detected and reported.

The input to the Editor is an ALGO source program via alphanumeric typewriter. The output is the partially processed data in one of two basic formats. See Formats 1 and 2. In both formats, bits T_{29} thru T_{25} of the odd word contain an ID code, and bits T_{24} thru T_{16} of the odd word contain the binary equivalent of the entry number typed.

In preparation for a general input the computer executes a carriage return and types the next entry number. A flag word is entered into 2301 and line 19 is cleared. As each input character is typed, it is tested for "→". This character will cause an immediate termination of the entry and the Editor will reinitiate general input. Characters which are not "→" are entered into line 23 and subsequently into the lower end of line 19. When the entry is terminated by a tab ⓢ line 19 is transferred to line 18. Line 19 is cleared, the flag reset in line 23, the next entry number is typed by the computer and typing is gated for the next input.

Simultaneously the information in line 18 is processed. Beginning at word 6 and continuing by four-word intervals the contents are tested for zero. When a zero is found the number of words entered is then determined. One character at a time is picked up out of line 18, tested for special characters defined below and is used in building words of output. The various forms of output words are discussed later in Section 3.6. As the words of output are completed, they are stored in line 17 beginning with word u5. When the line is filled a check sum is placed in word u6 causing the line to sum to zero and a number beginning with 1 is placed in word u7 representing the line of output. This number is incremented only for the magnetic tape scratch pad mode. Line 19 is copied into 16, line 17 is copied into line 19 and is recorded on punched paper tape or magnetic tape. When the output is completed, line 16 is copied into line 19 and processing continues.

3.1 Character Processing

The Editor processes a particular entry in the following manner:

Each character is tested for a carriage return or space and if so, is ignored.

If neither, it is converted to lower case by removal of the seventh bit of the eight-bit character. It is then tested for one of the following special characters:

1. Colon (which in lower case is a semi-colon)
2. Equal sign
3. Tab
4. Open Parenthesis
5. Space

Any character other than the above special characters is used to build an identifier. The least significant six bits of each character is retained. The identifier is terminated when one of the above special characters is found. Any programmed identifier which contains more than five characters will be processed in its entirety but only the first five characters will be retained.

A colon after the first identifier indicates that the entry is a labeled statement. The Editor will insert a bit in T_1 of format 1, ignore the label identifier, remove the colon from the special character list and will restart the character processing. See Section 3.1.

The Editor analyzes the identifier by comparison with a stored table to determine if it is a statement or a declaration.

3.2 Statements Format 1, 2 words plus statement.

A statement is signalled if the identifier is one of the words in Table 1. The corresponding code from the Table is placed in the Statement Type (ST) position. An ID code (00000) is placed in the ID code position. The Table 3.1 contains in the 3rd and 6th columns only the special characters which can cause the selection of a particular statement type. SP=space, T=tabs.

1st	ST Code		ST	ST Code	
DO	000001	SP	RETURN	001001	T SP
IF	000010	SP (	"Assignment"	001011	= SP
FOR	000011	SP	BEGIN	001100	T
GO TO	000100	SP	TABS	010000	SP (
READ	000101	SP (	CARR.	010001	SP (
STOP	000110	T SP	PERIODS	010010	SP (
WRITE	000111	SP (	BELLS	010011	SP (
PRINT	001000	SP (	END	010100	T

TABLE 3.1

For example, if a tab immediately follows an identifier, only STOP, RETURN, BEGIN or END is tested for statement types. If none of these, an ERROR is printed; similarly for opening parenthesis. If "=" is the following special character, an assignment statement is automatically assumed. If a space follows and there is no match with the possible candidates, the identifier is assumed to be a declaration. If it does not match the possible candidates for declarations, then it is assumed to be an assignment statement. See Section 3.3.

If the statement type is TABS, CARR., PERIODS or BELLS, the Editor continues scanning until a closing parenthesis is encountered. The number contained within parentheses is converted to binary and placed in the REP position of Format 1.

If the type is READ or WRITE, the Editor will scan further for the presence of opening parenthesis, "P" and closing parenthesis indicating paper tape input or output.

If the statement type is END, the Editor decrements the level counter which starts with 1 and is incremented whenever a PROCEdure or FUNCTion declaration is encountered. See Section 3.3.2. When this counter is decremented to zero, the Editor ceases to process any further statements and enters the completion phase. See Section 3.4.

At the conclusion of statement analysis, the number of characters processed in making the identification, excluding label identifiers, is entered into the CC position, and the number of words occupied by the statement is entered in the WC position of Format 1. The 8-bit characters forming the statement are appended to Format 1 and the entry is passed onto line 17 for output.

3.3 Declarations Formats 2 thru 8

A declaration is determined if the identifier is followed by a space and is one of the words in Table 3.2. The corresponding code from the Table is placed in the ID position of Format 2.

If the identifier does not match any entry in Table 3.2, an assignment statement is assumed. See Section 3.2.

PROCEdure	1xxxx	FORMAt	00110
FUNCTion	1xxxx	CONSTant	00111
LIBRAry	00101	DATA	01000
SUBSCript	00011	INPUT PARAM	00001
		OUTPUT PARAM	00010

TABLE 3.2

After the declaration type is determined, the Editor scans for one of the following special characters, discarding any spaces encountered: opening parenthesis, closing parenthesis, comma and tab. Any other characters are used for building identifiers in 6-bit codes, retaining the five most significant characters. Note that alphabetics, numerics and other characters can be included. Further processing depends on the declaration type detailed below. This identifier is place in position L_1 thru L_5 of the of the proper format.

Often a declaration entry may contain several identifiers. Usually for each identifier, a separate Format 2 is used. The Fractional Entry Number position contains a count of multiple identifiers in a single entry. A maximum of 16 multiple identifiers can occur.

3.3.1 Title Format 3, 2 Words

The first input is assumed to be the title, ID code 10000 is entered, EN code 1, and L_1 thru L_5 contains the Title. It is passed on to output.

3.3.2 Procedure Formats 2 and 3, 2 Word Groups

For each procedure or function, a level counter is incremented, starting at 1. This counter is represented by xxxx in Table 3.2 and forms part of the ID code. 0 is placed in T_6 of Format 3.

The character "=" is added to the special character list above.

If the special character is a tab, the entry is terminated, Format 3 is passed to the output line.

If the special character is opening parenthesis, the Format 3 containing the procedure name is passed to output; processing continues on to an input parameter.

If special character is "=", the Format 2 with ID code of 00001 is passed to output for the current input parameter. If there is no input parameter preceding the "=", an error is caused. If the input parameter is present, processing continues onto an output parameter.

If "," is special character, processing continues with either input or output parameters depending on current parameter, after passing current format to output.

Format 2 for output parameter has ID code 00010.

If ")", final output is passed on. A tab terminates Editor processing of this entry.

3.3.3 FUNCTion Format 3, 2 Words

A 1 bit is placed in T_6 of Format 3. Further processing is identical to PROCEdure. See Section 3.3.2.

3.3.4 LIBRAry Format 4, 2 Words

The "(" terminates the identifier which is placed in L_1 thru L_5 of Format 4, and precedes a 7-digit hexadecimal number which identifies the routine. The 3rd and 4th characters containing the starting location in a line are extracted, converted to binary, and placed in SSL. Zeros replace the 3rd and 4th characters of the hex number which is placed in the format as the check sum.

The ")" terminates this part of the entry and passes Format 4 to output. Processing continues.

The "," resets to process another library declaration.

The tab encountered after an identifier causes an ERROR, otherwise terminates processing.

3.3.5 SUBSCript Format 5, 2 Words

A "(" signifies two subscripts separated by a comma followed by a closing parenthesis.

A "," following an open parenthesis separates subscript pairs. A two word group is built for each subscript entered whether or not paired. The 1st of the pair is assigned an index register number and moved to output. A ")" terminates the 2nd of a pair of subscripts. The 2nd of the pair is moved to output.

A "," outside parenthesis resets for another subscript processing, and moves Format 5 to output.

A tab terminates processing.

Each subscript identifier is assigned an index register number. Paired subscripts will always be given index numbers in a certain sequence. An even index number is assigned the first identifier of a pair and an odd index number to the second of a pair. The two index numbers are in consecutive order. Single subscript identifiers, those not enclosed in parentheses, are assigned index numbers in consecutive order, unless a number is skipped due to a pair of subscripts. If this is the case, the first single subscript identifier following a pair will be assigned the index number which was skipped. The maximum number of indices is 20 registers.

The index numbers are determined in the following way. A word in memory contains twenty "1" bits. Each bit represents an index register number from 2 to 21 in succession. When a subscript identifier is assigned an index number, a "1" bit corresponding to this number is cleared to zero, so that the same index number will never be assigned to more than one subscript.

3.3.6 FORMAt Format 6, 6 Words

The "(" signals the start of format generation, and the end of the format name. Each numeric processed in this parentheses is accumulated, the alphabetic characters determine the type of output character format. Illegal alphabetic characters cause ERROR. The format is generated. A sign format character is automatically the first format character, whether or not declared.

The ")" terminates format generation by adding an end code to the format. If the accumulated number of digits exceeds 15, an ERROR occurs, otherwise, the total number is entered into TD position. A count is kept of the number of digits prior to the decimal point and is entered in DBD position of Format 6. Format 6 is passed on to output

The "," resets for another format.

The tab terminates processing.

3.3.7 DATA Format 7, 2 Words

The "(" terminates the DATA name which is placed in Format 7 with an ID code = 01000.

The "," inside this parentheses separates the lengths of a matrix array.

The ")" causes the number contained in parentheses to be placed in the size position of Format 7. If two numbers are in parentheses, their product is entered into the size position. The format is moved to output.

The "," outside of parentheses resets for another data array.

The tab terminates processing.

3.3.8 CONSTants Format 7, 2 Words

Processing of the constant declaration is similar to that of DATA. However, after a closing parenthesis Format 7 with an ID code = 00111 is moved to output and a different branch is taken.

The Editor disregards any information which may have been entered for the next entry and retypes the same entry number, gates numeric type-in and waits on input of the first constant of the array. The constant can be entered as fixed point integer, mixed fraction or in floating point form. In any case it is converted to the floating point binary representation and passed to output. This is repeated, indexing the entry number, until the number of constants declared in parentheses has been entered. If this is an odd number, a final word of zeros is passed to output. The Editor then returns to further processing of the CONSTant declaration. See Section 3.3.7.

3.4 Completion Phase Format 8, 4 Words

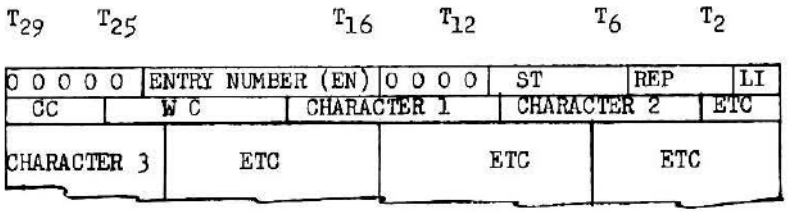
The completion phase is entered when the level counter is decremented to zero. See Sections 3.2, 3.3.2. Four words in Format 8 are constructed and moved to output. Each pair of words contains 511 in the entry number position, 14 and 15 respectively in the F.E.N. (Fractional Entry Number) position, the largest possible entry numbers. The ID of the first pair is the statement ID. The statement type position contains the END code, See Table 3.1. The ID in the 2nd word pair is (01001) the unambiguous End of Program code. The index register assignment code, See Section 3.3.5, is entered into the last word and the format is passed to output. The final information in line 17 is punched or recorded on magnetic tape and the Editor phase is completed.

3.5 Editor Error Routine

The error routine returns carriage, types "ERROR", clears line 19, sets flag in 23:01, rings bell, types out the entry number of the statement or declaration in which the error was located, and gates alphanumeric type-in.

When the error routine finds an error in a declaration, part of the declaration might already have been transferred to the output storage line. When the programmer types in the declaration correctly, that part of the declaration which was put in the output storage line is repeated with the same entry numbers. Package No. 2 (Rator-Cator) will recognize these as being repeats and ignore them.

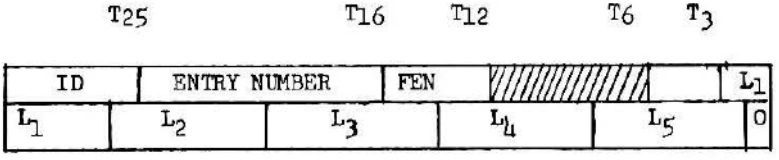
3.6 Formats of Output of Editor



FORMAT 1

This is the basic format for statements.

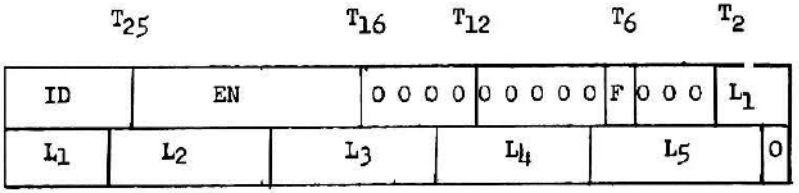
ST	Statement Type (See Table 3.1)
REP	Repetition for BELLS, TABS, CARR., PERIODS
LI	Label Indicator 0 (No label) 1 (Label).
CC	Character Count
WC	Word Count
Characters	The actual 8-bit characters entered for the statement.



FORMAT 2

This is basic format for declarations.

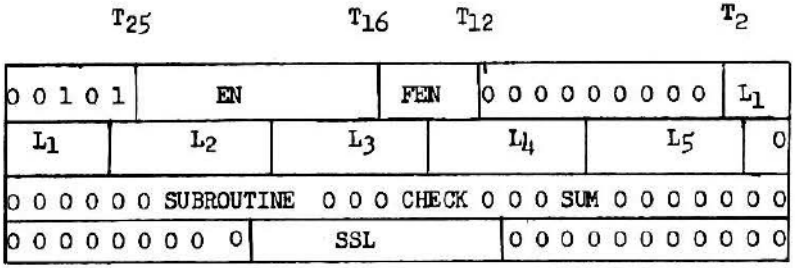
ID	Identification of ENTRY TYPE. See Table 3.2.
FEN	Fractional Entry Number. See Section 3.4.
L_1 thru L_5	An identifier of 5 - 6 bit characters. The hatched area is specified for particular declarations. If not used it is filled with zeros.



FORMAT 3

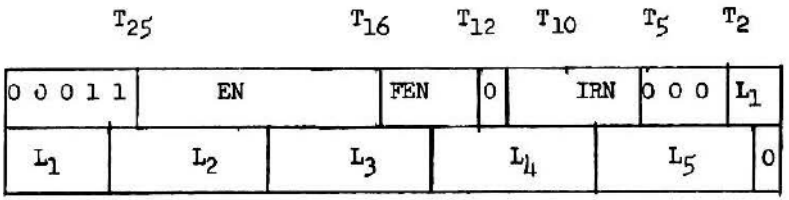
F = 0 if PROCEDURE See Section 3.3.2

= 1 if FUNCTION



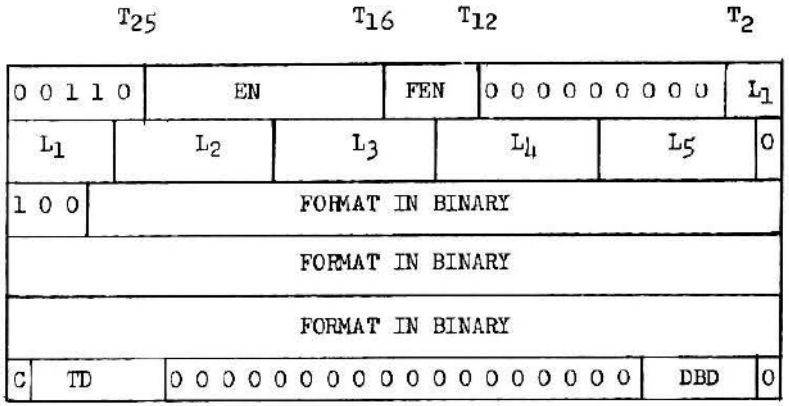
FORMAT 4 LIBRARY

SSL = Subroutine Starting Location. Section 3.3.4



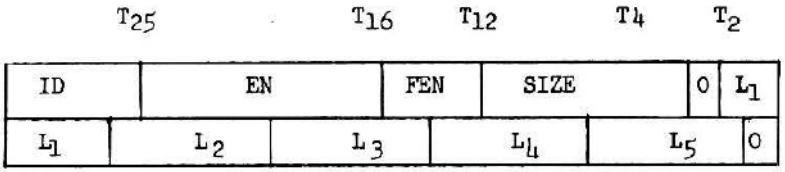
FORMAT 5 SUBSCRIPT

IRN, Index Register Number. See Section 3.3.5



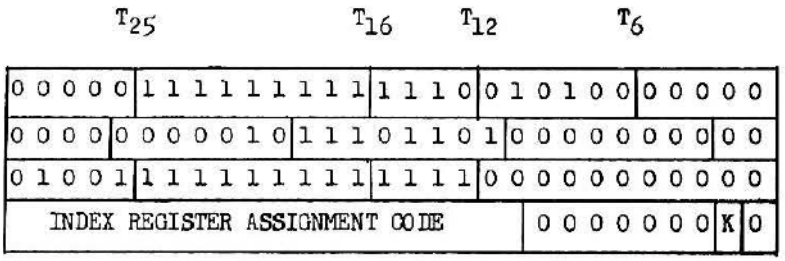
FORMAT 6 FORMAT

C = 1 if a carriage return enters into format.
TD = Total number of digits. See Section 3.3.6.
DBD = Number of digits before decimal.



FORMAT 7 CONSTANT, DATA

SIZE = Size of constant or data array. See Section 3.3.7, 3.3.8.



FORMAT 8 COMPLETION

The first pair is a Format 1, with a tab code in the Character-1 position.
The second pair is a special END of program type. See Section 3.4.
K = 1 if Index Register Number is zero.

4.0 RATOR-CATOR (Package 2)

General Description

The function of the Rator-Cator, short for Generator Allocator, is to accept as input the output from the EDITOR, to replace symbolic identifiers with allocated memory addresses for variables and constants, to replace statement labels with reference numbers, and to separate statements into basic units called elements. The outputs from the RATOR-CATOR are sets of elements, blocks of program constants, declared constants, and formats in the order of their assigned memory locations. The output also contains a list of library routines declared.

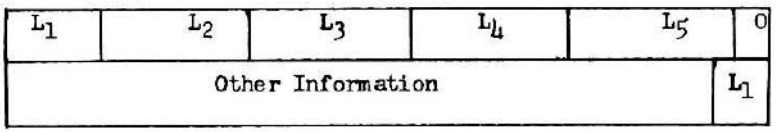
The EDITOR output is read into line 19, and transferred to line 16 for processing. Locations 18.00 thru 18.99 are used to hold constant arrays, G-15 formats passed on from the EDITOR, and for program constants. When these locations are filled, a line balancer is placed in word 18.u6, control commands inserted in u5 and u7 and the line is punched or recorded on magnetic tape.

The elements of the separated statements are inserted in line 11 beginning with u5 and working down to and including location 45. When full, a line balancer is placed in u6, control commands in u7 and 44, and the 64 words are recorded or punched.

4.1 Description of Tables and Lists

The assignment of memory addresses to variables, and reference numbers to statement labels depends on information that is secured from tables. These tables are constructed from data originating in declarations, control statements and labels.

There are nine tables constructed by the RATOR-CATOR. The first seven require two G-15 locations for each entry. The two locations are separated by 50 words within the same channel, e.g. if the first entry is in 15.03, the corresponding word is in 15.53. This allows processing and decision-making to occur on the first word of the pair, and the possible pickup of the second word in the same drum revolution. The seven tables have entries of the form

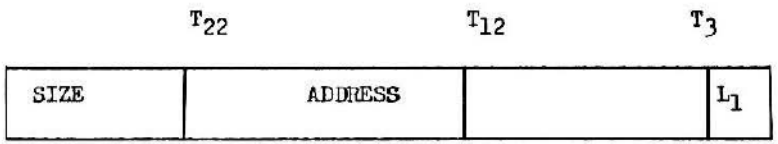


where L_1 thru L_5 is the symbolic identifier in the same format as described in the EDITOR, see Section 3.6. The remaining bits in the second word contain coded information relating to the particular table involved.

4.1.1 VARIABLE TABLE 49 entries, 2 words per entry. Located 1500-1548 and 1550 thru 1598.

The Variable table contains symbolic identifiers and corresponding addresses of all simple variables, data and constant arrays.

Format of the 2nd Word



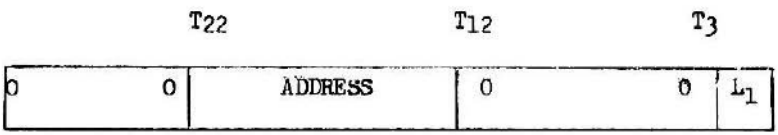
ADDRESS is the interpretive address assigned for the object program. It is an integer from 7 to 999. If the variable is a DATA or CONSTANT array, it is the address of the first location of the array. The G-15 address which corresponds to the interpretive address is found by adding to the first digit the channel base 09, and using the last two digits as the G-15 word location within the channel. Thus 435 in interpretive memory corresponds to G-15 location 13.35.

SIZE is filled with zeroes if the variable is not a DATA array. Otherwise it contains the number of words of the array.

4.1.2 FORMAT TABLE 8 entries, 2 words per entry, location 1220-1227 and 1270-1277.

Each entry in the Format table contains the symbolic identifier and the address of the first word of the four-word format group. One permanent entry in the FORMAT table is the floating point format (FL).

Format of the 2nd Word



4.1.3 PROCEDURE PARAMETER LIST 30 entries, 2 words per entry, location 1301-1330 and 1351-1380.

The Procedure Parameter List contains a list of all the input and output parameters and their associated addresses for all procedures and functions. This table is cleared whenever the END statement for a procedure (not a function) is encountered.

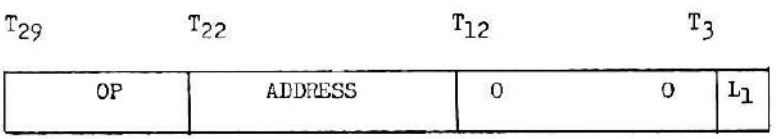
Format same as 4.1.1

4.1.4 LIBRARY AND DICTIONARY TABLE 20 two-word entries located 1420-1439 and 1470-1489.

This table contains the identifiers and starting address of library subroutines. It also contains the following six key words which can be considered as built-in subroutines. They are handled similar to the declared library routines.

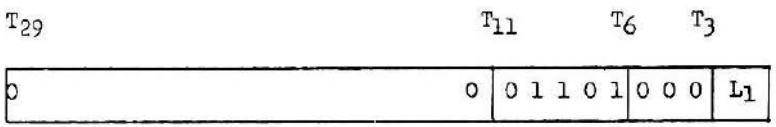
Name	OP Code	Name	OP Code
KEYBD	08	NEG	5u
SQRT	59	LOG	5v
ABS	5w	EXP	57
(library declared	5y)		

Format of 2nd Word

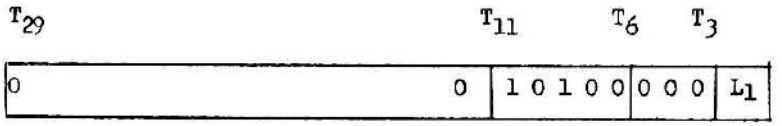


OP is a number used to designate the operation code in the object program. For routines declared in the LIBRAry declaration OP = 5y in hexadecimal notation.

The library and dictionary table also contains the words BEGIN and END which are encountered as statement parentheses. In this case the formats of the 2nd words are respectively



for BEGIN

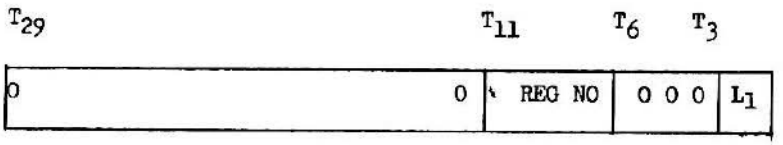


for END

4.1.5 SUBSCRIPT TABLE 20 two-word entries, located 1400-1419 and 1450-1469.

The subscript table contains the symbolic identifiers for subscripts and the index register number assigned.

Format of 2nd Word

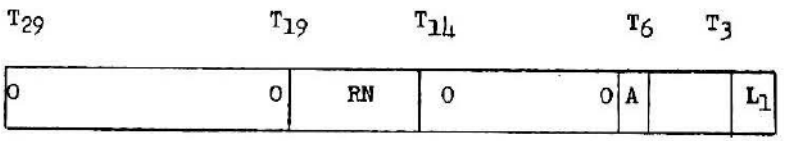


REG NO is the index register number assigned by the EDITOR, See Section 3.3.5.

4.1.6 LABEL TABLE 20 two-word entries, located 13.31-1350 and 13.81-13u0.

The label table contains all label identifiers used in GO TO statements and their cross reference numbers. It is cleared whenever the END statement of a Procedure is encountered.

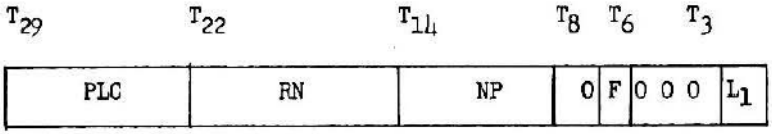
Format of 2nd Word



RN is a reference number which is used for cross reference purposes. This reference No. is used to later identify the labeled statement in Pkg. #3. The RATOR-CATOR does not assign addresses to commands that are constructed from the ALGO statements. This assignment is done by the LYZER-LATOR. See Section 5.0. Since the RATOR-CATOR removes all symbolic identifiers, it replaces the symbolic labels with cross-reference numbers which connect the label identifiers with address to be assigned by the LYZER-LATOR. "A" is a bit position containing a 1 if the label has been encountered immediately preceding the statement that it labels.

4.1.7 PROCEDURE TABLE, 10 two-word entries Located 1440-1449 and 1490-1499.

Format of 2nd Word



This table contains names of all the procedures or functions of a program.

PLC is the parameter list counter. This number designates the location of the first parameter in the Procedure Parameter List, See Section 4.1.3.

RN is a reference number for the starting command location of the procedure or function. See Section 4.1.6.

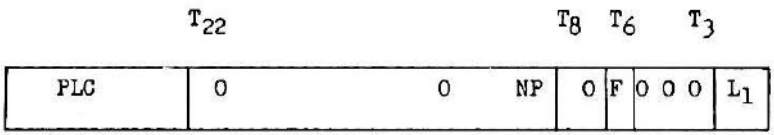
F is the function flag bit differentiating between the two types of processes. F=1 for FUNCTions, and F=0 for PROCEdures.

NP is the number of input and output parameters.

4.1.8 PROCEDURE LEVEL TABLE 4 two-word entries in consecutive locations. Location 1500-1507.

This table is an auxiliary table used to build the Procedure Table. Location 1599 is a required zero.

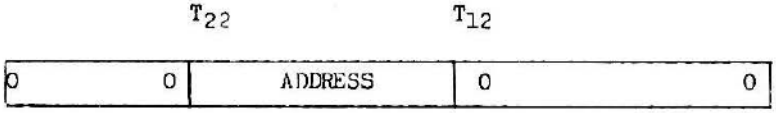
Format of 2nd Word



Refer to format description in 4.1.7.

4.1.9 LIBRARY-CHANNEL LIST 8 single word entries. Location 1400-1407.

Format of single word



ADDRESS is a multiple of 100 and indicates the channel in which the library routine is stored, e.g. ADDRESS = 0800 indicates the G-15 channel 17. See Section 4.1.1. The location in the list is indicated by the routines check sum.

4.2 Construction of Tables and Lists

All tables are initialized during loading. The RATOR-CATOR reads successive blocks of EDITOR output, performs sum checking of the block and transfers it to line 16 for further processing starting with words u4 and u5 and working down, two words at a time are handled. The entry number is compared with the previous entry number. If not greater, a switch is set to disregard this entry. This may occur when an input to the EDITOR is incorrectly entered at first and corrected immediately on the next line. See Section 3.5.

Next the ID code is inspected. If it is not 00000, it is therefore a declaration and is used to form a swtich to enter one of several subroutines to handle the particular type of declaration. These subroutines normally extract information from the entry to construct the tables and lists described above. A description of the basic operations performed by each subroutine follows.

4.2.1 Title ID = 10000.

4.2.2 Procedure ID = 1xxxx

The procedure identifier L_1 thru L_5, and bit T6 (F=0 for title and procedure) of the second word is extracted from the input pair and united with the Parameter List Counter (PLC) and placed into the Procedure Level Table. The position in this table is determined by the level of nesting of this procedure. This level is designated by a level counter and is added to the base address of the Procedure Level Table. The first entry in this table is always the TITLE of the program. It automatically has level 1. The table can hold up to 4 levels nesting excluding the TITLE entry.

4.2.3 Function ID = 1xxxx

The FUNCTion declaration is handled identical to the PROCEdure declaration. Bit T6=1. See Section 4.2.2.

4.2.4 Process Parameters ID=00001 or 00010.

The two-word input group associated with these ID numbers are the input and output parameters for a procedure. The RATOR-CATOR extracts the identifier (L_1 thru L_5), allocates an address for this parameter and places this entry into the Procedure Parameter List. The location of this entry within this list is determined by the current value of the PLC. The PLC is incremented by 1.

4.2.5 Subscript ID=00011.

The identifier and index register number is extracted from the input pair and is precessed into the Subscript Table.

4.2.6 Library ID=00101.

The input consists of four words. The check sum digit is picked up from the third word (See format 4, Section 3.6) and is used to inspect the contents of the corresponding word in the Library Channel List, See Section 4.1.9. That is, if the digit were 3, then the third word in the Library Channel List is interrogated. If that word is zero, the "next available channel number" for the subroutine is secured and placed in the interrogated position in the Library Channel List. If it is not zero, or if just assigned, channel number is combined with the Subroutine Starting Location (SSL), to form the complete address for the subroutine. The Library identifier and the subroutine OP code (5y00000) are combined with this address and are precessed into the Library and Dictionary Table. See Section 4.1.4.

4.2.7 Format ID=00110.

The third, fourth and fifth words of the input contain the actual format. These along with the sixth word containing control information for the OP package, are passed to the CATOR which allocates space for the format, places it into the constant pool in line 18, and gives the address of the first word of the format. This address is combined with the format identifier and is precessed into the Format Table. See Section 4.1.2.

4.2.8 Constants ID=00111.

The entry number is extracted and typed. The address of the first constant of the set is determined by the CATOR and is typed. The address is combined with the identifier and is placed in the Variable Table. See

Section 4.1.1. The size is extracted and used as a counter. The constants following are passed onto the CATOR for storage and the counter is decremented by 1. When the counter is zero, processing of the constants ends. If an odd number of constants were inserted, one final word of zero in the two-word input groups is neglected.

4.2.9 Data ID=01000.

The size is extracted from the input pair and sent to the CATOR which allocates space (in the high end of memory) for the data array. The address of the first allocated element of the data array is combined with the identifier and the size and is processed into the Variable Table. See Section 4.1.1. The identifier and address are typed.

4.2.10 End of Program See Format 8, Section 3.6

This input signals the end of the program. The End-Off routine is entered. This routine punches out or records on magnetic tape all partially filled data and performs other bookkeeping operations.

4.3 Processing of Statements

Statements are identified by an ID code of 00000. The different types of statements are determined by the ST code. See Format 1 in Section 3.6. In general statement processing proceeds as follows. When a new statement is encountered the next character location counter, called the bit counter is loaded with 18, signifying that the first 8-bit character of this statement occurs in bit 18 of the current word. The bit counter and word counter for line 16, determine uniquely the next character. These counters are used in the Next Character Routine which gets the following character and suitably adjusts the bit and word character.

The label indicator (flag) is interrogated. If the statement is labelled, the label is picked up. A colon terminates the label. The Label Table is scanned for this identifier. If absent, the next reference number (RN) is assigned. The label is typed out followed by the assigned reference number. The label identifier, the reference number, an "A" bit is then processed into the Label Table. See Section 4.1.6. If it is in the table, only an "A" bit is inserted. The statement type is extracted from the input word and is combined with the reference number and is placed in the element list for output to the LYZER-LATOR.

The element list (11.45 thru 11.u0) consists of single word entries. An entry contains the allocated address of a variable, index register numbers, an operation symbol such as *, =, -, "tab", or control information such as statement type. See Table 4.1. The element list contains no symbolic information.

Next a branch is made on the statement type code, which determines a statement mode for further processing of this statement. These modes determine which tables are to be searched.

Mode	
0	Normal search to match identifiers
2	Search Subscript table, then normal search
3	Search Label Table only
4	Search Procedure Table only
5	Search Format table only
6	Search Library and Dictionary table only

The declarations IF, READ, WRITE, or ASSIGNMENT set mode 0. Declaration FOR sets mode 2 and a First Identifier flag. GO TO sets mode 3; DO sets mode 4; PRINT sets mode 5; STOP, RETURN, TABS, CARR, PERIOD, BELLS set mode 6.

The statements are then processed character by character. Five classes of characters are considered: alphabetic, numeric, separator-operator, hollow point, and "do nothing". There are three modes for character processing: initial, alphanumeric, numeric. The 15 combinations determine the detailed functions that occur. Refer to flow charts for the various detailed operations. Briefly, however; if the string of characters is a decimal number, it is converted to binary, allocated storage, stored in output constant area, and the address placed in the element list.

If the string of characters is an identifier, the appropriate tables are searched depending on the statement mode. If a variable is in the table, the address is passed on to the element list. If a variable is not in the table, it is allocated a storage location. The identifier and address is typed, and the address is passed on to the element list. If the string is an operator such as =, or +, or neg, etc. a code for the operator is passed on to the element list; similarly, for separators such as (,), open and closing brackets.

The end of each statement is signalled by a tab character. This character is passed to the element list for LYZER-LATOR use.

Table 4.2 contains the detailed codes of information in the element list.

TABLE 4.1

Codes for Statement Types

DO	0000010
IF	0000020
FOR	0000030
GO TO	0000040
READ	0000050
STOP	0000060
WRITE	0000070
PRINT	0000080
RETURN	0000090
END	0000140
ASSIGNMENT	00000v0
CARR	0000110
TABS	0000100
BELLS	0000130
PERIODS	0000120
BEGIN	00000w0

TABLE 4.2

From Rator

=	-2100000
>	-2200000
<	-2300000
+	-3500000
-	-3100000
*	-4w00000
/	-4600000
↑	-5600000
expon	5700000
sqrt	5900000
neg	5u00000
log	5v00000
subroutines	5y-ADDR-00
KEYBD	0800000
TABS	6000000
CARR	6100000
PERIODS	6200000
BELLS	6300000
ABS	5w00000
TAB	-1000000
(	0v00000
)	0w00000
[	0x00000
]	0y00000
,	0z00000

5.0 LYZER-LATOR (Package 3)

General Description

The function of the Lyzer-Lator, short for Analyzer-Translator, is to analyze the element list from package 2, generate and translate commands into the object program language, and place them on the drum in the positions from which they are executed at run time. In addition, all formats and constants are placed on the drum.

The Lyzer uses three tables or lists for its processing. The first list is called the input list. This is the storage of the characters sent from package No. 2. The first entry is in word location number 1 and the last entry in word location number 61. (in Line 18).

The second list is called the L_j list. This list is used for storage of characters which have been picked up from the input list and have not been processed, (Lines 22, 08). Another use of this list is the storage of future commands and "begin" statements to be paired with future "end" statements.

The last list used is called the label table, (words u0 through u7 in lines 13 through 17). This table is used for reference to the starting locations of labeled statements and procedures. Up to 40 labels can be included.

Constants and formats are placed on the drum as they are received from package 2.

Element List Inputs

These inputs come in sixty-one word blocks from the Rator-Cator package. Each statement in this sixty-one word block is separated by a tab. Each begin and end statement is separated by a tab. Each statement contains as the first element a word which describes the type of statement. The Lyzer looks at each of the statements and determines by this statement type code what to do with the statement. The rest of the words in the statement can be either addresses of variables, constants, or operators. An operator is described as being a quantity of the form: +, -, *, /, ↑ (signifying exponentiation), =, <, >, or it can mean an operation such as square root (sqrt), sine, cosine, or some other subroutine type operator. As each statement is identified, the proper subroutine is selected to process the following elements in the

statement. For these statements different commands are generated in the Lyzer which will be passed to the Lator via line 23 and there further processed to form the final command. These commands will be sequentially put on the drum starting in line 9, or whichever line is specified from the Rator-Cator package. When a reference number of a labeled statement is encountered, it is typed followed by the address of the commands for the statement.

5.1 The Assignment Statement

The Assignment Statement code is a $\vee$ (See table 4.1). When this code is detected, control is given to the assignment subroutine. Each operator encountered is compared against the preceding operator to see if the precedence is greater or less than. (Refer to ALGO Programming Manual). If the precedence is less than, or equal to the preceding operator, then the element preceding the current operator will be processed. The following is an example of an assignment statement: C = A + B. The seven elements passed from the Rator-Cator package that the Lyzer will pick up are of the following form: a code for assignment ($\vee$) followed by an address for "C", an equal sign, an address for "A", a plus sign, address for "B" and then a tab. When the assignment code is encountered, zero will be put into the assignment indicator and the next element looked at. This is an address, therefore it will not be operated on at this time. The next element is an equal sign. This is compared against the last operator, non-existent in this assignment statement, therefore, the program looks further and passes the address of "A" and finally finds the plus sign. The precedence of the plus sign is greater than that of the equal sign, therefore, it is not acted upon at this time and the program looks further and finds the address "B" and finally the tab which has the lowest precedence of all. At this point it must go back and process the statement. First it looks to see if anything in the accumulator is of value, and at this time nothing in the accumulator is of value, therefore, the program does not store it. The last address, B, is picked up and clear and add "B" is generated, and stored into the list to be passed to the Lator. The program looks at the preceding operator and finding it a plus, generates a command to add "A". Thus far two commands have been built, clear and add "B", add "A". The preceding operator is inspected. It is an equal sign, therefore, a store command is generated. So three commands are built -- clear and add "B", add "A", store in "C", and the statement is complete. At this point control is given back to the master program to investigate the next element. Each assignment statement is investigated in a similar way. Push down lists are used in this process of going ahead and coming back.

5.2 The Print Statement

The Print Statement is similar to the assignment statement. It uses the same subroutine, except that an indicator for a print will be set instead of the zero as in the assignment indicator. The print statement is of the form, code for print followed by address of a format in parentheses, then an equal sign, then the variable or expression to be printed. When The Lyzer processes the print statement it will form all commands that are necessary to evaluate the expression but will not build the store command. At this point the indicator statement type will be checked and a print command will be built.

5.3 The For Statement

"For" Statements are of the form -- a "for" code, followed by either the address of a variable, or the number of the index register declared as a subscript, then an equal sign, followed by the base, opening parenthesis, difference, closing parenthesis, limit, and concluded by a tab. This Statement goes through the assignment statement subroutine. However, a special "for" statement indicator will be set. No commands are built because no arithmetic operations are allowed. When the tab is finally encountered to conclude the statement the "for" indicator is sensed and the "for" statement subroutine is used to form special looping commands. Those commands generated are of the following form. If the element incremented by the "for" statement is an index register, the program forms and sends the commands for setting the base, setting the difference, and setting the limit in the index register. Then it forms the commands to increment the index register and branch on incrementation. These last two commands are put into a list which will be picked up after the following statement is processed, (possibly a compound one bracketed by Begin and End). If the element to be used is a variable, and has not been declared as a subscript, then two commands are built, Clear and Add the Base, and store in the variable address. Then the Lyzer forms the commands, Clear and Add the variable, add the difference, store back in the variable, subtract the limit and branch on minus. These commands are stored into the list and will be picked up after the following statement is processed.

5.4 The "If" Statement

The operator in an "if" statement will be an equal, greater than, or less than. These are of the form: "if" statement code, followed by a variable, or expression followed by the operator (equal, less than, or greater than) followed by another variable or expression, and concluded by a tab. The commands formed here will be those necessary to evaluate the expression at the left and right of the operator and then either subtract or Inverse Subtract the first

variable, or expression and either branch on minus or non-zero depending on the operator. For the branch command, a dummy is sent to the Lator and this dummy stored on the drum. However, the command counter which is used to put the commands in their proper locations on the drum is stored away and at a future time when the branch address is determined, this new address is formed with the branch instruction and put in the proper place on the drum.

5.5 The "Do" Statement

The "do" statement means to go to a subroutine, which is called a procedure, operate this procedure, and come back to the main program. The two commands generated to do this are: Mark-Place and Transfer. The "do" statement will be of the form: "do" statement type code, followed by a reference number to signify which of the procedures to go to. The Lyzer picks up the reference number, uses it to look into a label table to determine whether the procedure has been processed. If it has not been processed, the present command counter is placed in a location in the label table which corresponds to this procedure. If this procedure has been processed the starting location will be picked up from the label table. An unconditional branch command will be formed.

5.6 The "Go To" Statement

The "go to" statement is very similar to the "do" statement except that it generates only an unconditional branch command. The "go to" uses the same logic as the "do" statement except that no mark-transfer is generated.

5.7 The "Read and Write" Statements

When these statements are encountered a command for "read" or "write" is built followed by a "set base and limit of index register number twenty-two", which is a special index register used for the "read and write" statements. The base is set to the starting address and the limit is set to the starting address plus the dimension of the array or variable which is to be read or written.

5.8 The "Begin" Parenthesizers

There are two types of "begin" parenthesizers, a procedure begin, and a statement parenthesizer. When the "begin" of a procedure

is found, the label table is set with the address of this "begin". If this location of the label table is already set, this means that the procedure has already been called for, and a location of a command which has to be altered is in the table. A new unconditional branch to the current location is stored in its proper location on the drum.

The other type of "begin" is a statement parenthesizer. On the coding sheet this will look like a "begin" following a statement. These are used following an "if" or a "for" statement, and they will be terminated by an end parenthesizer in some following statement. These "begins" will be stored into a list and when an end which will pair with this begin is encountered, the "for" or "if" statement's commands which have been held for future use will be stored onto the drum at this time in their proper location.

5.9 External Control Statements

Carriage returns, tabs, bells, and periods are special commands which cause external operations. These will be of the form: a code for carriage, bell, tab, or period, followed by the number of times these special operations are desired. A command code containing the number of operations is built.

5.10 The Labeled Statement

When the Lyzer looks at the statement type code it also investigates to see if a reference number is assigned to this statement. If there is a reference number, meaning the statement was labelled, then the current command address held in the command counter is put into the label table. When a "go to" is encountered, the proper branch command can be formed. Here use is made of the same logic as was used for the "begin" statement. If there was a "go to" this label already called for, then a previously assigned address will be in the label table and a patch will have to be made on the drum to complete the old branch instruction. Also, on a labelled statement, the Lyzer-Lator prints out the beginning location and ending location for the labelled statement, after printing the reference number of the label. This will be typed out when the statement is completed. An extra command (snapshot) is formed at this time.

5.11 The "Stop" Statement and the "Return" Statement

The Lyzer builds a "Stop" Command or a "Return to Mark" command

when encountering these statements.

5.12 Subscripted Variables

The address of a variable can be subscripted. These will be of the form: opening bracket, the subscript or subscripts, followed by a closing bracket. The subscript can be a simple or complex subscript. A simple subscript is described as being one which involves only the subscript. For instance, if a variable has I as a subscript, this would look like address of the variable, or if there was a pair of subscripts, it would be the address of the variable, I, J. If it was a complex subscript it would be of the form, address of variable, I $\pm$ D, J $\pm$ D. The Lyzer adds to the address of the variable any numeric quantities within the square brackets, plus the index register or registers which the subscripts designate.

5.13 The "Procedure" Call

When a programmer desires to use a procedure he writes a procedure call. The procedure call comes from the Rator-Cator in the form: reference number of the procedure, opening parenthesis, addresses, the first address is that of the current input parameter, the second address is that of the formal input parameter used in the declaration of the procedure. Two addresses occur for each of the inputs specified. An equal sign separates the inputs from the outputs. The outputs are also pairs of addresses. The first of the pair is the address of the formal output parameter, the second of the pair is that of the current output parameter. The series will be terminated with a closing parenthesis. The Lyzer will form the commands, "Clear and Add" the input, "Store" in the input parameter location, for each of the input parameters. When the inputs have been processed a mark place command will be generated followed by an unconditional transfer to the sub-procedure. After the equal sign the commands "Clear and Add" the formal output and "Store" in the current output, are generated.

5.14 LATOR (Package 3)

The function of the Lator is to translate the commands built by the Lyzer into the object program language, and place them on the drum in their correct locations.

Commands are received from the Lyzer in groups of 1 to 5 commands via line 23 and AR, and are translated in sequence, until all commands are translated at which time a return command stored by

the Lyzer is executed.

Commands built by the Lyzer are tested for arithmetic commands. If the commands are arithmetic the index registers, if any, are extracted, and the address is converted to G-15 channel and word. If the operand address is zero, the operand is the named index register, and a special arithmetic command is assembled. If the operand address is not zero, a conventional arithmetic pick-up or store command is assembled.

The commands are stored on the drum as they are assembled. After storing each command a test is made to see if the program has exceeded the allowable memory. If so, an error alarm is sounded. If the memory has not been exceeded a test is made to determine if this is the last command in the line and if so a transfer command to the first command in the next line is assembled and placed on the drum. After storing a command on the drum line 23 is tested to determine if any more commands are to be translated, and if so, the translation proceeds, if not, the return command is executed.

All commands translated and assembled by the Lator use this same routine to place the command on the drum.

If the command is not an arithmetic command, it is tested to see if it is in a "fixed form" category (example - keyboard, log, etc.) if so the correct fixed form command is picked up from a table and stored on the drum, if not, an N number switch distributes on the type of command. The appropriate dummies are picked up and combined with the address and/or index registers where necessary and the proper command is assembled.

Transfers are received in a different entry point of the Lator, where the appropriate dummy is picked up and added to the channel and word to assemble the command.

The address conversion subroutine tests for the special addresses of zero, one, two, or the accumulators, and supplies the proper G-15 address for these quantities. Other addresses are converted as described in section 4.1.1.

The "snapshot" subroutine types the reference number and assembles a command containing the address of the labeled statement plus the address of the snapshot command.

NUMERIC VALUES OF SYMBOLS USED

From Lyzer

Store	8y00000
CAD	-3900000
ADD	-3500000
Csu	-3700000
Sub-Inv.	-3100000
Sub	-3200000
Mul	-4w00000
Div-Inv.	-4600000
Div	-4300000
expon	5700000
sqrt	5900000
neg	5u00000
log	5v00000
subroutines	5y-ADDR-00
Gate input	5800000
Tabs	6000000
Carr	6100000
Periods	6200000
Bells	6300000
Abs	5w00000
Print	6700000
Punch	7z00000
Read	8100000
Return	5600000
Stop	5500000
ST-B Rel #	8700000
ST-D "	8800000
ST-L "	8900000
ST-B Acc	8y00000
ST-D "	8z00000
ST-L "	9000000
Increment	7200000
Mark Place	7500000
Transf after Inc	000w000+CC
Uncond. transf	0000000+CC
Trans. Non-zero	000v000+CC
Trans. non-neg	000u000+CC
Accum. 1-8	0000600-0002200
Const.s 0-1-2	0002600 0002u00 0002y00
Accum	0003200

TABLE 5.1

6.0 OP PACKAGE

General Description of OP Package

This routine is a single precision floating point interpretive routine contained in lines 00-08, words 00-06 of line 9, and words u0-ul lines 9-18.

Line 5 is used for execution of subroutines.

Interpretive memory is number 007-999, 100 words each in lines 9-18, excluding 9.00-9.06, the interpretive memory is continuous.

Subscripts are assigned index register locations, 22 index registers (numbered 2 - 23), 2 in each line (words u2-u7, lines 8-18). Two index registers, 22 and 23, in line 18, are not available for use by subscripts.

The accumulator is MQ repeated in both sides, complemented if negative.

6.1 Command Pick-up and Interpretation

Four commands are picked up in line 22 and re-arranged so that the commands can be precessed into and executed from AR. The transfer command to pick up four commands is incremented and placed in line 22 so that normally every 5th command executed picks up four new commands into line 22.

AR is tested for sign. If the command is positive it is executed at word time ul. If the command is negative, 5 bits are extracted to combine with a dummy to form a pickup command of an index register. All negative commands cause Index registers to be copied to line 23. The preceding portion, AR sign test, etc., will be referred to in the following discussion as "next".

Negative commands are tested for a bit in the T29 position by shifting left in AR and testing for overflow. All negative commands with a leading bit are special commands, and are identified by a 5-bit OP code scaled 2^{-17}. All other negative commands are indexed arithmetic commands.

Indexed arithmetic commands are checked for a bit in T28. The presence of a bit indicates an indexed pick-up command, the absence of a bit indicates an indexed store command. Bits T27 and T26 indicate which index register or registers (odd or even or both) to add to the base address. The correct pair of index registers has already been copied to line 23. The combined command and index registers are checked for "Line carry" and modified arithmetic

commands are assembled and executed.

Arithmetic commands are executed directly, and are of the form (CHWD) to AR, with NN used to specify the type of arithmetic command. See form of commands, Page 43.

Store commands copy either half of MQ into CHWD.

Arithmetic commands

The contents of CHWD (the operand) is in AR. The accumulator is both halves of MQ, complemented if negative, and is sometimes referred to as AMQ.

Clear and Add (NN=82)
AR is copied directly to the accumulator, and the next instruction is executed.

Add (NN=74)
If AMQ is zero, control goes to clear and add. If AR is zero, control goes to "next". If both AR and AMQ are non-zero, the larger number is shifted 1 bit to the right and the smaller number is shifted to the same binary scale factor as the larger number (up to 21 bits shift only).

The two numbers are added, and the sum is normalized. If the sum is zero, AMQ is cleared and control goes to "next". If the sum is not zero, a round-off is added (1×2^{-21}). If the round-off causes overflow, the sum is set to 1/2 and the exponent is decremented by 1.

If the number is in limits (If the binary exponent, excess 128, is positive and less than 256) the sum and exponent are combined in AR and control goes to clear and add. If the number is not in limits, the exponent is tested for sign. A negative exponent means the number is too large, and control goes to the error alarm, with OZ in AR. If the exponent is positive, the number is too small to be represented by a floating point number. AMQ is cleared to zero and control goes to "next".

Clear and Subtract (NN=78). AR is copied to AMQ with characteristic 3, changing the sign of the operand.

Reverse Subtract (NN=66). The sign of AMQ is changed, and control goes to Add.
Subtract (NN=68). The sign of AR is changed, and control goes to Add.
Reverse Divide (NN=76). The operand is to be divided by the contents of the accumulator.

AMQ is tested for zero, and if zero, control goes to the error alarm with OU in AR (divide by zero is illegal). AR is tested for zero, and if zero, AMQ is cleared and control goes to "next". If the AR is not zero, it is divided by (AMQ) scaling the quotient 2^{-5}. The exponent is corrected in AR, and control goes to the normalization sequence used by the Add instruction.

Divide (NN=70). AR and AMQ are interchanged, and control goes to reverse divide.

Multiply (NN=88). AMQ is multiplied by AR. If the product is zero, AMQ is cleared and control goes to "next". The sum of the exponents minus 128 is placed in AR and control goes to the general normalization sequence as in Add.

Positive Commands

Store: The contents of AMQ are copied to CHWD, and control goes to "next".
Negate: AMQ is copied to AR, and control goes to Clear and Subtract.
Absolute: The sign is removed from AMQ and control goes to the next instruction.

Square Root: If the operand is negative, control goes to the error alarm with OV in AR. The square root is obtained using Newton's method, with 2 divisions giving the required accuracy. Initial approximations are made which minimize the error.

Logarithm, Exponential: The log and exponential subroutine stored in line 7 is copied to line 5 for execution. The base used is the napierian e. The method used is the same as is used in Intercard single precision.

Return: The mark level counter is incremented and the transfer command is picked up from the mark list. The transfer command is placed in AR and executed at word time U1.

Keyboard: Typing is gated and control is transferred to test ready in line 19, so that each reload struck will cause a switch in the program.

If no hollow points are struck, the number is an integer with no decimal scale factor.

If one hollow point is struck, the number is treated as an integer, with a decimal scale factor determined by the difference between the number of digits in line 19 and line 23.

If two hollow points are struck, the number is treated as an integer with a decimal scale factor calculated from the first 2 digits typed.

If three hollow points are typed, control goes to the error alarm which types .64 and returns to the keyboard instruction.

The integer is converted to binary and normalized. The decimal scaling is removed by multiplying by combinations of 10^{-7} and 10 until the remaining scale factor is zero, at which time control goes to the general normalization routine as in Add.

The total number of digits typed must not exceed 14. No test is made on total digits typed.

Stop: The stop command is a G-15 halt. When the Compute switch is cycled, control goes to "next".

Transfer to CHWD: CHWD through WD+3 are copied to line 22. WD is reduced mod 4 to e, which can have values from 0-3. A switch is made on e.

If e is zero, all 4 commands can be executed before "re-loading" line 22. (WD+4) is incremented by 4, and line 22 is rearranged so that the first command is in AR, and the next 3 commands are in 22.1, 22.0 and 22.3 respectively, the incremented transfer command is in 22.2. Control goes to the test for negative in "next".

If e is one, only 3 commands will be executed before reloading line 22. (WD+4) is incremented by 3 and the transfer command is placed in 22.2 The first 3 commands are rearranged to be 22.1, 22.0, and 22.3 and control is transferred to "next", which will precess line 22 and pick up 22.1 as the first command to be executed.

If e is two or three, (WD+4) is incremented by 2 or 1 and line 22 is precessed the proper amount to put the transfer command and other commands in proper sequence. When (WD+4) is incremented, the NN number of the command is also modified, so that on subsequent executions of the transfer command, the switch on e will not be made, since e is known to be zero.

Transfer not zero: CHWD through WD+3 are copied to line 23, and AMQ is tested for zero. Only the mantissa of the floating point number is tested, so that if floating point zeros with large exponents (as found on Intercom 500) are encountered, they will test zero. If AMQ is not zero, line 23 is copied to line 22 and control goes to regular transfer. If AMQ is zero, control goes to "next".

Transfer not Negative: CHWD through WD+3 are copied to line 23. If the index limit has not been exceeded, (if ID_0 is clear), line 23 is copied to line 22 and control goes to the regular transfer. If the limit has been exceeded (ID_0 not zero) control goes to "next".

Print: The format is copied to line 23. 23.1 through 3 is the actual G-15 format and gets copied to line 2. 23.0 is a key word which contains the total digits scaled 2^{-6} and the number of digits before the decimal scaled 2^{-28}. If there is a carriage return in the format, T29 is set to 1.

The binary scaling of the contents of AMQ is removed by multiplying by 2 decimal scale factors, the first in 8 powers of 10 and the second in single powers of 10. The remaining binary scaling is shifted off, and if the resulting fraction is less than one tenth, it is multiplied by 10 and the decimal scale factor is decremented.

A round-off of $1/2 \times 10^{-5}$ is added to the fraction. If overflow occurs the number is set equal to .1 (BCD) and the decimal scale factor is incremented. If overflow has not occurred, the number is converted to BCD fraction.

The Decimal scale factor is compared with the number of digits before the decimal in the format.

If the number exceeds the decimal places allowed in the format, an F is typed followed by a space. The number is then converted and typed in floating point format, followed by a carriage return or tab as indicated in the format key word.

If the number is within the format limits it is shifted to fix the decimal point and is placed in line 19 for typeout. Only the number of digits called for in the format are copied to line 19. The maximum number of digits copied to line 19 is 14. However, only 5 of these digits can be non-zero.

Read, Write: The read and write commands are both transfers to interpretive subroutines. The current contents of line 22 are held in temporary storage in line 8 while the interpretive commands

are being executed. Both commands are always preceded by Set Register commands for I 22 and 23. Index registers 22 and 23 are never used by the object program, they are reserved for use by the interpreter. The Base of IR 22 is set to the starting relative number of the data array to read or write. The limit of IR 22 is set to the starting relative number plus the dimension minus one. The base of IR 23 is always set to zero.

A series of Indexed clear and add and Indexed store commands is used to fill or punch the array. Tape is read or punched every 100 words . The tape is not check-summed before punching. 7.2 inches of leader is punched between blocks.

Special Commands See Table 6.1

All special commands are negative, and have a leading bit. (T29=1). The special commands are identified by a 5-bit OP code, B, scaled 2^{-17}. The index registers involved have been copied to line 23.

Index Register Arithmetic B = 9 for odd I.R.

B = 25 for even I.R.

The base of the index register is to be used as the operand in an arithmetic command. The value of the base is extracted as an integer scaled 2^{-18}, and is normalized and combined with the proper exponent. The combined number is stored in 20.00 and a conventional arithmetic command, using 20.00 as the operand address, is assembled and executed.

Set Register: B = 0. The relative number to be set in the index register is carried 10 bits scaled 2^{-11}.

A store command is assembled from the word and channel keys contained in the command. The relative number is extracted and shifted to 2^{-18}. If the Index Register identified is not a Base register, the relative number is stored directly. If the register is a Base register, the relative number is converted to Channel and Word, and a composite number consisting of the word x 2^{-8}, the relative number x 2^{-18}, and the Channel x 2^{-23} and 2^{-28} is stored in the Index register.

Store in Index Register: B = 27. AMQ is to be stored in an index register.

If AMQ is zero, control is transferred to Set Register. If AMQ is not zero, its magnitude is tested. If the contents equal or exceed 1024, control goes to the error alarm with OW in AR. If AMQ is less than 1024 it is shifted to be scaled as an integer times 2^{-18}, and control is transferred to Set Register.

Increment: B = 2. The base is incremented by the difference and held. The incremented base is tested for exceeding the limit.

If the limit is exceeded the base value is set to zero, and ID_0 is set for detection by the Transfer on index command which always follows.

If the limit is not exceeded the base is converted and stored using the set register commands. ID_0 is cleared for detection by the transfer on index command.

Mark Place: B = 13. A transfer command to the place marked is assembled. The mark level counter is decremented and tested for zero. If the mark level is zero, 8 marks are already being held, and control goes to the error alarm with OY in AR. If the mark level is not zero, the assembled transfer command is placed in the mark list at the current level.

Tabs, Carriage Returns: B = 16. The number of Tabs or Carriage Returns is negated to AR. Minus zero is placed in both halves of ID and a shift is initiated during the odd word time to shift a bit into ID_1. The result is a number scaled 2^{-n} where N is the number of carriage returns or tabs. The command (with the leading bit shifted off) is a single tab or carriage return format code followed by an end code. The format is placed in line 2, 2^{-n} is placed in 19.u7, typing is initiated, and control goes to "next".

Periods: B = 17. The number of periods is extracted to AR. Periods are typed one at a time, decrementing AR for each period typed. When AR is zero, control goes to "next".

Bells: B = 18. The number of bells is extracted to AR, the bell is chimed every 7 drum cycles until N bells have been rung. Control then goes to "next".

Subroutines B = 19. The channel containing the subroutine is copied to line 05. The starting location of the subroutine is marked, and a return to line 05 command transfers control to the subroutine.

Snapshot B = 10. (disabled)
B = 11. (with BP)
A disabled snapshot transfers control to "next".

A snapshot with BP (as assembled) tests the punch switch. If the punch switch is off, control goes to "next". If the punch switch is on, the command is placed in 19.u7 and typed using a format which types the BCD location number contained in the snapshot command. Control is then transferred to the print command, with a key word in 23.00 which will insure the typeout of the number in floating point.

6.2 Error Alarm

When control goes to the error alarm, ready is set; terminating any input-output in progress. The contents of AR are typed, with a ...DD.. format followed by a carriage return. A return to mark in line 1 is then executed. Generally a halt is marked on entry to the error S.R., and when the compute switch is cycled the typeout is repeated. In the case of the keybd error, (3 hollow points), the keybd instruction is marked, so that the keybd subroutine is re-entered after the error typeout.

6.3 Manual Mode

The manual mode is entered by typing scf. The manual mode is an interpretive subroutine, so the current contents of line 22 are temporarily stored in line 8. A keyboard command is executed, followed by a transfer on zero. If zero is typed (or just tab s) , the original contents of line 22 being held in line 8 are restored, and control goes to "next".

IF AMQ is not zero, a test on the punch switch is made. If the punch switch is on, AMQ is stored in 0900 plus Index Register 22, and control goes back to the keyboard command, manual mode.

If the punch switch is not on, the integer portion of AMQ is stored in the base register of I.R. 22, and AMQ is tested for negative. If AMQ is not negative, the mark levels and extractors are initialized, and a transfer to 0900 plus I.R. 22 is executed. Since location 0900 always contains a transfer to the beginning of the program, setting I.R. 22 to zero will enable a restart. Any number typed into AMQ greater than zero but less than one will cause a restart of the program.

If AMQ is negative, a clear and add 0900 plus I.R. 22 is executed, and control is transferred to a machine language subroutine to test for a snapshot command. If 15 bits of the contents of AMQ are the same as the 15 standard bits of the snapshot command, it is assumed

that the contents of AMQ is a snapshot command. Note that this means the chances of the computer mistaking a number for a snapshot are about 1 in 32,768. If this is the case it will be impossible to inspect this location in the manual mode.

If AMQ contains a Snapshot command a bit is added to the breakpoint, and the carry, if any, extracted. This effectively changes the status of the Snapshot command. The modified snapshot command is stored in its proper location (0900 plus I22) and control goes to the keyboard in manual mode.

If AMQ does not contain a snapshot, it is typed in Floating Point notation, and control goes to the keyboard in manual mode.

Magazine 4 contains 2 separate routines, the Dump routine and the Operating package.

The Dump Routine loads the subroutines and prepares the memory when necessary.

The Dump Routine first sums several words in line 4 to determine if Magazine 3 is in memory. If Magazine 3 is in memory, control goes to the Memory Preparation Routine. If Magazine 3 is not in memory, control goes to a BP switch. If the compute switch is on GO, control goes to the punching routine. If the compute switch is on BP, control goes to the Operating Package loader when the switch is cycled.

6.4 Memory Preparation Routine

Words 09.01-06 are filled with a part of read routine. 09.00 is filled with a transfer to the starting location of the program. Lines 17 and 18 contain package 3 and are cleared. The subroutine table is checked for zero. If the subroutine table is not zero, the subroutine loader skips to the subroutines and searches until it finds the required subroutine or is out of subroutines. As each subroutine called for is loaded, the corresponding word in the subroutine table is cleared. If the correct subroutine is not found on the magazine, a type-out is copied to line 19 which signals the operator that a subroutine is missing, cycling the compute switch sends control back to the read tape of the subroutine loader.

If or when the subroutine table is zero, control goes to a BP switch. If the compute switch is on GO, control goes to the Punching routine. If the compute switch is to BP, control goes to the operating package loader when the compute switch is cycled.

6.5 Punching Routine

The routine punches leader and the object program loader which had been stored in line 7.

The non-zero lines in the interpretive memory are punched, starting with line 18, decreasing until a clear line or line 9 is encountered. Punching then starts at line 9 and continues punching lines until a clear line is encountered, unless line 9 is the last line. (All lines would have to be non-zero if this is the case). Each line is balanced to zero with an execution command in 19.u6, so that on reading in, 19.u6 is executed if the entire line sums to zero. On the last line punched the execution command is modified so that control goes back to the object program loader at a different place.

After all the required lines have been punched, (minimum 2, maximum 11) sufficient trailer is punched and control goes to the operating package loader.

The operating package loader checks to see if any subroutines have been read. If any subroutines have been read, the magazine is rewound to the beginning and the operating package is loaded. If no subroutines have been read, the operating package is loaded directly.

6.6 The Object Program Loader

The Object Program Loader is punched before all object programs. The loader initializes all the temporary locations on the drum, and after loading the object program, checks to see if the operating package is in memory by summing all the required lines. If the operating package is in memory, control goes to the manual mode. If it is not in memory, "Load No. 4" is typed.

FORM OF INTERPRETIVE COMMANDS

1. Positive Commands are executed immediately.

2. Negative Commands are checked for a leading bit. If the leading bit is not present it is an indexed arithmetic command.

3. Negative Commands with a leading bit are special, and the type of command is designated by a 5-bit OP code scaled 2^{-17}. (See Table).

Positive Commands

Straight Arithmetic
U.WD+1. 64+20P.0.CH.28

CH is the relative address divided by 100 plus 9
WD is the remainder
address 156 = 10.56

OP's are as follows

		OP	64+20P
CA	Clear & Add	09	82
AD	Add	05	74
CS	Clear & Subtract	07	78
RS	Reverse Subtract	01	66
SV	Subtract	02	68
RD	Reverse Divide	06	76
DV	Divide	03	70
MU	Multiply	0W(12)	88

Straight Store
W.WD.85.1.24.CH

Negate
U.01.78.1.24.28

Absolute
U.00.39.1.24.28

SQRT
W.U3.U5.1.24.21

Return
U.33.33.0.21.31

Keyboard
U.U0.U2.0.08.05

Logarithm
U.U0.17.0.07.05

Exponential
U.U0.06.0.07.05

Stop
U.85.85.0.16.31

Transfer
U.WD+4.26.0.CH.22

Transfer not zero
U.WD+4.11.0.CH.23

Transfer not negative
U.WD+4.10.0.CH.23

Transfer on index limit
U.WD+4.12.0.CH.23

Print
U.WD+4.43.0.CH.23

C H W D is the address of the format

Read
U.07.59.0.09.23

Write
U.83.59.0.08.23

Negative Commands

Indexed Arithmetic

$$A \times 2^{-4} + (WD + 1) \times 2^{-12} + (64+20P) \times 2^{-20} + I' \times 2^{-23} + C \times 2^{-27}$$

A=4 for both even and odd Index Registers (Subscripts)
A=5 for even register (subscript)
A=6 for odd register (subscript)
I'= (Index Register-2) ÷2, integer portion only
C= relative address ÷100, integer portion only WD = remainder
Subscripts are assigned indexes 2-21

Example:

Clear and Add Location 850 modified by index register 3.

A=6 Command is -.6335210
I'=0
C=9
OP=09

Indexed Store

$A'x2^{-4}$, $WD+1x2^{-12}$, $I'x2^{-23}$, $C \times 2^{-28}$ $A' = A-4$

Example: Store in location 850 modified by index registers 617
Command is -.0330048

Special, all contain -.8000000 = S, and $B \times 2^{-17}$, B is the "OP code"

Index Register Arithmetic
Base of index register is to be operand.

$S + B + I' \times 2^{-23} + OP \times 2^{-27}$ B = 25 for even subscript
B = 9 for odd subscript

Example CA 17 -.8004852

Set Index Register B = 0

$S + I' \times 2^{-23} + rel \times 2^{-11} + C \times 2^{-28}$
rel is integer valve to set into register

	valve of c	c
even	base	18
	difference	0
	limit	1
odd	base	19
	difference	4
	limit	5

example: set the difference register of I9 equal 10

-.8140064

Store in Index Register B = 27

Same as set register except rel = 0, add $B \times 2^{-17}$

example: store the accumulator in the base register of index 13

-.800X8V3

Increment: B = 2

$S + B + I' \times 2^{-23}$
plus only if odd accumulator add 1×2^{-7}

example: increment I 17

-.82010Y0

Mark Place B = 13

$S + B + WD \times 2^{-9} + CH \times 2^{-24}$

example: mark loc. 135 CH = 10 WD = 35

-.9186810

Tabs B = 16

$S + B + N \times 2^{-28} + .62$ N is Nr of tabs

example: 5 tabs

-.Y208005

Carr's B = 16

$S + B + N \times 2^{-28} + .22$ N is Nr of C-R's

example: 4 C.R's

-.U208004

Periods B = 17

$S + B + N \times 2^{-28} + .32$

example: 9 periods

-.V2008809

Bells B = 18

$S + B + N \times 2^{-28}$

example: 12 bells

-.800900W

Subroutines B = 19

$S + B + CH \times 2^{-24} + WD \times 2^{-9}$

CH is line of S.R., WD is starting loc.

example: SR Stored in channel 18, starts at word 01

-.8089820

Snapshot BP B = 11 (assembled w/BP)

no BP B = 10

$S + B + D_1 \times 2^{-8} + D_2 D_3 \times 2^{-28}$ $D_1 D_2 D_3$ is BCD loc.

example: Snapshot is at location 256

-.8205856

7.0 UPDATER LOADER

Magazine five is the Updater of the Algo system. The loader of magazine five prepares the G-15 memory for the Updater program.

The loader is read into the computer and MODE? is typed out. Then, depending on what the Editor output is, the operator types either 2 tab s or 1 tab DDD tab s.

A 2 tab s sets a switch indicating the Editor output to be updated is on paper tape. The loader reads the first block of the Updater program into line 19 and transfers control to 19:00.

A 1 tab DDD tab s sets a switch indicating the Editor output to be updated is on magnetic tape, starting at the identification number DDD. Following the type-in, the computer types out SET MAG SW=1 and halts. The operator after checking the magnetic tape unit is 1, cycles the compute switch. The loader searches forward for clean tape, then it reverse searches and reads every ID block following a file in an attempt to locate the last identification block. This identification block is the same as the Magnetic Tape service Routine AP 61. When the last identification block is found its identification number is incremented by one and the identification block is brought forward, written on clean tape and its identifying number is typed out. Next, there is a series of reverse searches and reads until the Editor output, with an identification number corresponding to the DDD typed by the operator is located. The program reads and stores in memory the Editor output, brings it forward to the new identification block and writes it on magnetic tape. It is checked for possible read or write error. If it is incorrect RECORDING ERROR is typed out, otherwise the first block of the Updater loader is read into line 19 and control transferred to 19:00.

8.0 ALGO UPDATER

General Description of Updater

The Updater deletes, changes, or inserts statements and/or declarations to the editor output in the Algo source language. The title and library declarations of the original program are not permitted to be changed by the Updater. The Updater was written using most of the subroutines used in the Editor. The Updating is done by use of the entry numbers of the statements to designate which statement or declaration is to be modified.

Initially the Updater reads in old editor output and stores it in line 16. It then transfers the title and library entries to line 17 (the storage for output line). Lines 19 and 23 are then cleared, carriage is returned, bell sounded and numeric type-in is gated. A precession routine is stored in line 19 to detect if any hollow points (∘) are typed. If no hollow points are typed, the number typed in is expected to be the entry number for a change or deletion. If nothing is typed in (except tab s) then the routine exits. If there is a four-word precession, then one ∘ has been typed and the number typed refers to an insertion. If two four-word precessions occur, the routine assumes the programmer made an error and clears 19 and 23 and starts again.

If there is to be a change or deletion, the entry number typed in is converted to binary and stored in the entry number desired register (09:76). If there is to be an insertion the integer part of the entry number typed in is converted to binary and incremented by 1 and stored in 09:76. Also the insert switch (07:u7) is set. The old editor output is interrogated, statement by statement. If the statement number of the old output is less than (09:76), the statement is put in the output storage line. If the old output entry number is greater than (09:76) an error is given and the routine clears line 19 and 23 and starts again. If the old output number is equal to (09:76), line 19 is cleared, 23:01 is set with a flag, two tabs are generated, a bell is rung, and alpha type-in is gated. Each character is interrogated to see if (→) is present; if it is, two tabs are generated and the procedure is repeated. When the correct statement has been typed in and terminated by a tab (s), line 19 is checked to see if this is a deletion. If it is, the statement or declaration (s) of the old Editor output is bypassed.

If a statement has been typed in, it is interrogated the same as the editor interrogates statements and the proper processing is selected and executed. For this processing, see Editor documentation. At completion of the processing, the insert switch is tested, if it is not set, this was a change and the old editor output is ignored for this entry number. If it was set, this was an insertion and the old editor output at this entry number is retained. Also 1 is added to the increment register (07:51) which is used to add to the entry number of every statement put into the output line.

The routine now clears line 19 and 23, carriage returns, rings bell, and gates numeric type-in for next entry number.

Constant changes are handled as special cases in the Updater. If the constant array identifier is deleted, the whole array is deleted. If a constant is to be changed, (09:76) will contain a number in the range of the old output constant entry number and the number of constants in the array. Each constant will be transferred to the output line until the constant assigned to the entry number specified in (09:76). Two tabs occur and numeric type-in is gated. The constant can be entered in integer, mixed decimal and fraction or as floating point. When a constant array is to be inserted, the identifier declaration sets the constant mode indicator which selects the gate numeric type-in mode for the number of constants that are in the array.

Termination

When nothing has been typed in for an entry number, the Updater transfers the rest of the old output to the output storage line and terminates.

9.0 HOUSEKEEPER

Package six of the ALGO System is the Housekeeper. It has a threefold purpose:

1. To transfer the ALGO System from paper tape to magnetic tape No. 2.
2. To correct a magnetic tape master if necessary.
3. To correct a paper tape master if necessary.

Upon reading the Housekeeper into the computer, the computer types out ANY CORRECTIONS? The program at this point may follow one of the following three paths:

9.1 Transfer System to Magnetic Tape

A type-in of NO starts a search for clean tape. This is accomplished by searching forward for file codes until none are found within a specified time interval. When this time interval goes to zero a reverse search and a ready test is set until a file code is encountered. Magnetic tape is read and checked to see if it is an identification block compatible with the magnetic tape service routine, Applications Project 61. If it is not, a file code is written followed by an identification block. If it is, magnetic tape is read further to see if any information follows the identification block. If there is information, a read magnetic tape is started and when the read times go to zero, a file code is written, followed by an identification block which has a file number one greater than the last identification block. Should there be no information following, then a reverse search and re-read in of the identification block occurs. After having established an identification block and storing the file number, the computer types out the number of the magazine to be placed on the photo reader. The compute switch is then cycled and the tapes are read and modified or corrected. This will be explained in detail later on.

After a magazine of paper tape has been recorded on magnetic tape, a file code is written. The end of a magazine is detected by testing to see if anything is being read into line 23. A timer is kept and when it goes to zero, the file code is written and the magazine rewound. The computer types out the number of the next magazine to mount.

When the subroutines appended to magazine 4 are read, a file code is written followed by the subroutines. After all the subroutines are written, a block containing the word 2000123 is written which terminates the subroutines. Following this an identification block is written and MOUNT MAGAZINE 5 is typed. Magazine No. 5 is then loaded and written on magnetic tape.

After the system has been placed on magnetic tape a check is made by reading each block written and subtracting from a total check sum. If after all the blocks are read and the check sum is not zero it will repeat the process and if a check sum of zero does not occur RECORDING ERROR is typed out and the computer halts.

If the check sum is zero, a reverse to Magazine 1 occurs and the file number of Magazine 1 is typed out.

9.2 Correction of Magnetic Tape Masters

A type-in of YES will key the computer to type MOUNT CORRECTION TAPE, which is described in detail later on. The tape is read and stored in line 07 and then Section 9.1 is followed.

9.3 Correction of Paper Tape Master

A type-in of YES UPDATE PAPER TAPE is the same as description in Section 9.2 except an updated paper tape is punched out with leader and trailer.

9.4 The Correction Tape

The correction tape is a tape sent from Bendix Computer Division to the user to correct any or all components of the ALGO System.

The Correction Tape is one line and is stored in line 07. It may consist of a maximum of 52 corrections. These corrections start at 00 and end at u4. It is important to note that the corrections are in sequence, starting with the lowest block to the final block to be corrected.

u7 is used to balance the correction tape to zero. WD u6 contains a constant which designates the magazine or magazines to be corrected. Word u5 contains the number of the correction tape.

Each correction occupies two words on the correction tape. At the even locations starting with 00 are located the block number of the block to be changed and the word where this change occurs. These are in hex with the block number occupying the two most significant digits and the next two digits specifying the word. The odd words of the correction tape are the actual corrections to be made.

Line 10 of the Housekeeper routine contains the changes to the ALGO System to use the system on magnetic tape. The format of these changes is the same as changes read in from the correction tape.

The corrections as well as the modifications expressed in paragraph 5 are inserted in their proper location in the following fashion. A table look-up is done. The even locations of line 10 and 7 in sequence are extracted.

The block number is first checked to see if the block read in is to be changed. If it is, then the odd location of line 7 or 10 is placed in both halves of a two word register. Then the extraction of the word time from the even location of lines 10 and 7 is added to a set command and executed out of AR.

Example:	00	0165000	Block 1 word ul
	01	4x4x2vz	Correction to ul block 1
	02	0x0x000	Block 13 word 13
	03	6x666vz	Correction to 13 of block 13

Listed below are some of the combinations for the constant in u6 to update various master tapes.

Magazine(s) to be Updated	Constant in U6
1,2,3,4	00000ZC
1,3,4	0081Z00
1,2,3	0001Z00
1,2,4	0005Z00
1,2	003Z000
1,3	00VZ000
1,4	013Z000
1	07Z0000
2,3,4	1001Z00
2,3	103Z000
2,4	10VZ000
2	1700000
3,4	200Z000
3	2700000
4	3700000
5	4700000
6	5700000

Table 9.1 contains the block numbers of the correction tape corresponding to the various lines of the ALGO System.

Actual Line of Master System Editor		Block Number for Correction		Actual Line of Master System Editor		Block Number for Correction	
	LDR	Block	01	Line	10	Block	0v
Line	04	Block	02	Line	09	Block	0w
Line	03	Block	03	Line	08	Block	0x
Line	00	Block	04	Line	07	Block	0y
	LDR	Block	05	Line	06	Block	0z
Line	15	Block	06	Line	04	Block	10
Line	14	Block	07	Line	03	Block	11
Line	13	Block	08	Line	02	Block	12
Line	12	Block	09	Line	01	Block	13
Line	11	Block	0u	Line	00	Block	14

RATOR-CATOR

Mod Auto Loader

	LDR	Block	15	Line	10	Block	1y
Line	00	Block	16	Line	11	Block	1z
Line	01	Block	17	Line	12	Block	20
Line	02	Block	18	Line	13	Block	21
Line	03	Block	19	Line	14	Block	22
Line	06	Block	1u	Line	17	Block	23
Line	07	Block	1v	Line	18	Block	24
Line	08	Block	1w	Line	05	Block	25
Line	09	Block	1x	Line	04	Block	26

LYZER LATOR

Mod Auto Loader

	LDR	Block	27	Line	04	Block	2x
Line	18	Block	28	Line	03	Block	2y
Line	17	Block	29	Line	02	Block	2z
Line	07	Block	2u	Line	01	Block	30
Line	06	Block	2v	Line	00	Block	31
Line	05	Block	2w				

Second Loader

	LDR	Block	32	Line	08	Block	33

OP PACKAGE

Selector

	LDR	Block	34	Line	05	Block	37
Line	00	Block	35	Line	07	Block	38
Line	04	Block	36				

Loader

	LDR	Block	39	Line	04	Block	3y
Line	00	Block	3u	Line	06	Block	3z
Line	01	Block	3v	Line	07	Block	40
Line	02	Block	3w	Line	08	Block	41
Line	03	Block	3x				

UPDATER

	LDR	Block	42	Line	09	Block	4y
Line	0	Block	43	Line	08	Block	4z
Line	2	Block	44	Line	07	Block	50
Line	3	Block	45	Line	06	Block	51
Line	5	Block	46	Line	04	Block	52
	LDR	Block	47	Line	03	Block	53
Line	15	Block	48	Line	02	Block	54
Line	14	Block	49	Line	01	Block	55
Line	13	Block	4u	Line	00	Block	56
Line	12	Block	4v	Line	07	Block	57
Line	11	Block	4w	Line	08	Block	58
Line	10	Block	4x				

HOUSEKEEPER

	LDR	Block	59	Line	03	Block	5y
Line	11	Block	5u	Line	02	Block	5z
Line	10	Block	5v	Line	01	Block	60
Line	06	Block	5w	Line	00	Block	61
Line	04	Block	5x				

CODING SHEETS

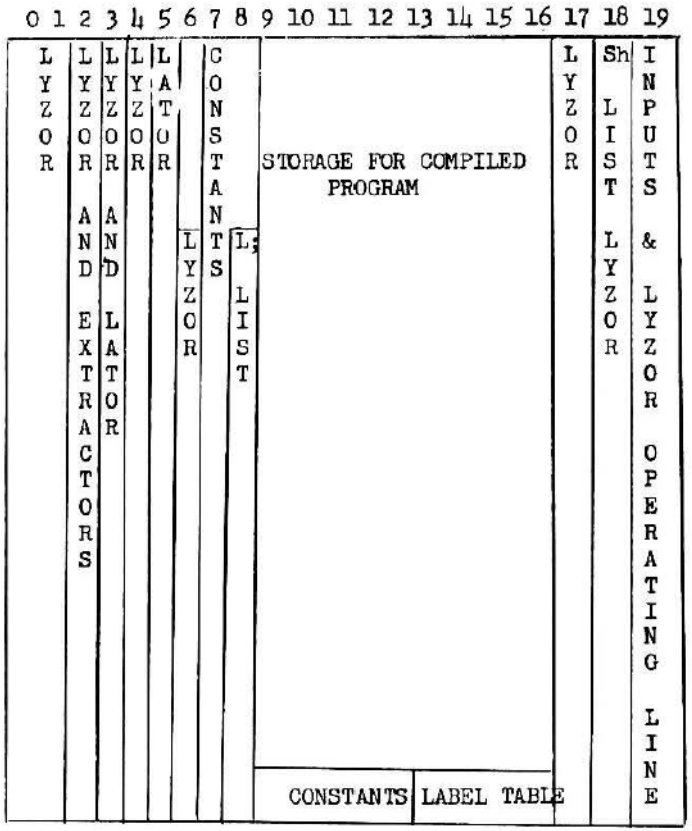
The notation LDD is used to facilitate following the flow of the program for the Lyzer-Lator.

The letter L designates the line number as follows:

A - Line 00
B - Line 01
C - Line 02
D - Line 03
E - Line 04
F - Line 06
G - Line 17
H - Line 18

The digits DD are used to reference the transfers and branches of conditional commands.

Lines 00, 01, 02, 03, 04, 06, 17, and 18 contain commands. Lines 06, 07, and 08 contain constants. Following is a view of the drum while the Lyzer-Lator (Magazine No. 3) is in operation.


0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
LYZOR
LYZOR AND EXTRACTORS
LYZOR AND LATOR
LYZOR
LATOR
LYZOR
CONSTANTS
L; LIST
STORAGE FOR COMPILED PROGRAM
CONSTANTS
LABEL TABLE
LYZOR
Sh LIST LYZOR
INPUTS & LYZOR OPERATING LINE

GLOSSARY OF TERMS USED IN ALGEBRAIC ANALYZER (MAG 3),

FLOW CHARTS AND CODING SHEETS

θ_1 + - * / = < >

θ_2 + - * / = < >

θ_3 Sin Cos Arctn Sqrt Neg

θ_4 Procedure Call

E Addr of next operand

ϵ Equivalence

Z Temporary Accumulator

A Accumulator

λ Location of Variable to be subscripted

S_h Word picked up from input table

L_j Top of Storage list

b_t Switch for control of subscripts

b_a Temporary Accumulator switch

b_s First pass switch

f_z Future address

K Constant to stack future commands in top of L_j list

c.c. Command counter. Location for storing built commands.

DIM Dimension of an array

IND Indicator register

TELO Temporary location

T-LOC Temporary Location

STOR Storage register for keeping track of how many commands are being taken from the L_j list.

CA "Clear and Add" command built

AD "Add" command built

CS "Clear and subtract" command built

SU "Subtract" command built

SI "Subtract Inverse" command built

MU "Multiply" command built

DV "Divide" command built

DI "Divide Inverse" command built

ST "Store" command built

M.P. "Mark Place" command built

INC "Increment" command built

$\overline{\text{ST-B}}$ "Store constant in base of IxR" command built

$\overline{\text{ST-D}}$ "Store constant in difference of IxR" command built

$\overline{\text{ST-L}}$ "Store constant in limit of IxR" command built

ST-B "Store accumulator in base of IxR" command built

ST-D "Store accumulator in difference of IxR" command built

ST-L "Store accumulator in limit of IxR" command built

TR "Transfer" command built

TNN "Transfer non-negative" command built

TNZ "Transfer non-zero" command built

FORMATS FOR SPECIAL COMMANDS
IN OP PACKAGE

Indexed Arithmetic	0	1			(	W	D	+	1			)	0	(	32	+	OP	)	(		I	)	(	C		)	0	1
Indexed Store	0	0			(	W	D	+	1			)	0	0	0	0	0	0	0	(		I'	)	0	(	C		)	1
Index Register Arithmetic	1	0	0	0	0	0	0	0	0	0	0	0	(	9	or	25	)	0	0	(		I'	)	(	0	P	)	0	1
Set Index Register	1	(			R	E	L				)	0	0	0	0	0	0	0	0	(		I'	)	0	(	C		)	1
Store Index Register	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	0	0	(		I'	)	0	(	C		)	1
Increment	1	0	0	0	0	0	K	0	0	0	0	0	0	0	0	1	0	0	0	(		I'	)	0	0	0	0	0	1
MARK PLACE	1	(		W	D				)	0	0	0	0	1	1	0	1	0	0	(	C	H		)	0	0	0	0	1
TABS	1	1	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	(	N		)	1
CARRS	1	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	(	N		)	1
PERIODS	1	0	1	1	0	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	(	N		)	1
BELLS	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	(	N		)	1
Machine Lang. Subroutine	1	(		W	D				)	0	0	0	1	0	0	1	1	0	0	(	C	H		)	0	0	0	0	1
SNAPSHOT with Breakpoint	1	0	0	0	(	D	$_1$	)	0	0	0	0	0	1	0	1	1	0	0	0	(	D	2	)	(	D	3	)	1
SNAPSHOT NO Breakpoint	1	0	0	0	(	D	1	)	0	0	0	0	0	1	0	1	0	0	0	0	(	D	2	)	(	D	3	)	1

G-15 Word

TABLE 6.1

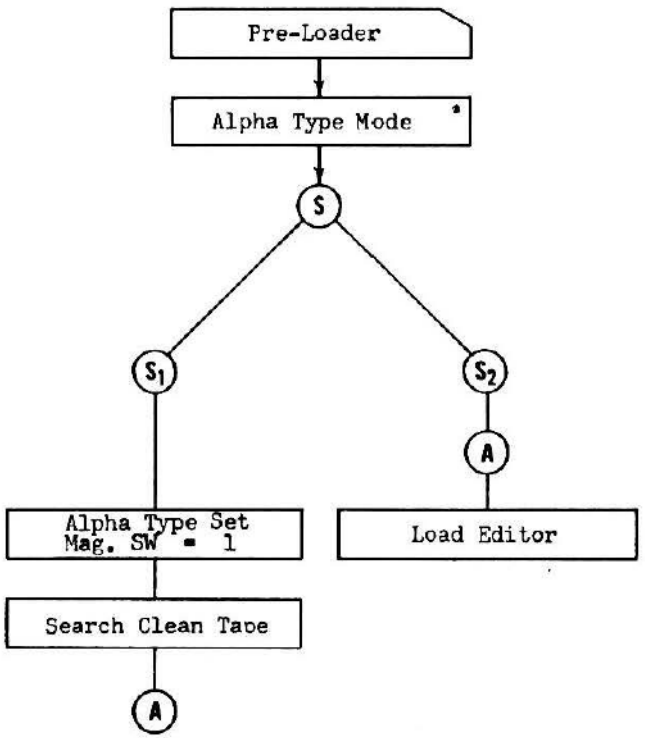
FLOW CHARTS

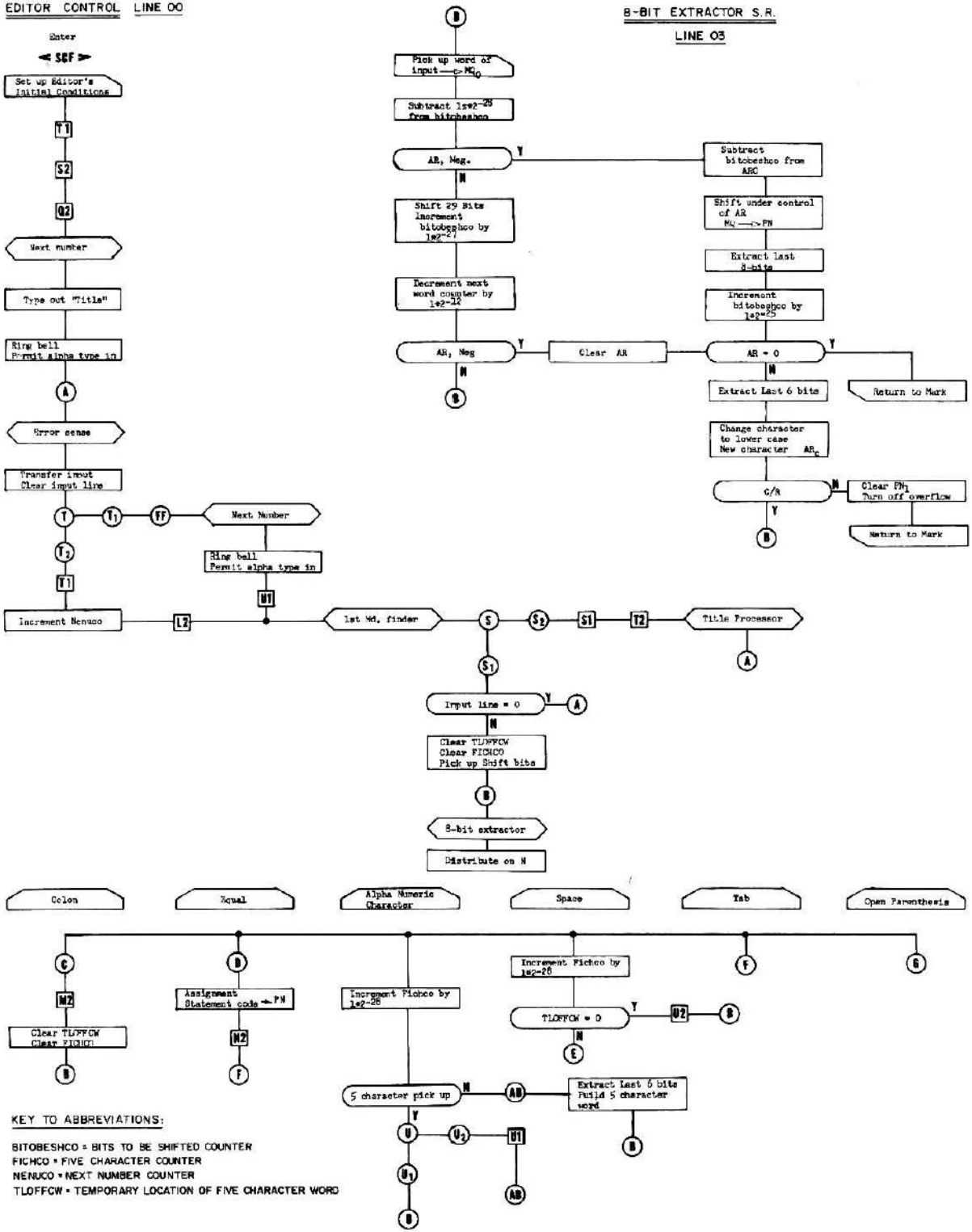
FOR THE

ALGO SYSTEM

NOTE: Refer to Technical Applications Memorandum No. 25, dated 27 August 1957, for an explanation of the flow chart symbols.

EDITOR LOADER

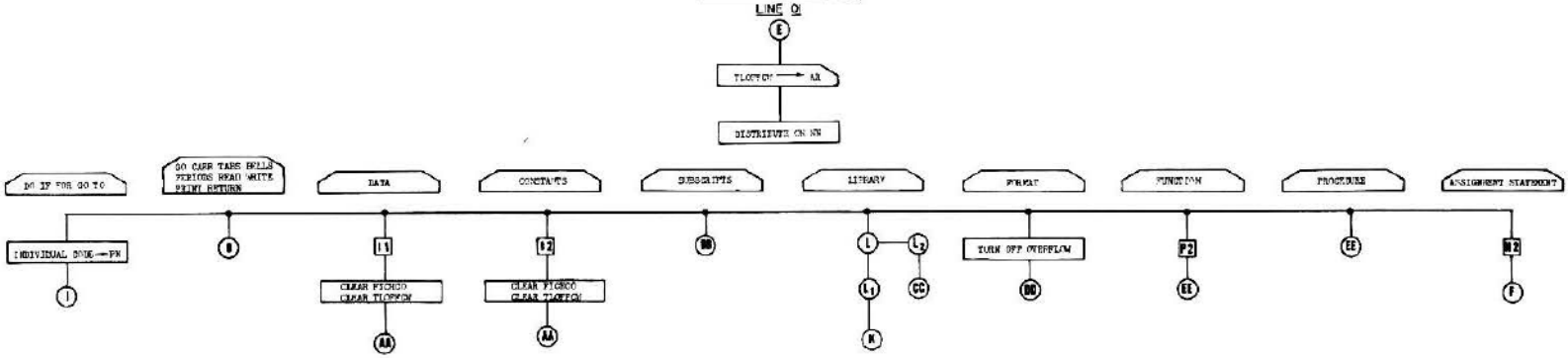



EDITOR CONTROL LINE 00
Enter
SGF
Set up Editor's Initial Conditions
T1
S2
Q2
Next number
Type out "Title"
Ring bell
Permit alpha type in
A
Error sense
Transfer input
Clear input line
T
T1
FF
Next Number
Ring bell
Permit alpha type in
U1
T2
T1
Increment Nenuco
L2
1st Wd. finder
S
S2
S1
T2
Title Processor
A
S1
Input line = 0
Y
A
N
Clear TLOFFCW
Clear FICHCO
Pick up Shift bits
B
8-bit extractor
Distribute on N
8-BIT EXTRACTOR S.R.
LINE 03
D
Pick up word of input
Subtract 1x2-28 from bitobeshco
AR, Neg.
Y
N
Shift 29 Bits
Increment bitobeshco by 1x2-27
Decrement next word counter by 1x2-12
AR, Neg
Y
Clear AR
N
B
Subtract bitobeshco from ARC
Shift under control of AR
MQ ⟷ FN
Extract last 8-bits
Increment bitobeshco by 1x2-25
AR = 0
Y
N
Extract Last 6 bits
Return to Mark
Change character to lower case
New character ARC
C/R
N
Clear FN1
Turn off overflow
Return to Mark
Y
B
Colon
Equal
Alpha Numeric Character
Space
Tab
Open Parenthesis
C
M2
Clear TLOFFCW
Clear FICHCO
B
D
Assignment Statement code → FN
M2
F
Increment Fichco by 1x2-26
5 character pick up
N
AB
Extract Last 6 bits Build 5 character word
B
Y
U
U2
U1
U1
AB
D
Increment Fichco by 1x2-26
TLOFFCW = 0
Y
U2
B
N
E
F
G
KEY TO ABBREVIATIONS:
BITOBESHCO = BITS TO BE SHIFTED COUNTER
FICHCO = FIVE CHARACTER COUNTER
NENUCO = NEXT NUMBER COUNTER
TLOFFCW = TEMPORARY LOCATION OF FIVE CHARACTER WORD

ALGO - EDITOR

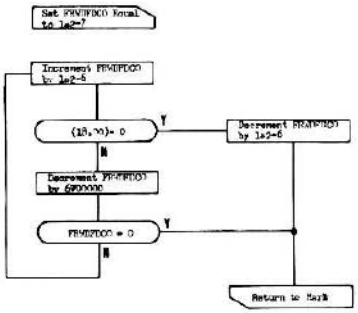
STATEMENT TESTS S.R

LINE 01



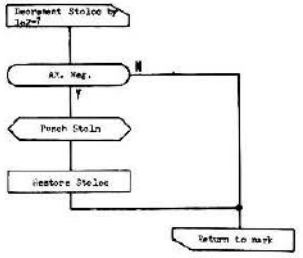
FIRST WORD FINDER S.R

LINE 03



NEXT STORAGE LOCATION S.R

LINE 03



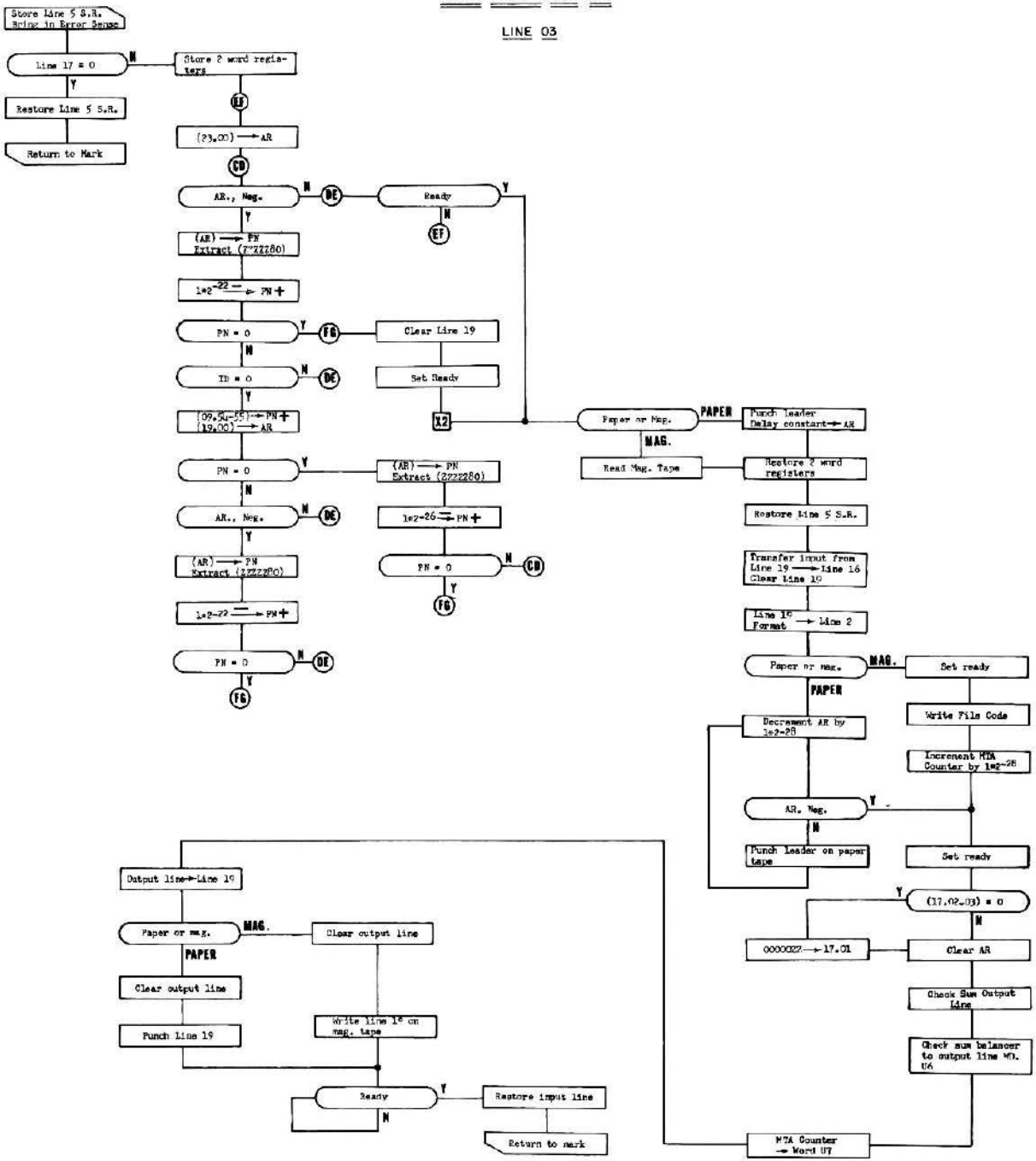
KEY TO ABBREVIATIONS:

FRWDFDCO = FIRST WORD FINDER COUNTER
STOLN = STORAGE LINE
STOLOC = NEXT STORE LOCATION COUNTER

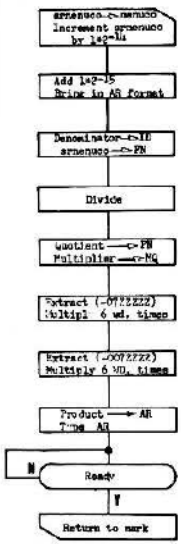
ALGO-EDITOR

PUNCH OUTPUT LINE S.R

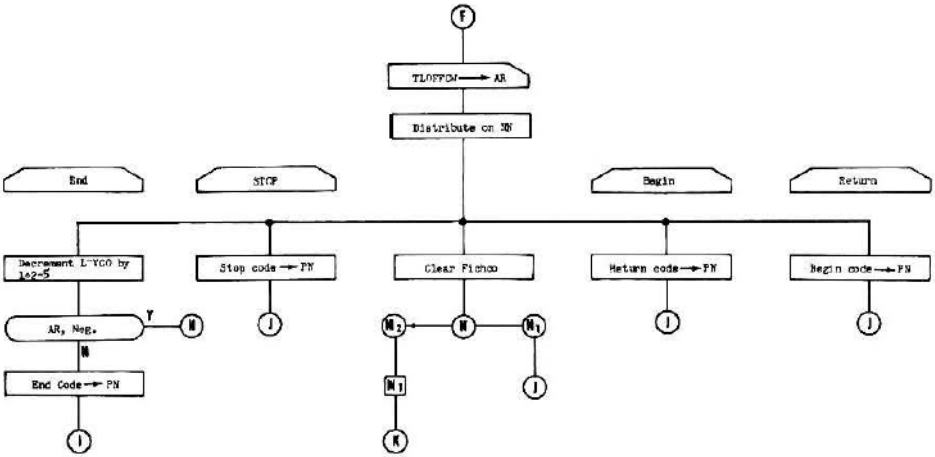
LINE 03



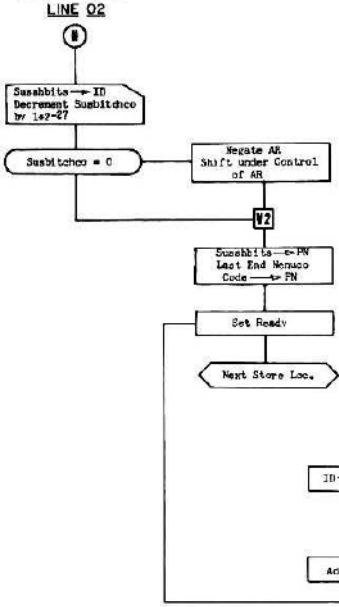
NEXT NUMBER S.R.
LINE 00



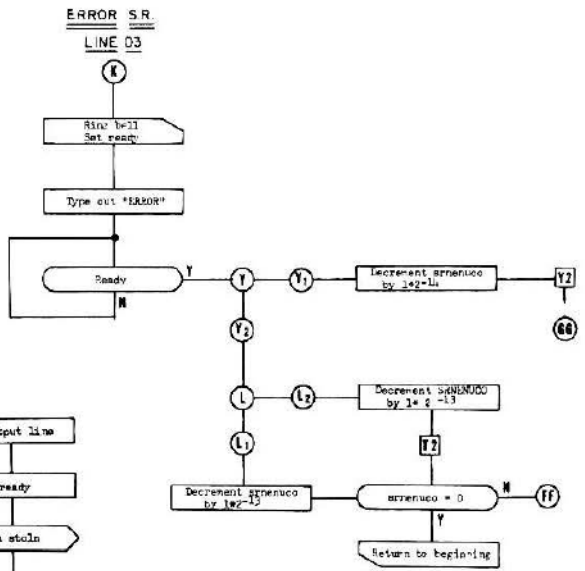
TAB S.R. LINE 00



END TAB S.R.
LINE 02



ERROR S.R.
LINE 03

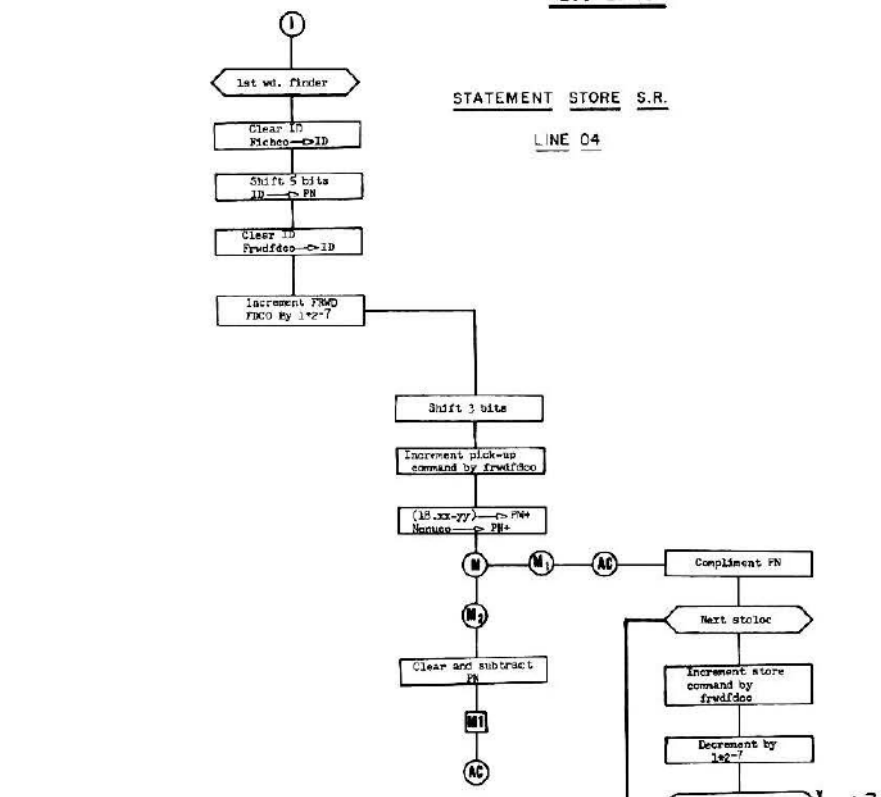


KEY TO ABBREVIATIONS

LEVCO = LEVEL COUNTER
SRNENUCO = SUBROUTINE NEXT NUMBER COUNTER
(SEQUENCE NUMBERING)
SUSBITCHCO = SUBSCRIPT BIT CHARACTER COUNTER
SUSSHBITS = SUBSCRIPT SHIFT BITS

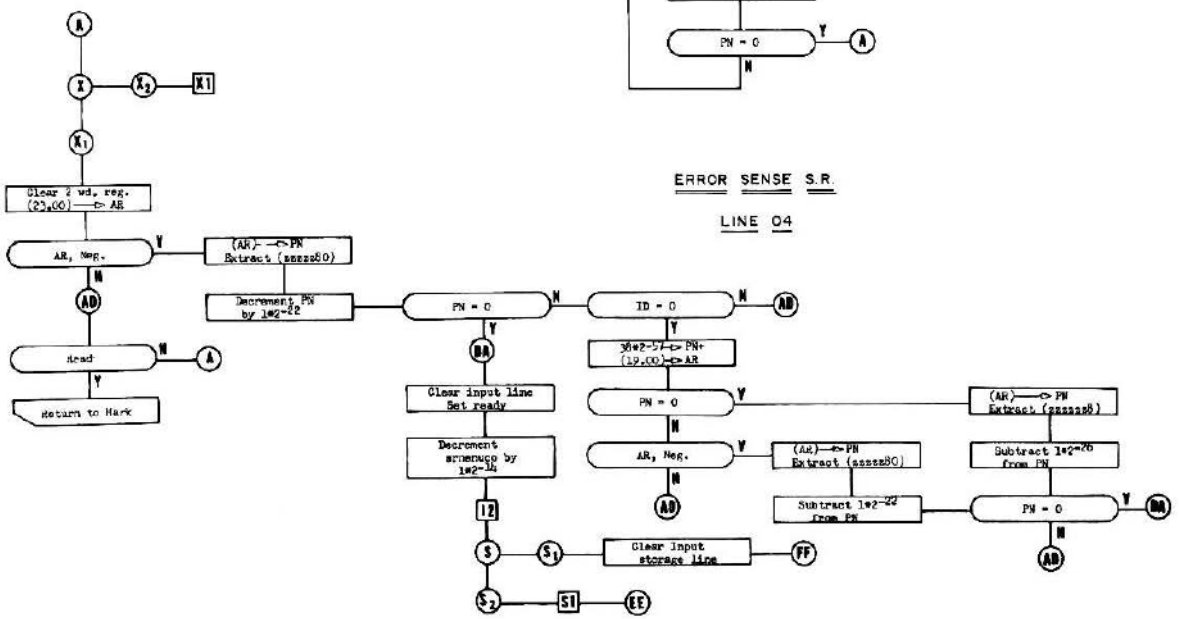
STATEMENT STORE S.R.

LINE 04



ERROR SENSE S.R.

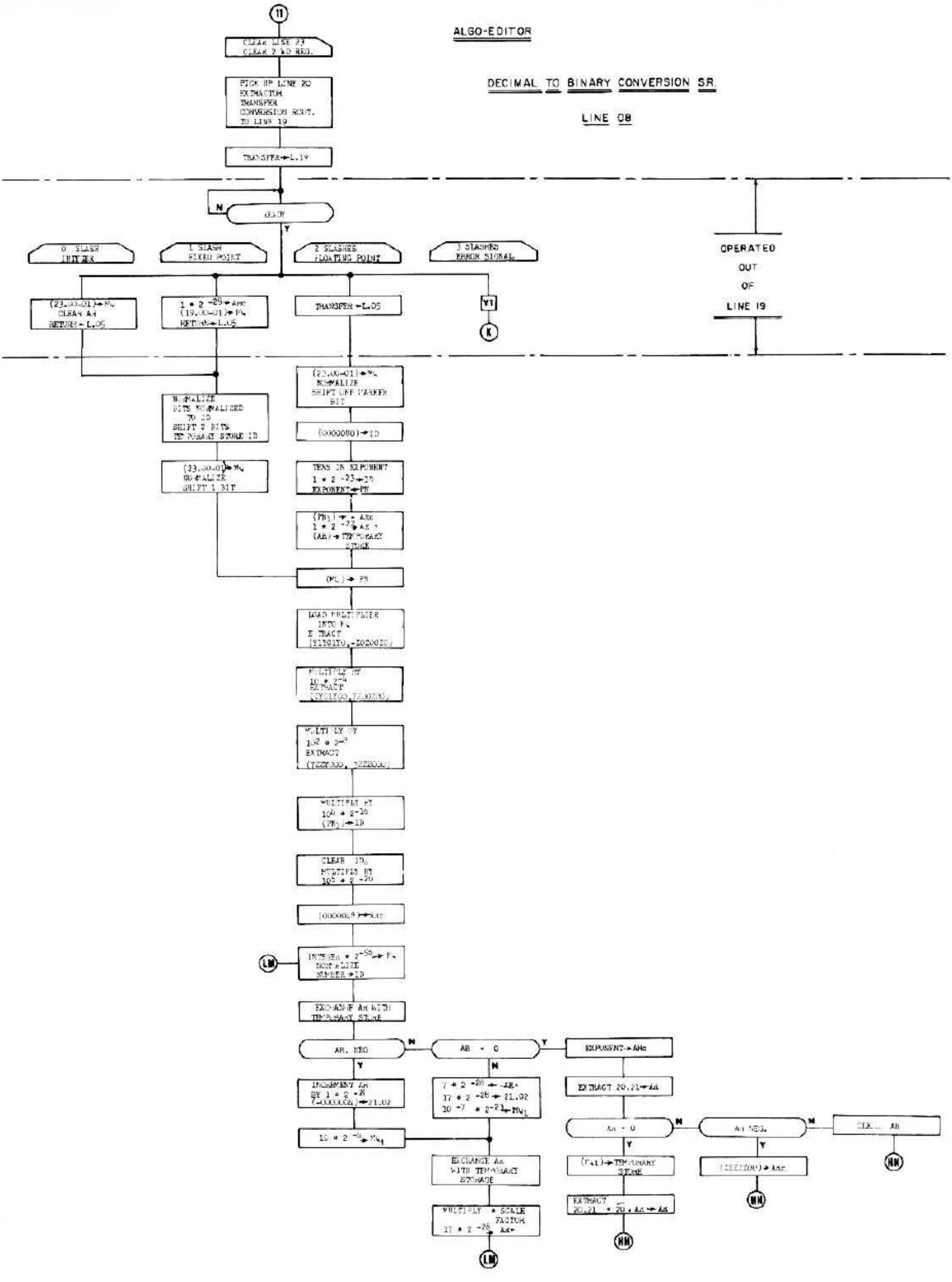
LINE 04



ALGO-EDITOR

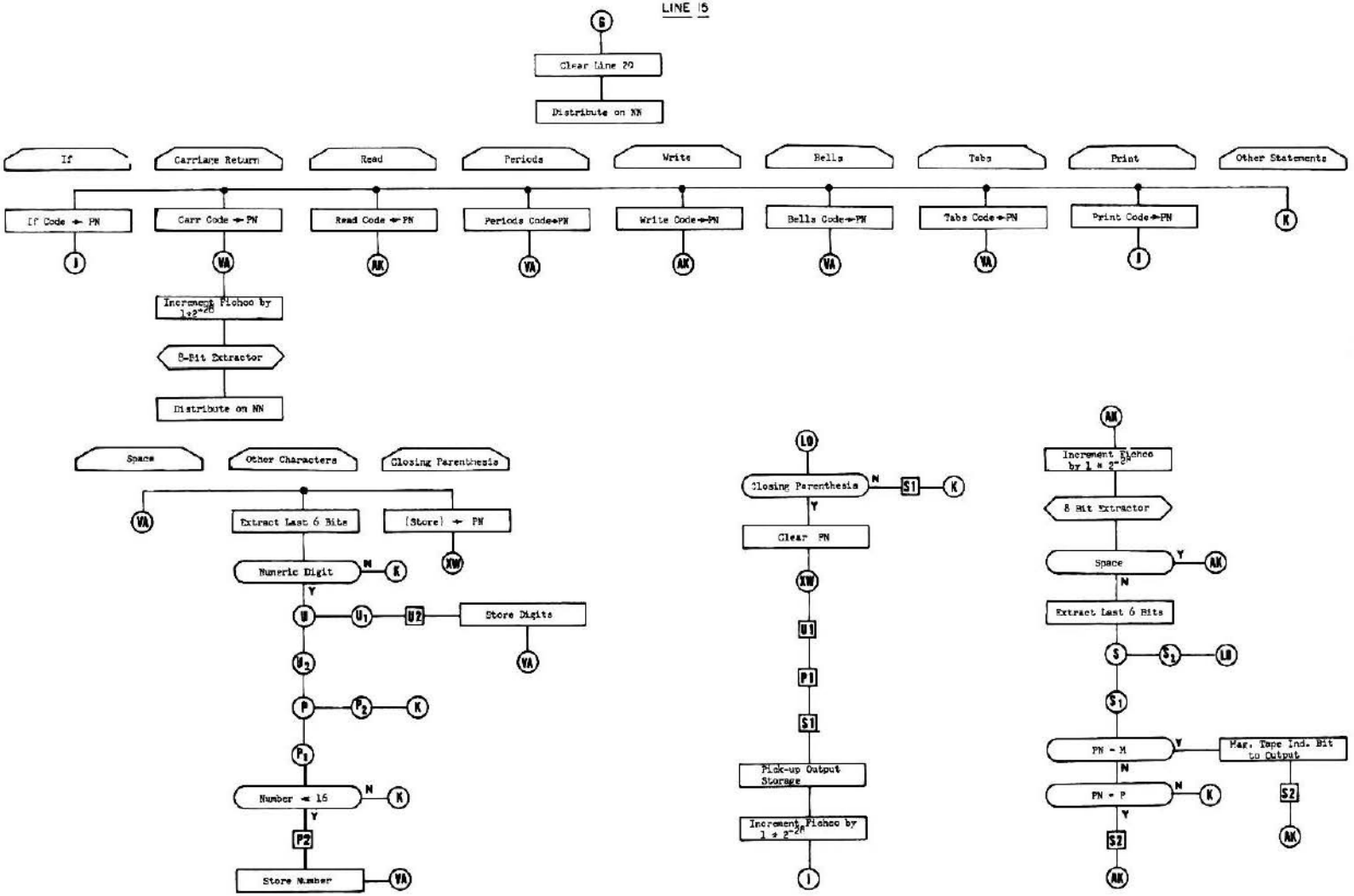
DECIMAL TO BINARY CONVERSION SR.

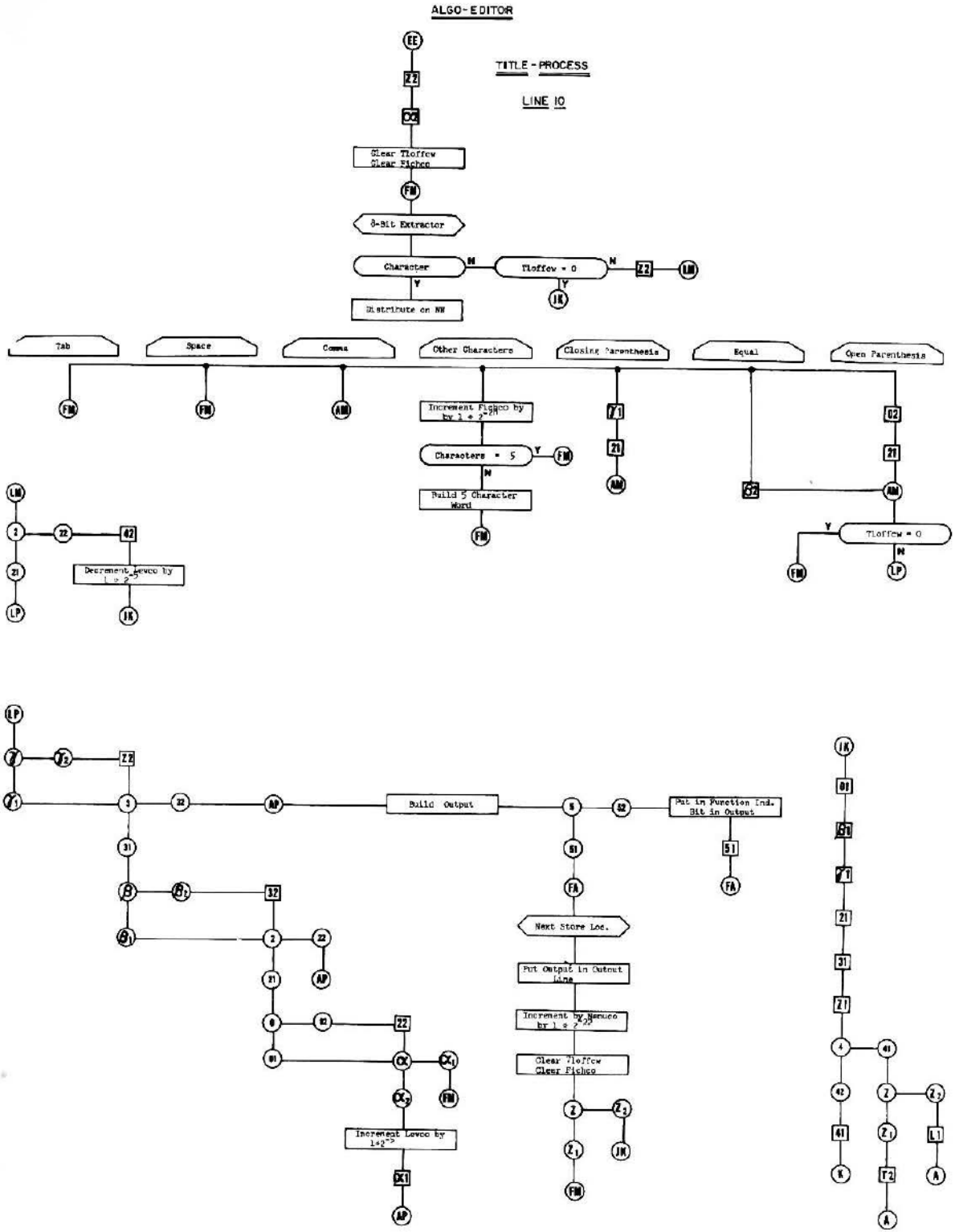
LINE 08



OPEN PARENTHESIS S.R.

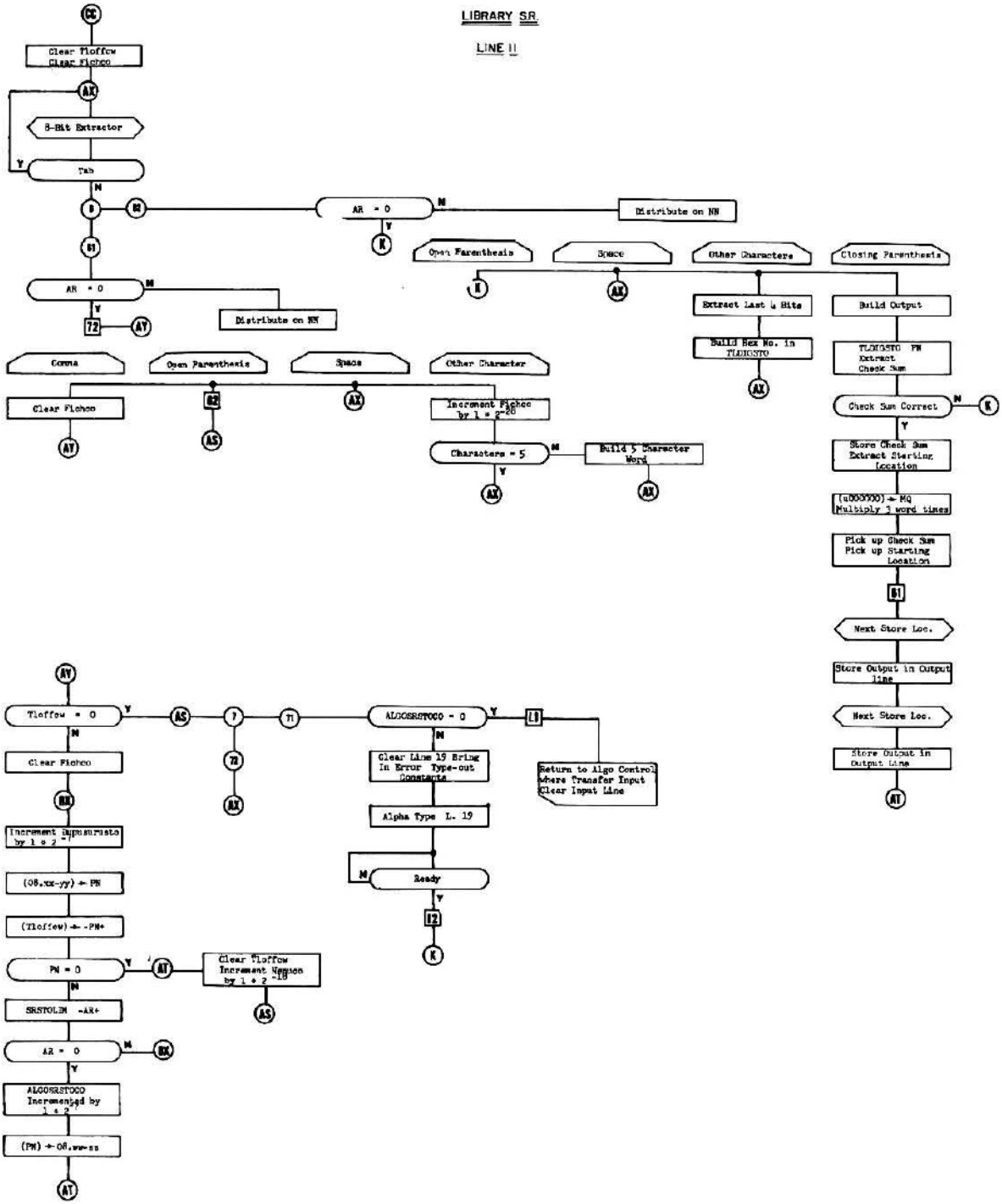
LINE 15




ALGO-EDITOR
TITLE-PROCESS
LINE 10
Clear Tloffcw
Clear Fichco
8-Bit Extractor
Character
Tloffcw = 0
Distribute on NN
Tab
Space
Comma
Other Characters
Closing Parenthesis
Equal
Open Parenthesis
Increment Fichco by
Characters = 5
Build 5 Character
Word
Decrement Levco by
Build Output
Put in Function Ind.
Bit in Output
Next Store Loc.
Put Output in Output
Line
Increment by Nevco
Clear Tloffcw
Clear Fichco
Increment Levco by

LIBRARY SR.

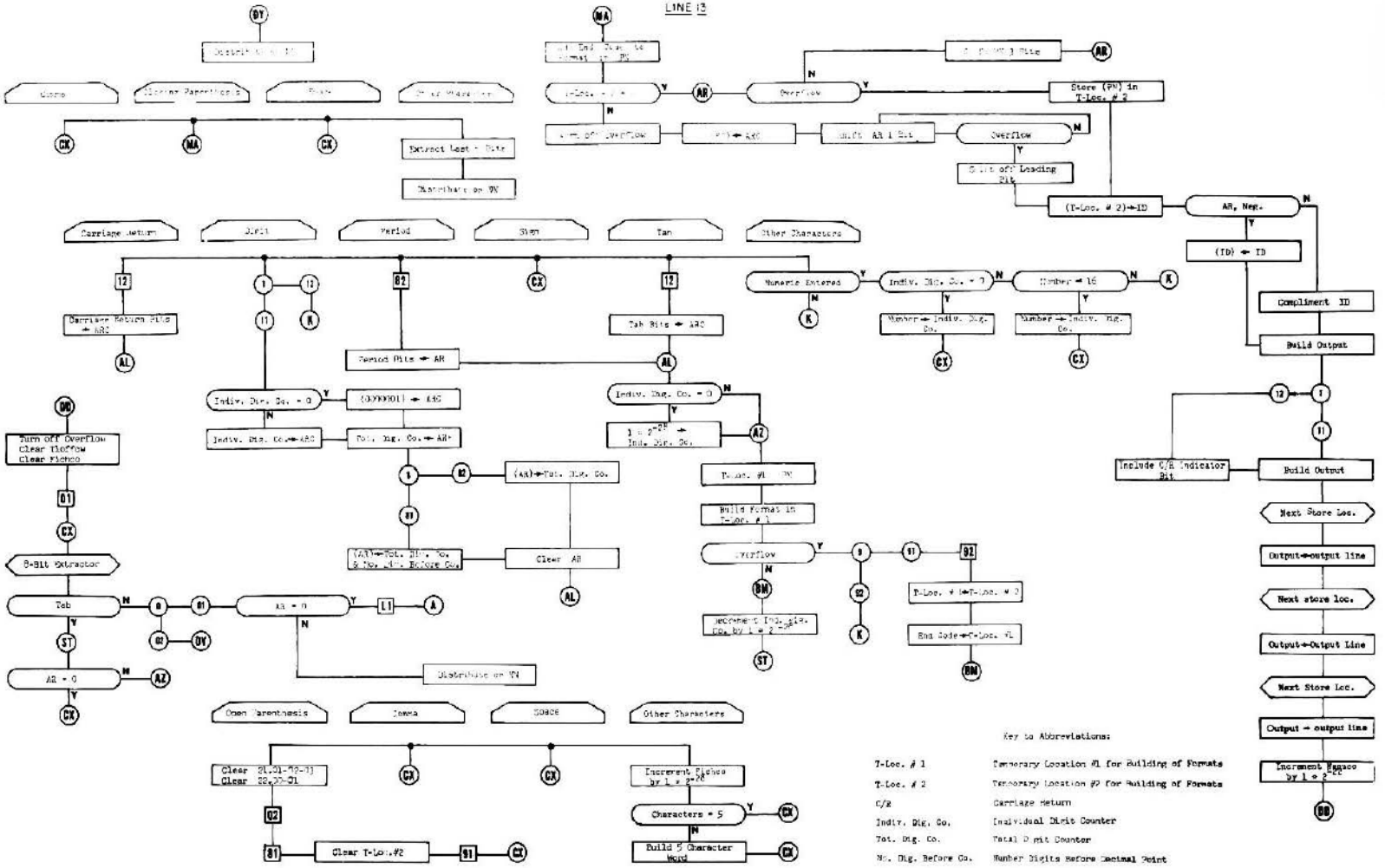
LINE II



ALGO-EDITOR

FORMAT S R

LINE 13

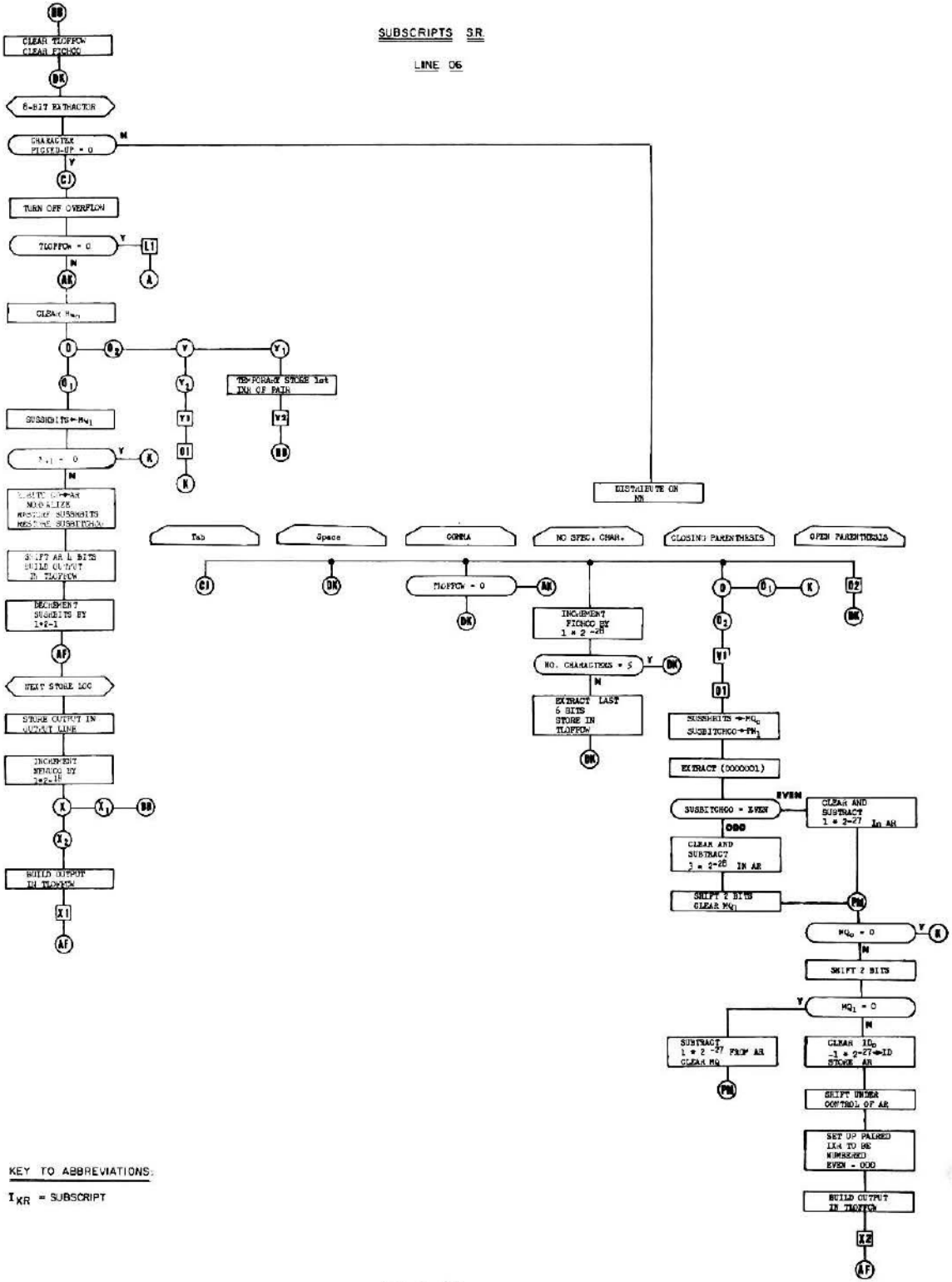


Key to Abbreviations:

T-Loc. # 1	Temporary Location #1 for Building of Formats
T-Loc. # 2	Temporary Location #2 for Building of Formats
C/R	Carriage Return
Indiv. Dig. Co.	Individual Digit Counter
Tot. Dig. Co.	Total Digit Counter
No. Dig. Before Co.	Number Digits Before Decimal Point

SUBSCRIPTS SR

LINE 06



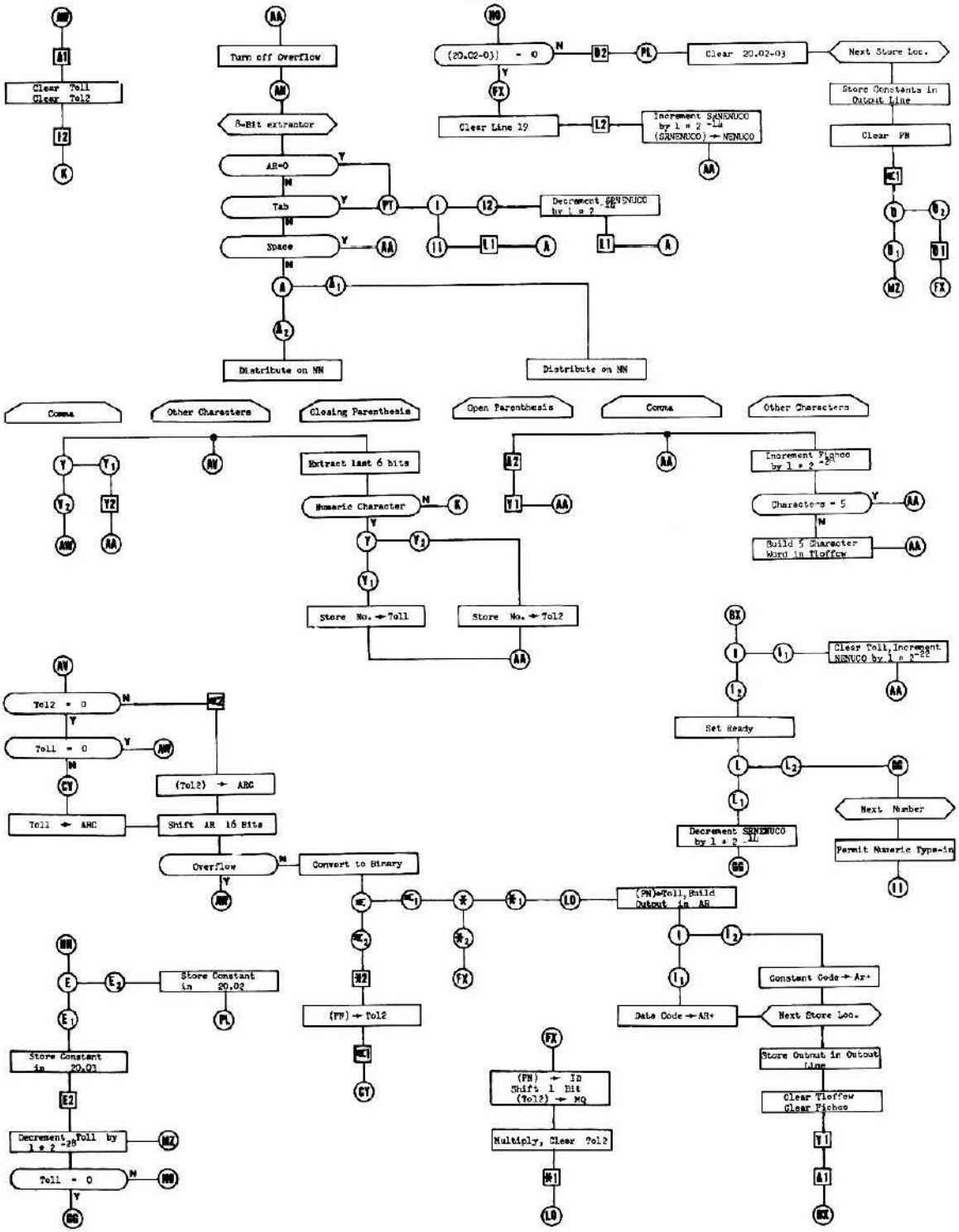
KEY TO ABBREVIATIONS:

I_{KR} = SUBSCRIPT

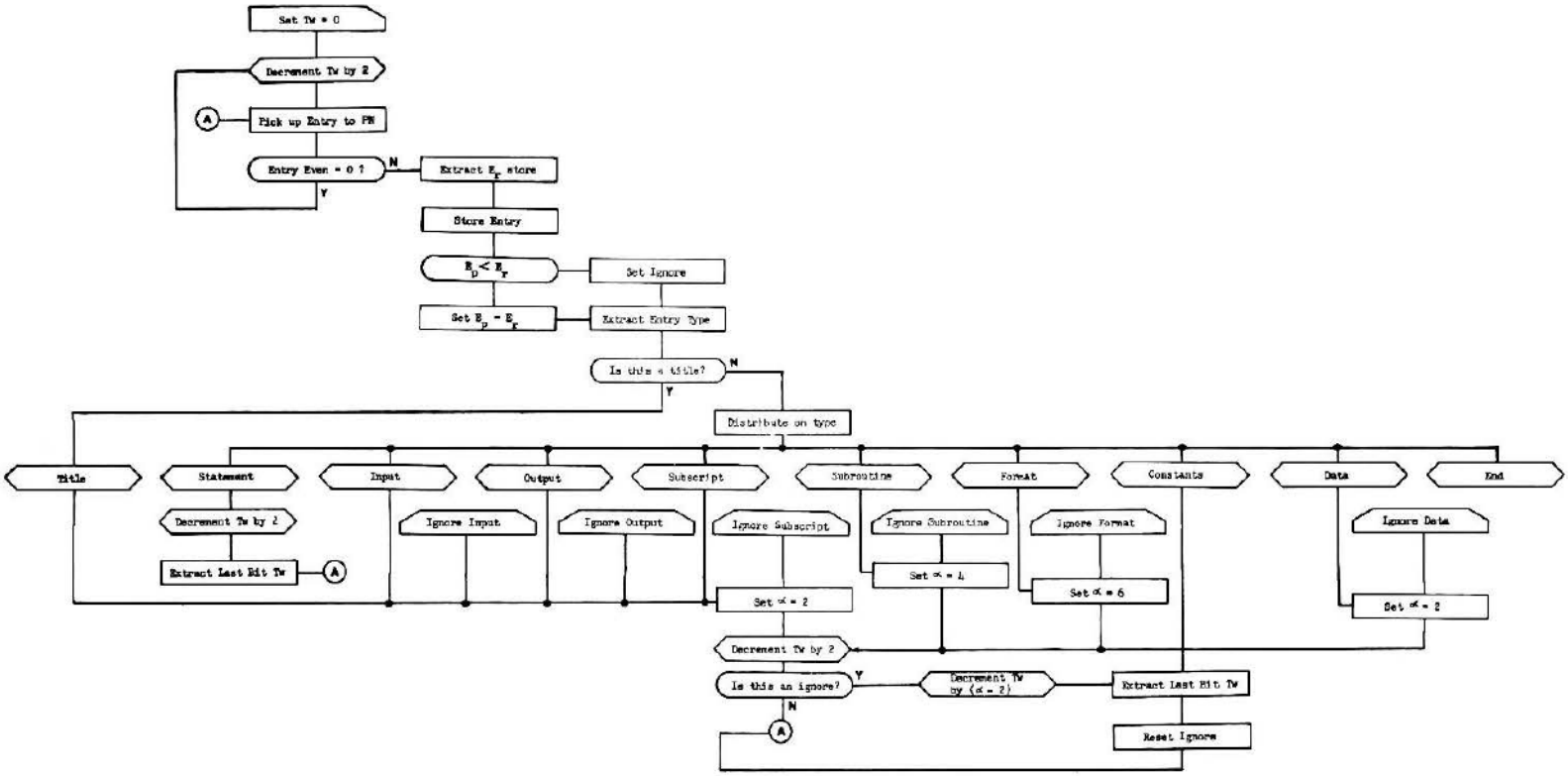
ALGO-EDITOR

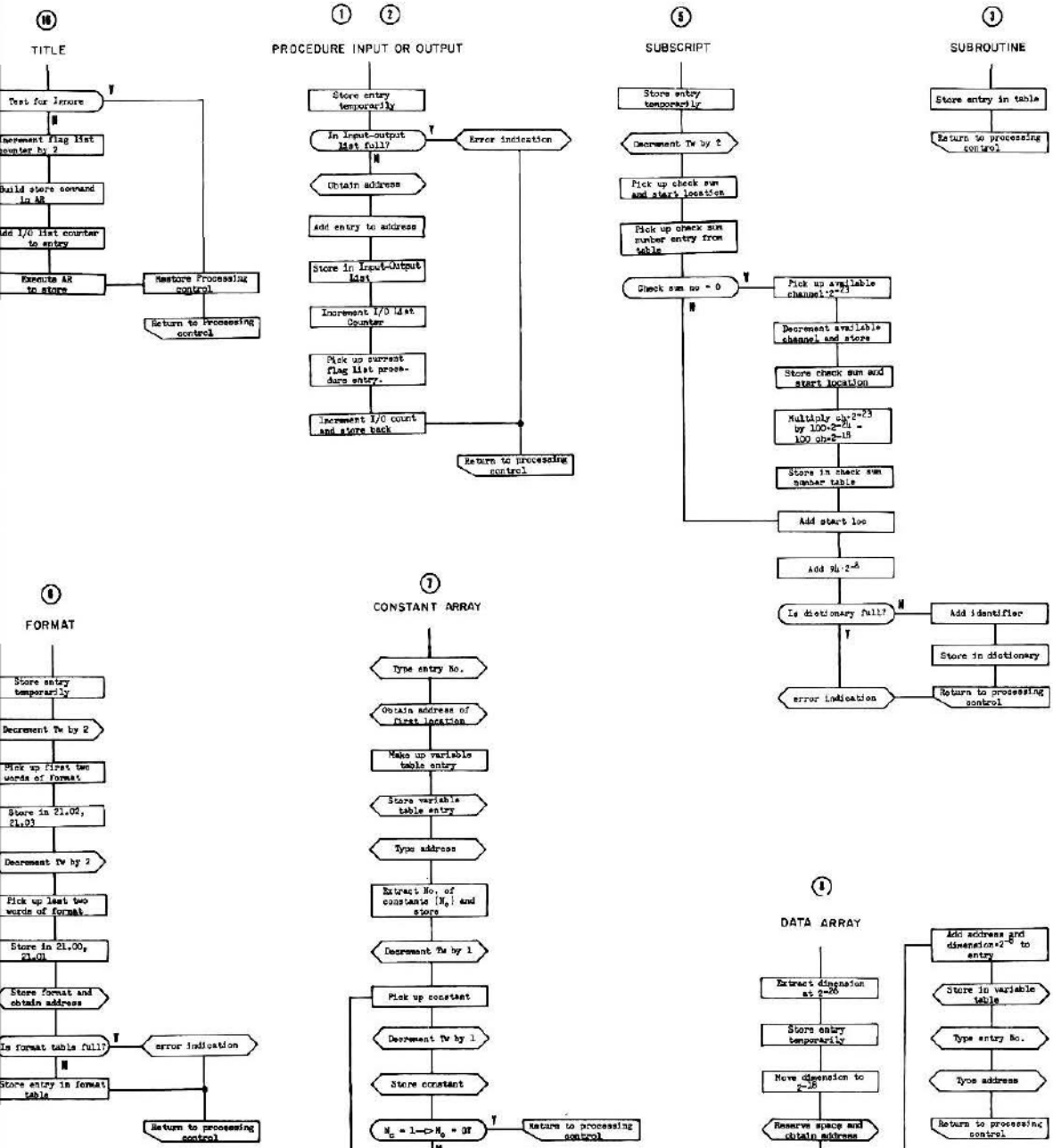
CONSTANT AND DATA S.R.

LINE 14

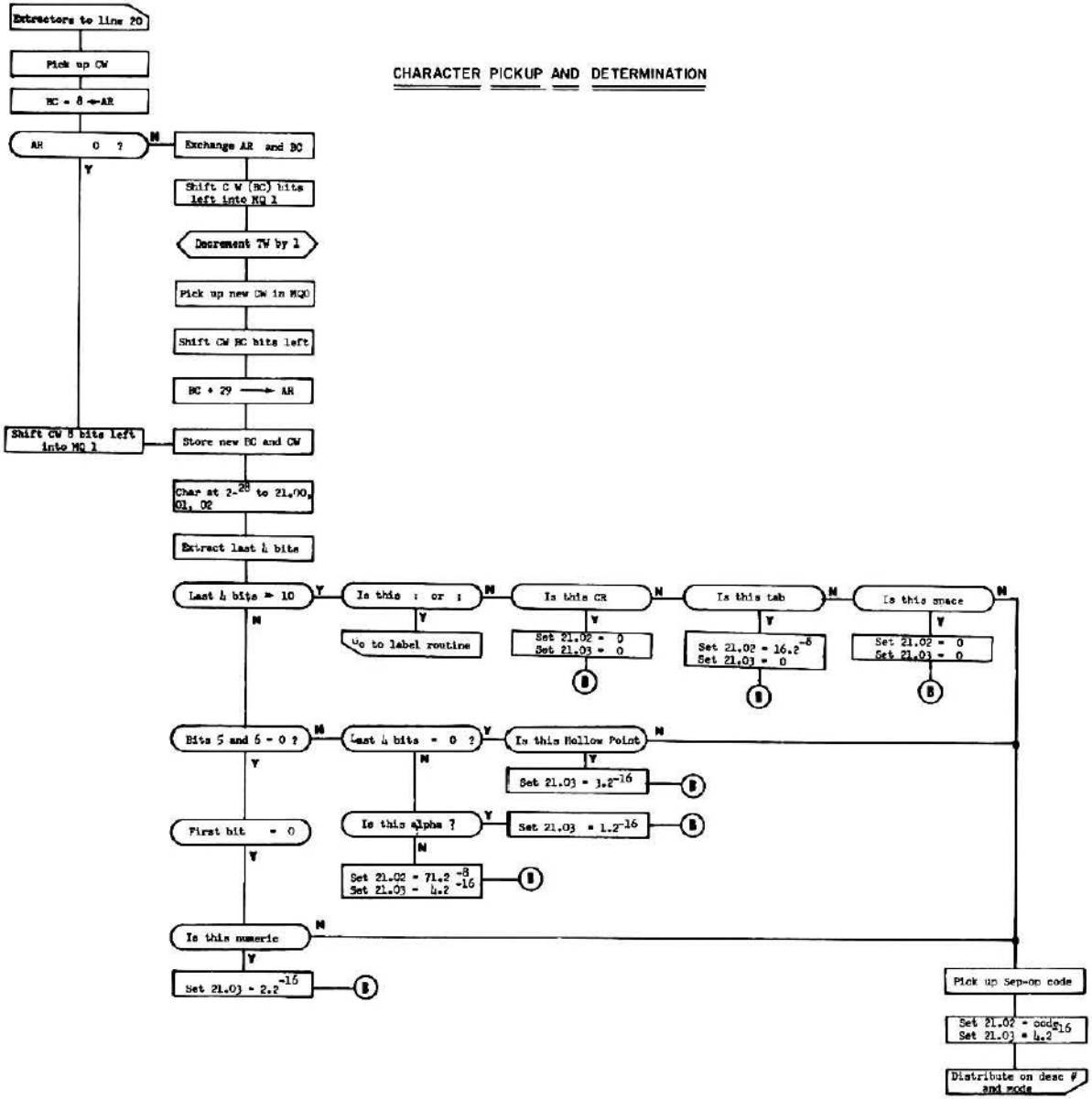


PROCESSING CONTROL




10
TITLE
Test for Irmore
Y
N
Increment Flag List counter by 2
Build store command in AR
Add I/O list counter to entry
Execute AR to store
Restore Processing control
Return to Processing control
1 2
PROCEDURE INPUT OR OUTPUT
Store entry temporarily
In Input-output list full?
Y
Error indication
N
Obtain address
Add entry to address
Store in Input-Output List
Increment I/O list Counter
Pick up current flag list procedure entry.
Increment I/O count and store back
Return to processing control
5
SUBSCRIPT
Store entry temporarily
Decrement Tw by 2
Pick up check sum and start location
Pick up check sum number entry from table
Check sum no = 0
Y
Pick up available channel
N
Decrement available channel and store
Store check sum and start location
Multiply ch by 2^23 by 100·2^-21 = 100 ch·2^-18
Store in check sum number table
Add start loc
Add 9A·2^-8
Is dictionary full?
N
Add identifier
Store in dictionary
Y
error indication
Return to processing control
3
SUBROUTINE
Store entry in table
Return to processing control
4
FORMAT
Store entry temporarily
Decrement Tw by 2
Pick up first two words of format
Store in 21.02, 21.03
Decrement Tw by 2
Pick up last two words of format
Store in 21.00, 21.01
Store format and obtain address
Is format table full?
Y
error indication
N
Store entry in format table
Return to processing control
7
CONSTANT ARRAY
Type entry No.
Obtain address of first location
Make up variable table entry
Store variable table entry
Type address
Extract No. of constants [N_c] and store
Decrement Tw by 1
Pick up constant
Decrement Tw by 1
Store constant
N_c = 1 <-> N_c = 0?
Y
Return to processing control
N
8
DATA ARRAY
Extract dimension at 2^-26
Store entry temporarily
Move dimension to 2^-18
Reserve space and obtain address
Add address and dimension·2^-8 to entry
Store in variable table
Type entry No.
Type address
Return to processing control

CHARACTER PICKUP AND DETERMINATION



CURRENT WORD PICKUP

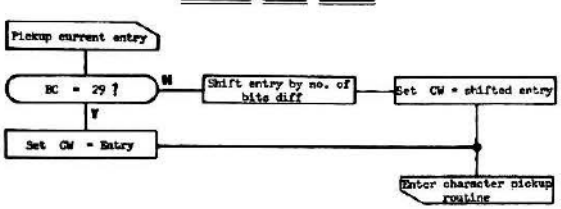
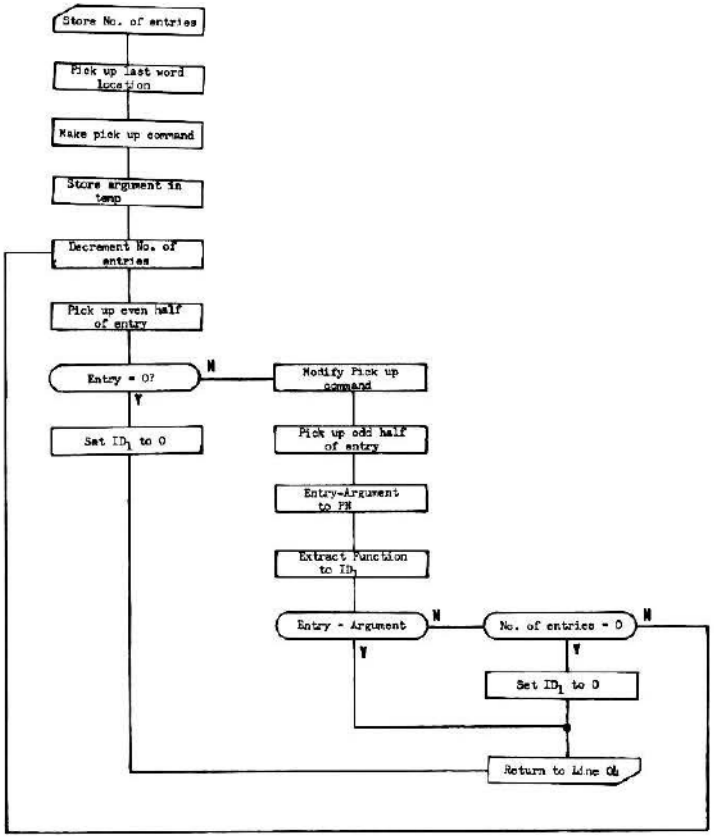
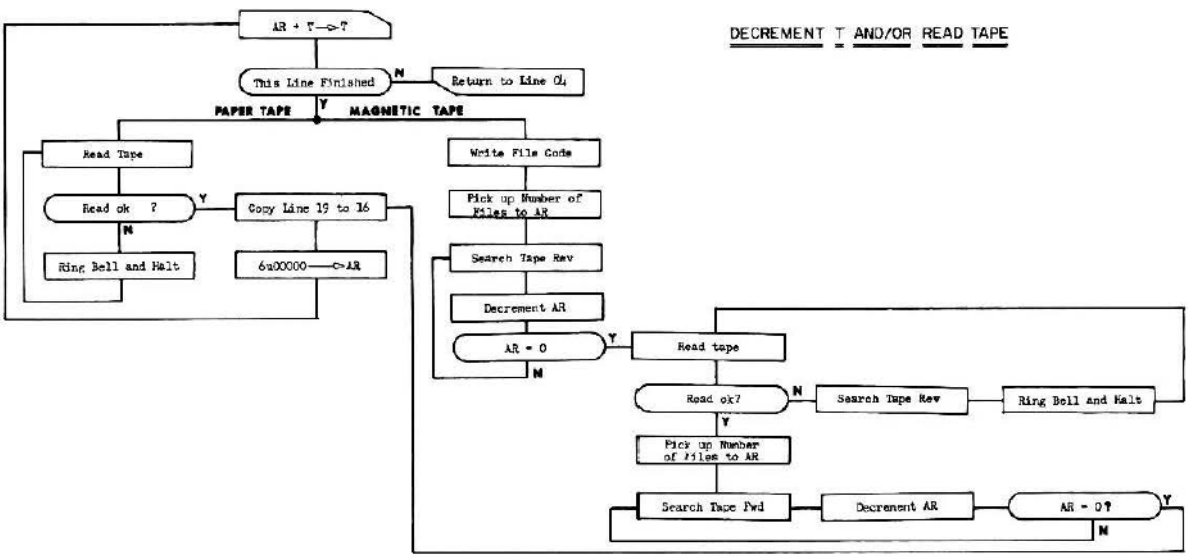


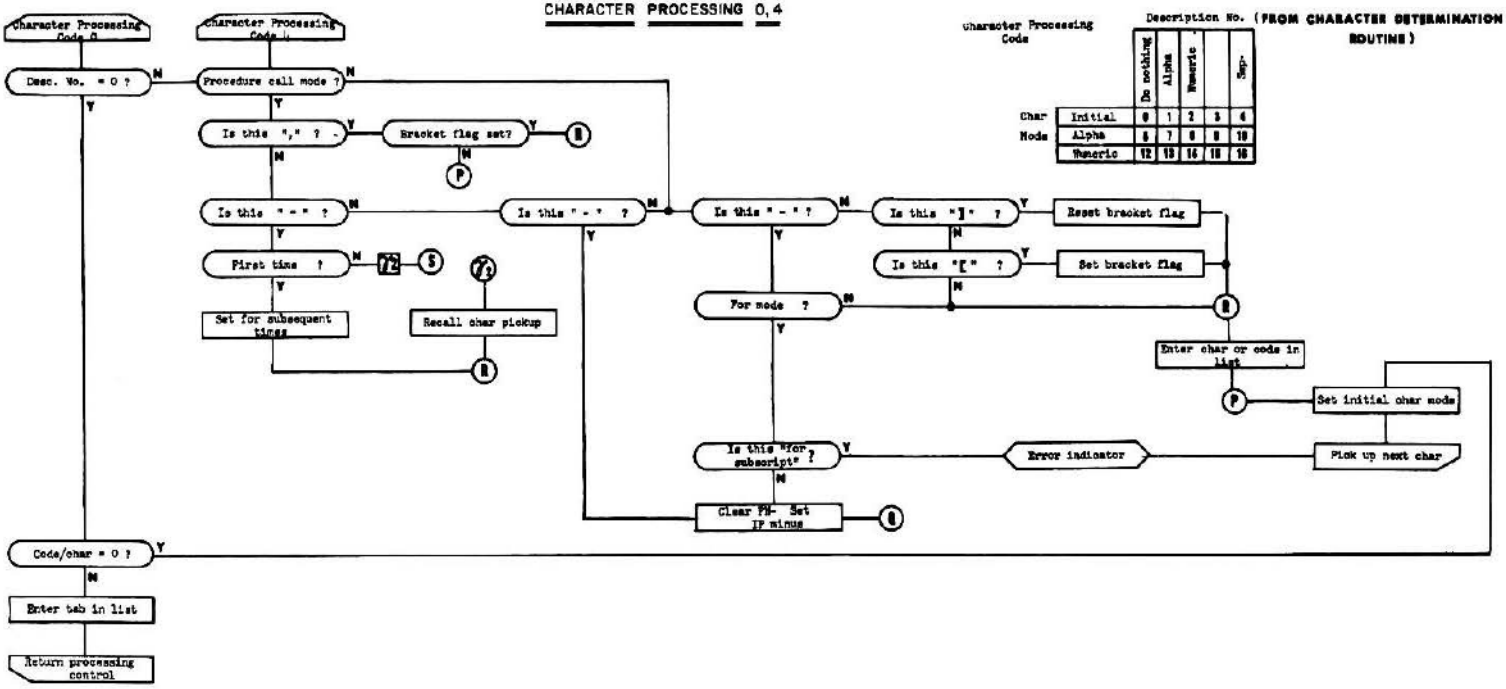
TABLE LOOKUP



DECREMENT T AND/OR READ TAPE



CHARACTER PROCESSING 0, 4

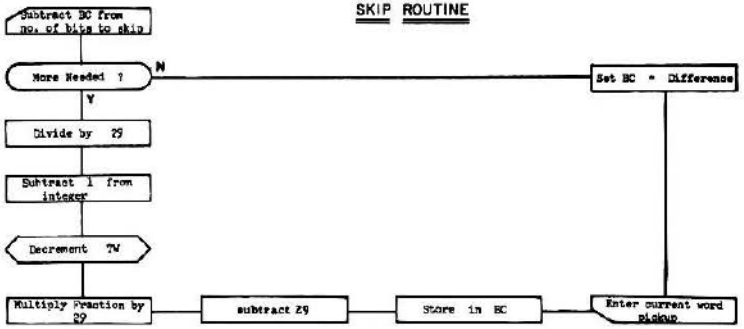


Character Processing Code

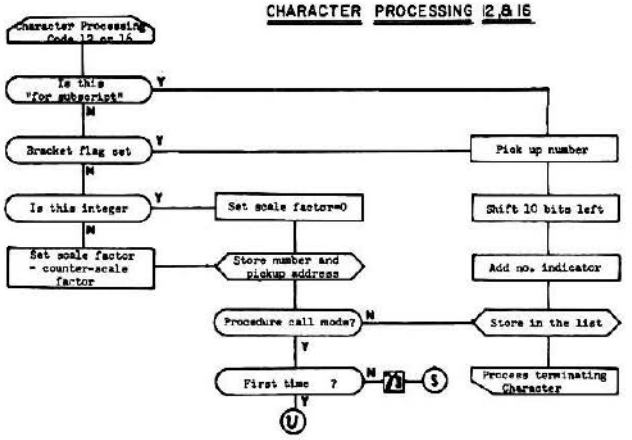
Description No. (FROM CHARACTER DETERMINATION ROUTINE)

Char Mode	Do nothing	Alpha	Numeric	'	Sep.
Initial	0	1	2	3	4
Alpha	5	7	8	9	10
Numeric	12	13	16	18	18

SKIP ROUTINE



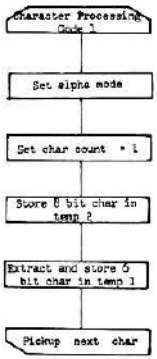
CHARACTER PROCESSING 12 & 16

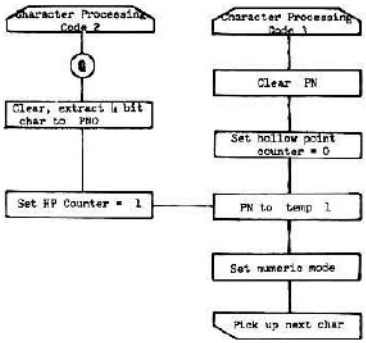


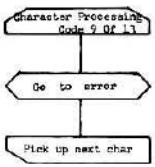
CHARACTER PROCESSING

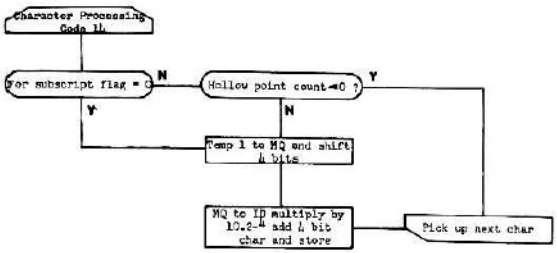
CODES 1, 2, 3, 5, 7, 8, 9, 13, 14, 15

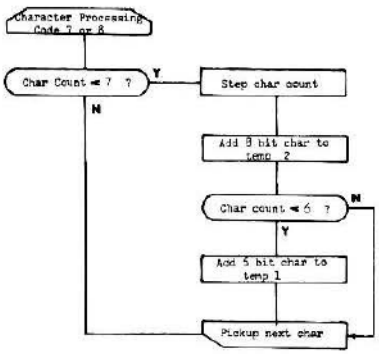
LINE 00

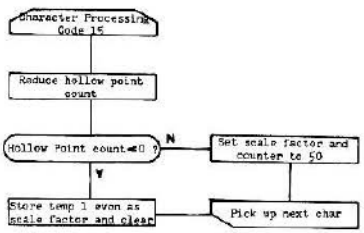




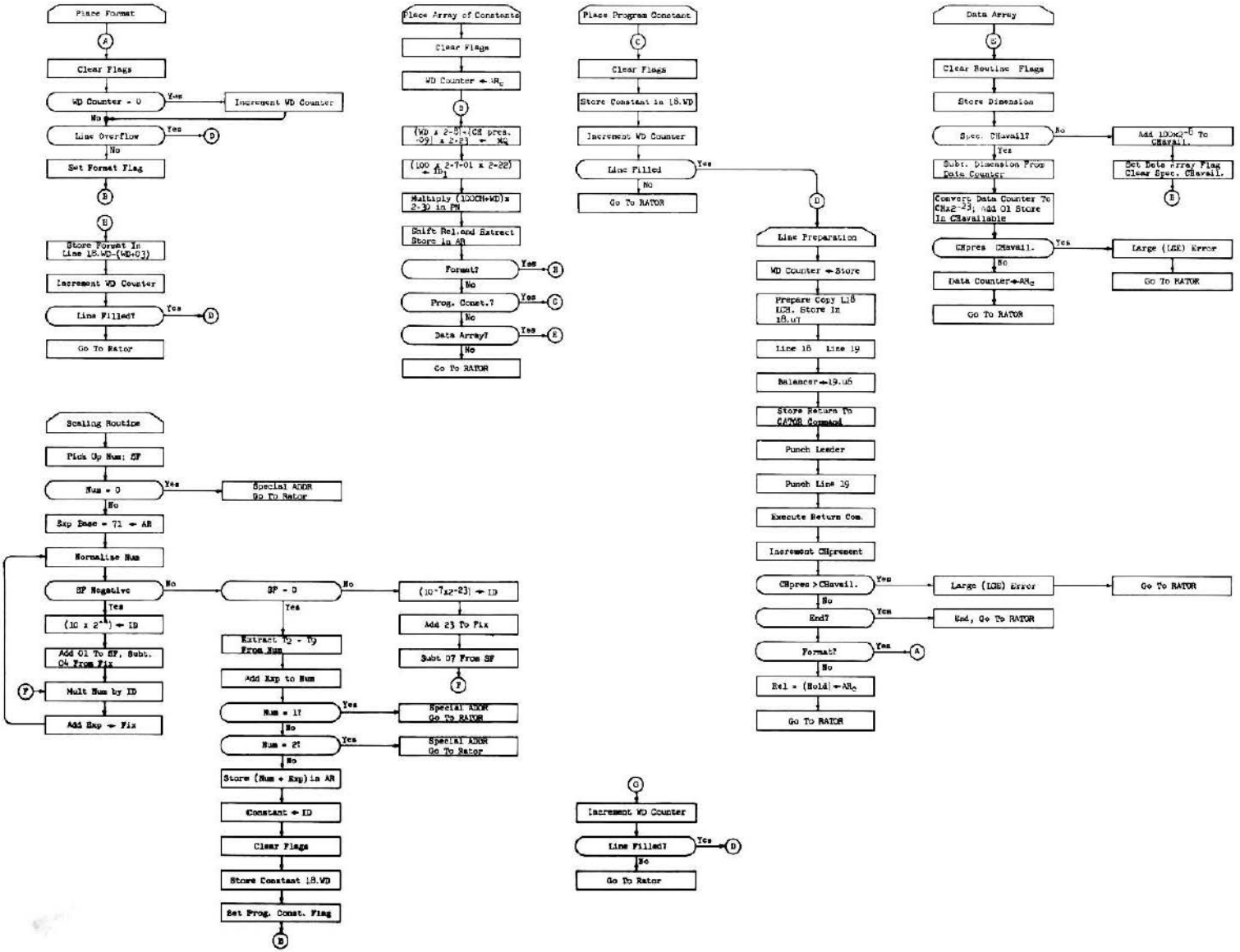


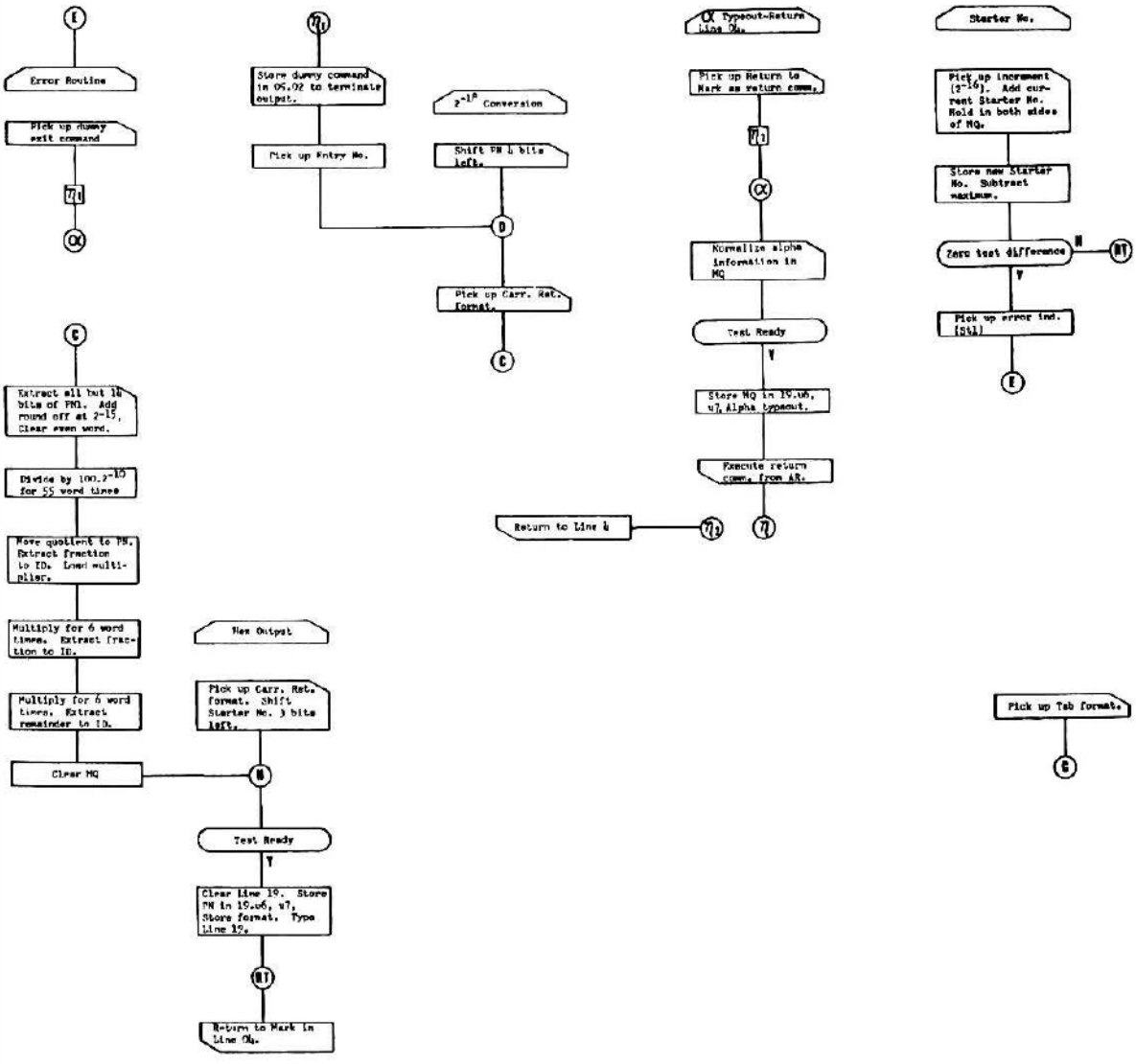




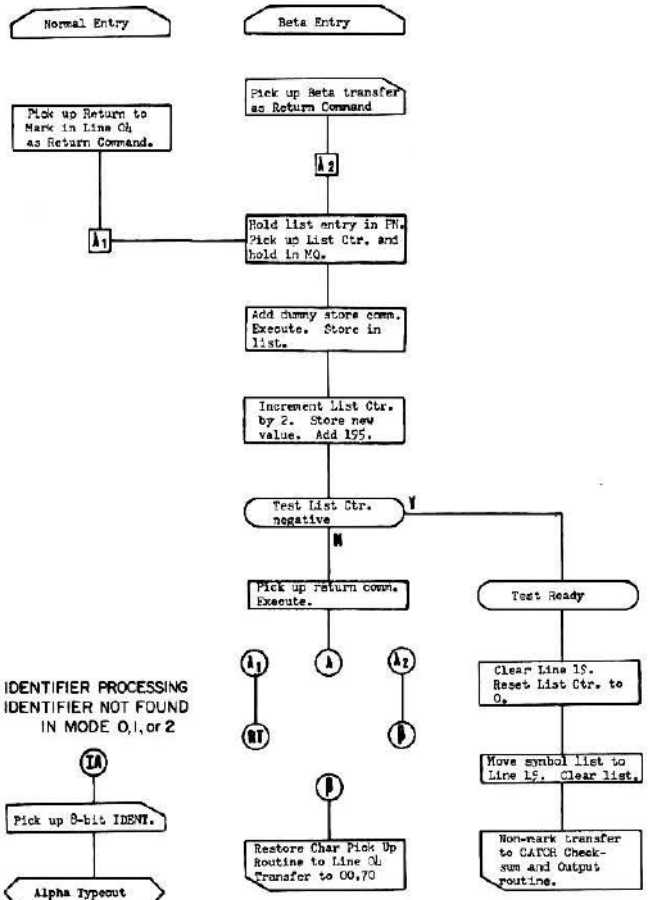


CATOR

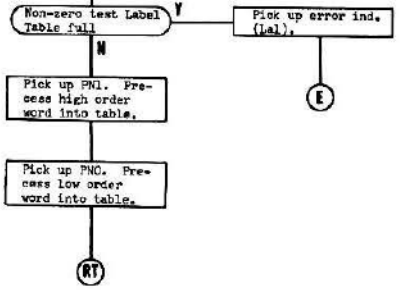

Place Format
A
Clear Flags
WD Counter = 0
Yes
Increment WD Counter
No
Line Overflow
Yes
D
No
Set Format Flag
B
E
Store Format In Line 18.WD-(WD+03)
Increment WD Counter
Line Filled?
Yes
D
Go To Rator
Place Array of Constants
Clear Flags
WD Counter ← AR0
B
(Wd x 2-8)+(CH pres. -09) x 2-23 ← MQ
(100 x 2-7-01 x 2-22) ← fb1
Multiply (100CH+WD)x 2-10 in FM
Shift Rel.and Extract Store in AR
Format?
Yes
H
No
Prog. Const.?
Yes
C
No
Data Array?
Yes
E
No
Go To RATOR
Place Program Constant
C
Clear Flags
Store Constant in 18.WD
Increment WD Counter
Line Filled
Yes
No
Go To RATOR
D
Line Preparation
WD Counter ← Store
Prepare Copy L18 ICH. Store In 18.07
Line 18 Line 19
Balancer ← 19.06
Store Return To CATOR Command
Punch Leader
Punch Line 19
Execute Return Com.
Increment CHpresent
CHpres > CHavail.
Yes
Large (LGE) Error
Go To RATOR
No
End?
Yes
End, Go To RATOR
Format?
Yes
A
No
Rel = (Hold) ← AR0
Go To RATOR
Data Array
G
Clear Routine Flags
Store Dimension
Spec. CHavail?
No
Add 100x2-8 To CHavail.
Yes
Subt. Dimension From Data Counter
Set Data Array Flag Clear Spec. CHavail.
E
Convert Data Counter To CHx2-23; Add 01 Store In CHavailable
CHpres CHavail.
Yes
Large (LGE) Error
No
Data Counter ← AR0
Go To RATOR
Go To RATOR
Scaling Routine
Pick Up Num: SF
Num = 0
Yes
Special ADDR Go To Rator
No
Exp Base = 72 ← AR
Normalize Num
SF Negative
No
SF = 0
No
(10-7x2-23) ← ID
Yes
(10 x 2-7) ← ID
Yes
Extract T2 - T0 From Num
Add 23 To Fix
Add 01 To SF, Subt. 04 From Fix
Add Exp to Num
Subt 07 From SF
F
Mult Num by ID
Num = 1?
Yes
Special ADDR Go To RATOR
Add Exp ← Fix
No
Num = 2?
Yes
Special ADDR Go To Rator
No
Store (Num + Exp) in AR
Constant ← ID
Clear Flags
Store Constant 18.WD
Set Prog. Const. Flag
B
G
Increment WD Counter
Line Filled?
Yes
D
No
Go To Rator


E
Error Routine
Pick up dummy exit command
71
α
C
Extract all but 18 bits of PR1. Add round off at 2-15, Clear even word.
Divide by 100.2-10 for 55 word times
Move quotient to PR. Extract fraction to ID. Load multiplier.
Multiply for 6 word times. Extract fraction to IB.
Multiply for 6 word times. Extract remainder to IA.
Clear MQ
71
Store dummy command in 05.02 to terminate output.
Pick up Entry No.
2-10 Conversion
Shift PR 4 bits left.
D
Pick up Carr. Ret. format.
C
Hex Output
Pick up Carr. Ret. format. Shift Starter No. 3 bits left.
N
Test Ready
Y
Clear Line 19. Store PR in 19.06, 07, Store format. Type Line 19.
RT
Return to Mark in Line 04.
04 Typeout-Return Line 04.
Pick up Return to Mark as return comm.
71
α
Normalize alpha information in MQ
Test Ready
Y
Store MQ in 19.06, 07, Alpha typeout.
Execute return comm. from AR.
Return to Line 4
71
71
Starter No.
Pick up increment (2-10). Add current Starter No. Hold in both sides of MQ.
Store new Starter No. Subtract maximum.
Zero test difference
N
RT
Y
Pick up error ind. (511)
E
Pick up Tab format.
C

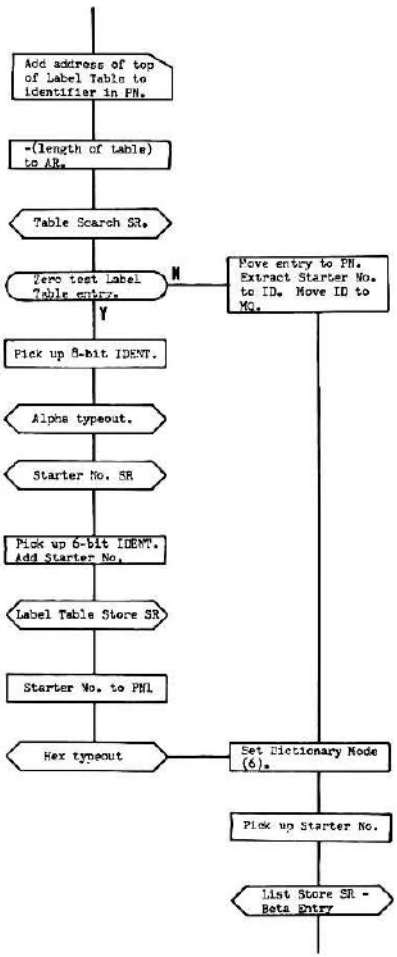
LIST STORE ROUTINE



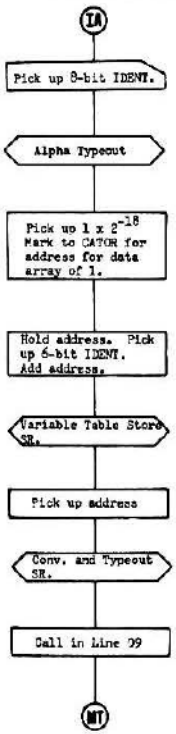
LABEL TABLE STORE ROUTINE



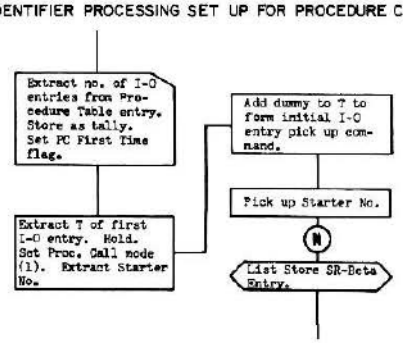
IDENTIFIER PROCESSING IN GO TO MODE



IDENTIFIER PROCESSING IDENTIFIER NOT FOUND IN MODE 0, 1, or 2

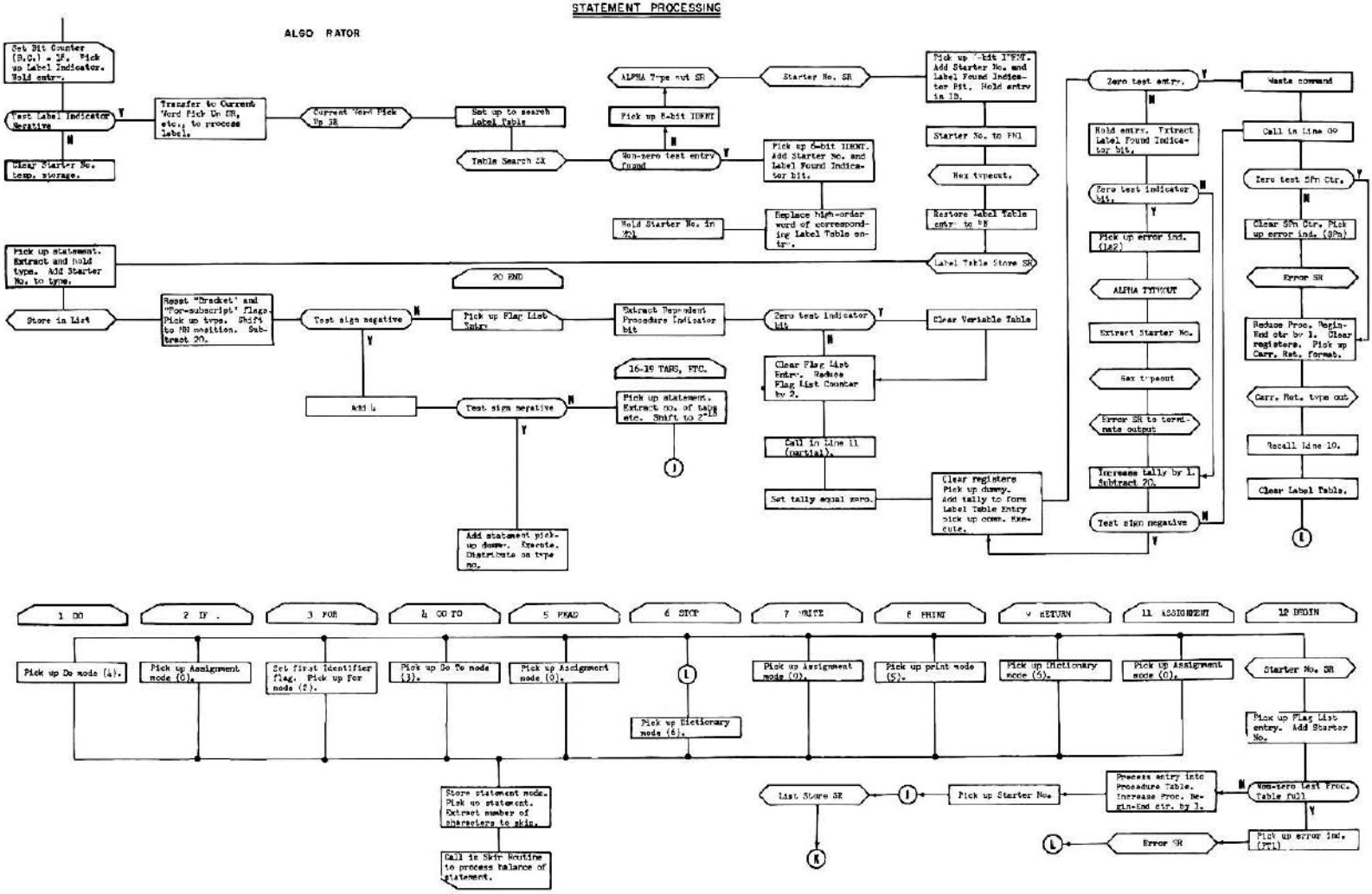


IDENTIFIER PROCESSING SET UP FOR PROCEDURE CALL



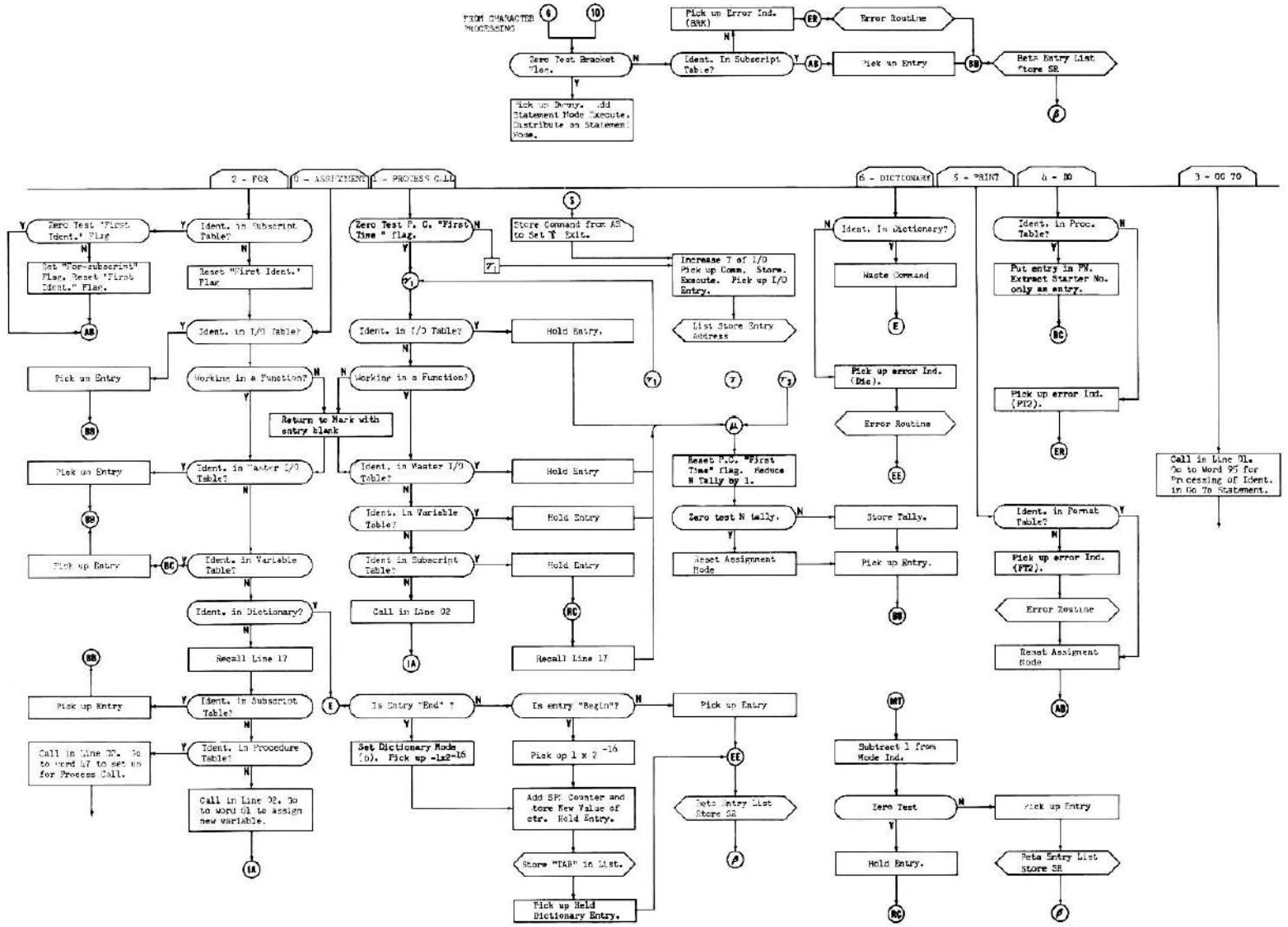
STATEMENT PROCESSING

ALGO RATOR

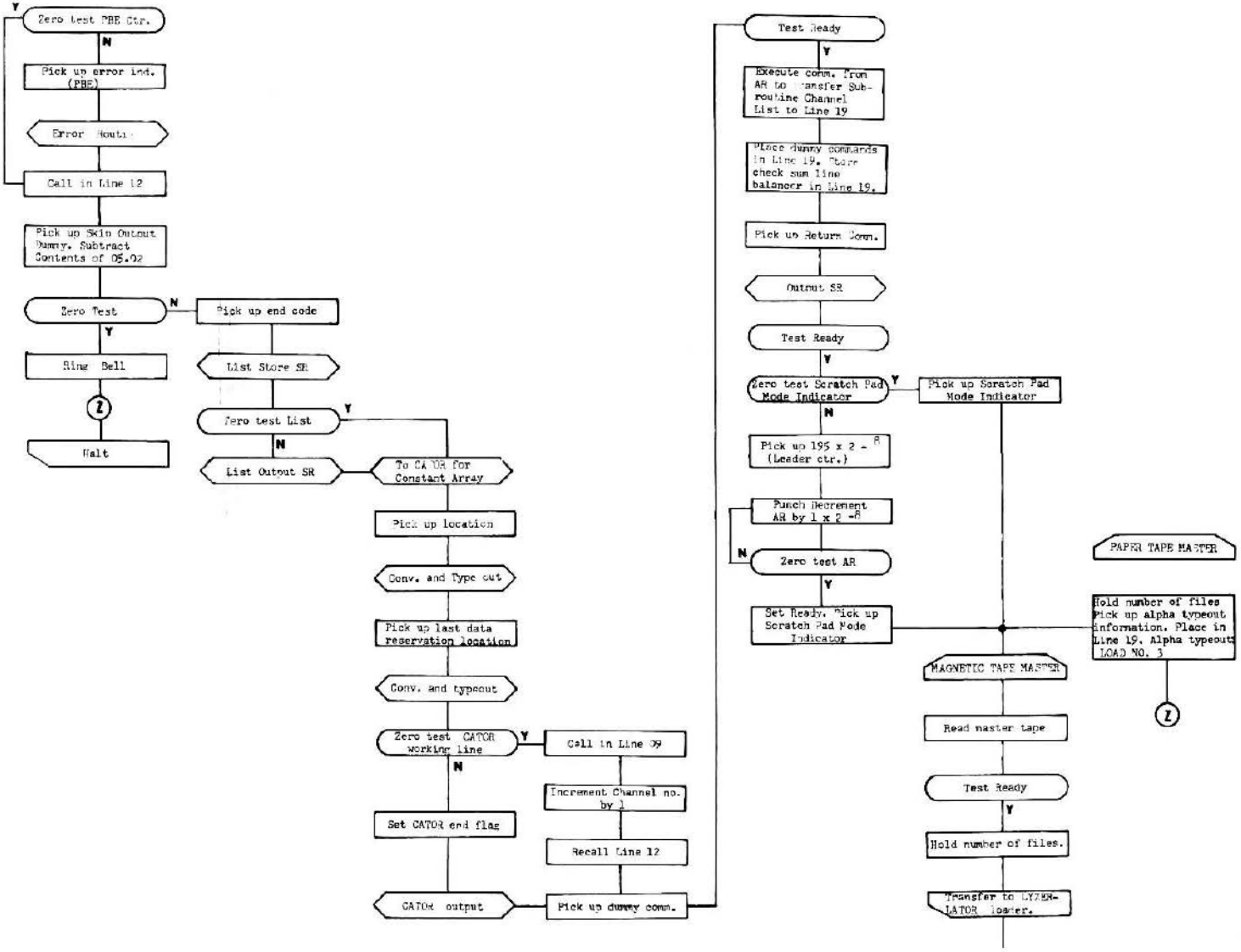


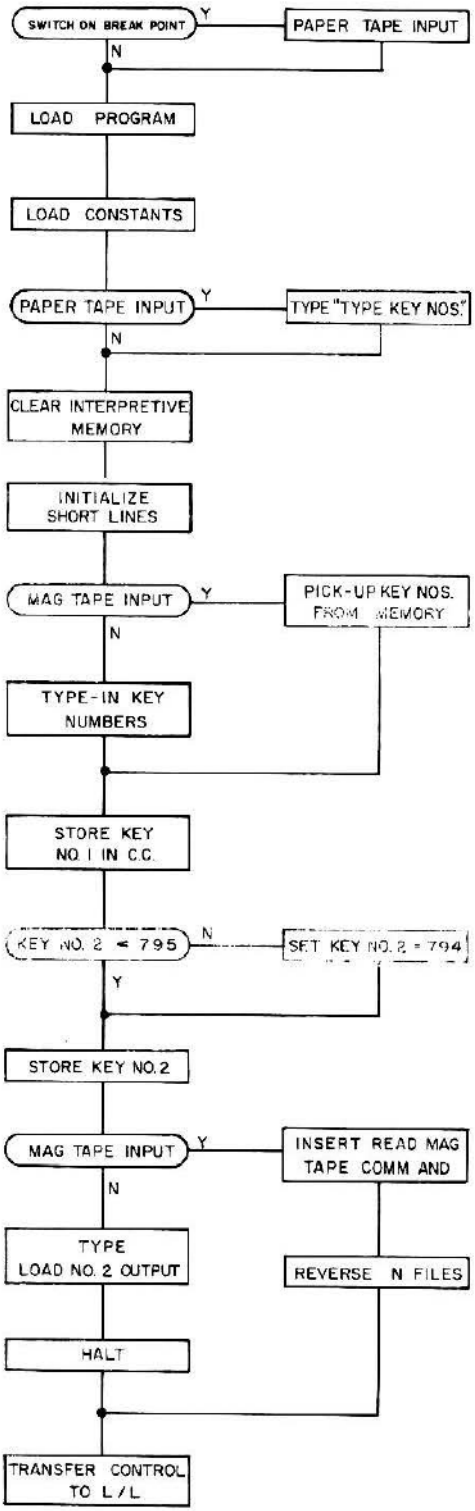
ALGO RATOR

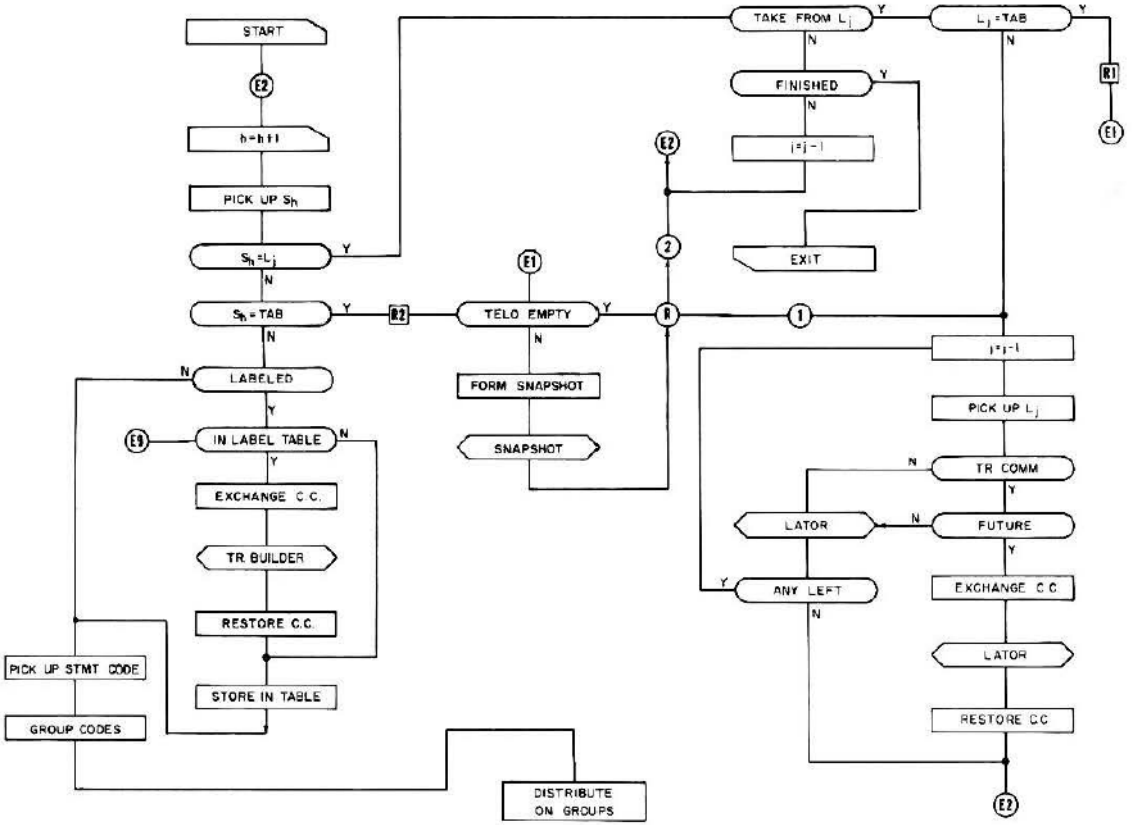
PROCESSING OF IDENTIFIERS

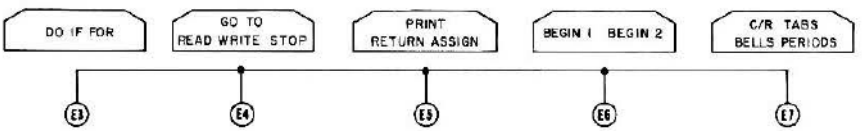


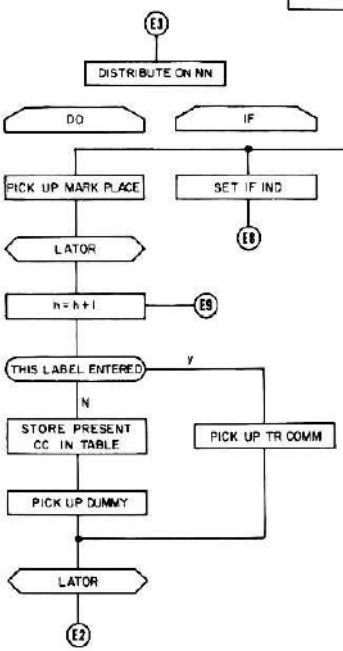
END OF ROUTINE

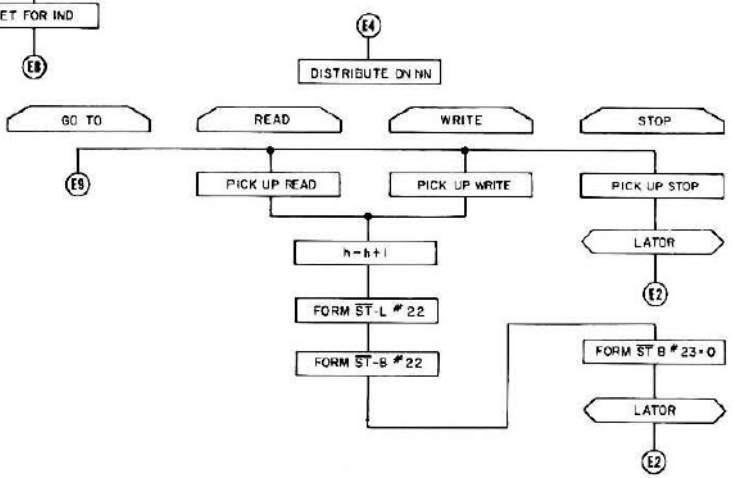


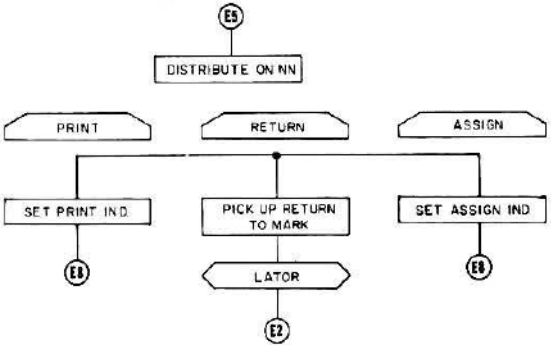

SWITCH ON BREAK POINT
Y
PAPER TAPE INPUT
N
LOAD PROGRAM
LOAD CONSTANTS
PAPER TAPE INPUT
Y
TYPE "TYPE KEY NOS."
N
CLEAR INTERPRETIVE MEMORY
INITIALIZE SHORT LINES
MAG TAPE INPUT
Y
PICK-UP KEY NOS. FROM MEMORY
N
TYPE-IN KEY NUMBERS
STORE KEY NO. 1 IN C.C.
KEY NO. 2 < 795
N
SET KEY NO. 2 = 794
Y
STORE KEY NO. 2
MAG TAPE INPUT
Y
INSERT READ MAG TAPE COMM AND
N
TYPE LOAD NO. 2 OUTPUT
REVERSE N FILES
HALT
TRANSFER CONTROL TO L/L

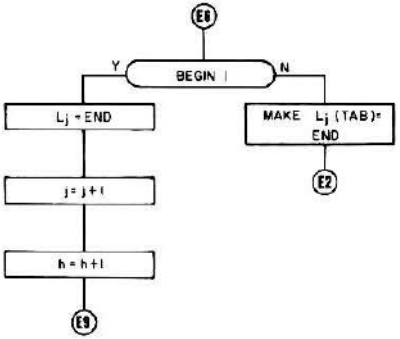

START
E2
h=h+1
PICK UP Sh
Sh=Lj
Y
N
Sh=TAB
Y
R2
N
LABELED
N
Y
E9
IN LABEL TABLE
N
Y
EXCHANGE C.C.
TR BUILDER
RESTORE C.C.
STORE IN TABLE
PICK UP STMT CODE
GROUP CODES
DISTRIBUTE ON GROUPS
E1
TELO EMPTY
Y
N
FORM SNAPSHOT
SNAPSHOT
TAKE FROM Lj
Y
N
FINISHED
Y
N
j=j-1
EXIT
E2
2
R
1
Lj=TAB
Y
N
R1
E1
j=j-1
PICK UP Lj
TR COMM
N
Y
LATOR
N
FUTURE
Y
ANY LEFT
Y
N
EXCHANGE C.C.
LATOR
RESTORE CC
E2

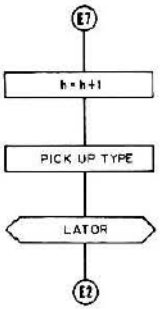

DO IF FOR
GO TO READ WRITE STOP
PRINT RETURN ASSIGN
BEGIN 1 BEGIN 2
C/R TABS BELLS PERIODS
E3
E4
E5
E6
E7


E3
DISTRIBUTE ON NN
DO
IF
FOR
PICK UP MARK PLACE
SET IF IND
SET FOR IND
E8
E8
LATOR
h=h+1
E9
THIS LABEL ENTERED
y
N
STORE PRESENT CC IN TABLE
PICK UP TR COMM
PICK UP DUMMY
LATOR
E2

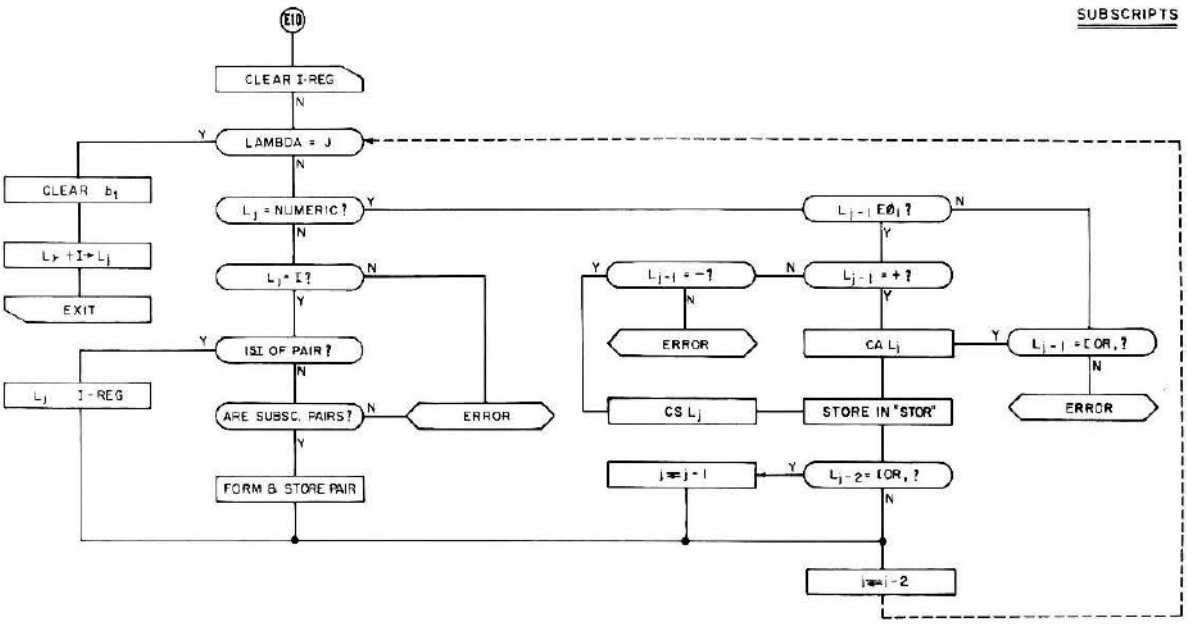

E4
DISTRIBUTE ON NN
GO TO
READ
WRITE
STOP
E9
PICK UP READ
PICK UP WRITE
PICK UP STOP
h=h+1
LATOR
E2
FORM ST-L #22
FORM ST-B #22
FORM ST B #23+0
LATOR
E2

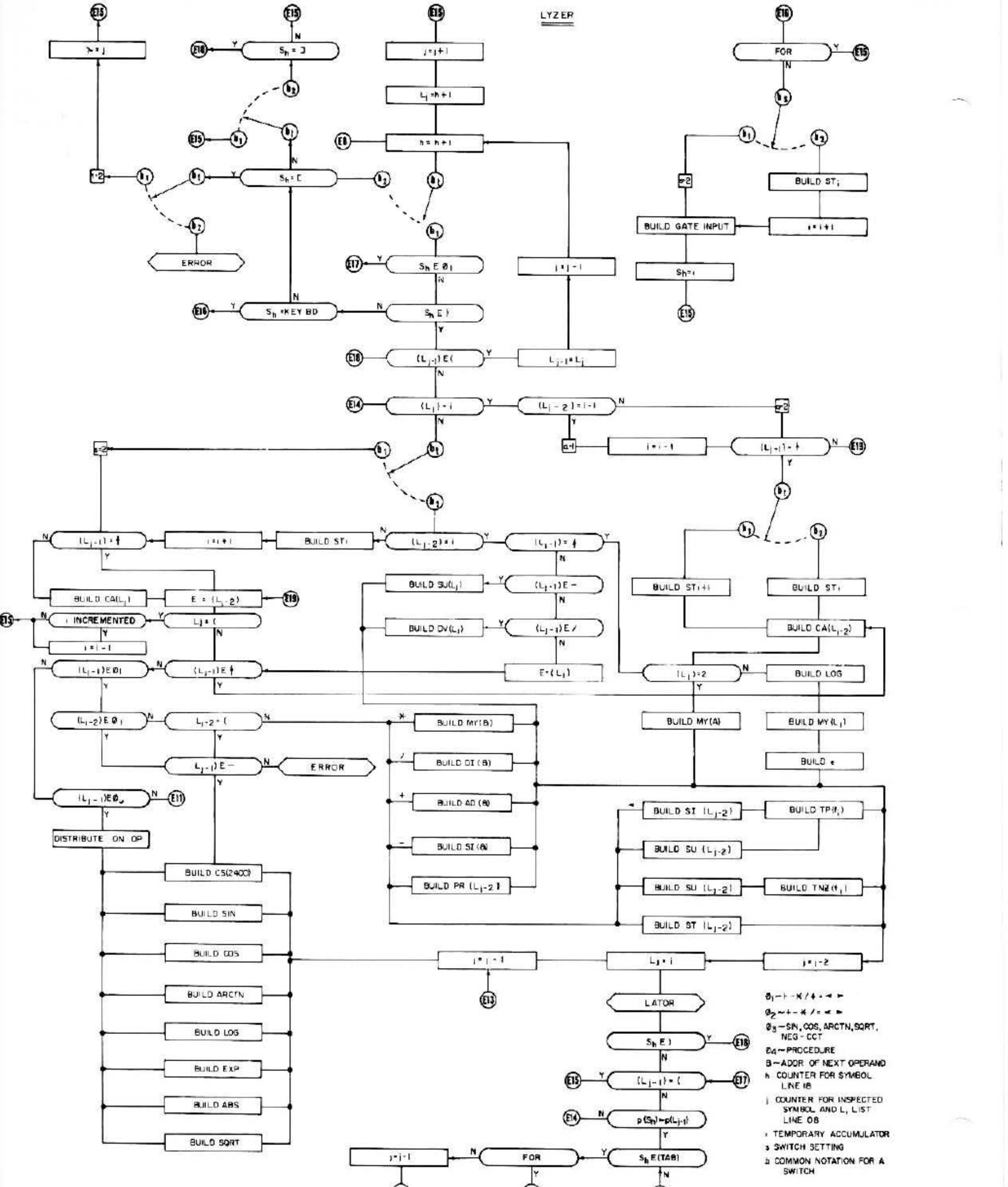

E5
DISTRIBUTE ON NN
PRINT
RETURN
ASSIGN
SET PRINT IND.
PICK UP RETURN TO MARK
SET ASSIGN IND.
E8
LATOR
E2
E8


E6
BEGIN ?
Y
N
Lj = END
MAKE Lj (TAB) = END
E2
j = j+1
h = h+1
E9

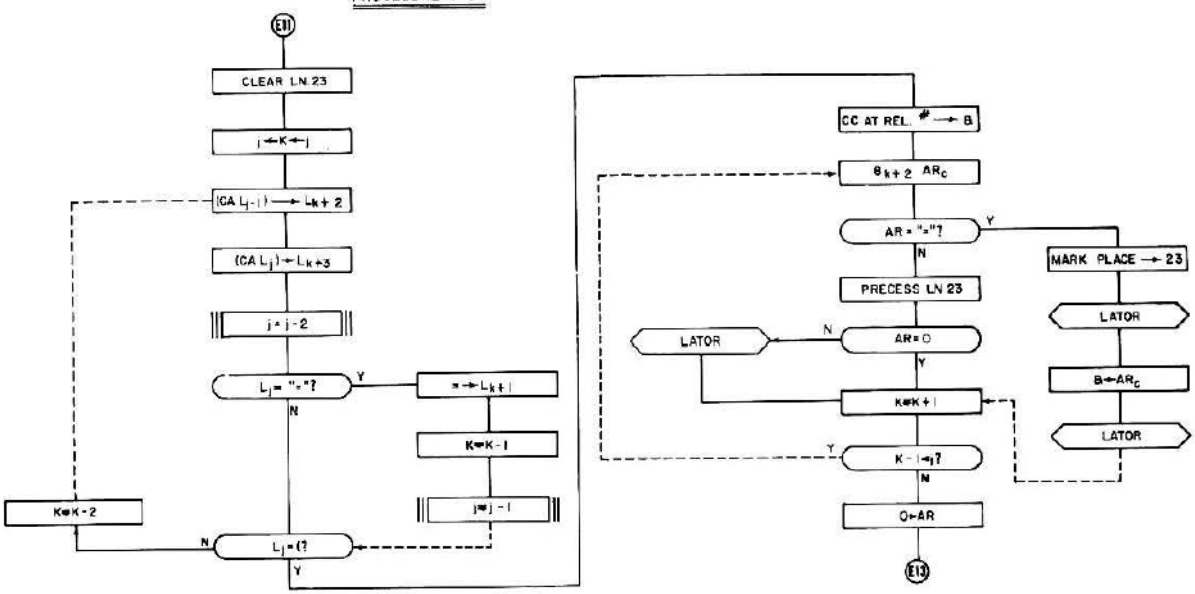

E7
h = h+1
PICK UP TYPE
LATOR
E2

SUBSCRIPTS

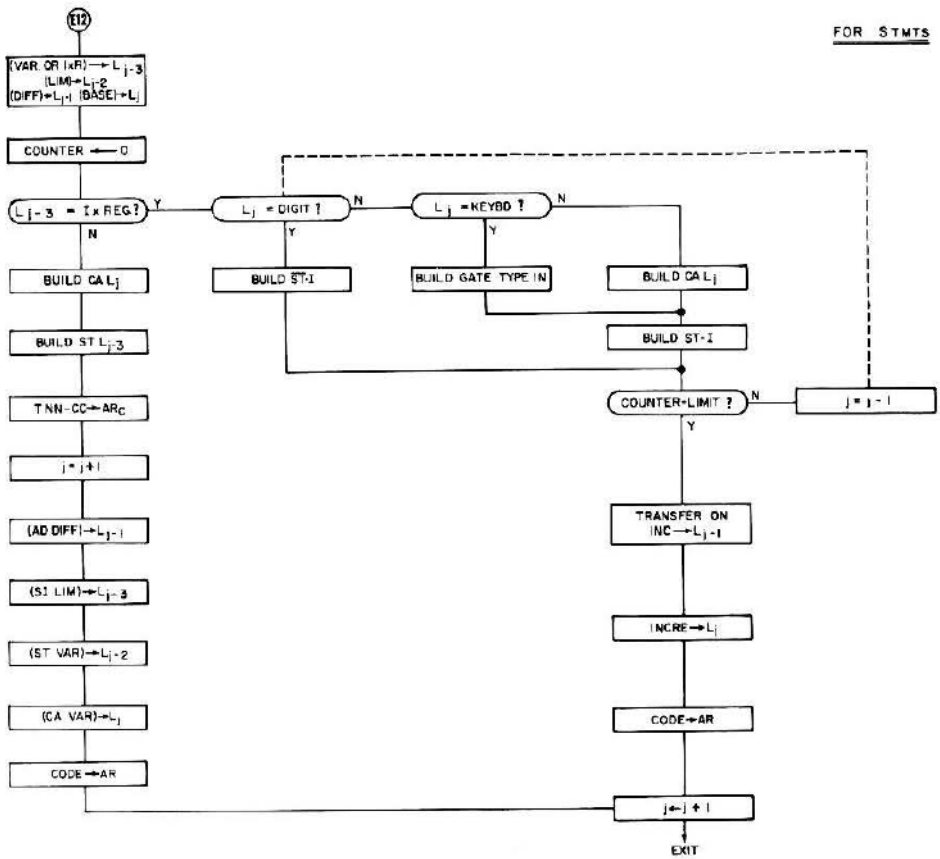

E10
CLEAR I-REG
LAMBDA = J
CLEAR b1
Lj + I → Lj
EXIT
Lj = NUMERIC?
Lj = I?
ISI OF PAIR?
Lj I-REG
ARE SUBSC. PAIRS?
ERROR
FORM & STORE PAIR
Lj-1 EØ1?
Lj-1 = -?
Lj-1 = +?
ERROR
CA Lj
Lj-1 = [OR, ?
ERROR
CS Lj
STORE IN "STOR"
j = j-1
Lj-2 = [OR, ?
j = j-2


LYZER
FOR
BUILD ST
BUILD GATE INPUT
ERROR
BUILD ST
BUILD CA
INCREMENTED
DISTRIBUTE ON OP
ERROR
BUILD SU
BUILD DV
BUILD MY (B)
BUILD DI (B)
BUILD AD (B)
BUILD SI (B)
BUILD LOG
BUILD MY (A)
BUILD CS(2400)
BUILD SIN
BUILD COS
BUILD ARCTN
BUILD LOG
BUILD EXP
BUILD ABS
BUILD SQRT
LATOR
FOR
NEG - CCT
PROCEDURE
ADDR OF NEXT OPERAND
COUNTER FOR SYMBOL
LINE 18
COUNTER FOR INSPECTED
SYMBOL AND L_i LIST
LINE 08
TEMPORARY ACCUMULATOR
SWITCH SETTING
COMMON NOTATION FOR A
SWITCH

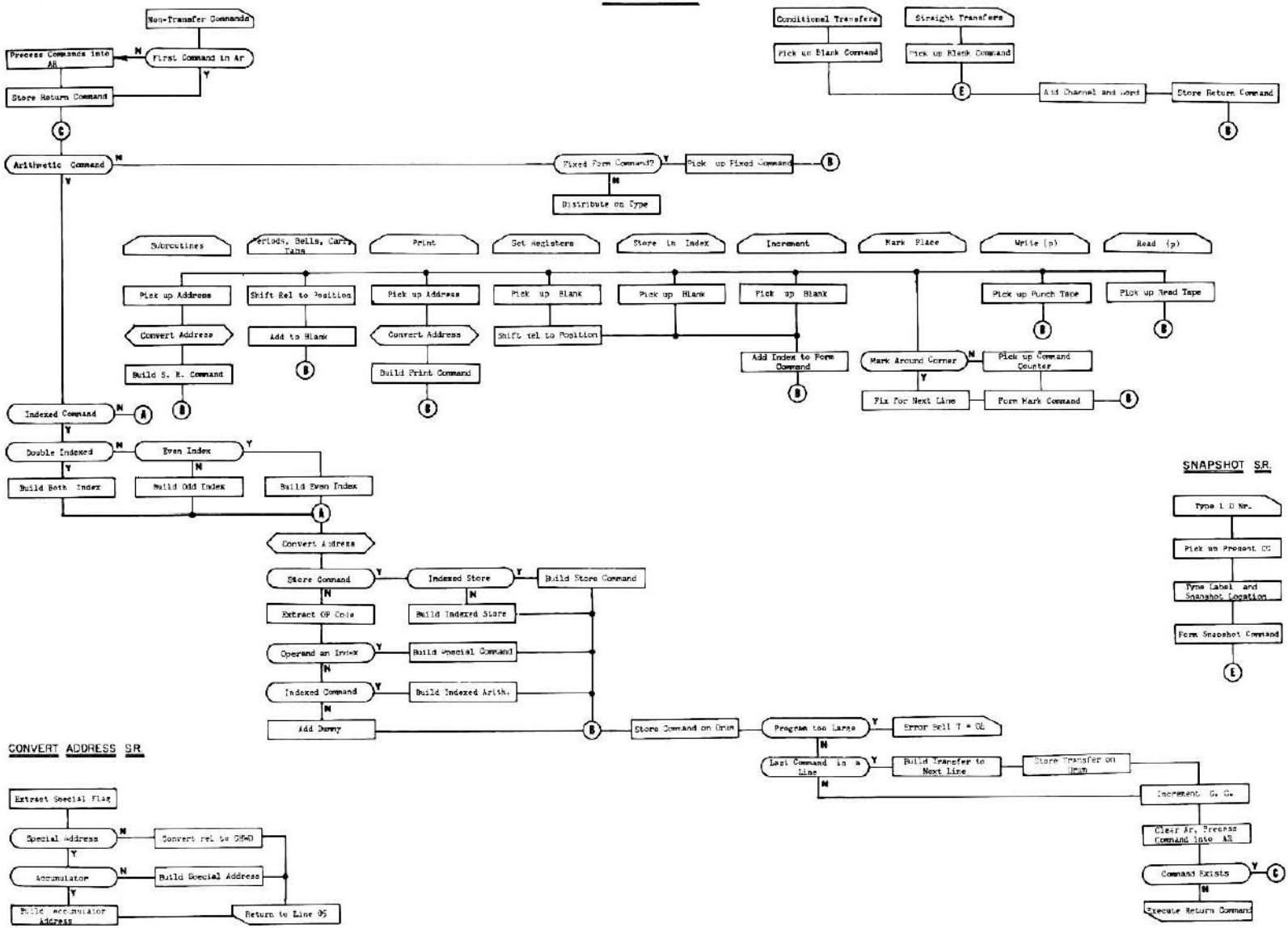
PROCEDURE CALL



FOR STMTS

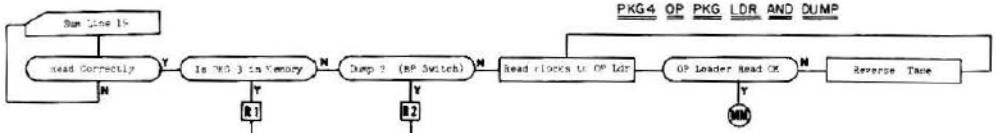


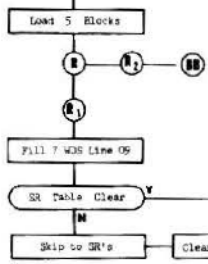
LYZER / LATOR

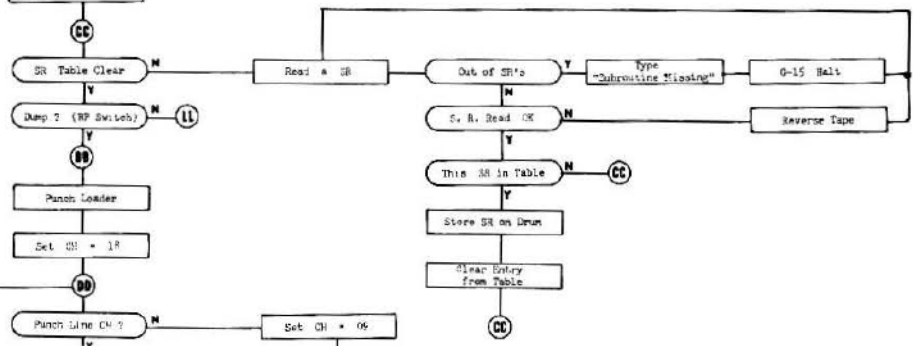

Non-Transfer Commands
Process Commands into AR
N
First Command in Ar
Y
Store Return Command
C
Arithmetic Command
N
Y
Fixed Form Command?
Y
Pick up Fixed Command
B
N
Distribute on Type
Conditionel Transfers
Straight Transfers
Pick up Blank Command
Pick up Blank Command
E
Add Channel and Word
Store Return Command
B
Subroutines
Periods, Bells, Carry Tabs
Print
Set Registers
Store in Index
Increment
Mark Place
Write (p)
Read (p)
Pick up Address
Convert Address
Build S. R. Command
B
Shift Rel to Position
Add to Blank
B
Pick up Address
Convert Address
Build Print Command
B
Pick up Blank
Shift rel to Position
Pick up Blank
Pick up Blank
Add Index to Form Command
B
Pick up Punch Tape
B
Pick up Read Tape
B
Mark Around Corner
N
Pick up Comand Counter
Y
Fix for Next Line
Form Mark Command
B
Indexed Command
N
A
Y
Double Indexed
N
Even Index
Y
Y
Build Both Index
Build Odd Index
N
Build Even Index
A
Convert Address
Store Command
Y
Indexed Store
Y
Build Store Command
N
Extract OP Code
N
Build Indexed Store
Operand an Index
Y
Build Special Command
N
Indexed Command
Y
Build Indexed Arith.
N
Add Dummy
B
Store Command on Drum
Program too Large
Y
Error Bell 7 = 01
N
Last Command in a Line
Y
Build Transfer to Next Line
Store Transfer on Drum
N
Increment C. C.
Clear Ar, Process Command into AR
Command Exists
Y
C
N
Execute Return Command
SNAPSHOT S.R.
Type I. D Nr.
Pick up Present CC
Type Label and Snapshot Location
Form Snapshot Command
E
CONVERT ADDRESS S.R.
Extract Special Flag
Special Address
N
Convert rel to 0040
Y
Accumulator
N
Build Special Address
Y
Build accumulator Address
Return to Line 05

OP LOADER AND DUMP

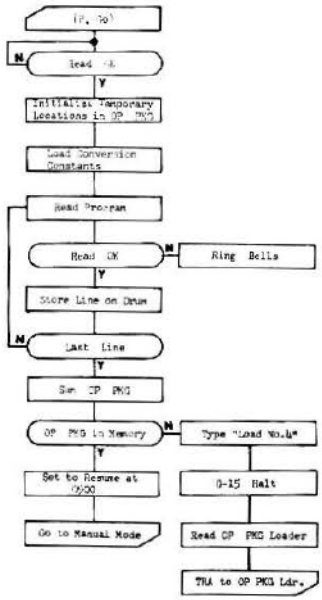
PKG4 OP PKG LDR AND DUMP

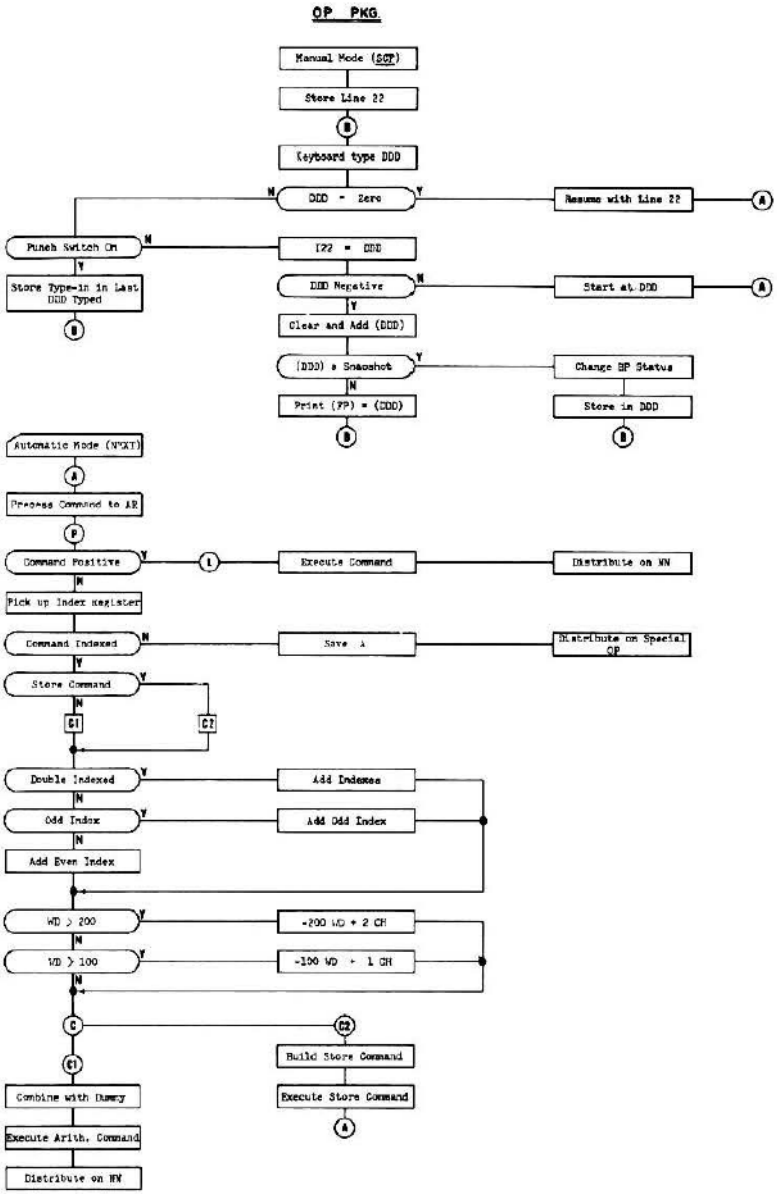


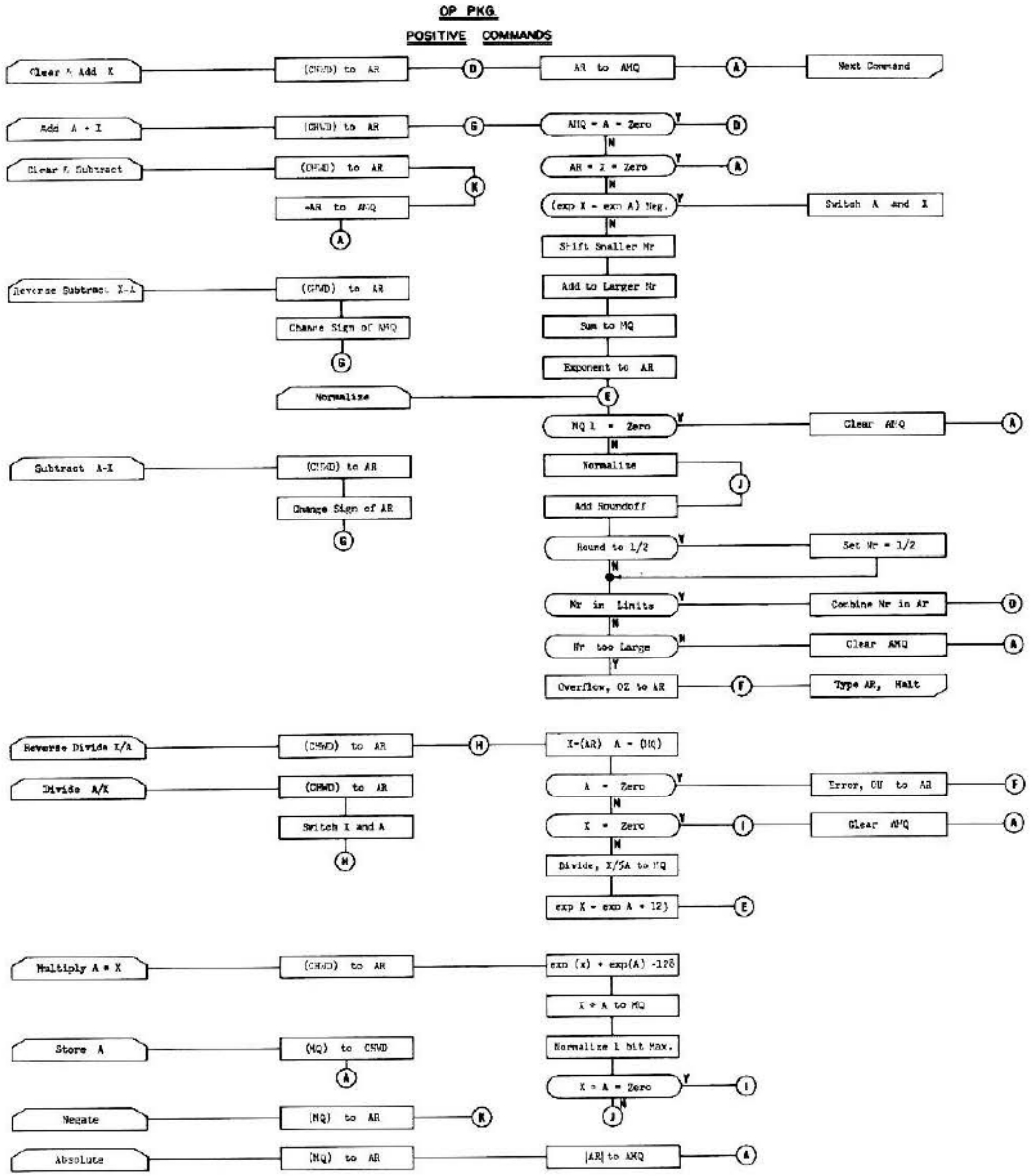


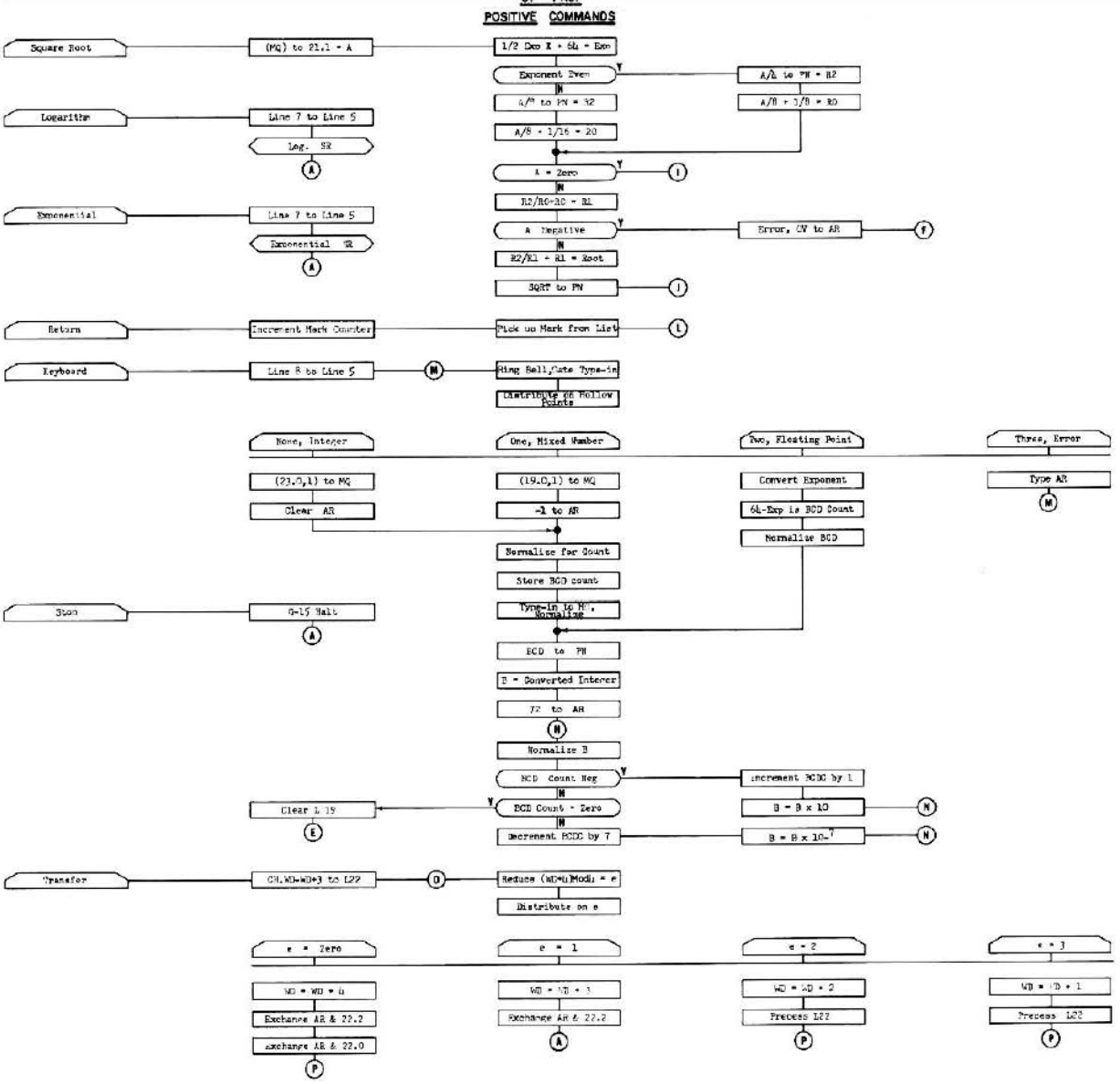


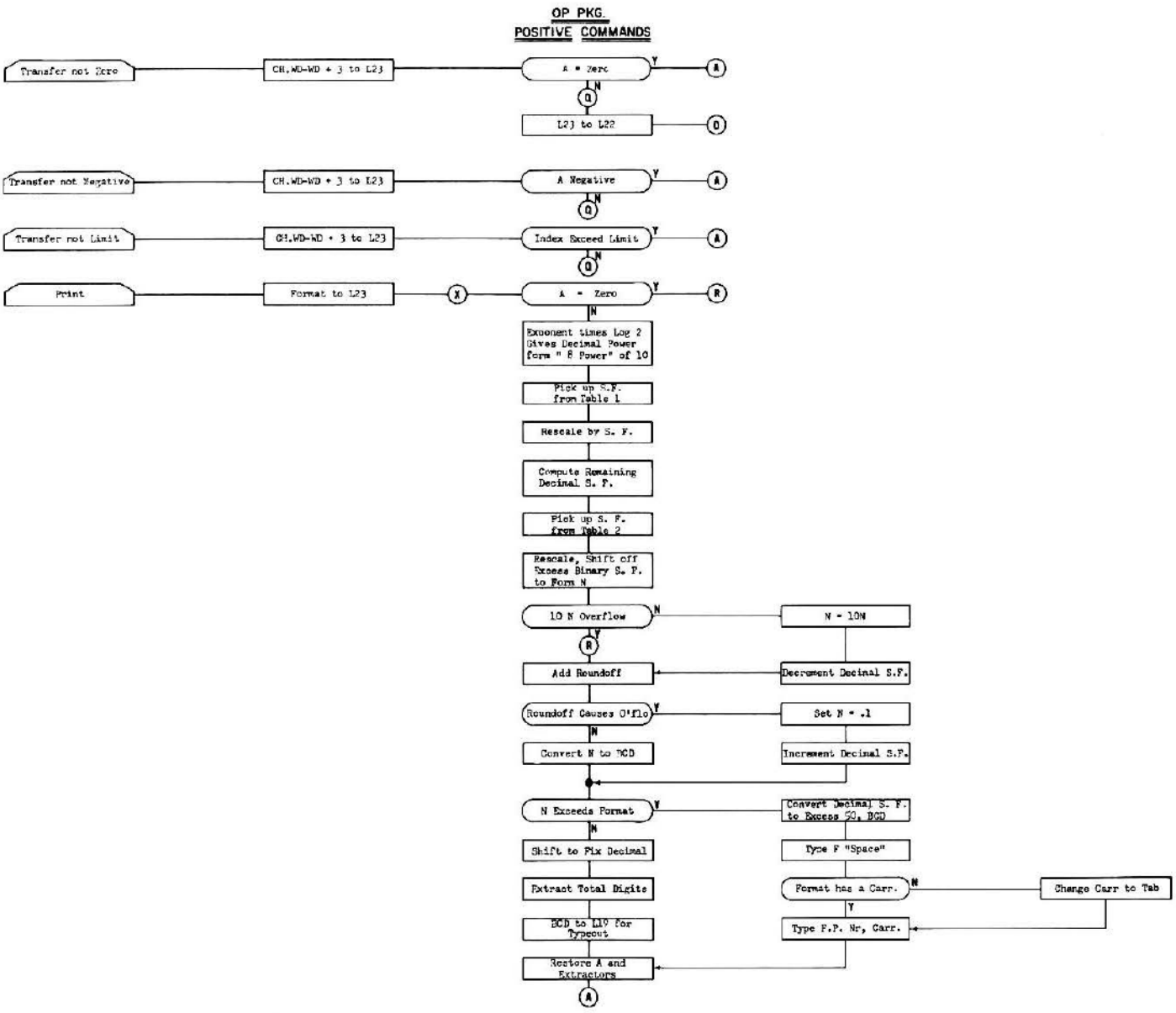
OP PKG PROGRAM LOADER

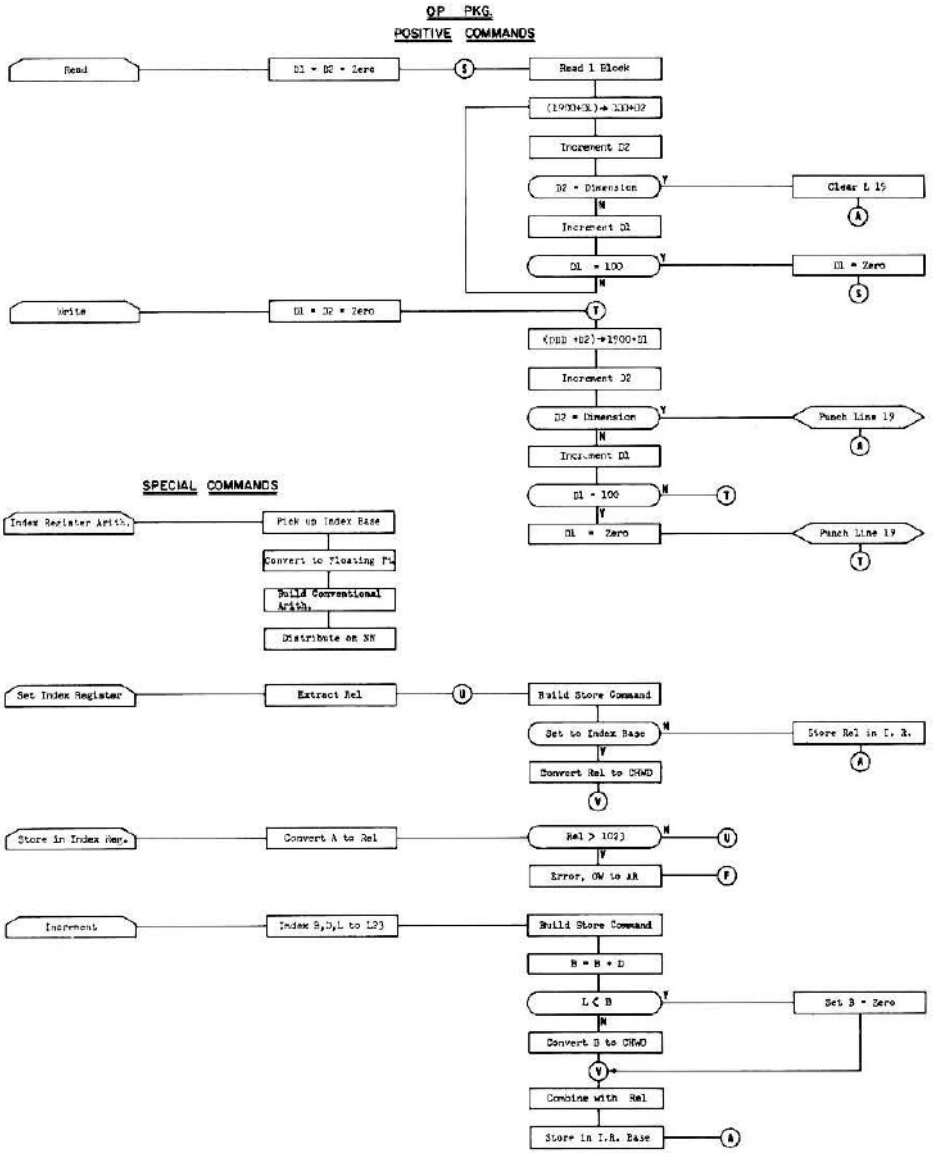



OP PKG
Manual Mode (SCP)
Store Line 22
B
Keyboard type DDD
DDD = Zero
Resume with Line 22
A
Punch Switch On
I22 = DDD
Store Type-in in Last DDD Typed
B
DDD Negative
Start at DDD
A
Clear and Add (DDD)
(DDD) = Snapshot
Change BP Status
Print (FP) = (DDD)
Store in DDD
B
B
Automatic Mode (NEXT)
A
Process Command to AR
P
Command Positive
L
Execute Command
Distribute on MN
Pick up Index register
Command Indexed
Save A
Distribute on Special OP
Store Command
C1
C2
Double Indexed
Add Indexes
Odd Index
Add Odd Index
Add Even Index
WD > 200
-200 WD + 2 CH
WD > 100
-100 WD + 1 CH
C
C2
C1
Build Store Command
Combine with Memory
Execute Store Command
Execute Arith. Command
A
Distribute on MN


OP PKG
POSITIVE COMMANDS
Clear & Add X
(CMD) to AR
D
AR to AMQ
A
Next Command
Add A + X
(CMD) to AR
G
AMQ = A = Zero
Y
D
N
Clear & Subtract
(CMD) to AR
AR = X = Zero
Y
A
N
-AR to AMQ
K
(exp X - exp A) Neg.
Y
Switch A and X
N
A
Shift Smaller Mr
Reverse Subtract X-A
(CMD) to AR
Add to Larger Mr
Change Sign of AMQ
Sum to MQ
G
Exponent to AR
Normalize
E
MQ 1 = Zero
Y
Clear AMQ
A
N
Subtract A-X
(CMD) to AR
Normalize
J
Change Sign of AR
Add Roundoff
G
Round to 1/2
Y
Set Mr = 1/2
N
Mr in Limits
Y
Combine Mr in AR
D
N
Mr too Large
N
Clear AMQ
A
Y
Overflow, OZ to AR
F
Type AR, Halt
Reverse Divide X/A
(CMD) to AR
H
X-(AR) A - (MQ)
Divide A/X
(CMD) to AR
A = Zero
Y
Error, OU to AR
F
N
Switch X and A
X = Zero
Y
I
Clear AMQ
A
N
H
Divide, X/5A to MQ
exp X - exp A + 128
E
Multiply A * X
(CMD) to AR
exp (x) + exp(A) -128
X * A to MQ
Store A
(MQ) to CMD
Normalize 1 bit Max.
A
X * A = Zero
Y
I
N
Negate
|MQ| to AR
K
J
Absolute
(MQ) to AR
|AR| to AMQ
A

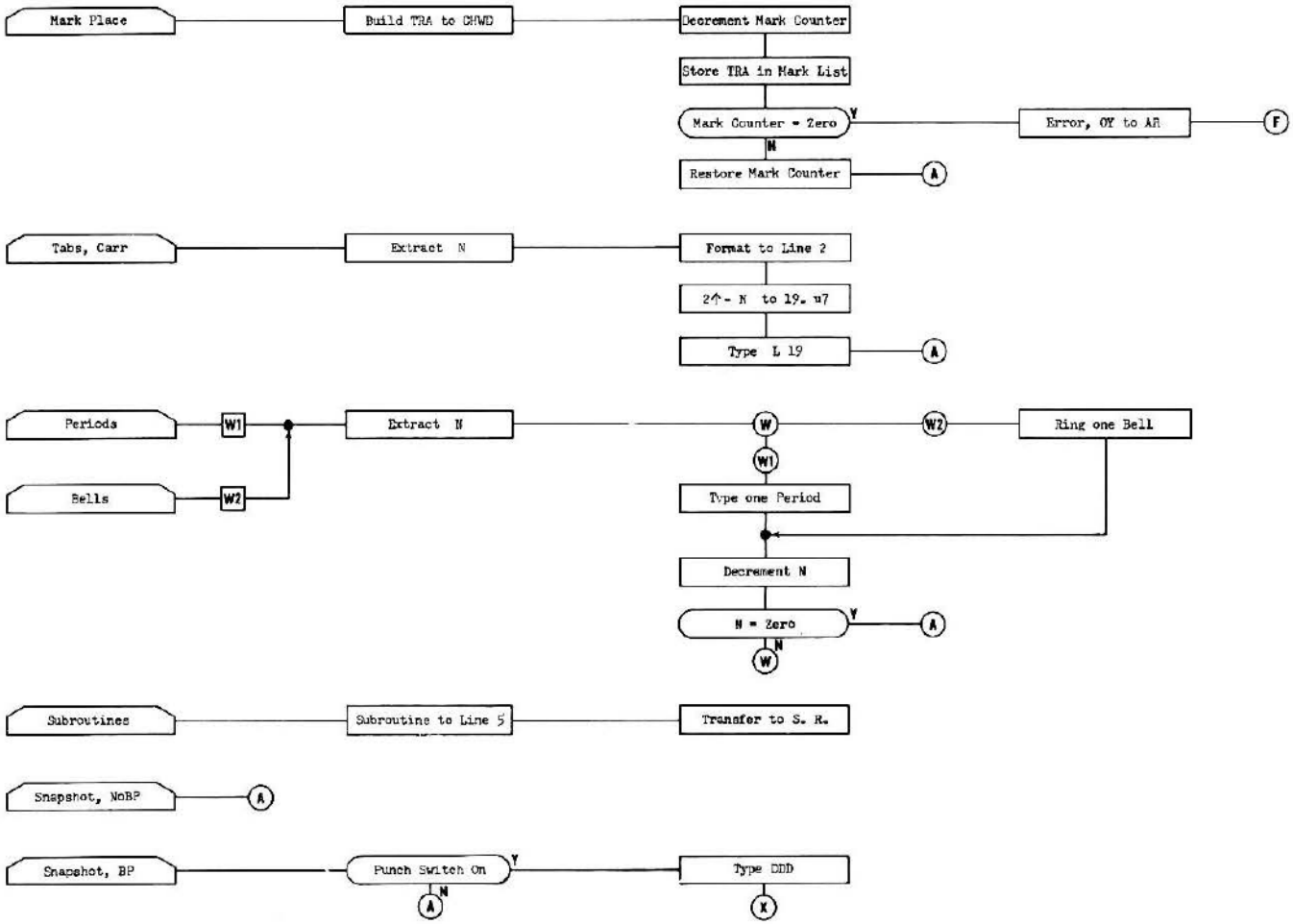

POSITIVE COMMANDS
Square Root
(MQ) to 21.1 = A
1/2 Dec X + 64 = Exp
Exponent Even
A/4 to PN = R2
A/8 + 3/8 = R0
A/8 + 1/16 = 20
A = Zero
R2/R0+20 = R1
A Negative
Error, CV to AR
R2/R1 = R1 = Root
SQRT to PN
Logarithm
Line 7 to Line 5
Log. SR
Exponential
Line 7 to Line 5
Exponential SR
Return
Increment Mark Counter
Pick up Mark from List
Keyboard
Line 8 to Line 5
Ring Bell, Gate Type-in
Distribute to Follow Points
None, Integer
One, Mixed Number
Two, Floating Point
Three, Error
(23.0,1) to MQ
Clear AR
(19.0,1) to MQ
-1 to AR
Convert Exponent
64-Exp is BCD Count
Normalize BCD
Type AR
Normalize for Count
Store BCD count
Type-In to R0, Normalize
Stop
0-15 Halt
BCD to PN
B = Converted Interger
72 to AR
Normalize B
BCD Count Neg
Increment BCDC by 1
B = B x 10
BCD Count = Zero
Clear L 19
Increment BCDC by 7
B = B x 10-7
Transfer
C(AC)=WD+e to L22
Reduce (WD+e)Mod4 = e
Distribute on e
e = Zero
e = 1
e = 2
e = 3
WD = WD + 0
Exchange AR & 22.2
exchange AR & 22.0
WD = WD + 1
Exchange AR & 22.2
WD = WD + 2
Precess L22
WD = WD + 1
Precess L22


OP PKG.
POSITIVE COMMANDS
Transfer not Zero
CH.WD-WD + 3 to L23
A = Zero
Y
A
N
Q
L23 to L22
O
Transfer not Negative
CH.WD-WD + 3 to L23
A Negative
Y
A
N
Q
Transfer not Limit
CH.WD-WD + 3 to L23
Index Exceed Limit
Y
A
N
Q
Print
Format to L23
X
A = Zero
Y
R
N
Exponent times Log 2 Gives Decimal Power form " 8 Power" of 10
Pick up S.F. from Table 1
Rescale by S. F.
Compute Remaining Decimal S. F.
Pick up S. F. from Table 2
Rescale, Shift off Excess Binary S. F. to Form N
10 N Overflow
N
N = 10N
Y
R
Add Roundoff
Decrement Decimal S.F.
Roundoff Causes O'flo
Y
Set N = .1
N
Convert N to BCD
Increment Decimal S.F.
N Exceeds Format
Y
Convert Decimal S. F. to Excess 50, BCD
N
Shift to Fix Decimal
Type F "Space"
Extract Total Digits
Format has a Carr.
N
Change Carr to Tab
BCD to 1110 for Typeout
Y
Type F.P. Nr, Carr.
Restore A and Extractors
A

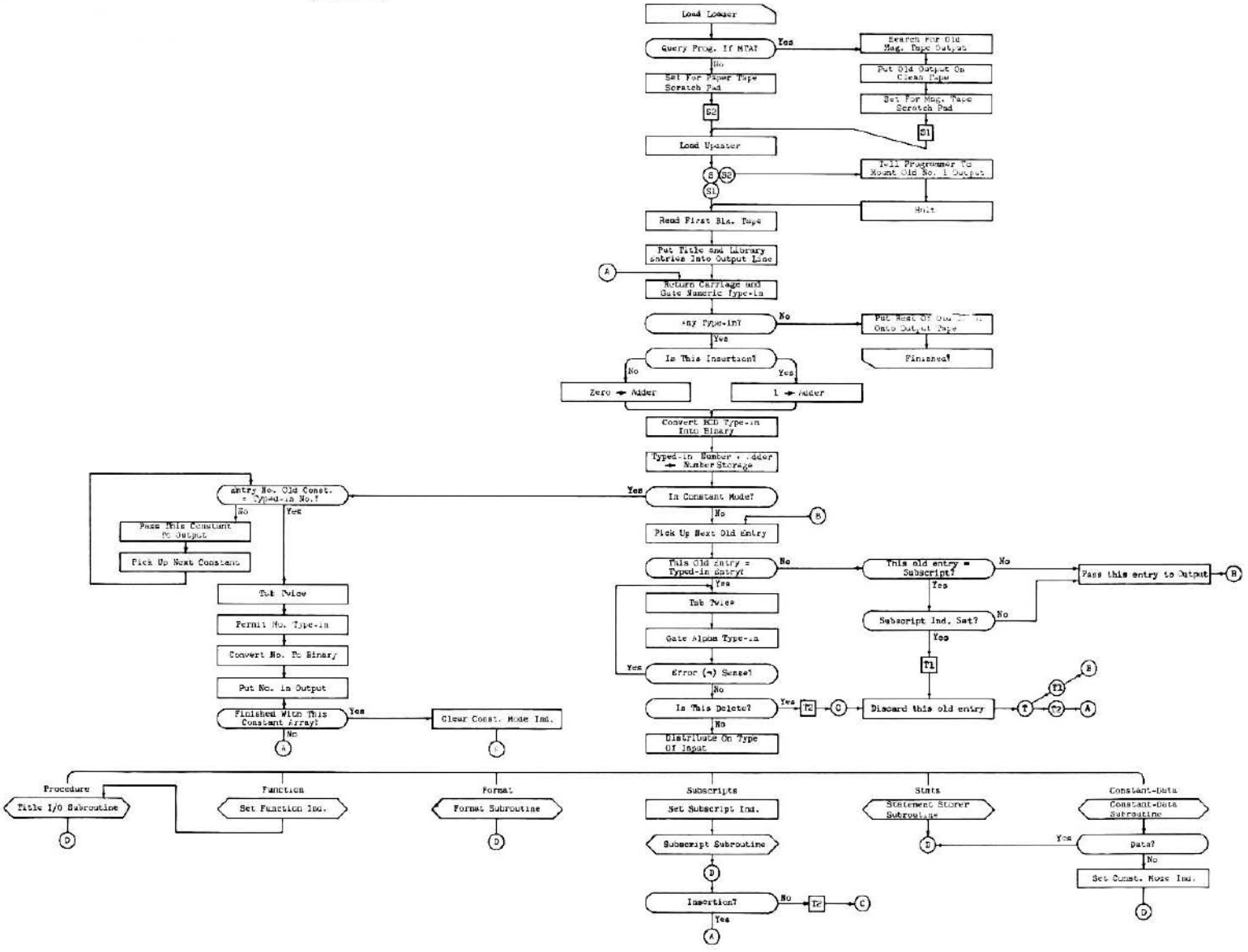

QP PKG.
POSITIVE COMMANDS
Read
D1 = D2 = Zero
S
Read 1 Block
(1900+D2) → 200+D2
Increment D2
D2 = Dimension
Y
Clear L 19
A
N
Increment D1
D1 = 100
Y
D1 = Zero
S
N
Write
D1 = D2 = Zero
T
(200 +D2) → 1900+D1
Increment D2
D2 = Dimension
Y
Punch Line 19
A
N
Increment D1
D1 = 100
N
T
Y
D1 = Zero
Punch Line 19
T
SPECIAL COMMANDS
Index Register Arith.
Pick up Index Base
Convert to Floating Pt.
Build Conventional Arith.
Distribute as SN
Set Index Register
Extract Rel
U
Build Store Command
Set to Index Base
N
Store Rel in I. R.
A
Y
Convert Rel to CHWD
V
Store in Index Reg.
Convert A to Rel
Rel > 1023
N
U
Y
Error, GW to AR
F
Increment
Index B,D,L to L23
Build Store Command
B = B + D
L < B
Y
Set B = Zero
N
Convert B to CHWD
V
Combine with Rel
Store in I.R. Base
A

OP PKG.

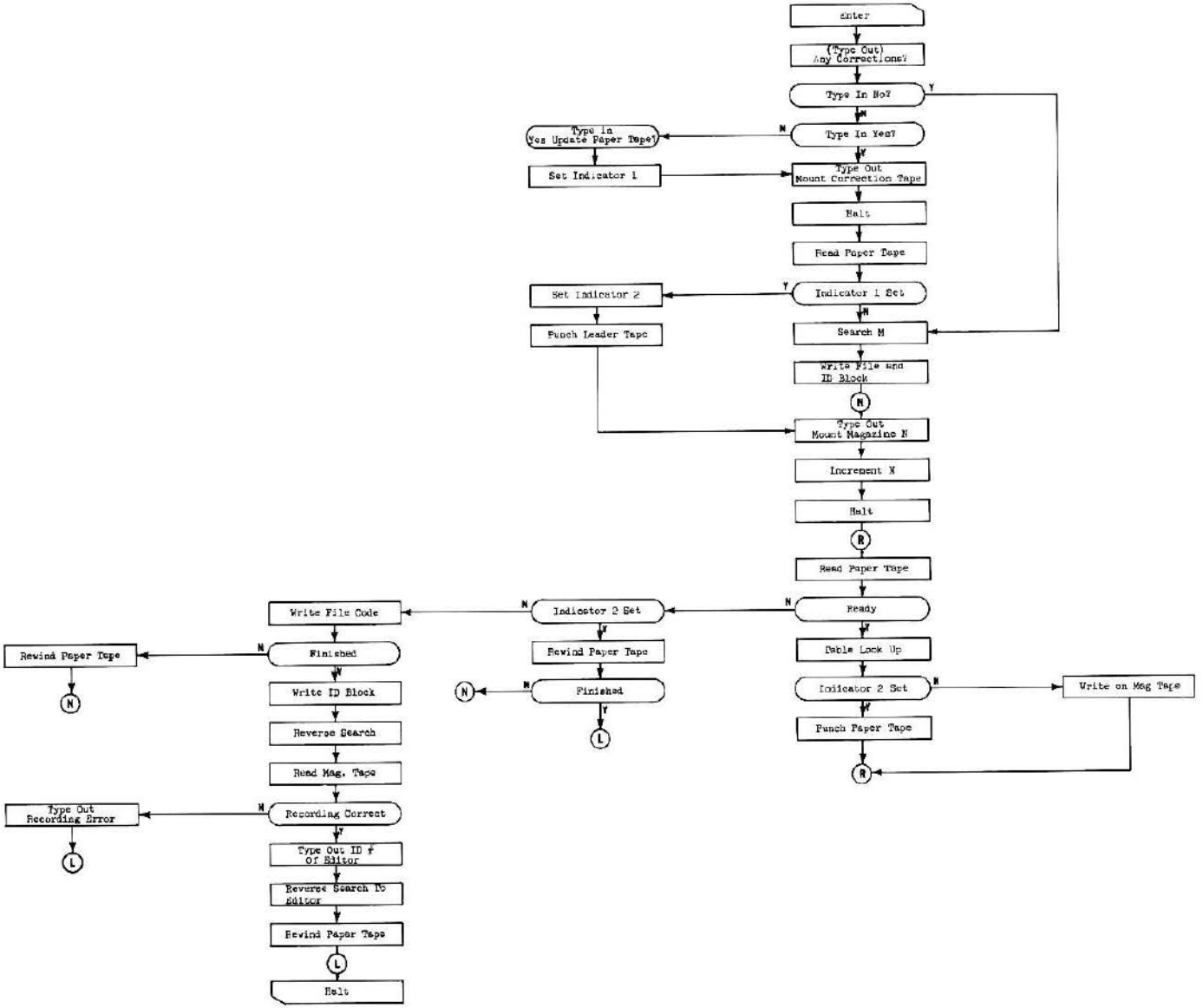
SPECIAL COMMANDS



UPDATER


Load Loader
Query Prog. If MTA?
Yes
No
Search For Old Mag. Tape Output
Put Old Output On Clean Tape
Set For Mag. Tape Scratch Pad
Set For Paper Tape Scratch Pad
S2
S1
Load Updater
S
S2
S1
Tell Programmer To Mount Old No. 1 Output
Wait
Read First Blk. Tape
Put Title and Library Entries Into Output Line
A
Return Carriage and Gate Numeric Type-in
Any Type-in?
No
Yes
Put Rest Of Old Tape Onto Output Tape
Finished!
Is This Insertion?
No
Yes
Zero → Adder
1 → Adder
Convert BCD Type-in Into Binary
Typed-in Number + Adder → Number Storage
In Constant Mode?
Yes
No
B
Pick Up Next Old Entry
This Old Entry = Typed-in Entry?
No
Yes
This old entry = Subscript?
No
Yes
Pass this entry to Output
B
Subscript Ind. Set?
No
Yes
Tab Twice
Gate Alpha Type-in
Error (=) Sense?
Yes
No
T1
Is This Delete?
Yes
No
T2
C
Discard this old entry
T
T1
T2
B
A
Distribute On Type Of Input
Entry No. Old Const. = Typed-in No.?
Yes
No
Pass This Constant To Output
Pick Up Next Constant
Tab Twice
Permit No. Type-in
Convert No. To Binary
Put No. In Output
Finished With This Constant Array?
Yes
No
Clear Const. Mode Ind.
A
Procedure
Title I/O Subroutine
D
Function
Set Function Ind.
Format
Format Subroutine
D
Subscripts
Set Subscript Ind.
Subscript Subroutine
D
Insertion?
No
Yes
T2
C
A
Stmts
Statement Storer Subroutine
E
Constant-Data
Constant-Data Subroutine
Data?
Yes
No
Set Const. Mode Ind.
D

HOUSEKEEPER



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D176 000                                EDITOR LOADER

D176 001      02.00 U.01.01.0.19.02     LINE 19 TO LINE 02
D176 002      02.01  .02.02.2.21.31     TRANSFER CONTROL TO LINE 02
D176 003      02.02  .04.04.0.15.31     READ PAPER TAPE
D176 004      02.04  .04.04.0.28.31     READY
D176 005      02.05 U.06.07.0.19.04     LINE 19 TO LINE 04
D176 006      02.07  .09.09.0.15.31     READ PAPER TAPE
D176 007      02.09  .09.09.0.28.31     READY
D176 008      02.10 U.11.12.0.19.03     LINE 19 TO LINE 03
D176 009      02.12  .14.14.0.15.31     READ PAPER TAPE
D176 010      02.14  .14.14.0.28.31     READY
D176 011      02.15 U.16.17.0.19.00     LINE 19 TO LINE 00
D176 012      02.17  .19.19.0.15.31     READ PAPER TAPE
D176 013      02.19  .19.19.0.28.31     READY
D176 014      02.20 U.21.00.0.19.02     LINE 19 TO LINE 02
D176 015     Z02.56                     -9585X22   BALANCER
D176 016     Z02.57                     U281960   CHECK SUM
               .

D177 000                                MAIN CONTROL

D177 001      02.00 U.04.05.6.21.31     TRANSFER COMMAND TO LINE 19
D177 002      02.09  .10.04.0.28.27     IS CHECK SUM CORRECT
D177 003      02.05  .06.07.0.00.28     CHECK SUM TO AR
D177 004      02.07 U.08.09.3.19.29     SUBTRACT LINE 19
D177 005      02.04  .05.U4.2.21.31     YES... TRANSFER COMM TO LINE 02
D177 006      02.U4 U.01.10.4.09.31     ALPHA TYPE LINE 19
D177 007      02.10  .10.10.0.28.31     READY
D177 008      02.11 U.12.13.0.02.19     LINE 02 TO LINE 19
D177 009      02.13 U.18.19.0.29.23     CLEAR LINE 23
D177 010      02.19  .21.U2.0.29.28     CLEAR AR
D177 011      02.U2  .24.25.0.00.23     00.24 TO 23.00
D177 012      02.25  .27.28.0.12.31     GATE NUMERIC TYPE IN
D177 013      02.28  .29.30.0.17.31     RING BELL
D177 014      02.30  .33.30.0.23.27     HAS A NUMBER BEEN TYPED IN
D177 015      02.31  .32.33.2.23.23     0000000 TO 23.00 0000XXX TO AR
D177 016      02.33  .33.33.0.28.31     READY
D177 017      02.34  .36.37.0.23.21     XXX TO IU00
D177 018      02.37  .U1.38.0.19.27     HAS LINE 19 BEEN PRECESSED

D177 019      02.39  .00.11.0.29.28     YES... CLEAR AR
D177 020      02.38  .39.40.3.00.29     SUBTRACT 0000001 FROM AR
D177 021      02.40  .41.42.0.28.27     IS IT THE MAG TAPE MODE
D177 022      02.42  .44.46.0.02.00     YES... SET MAG INDICATOR
D177 023      02.43  .39.41.3.00.29     NO... SUBTRACT 0000001 FROM AR
D177 024      02.41  .42.44.0.28.27     IS IT THE PAPER MODE
D177 025      02.44 U.45.47.0.04.19     YES... LINE 04 TO LINE 19
D177 026      02.47  .00.00.6.21.31     TRANSFER COMM TO LINE 19
D177 027      02.45  .00.11.0.29.28     NO... ERROR
D177 028      02.46 U.51.U3.0.00.23     00.47 TO 50 TO LINE 23
D177 029      02.U3 U.00.06.0.23.19     LINE 23 TO LINE 19
D177 030      02.06  .11.14.4.09.31     ALPHA TYPE 19
D177 031      02.14  .14.14.0.28.31     READY
D177 032      02.15  .18.16.0.23.31     CLEAR 2 WORD REG
D177 033      02.21  .20.22.0.21.27     HAS DDD NO. BEEN TYPED IN
D177 034      02.22  .42.49.1.05.31     SEARCH MAG TAPE FORW
D177 035      02.23 W.22.23.0.21.31     YES.. GO TO DECIMAL TO BINARY S R
D177 036      02.49  .51.52.0.00.28     000006Z TO AR
D177 037      02.52  .54.55.7.28.28     DECREMENT AR
D177 038      02.55  .56.57.0.28.27     AR EQUAL TO ZERO
D177 039      02.57  .61.60.0.00.31     YES.. SET READY
D177 040      02.16  .18.21.0.16.31     HALT
D177 041      02.58  .59.52.0.28.31     NO.. READY
D177 042      02.53  .00.22.0.00.00     GO TO READ MAG TAPE
D177 043      02.60  .80.81.1.04.31     REVERSE SEARCH
D177 044      02.81  .81.81.0.28.31     READY
D177 045      02.82 W.08.12.0.21.31     GO TO 16 DRUM CYCLE DELAY
D177 046      02.08  .10.12.1.13.31     READ MAG TAPE
D177 047      02.12  .15.17.0.00.28     0000030 TO AR
D177 048      02.17  .18.20.7.28.28     DECREMENT AR
D177 049      02.20  .21.26.0.28.31     READY
D177 050      02.27  .40.08.1.00.30     YES.. INCREMENT PN
D177 051      02.26  .27.35.0.28.27     AR EQUAL TO ZERO
D177 052      02.35  .37.29.0.00.31     SET READY
D177 053      02.36  .00.17.0.00.00     NO.. GO DECREMENT AR
D177 054      02.29  .49.50.1.04.31     REVERSE SEARCH
D177 055      02.50  .50.50.0.28.31     READY
D177 056      02.51 W.52.61.0.26.27     PN ZERO %
D177 057      02.61  .64.65.0.21.27     YES... ID # BEEN TYPED IN
D177 058      02.65 U.66.67.0.03.19     NO... LINE 03 TO LINE 19
D177 059      02.67  .57.59.0.19.28     DDD BZVV TO AR
D177 060      02.59  .61.56.0.28.21     %001BZVV□ TO 21.01
D177 061      02.56 W.00.63.1.01.31     WRITE 19 ON MAG TAPE
D177 062      02.63  .63.63.0.28.31     READY
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D177 063      02.64   .90.00.0.21.31   GO TO CONVERSION ROUTINE
D177 064      02.66   .69.70.0.21.28   YES.. DDD NO CONVERTED TO AR
D177 065      02.70   .57.65.0.28.03   DDD NO TO 03.57
D177 066      02.62 W.68.12.0.21.31   GO TO DELAY SR
D177 067      02.68   .70.71.0.26.28-  NO BLOCKS TO AR
D177 068      02.71   .73.74.1.13.31   READ MAG TAPE
D177 069      02.74   .74.74.0.28.31   READY
D177 070      02.75   .76.77.7.28.28   DECREMENT AR
D177 071      02.77   .78.79.0.28.27   AR EQUAL TO ZERO
D177 072      02.80   .81.71.0.02.00   NO.. SET INDICATOR
D177 073      02.79   .81.83.0.00.27   INDICATOR SET
D177 074      02.84   .86.87.1.13.31   YES.. READ MAG TAPE
D177 075      02.87   .89.88.0.00.31   SET READY
D177 076      02.88   .93.94.1.30.31   WRITE FILE CODE
D177 077      02.94   .96.89.0.21.27   DDD NO TYPED
D177 078      02.89   .00.65.0.00.00   DUMMY TO LINE 03 TO LINE 19
D177 079      02.90   .93.96.0.21.28   21.01 TO AR
D177 080      02.96   .57.65.0.28.03   AR TO 03.57
D177 081      02.83   .57.69.0.19.26   NO.. DDD NO TO PN
D177 082      02.69 W.73.76.3.23.31   EXTRACT %ZZZ0000¤
D177 083      02.76   .77.78.3.00.30   0008ZVV TO PN
D177 084      02.78   .79.85.0.26.27   PN EQUAL TO ZERO
D177 085      02.86   .00.84.0.00.00   NO.. GO TO READ MAG TAPE
D177 086      02.85   .88.91.0.21.27   DDDNO BEEN TYPED IN
D177 087      02.92   .00.84.0.00.00   YES.. DUMMY
D177 088      02.91   .57.98.0.19.21   DDD NO TO 21.01
D177 089      02.98   .97.24.1.13.31   READ MAG. TAPE
D177 090      02.24   .U3.18.0.00.31   SET READY
D177 091      02.18   .23.48.1.30.31   WRITE A FILE CODE
D177 092      02.48   .U2.U2.0.21.31   GO TO 00.U2
D177 093     Z02.73                    ZZZ0000
D177 094     Z02.03                    6000000
D177 095     Z02.93                    0ZZZZZZ
D177 096     Z02.95                    ZZ00000
D177 097     Z02.97                    00ZZZZZ
D177 098     Z02.99                    Z000000
D177 099     Z02.U5                    6W00000
D177 100     Z02.U6                    X292VZV
D177 101     Z02.54                    8U7Y43X ... BALANCER
D177 102     Z02.U7                    YUZXU4U
D177 103     Z02.72                    28W5548
                .

D178 000                               MAGNETIC TAPE IDENTIFICATION BLOCK
```

```
D178 001      03.00 W.02.61.6.21.31   TRANSFER COMM TO 19.61
D178 002      03.61   .63.39.0.29.28   CLEAR AR
D178 003      03.39 U.40.43.1.19.29   LINE 19 TO AR
D178 004      03.43   .45.20.0.28.27   AR EQUAL TO ZERO
D178 005      03.20 U.20.36.0.19.20   YES.. 19.21' 25 TO LINE 20
D178 006      03.36 U.95.95.0.29.23   CLEAR LINE 23
D178 007      03.95   .97.14.0.20.23   20.01 TO 23.01
D178 008      03.14 W.26.51.0.12.31   GATE NUMERIC
D178 009      03.51   .51.51.0.28.31   READY
D178 010      03.52   .56.79.0.23.28   23.00 TO AR
D178 011      03.79 U.24.24.0.28.21   AR TO LINE 21
D178 012      03.24 U.41.44.0.28.29   ADD AR TO ITSELF 16 TIMES
D178 013      03.44   .48.49.2.28.21   ABSOUTE VALUE OF AR TO 21.00
D178 014      03.49   .50.55.6.20.24   20.02 TO MQ
D178 015      03.55   .56.59.4.20.25   20.03 TO ID
D178 016      03.59   .60.63.1.25.20   ID TO 20.02
D178 017      03.63   .65.66.1.26.28   PN TO AR
D178 018      03.66   .68.74.0.31.29   EXTRACT
D178 019      03.74   .75.76.0.28.25   AR TO ID
D178 020      03.76   .77.30.1.24.27   MQ EQUAL TO ZERO
D178 021      03.30   .37.U1.0.28.22   AR TO 22.01
D178 022      03.U1   .U2.22.0.23.28   23.00 TO AR
D178 023      03.22   .24.04.0.22.31   AR NEG
D178 024      03.04   .07.47.0.31.25   EXTRACT
D178 025      03.47   .04.U7.1.26.31   SHIFT 2 BITS
D178 026      03.U7 U.20.22.0.19.05   19 TO 05 GO TO 02
D178 027      03.05   .07.16.0.28.28   DUMMY
D178 028      03.16 W.V2.00.0.16.31   HALT
D178 029      03.31   .08.59.0.24.31   MULTIPLY
D178 030      03.21   .22.16.0.17.31   RING BELL
D178 031      03.28 U.01.15.0.23.05   23 TO 05
D178 032      03.15   .69.01.0.31.28   EXTRACT
D178 033      03.01   .67.U6.3.05.29   05.67 TO AR
D178 034      03.U6   .30.37.0.28.27   AR EQUAL TO ZERO
D178 035      03.37   .39.16.0.28.28   YES.. DUMMY
D178 036      03.38   .41.53.0.23.27   NO.. 23.01 EQUAL TO ZERO
D178 037      03.53   .55.83.1.25.28   YES.. MQ TO AR
D178 038      03.83   .87.68.3.05.29   0000400 TO AR
D178 039      03.68   .U6.09.0.28.27   AR EQUAL TO ZERO
D178 040      03.54   .56.16.0.28.28   DUMMY
D178 041      03.09   .10.11.0.28.28   DUMMY
D178 042      03.11   .12.13.1.05.24   05.12 TO MQ
D178 043      03.13   .26.29.0.05.25   05.26 TO ID
D178 044      03.29   .33.34.0.05.20   05.33 TO 20.01
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D178 045      03.34   .36.97.5.21.31   TRAN COMM TO LINE 05
D178 046      03.10   .23.32.1.25.05   NO.. ID TO 05.23
D178 047      03.32   .87.48.1.05.25   0000400 TO ID
D178 048      03.48 W.64.97.5.21.31    GO TO LINE 05
D178 049      03.64 W.65.90.5.21.31    GO TO LINE 05
D178 050      03.85   .87.88.1.26.27   PN EQUAL TO ZERO
D178 051      03.88 W.89.69.0.28.28    DELAY
D178 052      03.69 W.70.70.0.28.28    DELAY
D178 053      06.7V W.74.71./.S@.2@    ¤GTV$V9
D178 054      03.72   .57.58.0.19.21   19.57 TO 21.01
D178 055      03.58   .61.40.1.30.28   EXTRACT
D178 056      03.40   .41.42.3.05.29   0008ZVV TO AR
D178 057      03.42   .44.45.0.28.27   AR EQUAL TO ZERO
D178 058      03.45   .U0.U5.1.25.05   ID TO 05.U0
D178 059      03.U5   .01.50.0.31.21   EXTRACT
D178 060      03.50   .53.56.1.21.28   21.01 TO AR
D178 061      03.56   .57.60.3.22.29   22.01 TO AR
D178 062      03.60   .61.75.0.28.26   AR TO PN
D178 063      03.75   .78.81.0.28.27   AR EQUAL TO ZERO
D178 064      03.81   .82.96.0.28.28   YES... DUMMY
D178 065      03.96 W.73.93.5.21.31    GO TO LINE 05
D178 066      03.82   .84.84.0.22.31   AR NEG
D178 067      03.84 W.86.97.5.21.31    GO TO 05.97
D178 068      03.86   .89.06.1.26.28   PN TO AR
D178 069      03.06   .07.08.3.05.29   05.07 TO AR
D178 070      03.08   .11.82.0.28.26   AR TO PN
D178 071      03.65   .23.11.1.05.25   05.23 TO ID
D178 072      03.73 W.75.00.6.21.31    TRANS COMM TO LINE 19
D178 073      03.46   .47.U0.0.17.31   NO.. RING BELL
D178 074      03.89   .07.35.1.05.30   05.07 TO PN
D178 075      03.98   .U7.77.0.04.31   REVERSE SEARCH
D178 076      03.77   .77.77.0.28.31   READY
D178 077      03.78   .80.79.5.20.31   RETURN TO MARK
D178 078      03.97   .98.99.0.05.28   05.98 TO AR
D178 079      03.99   .U0.U2.1.24.05   MQ TO 05
D178 080      03.U2   .U3.U4.1.25.29   ID TO AR
D178 081      03.U4   .U6.U6.0.31.31   N C FROM AR
D178 082     Z03.02                    720011Z
D178 083     Z03.03                    4410000
D178 084     Z03.07                    0010000
D178 085     Z03.17                    00Z0000
D178 086     Z03.18                    UU00000
D178 087     Z03.19                    0003000
D178 088     Z03.23                    0040000
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D178 089     Z03.33                    ZZZ0000
D178 090     Z03.41                    0008ZVV
D178 091     Z03.57                    0018ZVV
D178 092     Z03.67                    00U0000
D178 093     Z03.87                    0000400
D178 094     Z03.U0                    -01382VV   BALANCER
D178 095      03.12 W.34.97.5.21.31    T C TO LINE 05
D178 096      03.25 U.29.U4.2.05.23    05 TO LINE 23
D178 097      03.26   .00.35.0.28.28   DUMMY
D178 098      03.27 U.20.36.0.05.20    05 TO LINE 20
D178 099      03.62 U.01.87.7.30.24-   DUMMY
D178 100      03.80   .03.54.0.05.22   05.03 TO 22.03
D178 101      03.90   .91.U2.0.05.26   0591 TO AR
D178 102      03.91   .15.77.0.05.31   SEARCH FORWARD
D178 103      03.92   .93.U3.1.25.28   ID TO AR
D178 104      03.93 W.94.U2.0.05.28    014X1VZ TO AR
D178 105      03.94   .01.77.0.13.31   READ MAG TAPE
D178 106      03.U3   .U4.62.0.28.22   AR TO 22.00
D178 107      03.35 W.85.90.5.21.31    GO TO 05.90
D178 108      03.71 W.72.93.5.21.31    GO TO LINE 05
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D179 000                               LOADER FOR ACTUAL EDITOR PROGRAM

D179 001     Z00.56                    0000007
D179 002      04.17 U.18.04.0.19.05    LINE 19 TO LINE 05
D179 003      04.00   .01.17.1.19.31   STOP DA-1
D179 004      04.12 U.17.18.0.19.20    SET LINE FOR NO AND CHECK SUM
D179 005      04.18   .22.22.5.21.31   TRANSFER CONTROL TO LINE 05
D179 006      04.22   .23.24.0.20.28   46 2N 23. 4. 05. 24
D179 007      04.24   .25.26.0.20.29   0200000 TO AR
D179 008      04.26   .27.28.0.28.20   AR TO Z0.03
D179 009      04.28   .30.30.0.31.31   N C FROM AR
D179 010      04.23   .24.27.4.25.22   1D0.1 TO 22.00. 01
D179 011      04.27   .28.29.0.22.28   22.00 TO AR
D179 012      04.29   .30.30.3.20.29   SUBTRACT 20.02
D179 013      04.30   .32.33.0.28.27   AR EQUAL TO LAST LINE
D179 014      04.33   .36.20.0.20.28   YES... 20.00 TO AR
D179 015      04.20   .22.22.0.31.31   N C FROM AR
D179 016      04.34   .37.37.0.23.31   CLEAR 2 WD REG
D179 017      04.37 U.38.38.0.25.19    1D0.1 TO 19
D179 018      04.38   .41.41.0.15.31   READ PAPER TAPE
D179 019      04.41   .45.35.0.22.28   22.01 TO AR
D179 020      04.35   .35.35.0.28.31   READY
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D179 021      04.36   .37.31.0.28.27   IS NUMBER A CHECK SUM
D179 022      04.31   .32.42.0.28.28   NO..AR TO AR
D179 023      04.42   .44.21.0.22.28   22.00 TO AR
D179 024      04.21   .20.20.0.29.31   RESET OVERFLOW
D179 025      04.32 U.33.40.3.19.29    YES.. IS READING CORRECT
D179 026      04.40   .41.42.0.28.27   IS AR ZERO
D179 027      04.43   .44.44.0.06.31   NO.. REVERSE TAPE
D179 028      04.45   .46.37.0.17.31   RING BELL
D179 029     Z04.13                    0200000
D179 030     Z04.14                    ZZZZZZZ
D179 031      04.15   .46.23.4.05.25   AR COMMAND
D179 032      04.76   .44.80.0.00.27   IS MAG IND SET
D179 033      04.80 U.81.82.0.29.17    NO.. CLEAR LINE 17
D179 034      04.82 U.83.84.0.19.00    TRANSFER LINE 19 TO LINE 00
D179 035      04.84   .00.0*.0.21.31   TRANSFER COMM TO LINE 00
D179 036      04.81   .11.83.0.00.12   YES..  00.16.2.13.31 TO LINE 12
D179 037      04.83   .16.85.0.00.03   18.18.0.00.31 TO LINE 03
D179 038      04.85   .18.19.0.00.03   17.09.0.00.00 TO LINE 03
D179 039      04.19   .20.47.0.00.03   20.20.0.28.31 TO LINE 03
D179 040      04.47   .63.86.0.00.03   U 64. 24.0.29.17 TO LINE 03
D179 041      04.86   .21.87.0.10.07   SET INDICATOR
D179 042     Z04.49                    =0716105
D179 043     Z04.50                    171626Y
D179 044     Z04.51                    4V89Y65
D179 045     Z04.52                    171626X
D179 046     Z04.53                    -7Z2Y12Z
D179 047     Z04.54                    171626W
D179 048     Z04.56                    171626V
D179 049     Z04.57                    -7YV7422
D179 050     Z04.58                    171626U
D179 051     Z04.59                    88388Z0
D179 052     Z04.60                    1716269
D179 053     Z04.61                    -0655480
D179 054     Z04.62                    1716268
D179 055     Z04.63                    26W9974
D179 056     Z04.64                    1716267
D179 057     Z04.65                    -YW3U9Z7
D179 058     Z04.66                    1716266
D179 059     Z04.67                    W2XVX5Z
D179 060     Z04.68                    1716264
D179 061     Z04.69                    6Z3915Z
D179 062     Z04.70                    1716263
D179 063     Z04.71                    89502Y9
D179 064     Z04.72                    1716262

D179 065     Z04.73                    -ZUZ573X
D179 066     Z04.74                    1716261
D179 067      04.93 U.94.46.0.12.05
D179 068      04.04 U.09.09.0.19.23    FORMAT
D179 069      04.09  .02.10.4.23.02    FORMAT
D179 070      04.10  .00.11.4.23.02    FORMAT
D179 071      04.11  .02.12.4.19.03    FORMAT
D179 072      04.95  .91.97.0.04.28    000000Z TO AR
D179 073     Z04.02                    1000000
D179 074     Z04.03                    -8W00000
D179 075     Z04.05                    00000X0
D179 076     Z04.06                    0000034
D179 077     Z04.07                    800000X
D179 078     Z04.08                    0000110
D179 079      04.44   .44.44.0.28.31   READY
D179 080     Z04.48                    171626Z
D179 081     Z04.55                    -W49689Z
D179 082     Z04.75                    -6340X60
D179 083     Z04.87                    XX500UZ
D179 084      04.88   .88.88.0.28.31   READY
D179 085      04.89   .00.00.6.21.31   GO TO 19 00
D179 086     Z04.91                    000000Z
D179 087      04.94   .94.94.0.28.31   READY
D179 088      04.96   .95.U1.2.13.31   READ MAG. TAPE
D179 089      04.97   .98.U0.7.28.28   DECR. AR
D179 090      04.U0   .U2.96.0.28.27   AR ZERO
D179 091      04.U1   .U1.U1.0.28.31   READY
D179 092      04.U2   .U1.88.2.13.31   READ MAG. TAPE
D179 093      04.U3   .17.17.0.15.31   READ PAPER TAPE
D179 094      04.U4 U.01.01.0.19.02    FORMAT TO LINE 02
D179 095      04.U5   .03.03.2.21.31   GO TO 02.03
D179 096      04.U7   .05.05.0.15.31   READ PAPER TAPE
D179 097     Z04.77                    03X4U7W
                *

D180 000                               DELAY ROUTINE

D180 001      00.12   .13.14.0.00.28   0000010 TO AR
D180 002      00.14   .16.17.7.28.28   DECREMENT AR
D180 003      00.17   .18.21.0.28.27   AR EQUAL TO ZERO
D180 004      00.21   .21.20.2.20.31   YES.. RETURN TO MARK
                *

D181 000                               BINARY TO DECIMAL CONVERSION
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D181 001      00.U2   .05.09.0.23.31   CLEAR 2WD REGISTERS
D181 002      00.09   .13.25.0.21.26   21.01 TO PN
D181 003      00.25   .26.31.7.00.25   3Y80000 TO ID
D181 004      00.31   .57.58.1.25.31   DIVIDE
D181 005      00.58   .60.62.0.24.28   MQ TO AR
D181 006      00.62 W.63.66.0.28.25    AR TO ID
D181 007      00.66   .59.61.0.00.24   V680000 TO MQ
D181 008      00.61   .06.67.0.24.31   MULTIPLY
D181 009      00.67 W.93.53.3.23.31    EXTRACT   0ZZZZZZZ
D181 010      00.53   .06.65.0.24.31   MULTIPLY
D181 011      00.65 W.97.75.3.23.31    EXTRACT %00ZZZZZZ¤
D181 012      00.75   .06.83.0.24.31   MULTIPLY
D181 013      00.83   .85.01.0.26.28-  PN TO AR
                •

D182 000                               DECIMAL TO BINARY CONVERSION

D182 001      00.22   .00.14.0.00.00   NO.. GO TO DUMMY
D182 002      00.23   .26.27.0.23.31   CLEAR 2 WD REGISTERS
D182 003      00.27   .28.29.0.21.24   DDD NO TO MQ
D182 004      00.29   .32.33.0.26.31   SHIFT MQ 16 BITS
D182 005      00.33 W.34.35.6.24.26    MQ TO PN
D182 006      00.35 W.99.84.3.23.31    EXTRACT %Z0000000¤
D182 007      00.84   .85.87.0.00.24   V400000 TO MQ
D182 008      00.87   .06.93.0.24.31   MULTIPLY
D182 009      00.93 W.95.97.3.23.31    EXTRACT %ZZ000000¤
D182 010      00.97   .06.U3.0.24.31   MULTIPLY
D182 011      00.U3   .77.78.1.00.30   0008ZUU TO PN
D182 012      00.78   .81.82.0.26.21   PN TO 21.01
D182 013      00.82   .82.81.2.20.31   RETURN TO MARK
D182 014      00.00   .04.U1.0.21.27   HAS AN ID NO BEEN TYPE IN
D182 015      00.U1   .U5.01.0.21.28   21.01 TO AR
D182 016      00.01   .03.04.0.00.03   NO.. FORMAT TO AR
D182 017      00.04   .06.07.0.08.31-  TYPE AR
D182 018      00.07   .07.07.0.28.31   READY
D182 019      00.08   .44.44.2.21.31   TRANS COMM TO LINE 02
                •

D183 000                               FILE CODE ROUTINE

D183 001      00.28   .13.05.0.00.28   0000010 TO AR
D183 002      00.32   .37.54.1.30.31   WRITE A FILE CODE
D183 003      00.54   .54.54.0.28.31   READY
D183 004      00.55 W.56.57.0.00.28    0000007 TO AR




D183 005      00.57   .60.64.7.28.28   DECREMENT AR
D183 006      00.64 W.65.68.0.28.27    AR EQUAL TO ZERO
D183 007      00.69   .00.57.0.00.00   GO TO 57
                •

D184 000                               SEARCH CLEAN TAPE

D184 001      00.68   .70.72.1.13.31   YES... READ MAG. TAPE
D184 002      00.72   .56.70.0.00.28   0000007 TO AR
D184 003      00.73   .75.79.0.28.27   AR EQUAL TO ZERO
D184 004      00.80   .00.70.0.00.00   GO TO 70
D184 005      00.70   .72.73.7.28.28   DECR. AR
D184 006      00.79   .82.86.0.00.31-  SET READY
D184 007      00.86   .87.88.0.28.31   READY
D184 008      00.88   .00.79.0.00.00   GO TO 00 89
D184 009      00.89   .44.44.2.21.31   GO TO 02.44
D184 010      00.37 W.38.45.0.28.27    AR ZERO
D184 011      00.45   .47.52.0.00.31   SET READY
D184 012      00.52   .44.44.2.21.31   GO TO 02.44
D184 013     Z00.46                    8005000
D184 014      00.63 U.64.24.0.29.17    CLEAR LINE 17
D184 015      00.99 W.98.37.1.13.31    READ MAG. TAPE
                •

D185 000                               CONSTANTS USED IN EDITOR

D185 001     Z00.03                    0010000
D185 002     Z00.06                    8U7Y43X   CHECK SUM
D185 003      00.11 U.13.16.1.13.31    TO LINE 12
D185 004     Z00.13                    0000010
D185 005      00.16   .18.18.0.00.31   TO LINE 03
D185 006      00.18   .17.10.0.00.00   TO LINE 03
D185 007     Z00.47                    YUV 295V
D185 008      00.20   .20.20.0.28.31   TO LINE 03
D185 009     Z00.24                    0800000
D185 010     Z00.39                    0000001
D185 011     Z00.40                    0000001
D185 012     Z00.44                    0000000  MAG INDICATOR
D185 013     Z00.48                    65Y0Z50
D185 014     Z00.49                    -5ZZ6WUX
D185 015     Z00.50                    7ZV4923
D185 016     Z00.51                    000006Z
D185 017     Z00.81                    0000000  INDICATOR
D185 018     Z00.85                    V400000
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D185 019      Z00.59                        V680000
D185 020       00.05  .06.08.0.28.27        AR ZERO
D185 021      Z00.10                        0V0W133
D185 022      Z00.15                        0000030
D185 023      Z00.19                        0000080
D185 024      Z00.26                        3Y80000
D185 025      Z00.77                        0008ZVV
D185 026      Z00.U7                        1W1XZ95   BALANCER
D185 027       00.74 W.75.79.0.28.27        AR EQUAL TO ZERO
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D000 000                                   CONTROL LINES 00 01 02 08 10 12
D000 001       00.00 U.01.01.0.10.05       BRING IN LINE 10
D000 002       00.01  .07.93.0.09.07       SET SWITCH S1
D000 003       00.93  .90.90.5.20.31       TRANSFER FOR PART OF ROUTINE
D000 004       10.90 U.91.91.0.29.19       CLEAR LINE 19
D000 005       10.91 U.92.92.0.29.17       CLEAR LINE 17
D000 006       10.92  .33.80.0.09.28       RESTORE STORE COUNTER
D000 007       10.80  .94.50.0.28.09       STORE IN COUNTER
D000 008       10.50  .76.89.0.29.07       CLEAR SRNENUCO
D000 009       10.89 U.90.90.0.12.05       BRING IN LINE 12
D000 010       12.90  .00.09.4.29.07       CLEAR TLOFFCW2.3
D000 011       12.09  .10.32.4.29.09       CLEAR TLOFFCW0.1
D000 012       12.32  .39.44.0.29.09       CLEAR FICHCO
D000 013       12.44  .56.63.0.29.09       CLEAR CONST. IND.
D000 014       12.63  .87.89.0.29.07       CLEAR LIB. IND
D000 015       12.89  .27.30.0.29.09       CLEAR SWITCH S2
D000 016       12.30  .88.68.0.12.07       RESTORE LEVCO
D000 017       12.68  .76.77.0.12.28       SUSSHBITS CONSTANT PICKUP
D000 018       12.77  .95.00.0.28.07       RESTORE SUSSHBITS
D000 019       12.00  .53.64.0.09.28       SUSBITCHCO CONST.
D000 020       12.64  .06.58.0.28.07       RESTORE SUSBITCHCO
D000 021       12.58  .72.73.0.09.28       MTA CONSTANT PICKUP
D000 022       12.73  .15.67.0.28.11       RESTORE MTA COUNTER
D000 023       12.67 W.25.72.0.21.31       NEXT NUMBER S.R.
D000 024      Z12.88                       -Z800000
D000 025      Z12.76                       ZZZZZ00
D000 026      Z12.92                       0004000
D000 027       00.25  .28.30.0.23.31       CLEAR 2 WORD REGISTERS
D000 028       00.30  .32.54.4.07.24       TITLE CONSTANTS TO MQO.1
D000 029       00.54  .56.74.0.29.09       CLEAR CONST. IND.
D000 030       00.04  .09.10.4.09.31       ALPHA TYPE LINE 19
D000 031       00.10  .10.10.0.28.31       TEST READY
D000 032       00.11  .12.14.0.17.31       RING BELL
D000 033       00.14  .20.40.4.12.31       GATE ALPHA TYPE-IN
D000 034       00.40  .56.17.4.07.23       OVERFLOW BIT TO LINE 23
D000 035       00.74  .U6.04.4.24.19       MQ1.0 TO 19.U6-U7
D000 036       00.17 W.96.00.4.21.31       ERROR SENSE S.R.
D000 037       00.96 U.97.22.0.19.18       INPUT TO LINE 18
D000 038       00.22 U.23.23.0.29.19       CLEAR LINE 19
D000 039       00.23  .27.33.0.09.27       TEST SWITCH S2 SET
D000 040       00.33 W.37.72.0.21.31       NO...NEXT NUMBER S.R.
D000 041       00.34  .27.48.0.29.09       YES...CLEAR SWITCH S2
D000 042       00.37  .38.39.0.17.31       RING BELL
D000 043       00.39  .45.52.4.12.31       GATE ALPHA TYPE-IN
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D000 044      00.52   .56.58.4.07.23   OVERFLOW BIT TO LINE 23
D000 045      00.58   .80.67.0.29.07   CLEAR SWITCH S3
D000 046      00.67 W.15.15.3.21.31    1ST WORD FINDER S.R.
D000 047      00.15   .07.08.0.07.27   TEST SWITCH S1 SET
D000 048      00.08 U.09.17.0.18.27    NO...TEST LINE 18 EQUAL 0
D000 049      00.09   .07.89.0.29.07   YES...CLEAR SWITCH S1
D000 050      00.89 U.90.90.0.10.05    BRING IN TITLE PROCESSOR S.R.
D000 051      00.90 W.24.59.5.21.31    TITLE PROCESSOR S.R.
D000 052      00.24   .27.17.0.00.09   SET SWITCH S2
D000 053      00.18   .10.76.4.29.09   NO...CLEAR TLOFFCW0,1
D000 054      00.76   .39.68.0.29.09   CLEAR FICHCO
D000 055      00.68   .71.86.0.07.22   NO. OF SHIFT BITS TO BITOBESCHO
D000 056      00.86 W.16.08.3.21.31    8-BIT EXTRACTOR S.R.
D000 057      00.16   .19.94.0.23.31   CLEAR 2 WORD REGISTERS
D000 058      00.94   .96.97.0.28.26   8-BIT CHARACTER TO PN0
D000 059      00.97   .U0.U1.3.07.29
D000 060      00.U1   .U3.U4.0.28.27   COLON
D000 061      00.U4   .52.52.1.20.31   YES...LABEL STATEMENT S.R.
D000 062      00.U5   .U7.12.1.07.29   NO...
D000 063      01.52   .U5.04.0.07.09   SET LABEL IND.
D000 064      01.04   .10.30.4.29.09   CLEAR TLOFFCW0,1
D000 065      01.30   .39.56.0.29.09   CLEAR FICHCO
D000 066      01.56   .86.86.0.20.31   RETURN
D000 067      00.12   .20.28.0.28.27   EQUAL
D000 068      00.28   .79.79.1.20.31   YES...TRANSFER TO 01.79
D000 069      00.29   .30.31.3.07.29   NO...
D000 070      01.79   .U6.91.6.07.26   ASSIGNMENT CODE TO PN
D000 071      01.91   .82.U0.0.09.12   SET ASSIGN. STAT. SWITCH
D000 072      01.U0   .35.35.0.20.31   RETURN
D000 073      00.31   .33.35.0.28.27   TAB
D000 074      00.35   .10.32.0.09.28   YES...TLOFFCW0 TO ARC
D000 075      00.36   .42.41.3.09.29   NO...
D000 076      00.32   .35.38.3.07.29
D000 077      00.38   .40.46.0.28.27   END
D000 078      00.46   .88.92.0.07.28   YES...LEVCO TO ARC
D000 079      00.47   .79.88.3.07.29   NO...
D000 080      00.88   .94.02.0.28.27   STOP
D000 081      00.02   .13.27.1.07.26   YES...STOP CODE TO PN1
D000 082      02.31   .22.37.3.09.29
D000 083      02.37   .38.39.0.28.27   BEGIN
D000 084      02.39   .95.36.1.11.26   YES...BEGIN CODE TO PN1
D000 085      02.40   .U4.62.3.07.29   NO...
D000 086      02.36   .27.27.0.20.31   RETURN
D000 087      02.62   .64.70.0.28.27   RETURN
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D000 088      02.70   .93.36.1.11.26   YES...RETURN CODE TO PN1
D000 089      02.71   .39.97.0.29.09   NO   CLEAR FICHCO
D000 090      02.97 U.98.19.0.08.05    BRING IN PART OF ROUTINE
D000 091      02.19   .05.05.5.20.31   RETURN
D000 092      08.05   .82.02.0.12.27   TEST ASSIGN. STAT. SWITCH SET
D000 093      08.02 U.03.72.0.12.05    NO...ERROR S.R.
D000 094      08.03   .82.04.0.29.12   YES...CLEAR ASSIGN. STAT. SWITCH
D000 095      08.04   .82.82.1.20.31   RETURN
D000 096      00.03   .31.31.2.20.31   NO...TRANSFER TO COMPLETE ROUTINE
D000 097      00.27   .06.06.4.20.31   STATEMENT STORE S.R.
D000 098      00.92   .05.71.3.09.29   DECREMENT LEVCO
D000 099      00.71   .88.U0.0.28.07   RESTORE LEVCO
D000 100      00.U0   .U2.20.0.22.31   TEST AR NEGATIVE
D000 101      00.20   .69.27.1.11.26   NO...END CODE TO PN1
D000 102      00.21   .64.64.2.20.31   YES...END TAB PROCESSOR S.R.
D000 103      00.41   .43.44.0.28.27   OPEN PARENTHESIS
D000 104      00.44 U.45.85.0.15.05    YES...BRING IN OPEN PAR. ROUTINE
D000 105      00.45   .48.50.3.09.29   NO...
D000 106      00.85   .00.00.5.21.31   TRANSFER TO 05.00
D000 107      00.50   .39.65.2.09.09   AR TO FICHCO / FICHCO TO ARC
D000 108      00.65   .72.49.1.09.29   INCREMENT FICHCO
D000 109      00.49   .39.63.2.09.09   AR TO FICHCO / FICHCO TO ARC
D000 110      00.63   .39.55.2.09.27   SPACE  / FICHCO TO ARC
D000 111      00.55   .10.42.4.09.27   YES...TEST TLOFFCW0,1 EQUAL 0
D000 112      00.42   .80.86.0.15.07   YES...SET SWITCH S3
D000 113      00.43   .08.08.1.20.31   NO... TRANSFER TO 01.08
D000 114      00.56   .72.75.3.07.29   NO...
D000 115      00.75   .77.78.0.22.31   TEST FOR FIVE CHARACTER PICK-UP
D000 116      00.78   .80.60.0.07.27   NO... TEST SWITCH S3 SET
D000 117      00.60   .70.86.0.00.00   NO...RETURN
D000 118      00.61   .80.79.0.29.07   YES...CLEAR SWITCH S3
D000 119      00.79 W.06.07.3.23.31    YES...SPECIAL EXTRACT LAST 6 BITS
D000 120      00.07   .10.83.0.09.24   TLOFFCW0 TO MQ0
D000 121      00.83   .12.77.1.26.31   SHIFT MQ LEFT 6 BITS
D000 122      00.77   .78.U3.1.24.30   ADD TO NEXT 6 BITS
D000 123      00.U3   .10.86.1.26.09   STORE IN TLOFFCW0
D000 124      00.48 U.49.87.0.08.05    BRING IN PART OF ROUTINE
D000 125      00.87   .69.69.5.20.31   TRANSFER FOR PART OF ROUTINE
D000 126      08.69   .56.00.0.09.27   TEST CONST. IND. SET
D000 127      08.00   .76.68.0.09.28   NO...NENUCO TO ARC
D000 128      08.01   .76.67.0.09.28   YES...NENUCO TO ARC
D000 129      08.68   .51.51.0.20.31   RETURN
D000 130      08.67   .86.66.0.07.29   INCREMENT NENUCO
D000 131      08.66   .59.59.0.20.31   RETURN
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D000 132      00.51  .41.59.1.09.29   INCREMENT NENUCO  RETURN FROM L.08
D000 133      00.59  .76.82.0.28.09   RESTORE NENUCO  RETURN FROM L.08
D000 134      00.82  .87.33.0.09.07   SET LIBRARY IND.
D000 135      00.66 U.67.22.0.29.18   CLEAR LINE 18
D000 136      00.U6  .55.55.5.20.31   USED TO RETURN TO CONSTANT / DATA S.R.
D000 137      00.19  .21.39.1.20.31   RETURN USED IN THE SERIES OF RETURNS
D000 138     Z00.U7                   9UW1Z96
               .

D003 000                              NEXT NO SR   LINE 00

D003 001      00.72  .76.73.0.07.28
D003 002      00.73  .76.84.0.28.09   SRNENUCO TO NENUCO
D003 003      00.84  .86.70.1.07.29   INCREMENT SRNENUCO
D003 004      00.70  .76.95.0.28.07   RESTORE SRNENUCO
D003 005      00.95  .96.98.1.07.29   ADD ROUND OFF
D003 006      00.98  .U1.U2.0.23.31   CLEAR 2 WORD RGISTERS
D003 007      00.U2  .03.06.0.07.03   FORMAT TO 03.03
D003 008      00.06  .29.53.0.07.25   DENOMINATOR TO ID1
D003 009      00.53  .55.57.0.28.26   SRNENUCO TO PN1
D003 010      00.57  .57.13.1.25.31   DIVIDE
D003 011      00.13  .14.64.6.24.26   QUOTIENT TO PN1
D003 012      00.64  .65.69.0.07.24   MULTIPLIER TO MQ1
D003 013      00.69 W.79.91.3.23.31   SPECIAL EXTRACT
D003 014      00.91  .06.62.0.24.31   MULTIPLY 6 WORD TIMES
D003 015      00.62 W.U1.99.3.23.31   SPECIAL EXTRACT
D003 016      00.99  .06.05.0.24.31   MULTIPLY 6 WORD TIMES
D003 017      00.05  .21.26.0.26.28   PRODUCT TO AR
D003 018      00.26  .28.80.0.08.31   TYPE AR
D003 019      00.80  .80.80.0.28.31   TEST READY
D003 020      00.81  .83.82.0.20.31   RETURN TO MARK IN LINE 00
               .

D005 000                              STATEMENT TESTS LINES 01 02 03 12

D005 001      01.08  .10.11.0.09.28   TLOFFCWO TO ARC
D005 002      01.11  .12.13.3.07.29
D005 003      01.13  .14.15.0.28.27   DO
D005 004      01.15  .19.82.1.07.26   YES...DO CODE TO PN1
D005 005      01.16  .17.18.3.07.29   NO...
D005 006      01.82  .06.06.4.20.31   STATEMENT STORE S.R.
D005 007      01.18  .19.20.0.28.27   GO
D005 008      01.20  .86.86.0.20.31   YES...TRANSFER
D005 009      01.21  .23.24.3.07.29   NO...

D005 010      01.24  .26.27.0.28.27   IF
D005 011      01.27  .34.82.6.07.26   YES...IF CODE TO PN1
D005 012      01.28  .31.33.3.07.29   NO...
D005 013      01.33  .35.36.0.28.27   FOR
D005 014      01.36  .39.82.1.07.26   YES...FOR CODE TO PN1
D005 015      01.37  .38.68.3.07.29   NO...
D005 016      01.68  .41.42.0.28.27   CARR
D005 017      01.42  .86.86.0.20.31   YES...RETURN
D005 018      01.43  .45.46.3.07.29   NO...
D005 019      01.46  .48.49.0.28.27   DATA
D005 020      01.49  .56.61.0.29.09   YES...CLEAR CONSTANT IND.
D005 021      01.50  .54.55.3.07.29   NO...
D005 022      01.61 U.62.62.0.14.05   BRING IN CONST. & DATA PROCESSOR
D005 023      01.62  .39.83.0.29.09   CLEAR FICHCO
D005 024      01.83  .10.92.4.29.09   CLEAR TLOFFCWO,1
D005 025      01.92  .U5.U5.5.20.31   CONSTANT AND DATA S.R.
D005 026      01.55  .57.58.0.28.27   GO TO
D005 027      01.58  .60.82.6.07.26   YES...GO TO CODE TO PN1
D005 028      01.59  .70.71.3.07.29   NO...
D005 029      01.71  .73.74.0.28.27   READ
D005 030      01.74  .86.86.0.20.31   YES...RETURN
D005 031      01.75  .92.93.3.07.29   NO...
D005 032      01.93  .95.96.0.28.27   TABS
D005 033      01.96  .86.86.0.20.31   YES...RETURN
D005 034      01.97  .U1.U2.3.07.29   NO...
D005 035      01.U2  .U4.00.0.28.27   BELLS
D005 036      01.00  .86.86.0.20.31   YES...RETURN
D005 037      01.01  .04.05.3.07.29   NO...
D005 038      01.05  .07.09.0.28.27   SUBSCRIPTS
D005 039      01.09 U.10.84.0.06.05   YES...BRING IN SUBSC. PROCESSOR
D005 040      01.10  .11.12.3.07.29   NO...
D005 041      01.84  .31.31.5.20.31   SUBSCRIPTS S.R.
D005 042      01.12  .14.25.0.28.27   LIBRARY
D005 043      01.25  .87.88.0.07.27   YES...TEST LIBRARY IND. SET
D005 044      01.26  .28.29.3.07.29   NO...
D005 045      01.88  .U3.U3.3.20.31   NO...ERROR S.R.
D005 046      01.89 U.90.90.0.11.05   YES...BRING IN LIBRARY PROCESSOR
D005 047      01.90  .05.05.5.20.31   LIBRARY S.R.
D005 048      01.29  .30.31.0.28.27   CONSTANTS
D005 049      01.31  .56.61.0.01.09   YES...SET CONSTANT IND.
D005 050      01.32  .36.38.3.07.29   NO...
D005 051      01.38  .39.40.0.28.27   FORMAT
D005 052      01.40 U.41.44.0.13.05   YES...BRING IN FORMAT PROCESSOR
D005 053      01.41  .44.45.3.07.29   NO...
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D005 054      01.44  .91.91.2.21.31   TRANSFER TO LINE 02 THEN FORMAT S.R.
D005 055      02.91  .93.90.0.29.31   TURN OFF OVERFLOW
D005 056      02.90  .00.00.5.21.31   RETURN
D005 057      01.45  .46.47.0.28.27   WRITE
D005 058      01.47  .86.86.0.20.31   YES...RETURN
D005 059      01.48  .87.87.2.21.31   NO...TRANSFER TO PART OF ROUTINE
D005 060      02.87  .29.35.3.10.29
D005 061      02.35 U.37.82.0.28.27   FUNCTION
D005 062      02.82 U.83.34.0.10.05   YES...BRING IN I/O ROUTINE
D005 063      02.83  .48.52.3.07.29   NO...
D005 064      02.52  .60.60.1.21.31   RETURN
D005 065      02.34  .93.99.0.09.05   SET CSP SWITCH
D005 066      02.99  .53.53.1.21.31   RETURN
D005 067      01.53  .30.30.5.21.31   PROCEDURE S.R.
D005 068      01.60  .62.63.0.28.27   PERIODS  RETURN FROM LINE 02
D005 069      01.63  .86.86.0.20.31   YES...RETURN
D005 070      01.64  .66.67.3.07.29   NO...
D005 071      01.67  .68.69.0.28.27   PRINT
D005 072      01.69  .86.86.0.20.31   YES...RETURN
D005 073      01.70  .73.76.3.07.29   NO...
D005 074      01.76 U.77.78.0.12.05   BRING IN PART OF ROUTINE
D005 075      01.78  .36.36.5.20.31   TRANSFER CONTROL
D005 076      12.36  .38.84.0.28.27   PROCEDURE
D005 077      12.84 U.85.30.0.10.05   YES...PROCEDURE S.R.
D005 078      12.85  .63.66.3.15.29   NO...1V0X854 TO -AR
D005 079      12.66  .68.86.0.28.27   RETURN
D005 080      12.86  .70.70.2.20.31   YES...RETURN
D005 081      12.87  .22.39.0.07.29   NO...-773ZW7Y TO AR
D005 082      12.39  .51.51.3.20.31   TRANSFER
D005 083      03.51  .53.22.0.28.27   STOP
D005 084      03.22  .02.02.0.20.31   YES...RETURN
D005 085      03.23  .79.79.1.20.31   NO...RETURN
D005 086      01.66  .87.U3.0.29.07   CLEAR LIBRARY IND.
D005 087      01.U3  .17.17.0.20.31   RETURN
D005 088      01.73  .87.95.0.29.07   CLEAR LIBRARY IND.
D005 089      01.95  .17.17.0.21.31   RETURN
D005 090      01.39  .41.56.2.20.31   RETURN USED BY SERIES OF RETURNS
D005 091     Z01.U7                    0000001
               •

D016 000                               END TAB SR LINES 02 08 12 15

D016 001      02.64  .95.96.1.07.29   SUSSHBITS TO ID1
D016 002      02.96  .06.17.0.07.28   SUSBITCHCO TO ARC




D016 003      02.17  .19.27.3.10.29   DECREMENT SUSBITCHCO BY 2
D016 004      02.27  .32.42.0.28.27   TEST SUSBITCHCO FOR 0
D016 005      02.42  .46.63.0.07.21   YES...SET SWITCH S7
D016 006      02.43  .44.47.3.28.28   NO...NEGATE AR
D016 007      02.47  .54.42.0.26.31   SHIFT UNDER CONTROL OF AR
D016 008      02.63  .65.66.0.25.28
D016 009      02.66  .68.98.0.28.26   SUSSHBITS TO PN0
D016 010      02.98  .27.30.0.07.26   LAST END MENUCO CODE TO PN1
D016 011      02.30  .32.44.0.00.31   SET READY
D016 012      02.44 W.46.93.3.21.31   NEXT STORE LOCATION S.R.
D016 013      02.46 U.47.50.0.08.05   BRING IN PART OF ROUTINE
D016 014      02.50  .13.13.5.20.31   TRANSFER TO COMPLETE ROUTINE
D016 015      08.13  .14.07.0.21.27   TEST SWITCH S7 SET
D016 016      08.07  .08.10.0.07.29   NO...DUMMY STORE COMMAND TO AR
D016 017      08.08  .62.09.0.07.29   YES...DUMMY STORE DOMMAND TO AR
D016 018      08.09  .70.10.5.11.25   LAST END CODE TO ID
D016 019      08.10  .12.12.0.31.31   NEXT COMMAND FROM AR
D016 020      08.12  .14.06.0.29.21   CLEAR SWITCH S7
D016 021      08.06  .28.65.0.09.30   PUT IND. BIT IN PN0
D016 022      08.65  .30.30.2.20.31   RETURN
D016 023      08.11 U.12.88.0.15.05   BRING IN PART OF ROUTINE
D016 024      15.88  .90.03.0.00.31   SET READY
D016 025      15.03 W.98.04.3.21.31   PUNCH STOLN S.R.
D016 026      15.98  .15.66.0.11.28   PICK UP EDITOR MTA COUNTER
D016 027      15.66  .70.93.0.28.21   STORE COUNTER
D016 028      15.93 U.94.51.0.12.05   TRANSFER
D016 029      15.93 U.94.46.0.12.05   TRANSFER FOR MAG SCRATCH PAD
D016 030      12.46  .21.75.0.07.21   SET S MODE SWITCH
D016 031      12.51  .21.81.0.07.21   SET S MODE SWITCH
D016 032      12.81  .21.48.0.07.27   MAG. OUTPUT IND. SET
D016 033      12.48  .41.47.0.09.28   NO...CONSTANT TO ARC
D016 034      12.49  .60.75.0.00.00   YES...DUMMY
D016 035      12.47  .60.83.3.07.29   DECREMENT AR
D016 036      12.83  .85.55.0.00.31   SET READY
D016 037      12.55  .64.69.0.28.27
D016 038      12.69  .71.75.0.00.31   YES...SET READY
D016 039      12.7D U.05.47.0.10.31   NO...PUNCH TRAILOR
D016 040      12.75 U.00.18.0.13.19   PICK UP CONSTANTS
D016 041      12.18  .23.78.4.09.31   ALPHA TYPE LINE 19
D016 042      12.78  .78.78.0.28.31   READY
D016 043      12.79  .81.79.0.16.31   HALT
D016 044     Z02.02                    000Z0Z0
D016 044      12.75  .77.78.2.13.31   READ MAG TAPE NO 2     MAG TAPE MASTER
D016 045      12.79  .00.00.6.21.31   TRANSFER TO RATOR/CATOR  MAG TAPE MASTER
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D021 000                                    EXTRACTORS AND CONSTANTS LINES 02 07 09

D021 001      Z02.06                        -ZZZZZW0
D021 002      Z02.07                        -ZZZZZZZ
D021 003      Z02.18                        -ZZZZZW0
D021 004      Z02.23                        UW9Z426
D021 005      Z02.24                        4V4V000
D021 006      Z02.26                        ZZZZZ80
D021 007      Z02.28                        0000008
D021 008      Z02.32                        ZZZZZZ8
D021 009      Z02.33                        -ZZZZZ00
D021 010      Z02.38                        -ZW003ZZ
D021 011      Z02.45                        -ZZZZZW0
D021 012      Z02.54                        -0000004
D021 013      Z02.55                        003W000
D021 014      Z02.57                        -ZZZZZ00
D021 015      Z02.58                        Y1Y01Y0
D021 016      Z02.59                        -Z0Z00Z0
D021 017      Z02.60                        7ZZY000
D021 018      Z02.61                        3ZZZ000
D021 019      Z02.74                        -ZZZZZW0
D021 020      Z02.75                        00ZZ000
D021 021      Z02.79                        -07ZZZZZ
D021 022      Z02.84                        -ZZZZZZ0
D021 023      Z02.U1                        -007ZZZZ
D021 024      Z02.U2                        ZY01Y00
D021 025      Z02.U3                        7Z00Z00
D021 026      Z02.29                        0000001
D021 027       02.56  .58.80.3.20.31        RETURN USED IN SERIES
D021 028      Z07.00                        0000000 TLOFFCW2
D021 029      Z07.01                        0000000 TLOFFCW3
D021 030      Z07.02                        0000000 SCA
D021 031      Z07.03                        4007880 NEXT NUMBER FORMAT
D021 032      Z07.04                        07UZ3U1
D021 033       07.05  .00.19.0.20.31
D021 034      Z07.06                        0000002 SUSSBITCHCO
D021 035      Z07.07                        0000000 SWITCH S1
D021 036       07.08  .00.11.5.26.17
D021 037      Z07.09                        0000000 TO11
D021 038      Z07.10                        0000000 TO 12
D021 039      Z07.11                        093ZXVY
D021 040      Z07.12                        0000526
D021 041      Z07.13                        0000060
D021 042      Z07.14                        0000000 STORAGE

D021 043      Z07.15                        U5U6000
D021 044       07.16  .00.49.5.26.17
D021 045      Z07.17                        00000W0
D021 046      Z07.18                        0000000 SWITCH S1ST
D021 047      Z07.19                        0000010
D021 048      Z07.20                        -8000000
D021 049      Z07.21                        0000000  MAG TAPE OUTPUT SWITCH
D021 050      Z07.22                        -773ZW7Y
D021 051      Z07.23                        0000070
D021 052      Z07.24                        0000000 SWITCH S5S
D021 053      Z07.25                        2800000
D021 054      Z07.26                        0000000 SWITCH S2ND
D021 055      Z07.27                        4ZZZW00
D021 056      Z07.28                        0353262
D021 057      Z07.29                        3200000
D021 058      Z07.30                        0000022
D021 059      Z07.31                        0016353
D021 060      Z07.32                        72V2U00
D021 061      Z07.33                        V399V3U
D021 062      Z07.34                        0000020
D021 063      Z07.35                        0015954
D021 064      Z07.36                        3003W5Y
D021 065      Z07.37                        0000010
D021 066      Z07.38                        04VV0W0
D021 067      Z07.39                        0000030
D021 068      Z07.41                        0000002
D021 069      Z07.42                        0000000 BCD IND.
D021 070      Z07.43                        0800000
D021 071      Z07.44                        00V03W4
D021 072      Z07.45                        0040268
D021 073      Z07.46                        34X5200
D021 074      Z07.47                        -YU95U9U
D021 075      Z07.48                        0844173
D021 076      Z07.49                        -0000002
D021 077      Z07.50                        0000070
D021 078      Z07.51                        12YZV20
D021 079      Z07.52                        0800000
D021 080      Z07.53                        0000010
D021 081      Z07.54                        00X5015
D021 082      Z07.55                        0000640
D021 083      Z07.56                        0000000
D021 084      Z07.57                        0000400
D021 085      Z07.58                        0800000
D021 086      Z07.59                        1000000
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D021 087      Z07.60                    0000040
D021 088      Z07.61                    1800000
D021 089       07.62  .00.12.5.25.17
D021 090      Z07.64                    04X1U69
D021 091      Z07.65                    V680000
D021 092      Z07.66                    04Z030X
D021 093      Z07.67                    000001Z
D021 094      Z07.68                    2000000
D021 095      Z07.69                    0000000 COMMA IND.
D021 096      Z07.70                    046Y76Y
D021 097      Z07.71                    0000014
D021 098      Z07.72                    0000006
D021 099      Z07.73                    000WV62
D021 100      Z07.74                    3800000
D021 101      Z07.75                    0000050
D021 102      Z07.76                    0000000 S.R. MENUCO
D021 103      Z07.77                    0000000 OPEN PAR. IND.
D021 104      Z07.78                    0008000
D021 105      Z07.79                    0W9Y053
D021 106      Z07.80                    0000000 SWITCH S3
D021 107      Z07.81                    0000000 SHIFT BIT IND.
D021 108      Z07.84                    1892440
D021 109      Z07.85                    00000X0
D021 110      Z07.86                    0004000
D021 111      Z07.87                    0000000 LIBRARY IND.
D021 112      Z07.88                    -Z800000 LEVCO
D021 113      Z07.89                    00000Y0
D021 114      Z07.90                    5005X74
D021 115      Z07.91                    0004000
D021 116      Z07.92                    027W05Y
D021 117      Z07.93                    0000030
D021 118      Z07.94                    88W0382
D021 119      Z07.95                    ZZZZZ00 SUSSMBITS
D021 120      Z07.96                    0002000
D021 121      Z07.97                    00000Z0
D021 122      Z07.98                    04Z030X
D021 123      Z07.99                    00000ZX
D021 124      Z07.U0                    00000XX
D021 125      Z07.U1                    1892440
D021 126       07.U2  .00.74.5.26.17
D021 127      Z07.U3                    0000001
D021 128      Z07.U4                    701W6W4
D021 129      Z07.U5                    0000080
D021 130      Z07.U6                    00000V0
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D021 131      Z07.U7                    0000012
D021 132      Z09.00                    0400000
D021 133      Z09.01                    0000000
D021 134      Z09.02                    0000000
D021 135      Z09.03                    8000000
D021 136      Z09.04                    0000000 ERROR SWITCH
D021 137      Z09.05                    0800000
D021 138      Z09.06                    0000001
D021 139      Z09.07                    000000V
D021 140      Z09.08                    0000000 NOBLRDCO
D021 141      Z09.09                    0000003
D021 142      Z09.10                    0000000 TLOFFCW0
D021 143      Z09.11                    0000000 TLOFFCW1
D021 144      Z09.12                    000000W
D021 145      Z09.13                    0000000
D021 146       09.14  .00.47.1.18.28
D021 147      Z09.15                    0000096
D021 148       09.16  .00.54.5.26.17
D021 149      Z09.17                    0000001
D021 150      Z09.18                    0100000
D021 151       09.19  .00.99.5.18.26
D021 152      Z09.20                    0000000 TLDIGSTO
D021 153      Z09.21                    0000000 USED FOR TEMP. STORE IN LINE 11
D021 154      Z09.22                    18U3WVY
D021 155      Z09.23                    0000ZV
D021 156      Z09.24                    00000XW
D021 157      Z09.25                    0000000 INITIAL OVFL. IND.
D021 158      Z09.26                    0W00000
D021 159      Z09.27                    0000000 SWITCH S2
D021 160      Z09.28                    0000001
D021 161      Z09.29                    0000000 IND. D
D021 162      Z09.30                    0000040
D021 163      Z09.31                    00000YX
D021 164      Z09.32                    1000000
D021 165      Z09.33                    6U00000
D021 166      Z09.34                    0000020
D021 167      Z09.35                    0000000 IDKN REGISTER
D021 168      Z09.36                    0000024
D021 169      Z09.37                    0000U00
D021 170      Z09.38                    0000004
D021 171      Z09.39                    0000000 FICHCO
D021 172       09.40  .00.01.5.18.26
D021 173      Z09.41                    0003W00
D021 174      Z09.42                    000000Z
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D021 175      Z09.43                        0400000
D021 176      Z09.44                        0000040
D021 177      Z09.45                        ZZZZZZZ
D021 178      Z09.46                        0000011
D021 179      Z09.47                        0600000
D021 180      Z09.48                        0000001
D021 181       09.49  .00.09.4.08.26
D021 182      Z09.50                        0000000 STO. LOC.
D021 183      Z09.51                        0400000
D021 184       09.52  .00.U2.5.18.26
D021 185      Z09.53                        0000002
D021 186      Z09.54                        0000038
D021 187      Z09.55                        0000000
D021 188      Z09.56                        0000000 CONSTANT IND.
D021 189      Z09.57                        0000006
D021 190       09.58  .00.40.0.18.27
D021 191      Z09.59                        U000000
D021 192      Z09.60                        0000000 SALL
D021 193      Z09.61                        00000ZW
D021 194      Z09.62                        0000000 ALGOSRSTOCO
D021 195      Z09.63                        6V00000
D021 196      Z09.64                        00000XW
D021 197       09.65  .00.81.5.26.17
D021 198       09.66  .00.82.5.25.17
D021 199       09.67  .00.71.5.24.17
D021 200      Z09.68                        0000008
D021 201      Z09.69                        6800000
D021 202      Z09.70                        07ZZU49
D021 203      Z09.71                        00000W0
D021 204      Z09.72                        0000001
D021 205      Z09.73                        0000010
D021 206      Z09.74                        4000000
D021 207       09.75  .06.09.4.08.26
D021 208      Z09.76                        0000000 NENUCO
D021 209      Z09.77                        0000000 PERIOD IND.
D021 210      Z09.78                        000001Z
D021 211      Z09.79                        0000400
D021 212      Z09.80                        00000U0
D021 213      Z09.81                        0000013
D021 214      Z09.82                        0000003
D021 215      Z09.83                        0000000 IND.
D021 216       09.84  .00.10.5.25.17
D021 217      Z09.85                        0200000
D021 218      Z09.86                        0000002
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D021 219      Z09.87                        00003ZW
D021 220      Z09.88                        0ZY0000
D021 221      Z09.89                        ZW00000
D021 222       09.90  .00.03.5.26.17
D021 223       09.91  .50.03.5.26.08
D021 224      Z09.92                        0000002
D021 225      Z09.93                        000000U
D021 226      Z09.94                        6U00000 STOLOCO
D021 227      Z09.95                        3000000
D021 228       09.96  .50.03.5.08.25
D021 229      Z09.97                        6800000
D021 230       09.98  .00.99.5.26.17
D021 231      Z09.99                        0000000 SUPERELOCO
D021 232       09.U0  .00.90.4.18.30
D021 233      Z09.U1                        8000000
D021 234      Z09.U2                        0000000 SUPERINC
D021 235      Z09.U3                        2800000
D021 236       09.U4  .70.70.3.20.31
D021 237      Z09.U5                        0000000 LABEL IND.
D021 238      Z09.U6                        0000000   STORAGE
D021 239      Z09.U7                        ZZZZZZZ
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D010 000                                    PUNCH STOLN SR LINES 02 03 04 12

D010 001       03.04 U.05.05.0.05.16        TRANSFER S.R. IN LINE 05 TO LINE 16
D010 002       03.05 U.06.06.0.12.05        BRING IN ERROR SENSE S.R.
D010 003       03.06  .08.08.5.20..1        TRANSFER TO LINE 5
D010 004       12.08 U.09.03.0.17.27        TEST LINE 17 EQUAL 0
D010 005       12.03  .42.42.4.20.31        YES... RETUR
D010 006       12.04  .40.42.5.24.12        NO...MQQ,1 TO STORE
D010 007       04.42 U.43.84.0.16.05        BRING IN LINE 5 S.R.
D010 008       04.84  .00.19.0.20.31        RETURN
D010 009       12.42  .52.54.5.26.12        PNO.1 TO STORE
D010 010       12.54  .56.10.5.25.12        IDO.1 TO STORE
D010 011       12.10  .13.14.0.23.31        CLEAR 2 WD. REG.
D010 012       12.14 U.17.17.0.23.28        23.00 TO ARC
D010 013       12.17  .19.20.0.22.31        TEST AR NEG.
D010 014       12.20  .22.10.0.28.31        NO...TEST READY
D010 015       12.21 U.23.23.0.28.26        YES...AR TO PNO
D010 016       12.11  .15.16.0.09.28        YES...DELAY CONST. TO ARC
D010 017       12.16  .19.24.0.23.31        CLEAR 2 WD. REG.
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D010 018      12.24  .56.59.5.12.25   STORE TO ID0.1

D010 019      12.59  .52.60.5.12.26   STORE TO PN0.1
D010 020      12.60  .40.43.5.12.24   STORE TO MQ0.1
D010 021      12.43  .07.07.3.20.31   RETURN
D010 022      12.23 W.26.27.3.23.31   SPECIAL EXTRACT
D010 023      12.27  .30.31.3.09.30   DECREMENT PN BY 40
D010 024      12.31 U.33.33.0.26.27   TEST PN0 EQUAL 0
D010 025      12.33 U.34.22.0.29.19   YES... CLEAR LINE 19
D010 026      12.34  .36.37.0.25.27   NO...TEST ID0 EQUAL 0
D010 027      12.37  .54.62.5.09.30   YES...0000000. 0000038 TO PN
D010 028      12.38  .40.10.0.28.31   NO...TEST READY
D010 029      12.62  .00.02.0.19.28   19.00 TO ARC
D010 030      12.02  .04.05.0.26.27   TEST PN0 EQUAL 0
D010 031      12.05 U.07.50.0.28.26   YES...AR TO PN0
D010 032      12.06  .08.12.0.22.31   NO...TEST AR NEG.
D010 033      12.50 W.32.35.3.23.31   SPECIAL EXTRACT
D010 034      12.35  .38.45.3.09.30   DECREMENT PN BY 4
D010 035      12.12  .14.10.0.28.31   NO...TEST READY
D010 036      12.13 U.15.15.0.28.26   YES...AR TO PN0
D010 037      12.15 W.26.28.3.23.31   SPECIAL EXTRACT
D010 038      12.28  .44.45.3.09.30   DECREMENT PN BY 40
D010 039      12.45  .46.19.0.26.27   TEST PN0 EQUAL 0
D010 040      12.19 U.20.22.0.29.19   YES...CLEAR LINE 19
D010 041      12.22  .24.25.0.00.31   SET READY
D010 042      12.25  .29.11.0.07.12   SET ERROR MARK IND.
D010 043     Z12.29                   0000000  ERROR MARK IND.
D010 044     Z12.40                   70Y1288 STORAGE / LINE BALANCER FOR MTA MASTER
D010 045     Z12.41                   0000000 STORAGE
D010 046     Z12.52                   0000000 STORAGE
D010 047     Z12.53                   0000000 STORAGE
D010 048     Z12.56                   0000000 STORAGE
D010 049     Z12.57                   0000000 STORAGE
D010 050      12.11  .13.16.1.13.31   READ MAG TAPE FOR MAG TAPE SCRATCH PAD
D010 051      03.07 U.08.14.0.16.05   RETURN LINE 05 S.R.
D010 052      03.14 U.15.52.0.19.16   INPUT TO LINE 16
D010 053      03.52 U.53.07.0.29.19   CLEAR LINE 19
D010 054      03.07 U.24.36.0.09.02   FORMAT TO 02.0-1-2-3
D010 055      03.16 U.18.18.3.09.29   DECREMENT AR
D010 056      03.18  .20.20.0.22.31   TEST AR NEGATIVE
D010 057      03.20 W.01.16.0.10.31   NO...PUNCH PAPER TAPE
D010 058      03.21  .23.00.0.00.31   YES...SET READY
D010 059      03.00  .00.27.4.17.27   TEST 17.00-01 EQUAL 0
D010 060      03.27  .01.28.0.15.17   YES...0000ZZ TO 17.01

D010 061      03.28  .24.25.0.29.28   NO...CLEAR AR
D010 062      03.25 U.26.26.1.17.29   CHECK SUM LINE 17
D010 063      03.26 U.28.43.1.28.28   COMPLIMENT AR
D010 064      03.43  .45.84.3.28.28   CLEAR & SUBTRACT
D010 065      03.84  .U6.11.1 28.17   CHECK SUM BALANCER TO 17.U6
D010 066      03.11  .15.37.0.11.28   PICK UP MTA COUNTER
D010 067      03.37  .U7.55.0.28.17   MTA COUNTER TO 17.U7
D010 068      03.55 U.56.63.0.17.19   OUTPUT TO LINE 19
D010 069      03.63 U.64.32.0.29.17   CLEAR OUTPUT LINE
D010 070      03.32  .34.74.0.10.31   PUNCH LINE 19
D010 071      03.74  .74.74.0.28.31   TEST READY
D010 072      03.75 U.76.91.0.16.19   RESTORE LINE 19 WITH INPUT
D010 073      03.16  .18.18.0.00.31   SET READY FOR MAG TAPE SCRATCH PAD
D010 074      03.18  .17.10.0.00.00   DELAY FOR MAG TAPE SCRATCH PAD
D010 075      03.20  .20.20.0.28.31   TEST READY FOR MAG TAPE SCRATCH PAD
D010 076      03.63 U.64.24.0.29.17   CLEAR LINE 17 FOR MAG TAPE SCRATCH PAD
D010 077      03.10  .15.01.1.30.31   WRITE FILE CODE
D010 078      03.01  .U4.U4.2.20.31   TRANSFER FOR PART OF ROUTINE
D010 079      02.U4  .15.22.0.11.28   MTA COUNTER TO ARC
D010 080      02.22  .28.U5.0.09.29   INCREMENT MTA COUNTER
D010 081      02.U5  .15.U6.0.28.11   RESTORE
D010 082      02.U6  .20.20.3.20.31   RETURN
D010 083      03.24 W.00.74.1.01.31   WRITE ON MAG. TAPE

D014 000                              NEXT STOLOC SR   LINE 03

D014 001      03.93  .94.48.0.09.28
D01  002      03.48  .85.88.3.09.29   DECREMENT STOLOC BY 2
D014 003      03.88  .94.97.0.28.09   RESTORE
D014 004      03.97  .99.91.0.22.31   TEST AR NEGATIVE
D014 005      03.91 U.00.19.0.20.31   NO... EXIT
D014 006      03.92  .U4.U5.0.09.28   YES...
D014 007      03.U5  .91.U4.0.28.03   DUMMY RETURN TO 03.91
D014 008      03.U4  .04.04.3.20.31   PUNCH STOLN S.R.
D014 009      03.70  .69.73.0.09.28
D014 010      03.73  .94.98.0.28.09   RESTORE STOLOC WITH 6800000
D014 011      03.98  .91.91.0.12.03   RETURN TO 03.91

D013 000                              1ST WORD FINDER SR   LINE 03
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D013 001      03.15   .85.29.0.09.28
D013 002      03.29   .30.31.0.28.22   SET FRWDFDCO EQUAL TO 02
D013 003      03.31   .34.39.0.22.28
D013 004      03.39   .43.44.1.09.29   INCREMENT FRWDFDCO BY 04
D013 005      03.44   .46.57.0.28.22   RESTORE
D013 006      03.57   .58.59.0.09.29   DUMMY STORE COMMAND TO AR
D013 007      03.59   .61.61.0.31.31   NEXT COMMAND FROM AR
D013 008      03.60   .63.45.3.09.28   YES... DECREMENT FRWDFDCO BY 04
D013 009      03.41   .42.60.0.22.28   NO...                          ↓
D013 010      03.60   .63.38.3.09.29   DECREMENT FRWDFDCO BY 6V
D013 011      03.38   .39.45.0.28.27   FRWDFDCO EQUAL ZERO
D013 012      03.45   .46.61.1.22.29   YES... FRWDFDCO TO AR
D013 013      03.46   .48.31.0.00.00   NO... DUMMY
D013 014      03.61   .62.91.0.28.22   RESTORE FRWDFDCO
                •

D015 000                               8-BIT EXTRACTOR SR  LINES 03 04

D015 001      03.08   .11.12.0.23.31   CLEAR 2 WORD REGISTERS
D015 002      03.12   .14.17.0.09.28   DUMMY PICK-UP COMMAND TO ARC
D015 003      03.17   .18.59.1.22.29   NEXT WORD COUNTER TO AR
D015 004      03.47   .48.49.1.28.24   AR TO MQ0
D015 005      03.49   .51.62.0.22.28   BITOBESHCO TO ARC
D015 006      03.62   .67.68.3.07.29   SUBTRACT 12 FROM BITOBESHCO
D015 007      03.68   .70.71.0.22.31   TEST AR NEGATIVE
D015 008      03.71   .58.42.1.26.31   NO... SHIFT 29 BITS
D015 009      03.72   .75.89.3.22.28   YES... BITOBESHCO TO -ARC
D015 010      03.42   .53.54.1.09.29   INCREMENT BITOBESHCO BY 2
D015 011      03.54   .55.56.0.28.22   RESTORE BITOBESHCO
D015 012      03.56   .58.64.0.22.28   NEXT WORD COUNTER TO ARC
D015 013      03.64   .18.19.3.09.29   DECREMENT BY 01
D015 014      03.19   .22.36.0.28.22   RESTORE NEXT WORD COUNTER
D015 015      03.36   .38.12.0.22.31   TEST AR NEGATIVE
D015 016      03.13   .14.95.0.29.28   YES... CLEAR AR
D015 017      03.95   .97.98.0.28.27   IS AR EQUAL 0
D015 018      03.99  W.45.79.3.23.31   NO...SPECIAL EXTRACT LAST 6 BITS
D015 019      03.79   .17.U1.1.07.30   CHANGE CHARACTER TO LOWER CASE
D015 020      03.U1   .U3.09.1.26.28   PICK-UP CHARACTER IN AR
D015 021      03.09   .76.76.4.20.31   TRANSFER
D015 022      04.76   .41.64.3.10.30   SUBTRACT CONSTANT FOR C&R
D015 023      04.64   .67.91.0.26.27   C&R
D015 024      04.91   .08.08.3.20.31   YES...RETURN
D015 025      04.92   .95.85.0.29.26   NO...CLEAR PN1
D015 026      04.85   .87.84.0.29.31   TURN OFF OVERFLOW

D015 027      03.89   .80.69.0.26.31   SHIFT UNDER CONTROL OF AR
D015 028      03.69   .71.30.0.24.26   MQ1 TO PN1
D015 029      03.30  W.33.50.3.23.31   SPECIAL EXTRACT LAST 8 BITS
D015 030      03.50   .51.53.0.22.28   BITOBESHCO TO ARC
D015 031      03.53   .68.81.1.09.29   INCREMENT BY 8
D015 032      03.81   .83.95.2.26.22   RESTORE BITOBESHCO & PN1 TO AR
D015 033      03.80   .82.94.4.20.31   RETURN USED BY SERIES OF RETURNS
                •

D008 000                               ERROR SR  LINES 01 03

D008 001      03.U3   .U4.U6.0.17.31   RING BELL
D008 002      03.U6   .01.33.0.00.31   SET READY
D008 003      03.33   .46.00.5.07.24   ERROR CONSTANT TO MQ
D008 004      03.00   .U6.65.5.24.19   MQ TO 19.U6-U7
D008 005      03.65   .69.76.4.09.31   ALPHA TYPE LINE 19
D008 006      03.76   .76.76.0.28.31   TEST READY
D008 007      03.77   .76.58.0.07.28   SRNENUCO TO ARC
D008 008      03.58   .24.85.0.08.27   TEST TYPE-IN IND. EQUAL 0
D008 009      03.85   .86.34.3.07.29   NO... DECREMENT BY 1
D008 010      03.86   .87.82.0.07.27   YES... TEST LIBRARY IND. SET
D008 011      03.34   .76.90.0.28.07   RESTORE S.R NENUCO
D008 012      03.90   .24.87.0.09.08   SET TYPE-IN IND. NON ZERO
D008 013      03.87   .88.88.5.21.31   RETURN
D008 014      03.82   .78.35.3.07.29   NO... DECREMENT BY 2
D008 015      03.35   .76.94.0.28.07   RESTORE S.R. NENUCO
D008 016      03.94   .23.23.1.21.31   RETURN
D008 017      01.23  U.24.U6.0.29.19   CLEAR LINE 19
D008 018      01.U6   .76.98.0.07.27   TEST SRNENUCO EQUAL 0
D008 019      01.98  W.00.00.0.21.31   YES...RETURN TO BEGINNING
D008 020      01.99  W.14.72.0.21.31   NO...NEXT NUMBER S.R.
D008 021      03.83   .78.96.3.07.29   YES...DECREMENT BY 2
D008 022      03.96   .27.35.0.07.09   SET SWITCH S2
D008 023     Z03.02                    1000000
D008 024     Z03.03                    -8W00000
                •

D011 000                               STATEMENT STORER SR  LINES 02 04

D011 001      04.06  W.51.15.3.21.31   1ST WORD FINDER S.R.
D011 002      02.51   .74.81.0.29.25   CLEAR ID0
D011 003      02.81   .39.41.1.09.25   FICHCO TO ID1
D011 004      02.41   .10.65.1.26.31   SHIFT ID 5 BITS
D011 005      02.65   .66.76.0.25.30   ID0 TO PN0
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D011 006      02.76  .78.80.0.22.28   FRWDFDCO TO AR
D011 007      02.80 U.83.85.5.29.25   CLEAR ID0.1
D011 008      02.85  .70.70.4.20.31   RETURN
D011 009      04.58  .00.57.4.18.27   TEST 1800-01 EQUAL 0
D011 010      04.70  .85.57.1.09.29   INCREMENT FRWDFDCO BY 02
D011 011      04.57  .60.61.1.28.25   YES... AR TO ID0
D011 012      04.61  .06.89.1.26.31   SHIFT ID RIGHT 3 BITS
D011 013      04.89  .90.46.0.22.28   FRWDFDCO TO ARC
D011 014      04.46  .U0.68.0.09.29   DUMMY PICK-UP COMMAND TO AR
D011 015      04.68  .70.70.0.31.31   NEXT COMMAND FROM AR
D011 016      04.90  .96.43.1.25.30   ID0 TO PN0
D011 017      04.43  .76.47.0.09.28   NENUCO TO ARC
D011 018      04.47  .93.97.1.28.30   AR TO PN1
D011 019      04.97  .U5.U6.0.09.27   TEST LABEL IND. SET
D011 020      04.U6  .56.U3.5.26.26   NO... COMPLIMENT PN
D011 021      04.U7  .77.79.3.26.28   YES... CLEAR & SUBTRACT PN1
D011 022      04.59  .61.95.1.28.26   RESTORE PN1
D011 023      04.95  .U5.U6.0.29.09   CLEAR LABEL IND.
D011 024      04.U3 W.88.93.3.21.31   NEXT STORAGE LOCATION S.R.
D011 025      04.88  .29.68.0.15.29   DUMMY STORE COMMAND TO AR
D011 026      04.54  .58.60.0.22.28   FRWDFDCO TO ARC
D011 027      04.60  .85.98.3.09.29   DECREMENT BY 02
D011 028      04.98  .U0.U1.0.22.31   TEST AR NEGATIVE
D011 029      04.U1  .U2.14.0.28.22   NO... RESTORE FRWDFDCO
D011 030      04.U2  .66.66.1.21.31   TES... RETURN
D011 031      04.14  .19.68.0.09.29   DUMMY PICK-UP COMMAND TO AR
D011 032      04.99  .U0.U3.0.00.00   DUMMY
D011 033      04.94  .96.U7.5.20.31   RETURN USED BY SERIES OF RETURNS
                .

D012 000                              ERROR SENSE SR  LINES 02 04 07

D012 001      04.00  .29.36.0.12.27   TEST ERROR MARK IND. SET
D012 002      04.36  .39.03.0.23.31   NO...CLEAR 2 WORD REGISTERS
D012 003      04.37  .29.40.0.29.12   YES...CLEAR ERROR MARK
D012 004      04.03 U.05.05.0.23.28   23.00 TO ARC
D012 005      04.05  .07.19.0.22.31   TEST AR NEGATIVE
D012 006      04.19  .21.00.0.28.31   NO...TEST READY
D012 007      04.20  .22.25.0.28.26   YES... AR TO PN0
D012 008      04.01  .03.02.0.20.31   RETURN
D012 009      04.25  .27.28.3.23.31   SPECIAL EXTRACT
D012 010      04.28  .30.33.3.09.30   DECREMENT PN BY 40
D012 011      04.33  .34.40.0.26.27   TEST PN0 EQUAL 0
D012 012      04.40 U.41.53.0.29.19   YES... CLEAR LINE 19

D012 013      04.41  .42.44.0.25.27   NO... TEST ID0 EQUAL 0
D012 014      04.44  .54.56.5.09.30   YES... 0000000, 000038 TO PN0.1
D012 015      04.45  .47.00.0.28.31   NO... TEST READY
D012 016      04.56  .00.04.0.19.28   19.00 TO ARC
D012 017      04.04  .06.29.0.26.27   TEST PN0 EQUAL 0
D012 018      04.29  .30.31.0.28.26   YES... AR TO PN0
D012 019      04.30  .32.50.0.22.31   NO... TEST AR NEGATIVE
D012 020      04.50  .52.00.0.28.31   NO... TEST READY
D012 021      04.51  .52.10.0.28.26   YES... AR TO PN0
D012 022      04.10 W.26.39.3.23.31   SPECIAL EXTRACT
D012 023      04.39  .44.52.3.09.30   SUBTRACT 40 FROM PN0
D012 024      04.31  .33.34.3.23.31   SPECIAL EXTRACT
D012 025      04.34  .38.52.3.09.30   SUBTRACT 4 FROM PN0
D012 026      04.52  .54.49.0.26.27   TEST PN0 EQUAL 0
D012 027      04.49 U.50.53.0.29.19   YES... CLEAR LINE U9
D012 028      04.53  .55.66.0.00.31   SET READY
D012 029      04.66  .76.69.0.07.28   SRNENUCO TO ARC
D012 030      04.69 W.92.11.3.12.29   DECREMENT SRNENUCO
D012 031      04.11  .76.U5.0.28.07   RESTORE SRNENUCO
D012 032      04.U5 U.U6.63.0.07.05   BRING IN LINE 7
D012 033      04.63  .40.40.5.20.31   TRANSFER
D012 034      07.40  .56.63.0.10.09   SET CONSTANT IND.
D012 035      07.63  .07.82.0.07.27   TEST SWITCH S1 SET
D012 036      07.82  .04.04.2.20.31   NO...NEXT NUMBER S.R.
D012 037      07.83  .23.23.1.20.31   YES...RETURN
D012 038      02.04 U.05.05.0.29.18   CLEAR LINE 18
D012 039      02.05  .33.33.0.20.31   RETURN
                .

D006 000                              SUBSCRIPTS SR  LINES 02 03 06

D006 001      06.00 W.U4.08.3.21.31   8-BIT EXTRACTOR S.R.
D006 002      06.U4  .03.04.0.28.27   TEST AR 0
D006 003      06.04  .06.55.0.29.31   YES... TEST FOR OVERFLOW
D006 004      06.05  .06.11.0.28.26   NO... 8-BIT CHARACTER TO PN0
D006 005      06.11  .31.26.3.09.29
D006 006      06.26  .30.40.0.28.27   TAB
D006 007      06.40  .00.04.0.00.00   YES... DUMMY
D006 008      06.41  .73.U0.3.09.29   NO...
D006 009      06.U0  .U2.00.0.28.27   SPACE
D006 010      06.01  .53.54.1.09.29   NO...
D006 011      06.54  .56.57.0.28.27   COMMA
D006 012      06.57  .10.23.4.09.27   YES... TEST TLOFFCW0.1 EQUAL 0
D006 013      06.58  .72.73.3.09.29   NO...
```

```
D006 014        06.73   .74.75.0.28.27   OPEN PARENTHESIS
D006 015        06.75   .77.00.0.00.07   YES... SET OPEN PAR. IND.
D006 016        06.76   .34.35.1.09.29   NO...
D006 017        06.35   .39.37.2.09.27   CLOSING PAR. & FICHCO TO ARC
D006 018        06.37   .77.78.0.07.27   YES... TEST OPEN PAR. IND. SET
D006 019        06.38   .48.87.1.09.29   NO... INCREMENT FICHCO
D006 020        06.87   .39.43.0.28.09   RESTORE FICHCO
D006 021        06.43   .57.62.3.09.29   TEST FOR FIRST FIVE CHARACTERS
D006 022        06.62   .64.71.0.22.31   TEST AR NEGATIVE
D006 023        06.71   .90.00.0.00.00   NO... DUMMY
D006 024        06.72   .10.33.4.09.24   YES... TLOFFCW0,1 TO MQ0,1
D006 025        06.33   .12.47.1.26.31   SHIFT MQ LEFT 6 BITS
D006 026        06.47 W.74.89.3.23.31    SPECIAL EXTRACT
D006 027        06.89   .90.94.5.24.30   BUILD UP-TO-DATE FIVE CHAR. WORD
D006 028        06.94   .10.00.4.26.09   STORE IN TLOFFCW0,1
D006 029        06.55   .10.67.4.09.27   NO... TEST TLOFFCW0,1 EQUAL 0
D006 030        06.56   .90.04.0.00.00   YES... DUMMY
D006 031        06.67 W.70.66.1.21.31    YES... EXIT
D006 032        06.68   .70.57.0.00.00   NO... DUMMY
D006 033        06.23   .30.00.0.00.00   YES... DUMMY
D006 034        06.24   .58.61.0.29.24   NO... CLEAR MQ0
D006 035        06.61   .77.91.0.07.27   TEST OPEN PAR. IND. SET
D006 036        06.91   .95.46.0.07.24   NO... SUSSHBITS TO MQ1
D006 037        06.92   .09.09.2.20.31   YES... TRANSFER TO PART OF ROUTINE
D006 038        02.09   .83.15.0.09.27   TEST IND. SET
D006 039        02.15   .10.25.4.09.26   NO... TLOFFCW0,1 TO PN0,1
D006 040        02.16   .50.50.5.20.31   YES... TRANSFER TO TRANSFER TO ERROR S.R.
D006 041        02.25   .00.13.4.26.07   PN0,1 TO TLOFFCW2,3
D006 042        02.13   .06.06.5.20.31   RETURN
D006 043        06.06   .83.31.0.07.09   SET IND.
D006 044        06.31   .10.36.4.29.09   CLEAR TLOFFCW0,1
D006 045        06.36   .39.00.0.29.09   CLEAR FICHCO
D006 046        06.46   .49.51.0.24.27   TEST MQ1 EQUAL 0
D006 047        06.51   .60.78.0.00.00   YES... DUMMY
D006 048        06.52   .06.29.0.07.28   NO... SUSBITCHCO TO ARC
D006 049        06.29   .54.84.0.27.31   NORMALIZE
D006 050        06.84   .95.98.0.24.07   RESTORE SUSSHBITS
D006 051        06.98   .06.45.0.28.07   RESTORE SUSSBITCHCO
D006 052        06.45 U.60.03.1.28.29    SHIFT AR 4 BITS
D006 053        06.03   .11.27.0.09.29   BUILD OUTPUT
D006 054        06.27   .76.85.1.09.29   BUILD OUTPUT
D006 055        06.85   .61.U3.1.07.29   BUILD OUTPUT
D006 056        06.U3   .11.15.0.28.09   STORE OUTPUT IN TLOFFCW1
D006 057        06.15   .20.25.0.07.28

D006 058        06.25   .27.69.1.24.29   DECREMENT SUSSHBITS BY 8
D006 059        06.69   .95.U7.0.28.07   RESTORE SUSSHBITS
D006 060        06.U7   .30.33.4.09.26   TLOFFCW0,1 TO PN0,1
D006 061        06.13 W.U1.93.3.21.31    NEXT STORE LOC. S.R.
D006 062        06.U1   .U2.30.0.07.29   DUMMY STORE COMMAND TO AR
D006 063        06.30   .32.74.0.31.31   NEXT COMMAND FROM AR
D006 064        06.74   .76.93.1.09.28   NENUCO TO ARC
D006 065        06.93   .57.59.1.07.29   INCREMENT NENUCO BY 400
D006 066        06.59   .76.02.0.28.09   RESTORE NENUCO
D006 067        06.02   .24.31.0.07.27   TEST SWITCH SSS SET
D006 068        06.32   .14.77.0.07.28   YES... STORAGE TO ARC
D006 069        06.77   .11.65.0.09.29   BUILD OUTPUT
D006 070        06.65   .76.82.1.09.29   BUILD OUTPUT
D006 071        06.82   .61.95.1.07.29   BUILD OUTPUT
D006 072        06.95   .11.22.0.28.09   STORE OUTPUT IN TLOFFCW1
D006 073        06.22   .24.U7.0.29.07   CLEAR SWITCH SSS
D006 074        06.78 U.79.80.0.12.05    NO... ERROR S.R.
D006 075        06.79   .83.39.0.29.09   YES... CLEAR IND.
D006 076        06.39   .77.80.0.29.07   CLEAR OPEN PAR. IND.
D006 077        06.80   .89.88.0.23.31   CLEAR 2 WORD REGISTERS
D006 078        06.88   .95.96.0.07.28   SUSSHBITS TO ARC
D006 079        06.96   .98.99.0.28.24   AR TO MQ0
D006 080        06.99   .06.14.6.07.26   SUSSBITCHCO TO PN1
D006 081        06.14 W.29.81.3.23.31    SPECIAL EXTRACT
D006 082        06.81   .83.U5.0.25.27   TEST FOR SUSSBITCHCO EVEN
D006 083        06.U5   .41.42.3.07.28   YES..CLEAR / SUBTRACT 2  EVEN # OF IXR
D006 084        06.U6   .09.07.3.09.28   NO...CLEAR / SUBTRACT 3  ODD # OF IXR
D006 085        06.07   .04.21.1.26.31   SHIFT 4 BITS
D006 086        06.21   .23.42.1.29.24   CLEAR MQ1
D006 087        06.42   .72.08.0.24.27   TEST MQ0 EQUAL 0
D006 088        06.08   .60.78.0.00.00   YES... DUMMY
D006 089        06.09   .04.16.1.26.31   NO... SHIFT MQ LEFT 2 BITS
D006 090        06.16 U.18.18.0.24.27    TEST MQ1 EQUAL 0
D006 091        06.18   .41.21.3.07.29   YES...SUBTRACT  2
D006 092        06.19   .20.49.1.29.25   NO... CLEAR ID0
D006 093        06.49   .49.63.1.07.25   -0000002 TO ID1
D006 094        06.63   .14.17.1.28.07   AR TO STORAGE
D006 095        06.17   .54.83.0.26.31   SHIFT UNDER CONTROL OF AR
D006 096        06.83   .95.U2.0.07.28   SUSSHBITS TO ARC
D006 097        06.U2   .U4.20.1.25.29   ID0 TO AR
D006 098        06.20   .95.44.2.28.07   ABSOLUTE AR TO SUSSHBITS
D006 099        06.44   .06.86.0.07.28   SUSBITCHCO TO ARC
D006 100        06.86   .48.12.3.09.29   INCREMENT SUSBITCHCO BY 1
D006 101        06.12   .14.28.2.07.29   ABSOLUTE STORAGE TO AR
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D006 102        06.28 U.33.34.0.28.29   SHIFT AR 4-BITS
D006 103        06.34  .14.48.0.28.07   AR TO STORAGE
D006 104        06.48  .53.66.3.07.29   DECREMENT BY 10
D006 105        06.66  .01.60.0.07.29   BUILD OUTPUT
D006 106        06.60  .76.90.1.09.29   BUILD OUTPUT
D006 107        06.90  .61.97.1.07.29   BUILD OUTPUT
D006 108        06.97  .01.10.0.28.07   STORE OUTPUT IN TLOFFCW3
D006 109        06.10  .24.64.0.09.07   SET SWITCH SSS
D006 110        06.64  .00.13.4.07.26   TLOFFLW2,3 TO PN0,1
D006 111        06.50  .83.70.0.29.09   CLEAR IND.
D006 112        06.70  .77.78.0.29.07   CLEAR OPEN PAR. IND.
D006 113       Z06.53                   0900000 USED AT 11.50
D006 114        12.80  .U2.U2.3.20.31   TRANSFER FOR PART OF ROUTINE   SUBSCRIPTS
D006 115        03.U2  .76.78.0.07.28   SRNENUCO TO ARC
D006 116        03.78  .66.66.0.07.29   INCREMENT BY 1
D006 117        03.66  .76.67.0.28.07   RESTORE SRNENUCO
D006 118        03.67  .72.72.5.20.31   RETURN
                 *

D019 000                                BCD TO BINARY CONVERSION SR  LINE 08

D019 001        08.20  .24.27.7.29.23   CLEAR LINE 23 & PUT IN MARKER BIT
D019 002        08.27  .30.31.0.23.31   CLEAR 2 WORD REGISTERS
D019 003        08.31  .33.38.0.02.20   EXTRACTOR TO 20.01
D019 004        08.38 U.39.42.0.08.19   LINE 08 TO LINE 19
D019 005        08.42  .44.44.6.21.31   TRANSFER
D019 006        08.44  .44.44.0.28.31   TEST READY INTEGER 0 SLASHS
D019 007        08.45  .46.47.0.29.28   CLEAR AR
D019 008        08.47  .48.70.4.23.24   INPUT TO MQ0,1
D019 009        08.70  .73.73.5.21.31   RETURN
D019 010        08.73  .V4.72.0.27.31   NORMALIZE
D019 011        08.72 U.75.79.0.28.25   BITS NORMALIZED TO ID
D019 012        08.79  .04.91.1.26.31   SHIFT ID RIGHT 2 BITS
D019 013        08.91  .93.97.0.25.21   ID1 TO 21.01
D019 014        08.97  .U0.U3.4.23.24   INPUT TO MQ0,1
D019 015        08.U3  .V2.85.1.27.31   NORMALIZE
D019 016        08.85  .02.86.1.26.31   SHIFT 1 BIT
D019 017        08.86  .88.22.4.24.26   MQ0,1 TO PN0,1
D019 018        08.22 U.25.25.0.02.24   LOAD MULTIPLIER
D019 019        08.25 W.58.71.7.23.31   SPECIAL EXTRACT Y1Y01Y0, -Z020020
D019 020        08.71  .06.80.0.24.31   MULTIPLY BY 10*2**-4
D019 021        08.80 W.U2.U5.7.23.31   SPECIAL EXTRACT
D019 022        08.U5  .12.49.0.24.31   MULTIPLY BY 10**2*2**-8
D019 023        08.49 W.60.77.7.23.31   SPECIAL EXTRACT

D019 024        08.77  .18.96.0.24.31   MULTIPLY BY 10**4*2**-16
D019 025        08.96  .97.15.0.26.25   PN1 TO ID1
D019 026        08.15  .16.81.1.29.25   CLEAR ID0
D019 027        08.81  .42.16.0.24.31   MULTIPLY BY 10**5*2**-20
D019 028        08.16  .17.21.0.08.28   72 EQUAL 0000048 TO ARC
D019 029        08.21  .22.33.4.26.24   INTEGER *2**-56 TO MQ0,1
D019 030        08.33  .V2.74.0.27.31   NORMALIZE
D019 031        08.74  .76.78.4.24.25   NR TO ID0,1
D019 032        08.78  .81.82.2.21.21   21.01 TO AR & AR TO 21.01
D019 033        08.82  .84.U1.0.22.31   TEST AR EQUAL N EQUAL NEGATIVE
D019 034        08.U1  .U2.18.0.28.27   NO... TEST AR 0
D019 035        08.U2  .17.26.0.09.29   YES... N EQUAL N PLUS 1
D019 036        08.26  .54.76.0.02.21   -0000004 TO 21.02
D019 037        08.76  .89.93.0.08.24   10*2**-4 TO MQ1
D019 038        08.18  .21.23.0.21.28   YES... 21.01 EXPONENT TO ARC
D019 039        08.19  .23.30.3.10.29   NO... 0000007 TO -AR
D019 040        08.30  .46.84.0.10.21   E EQUAL 23*2**-28 TO 21.02
D019 041        08.84  .87.93.0.08.24   X6VZ94Y 10**-7*2**23 TO MQ1
D019 042        08.93  .97.99.2.21.21   AR TO 21.01 & 21.01 TO ARC
D019 043        08.99  .56.U4.0.24.31   MULTIPLY * SCALE FACTOR
D019 044        08.U4  .18.21.1.21.29   E TO AR
D019 045        08.23  .25.28.2.31.27   TEST 31.01 EQUAL 0
D019 046        08.28  .29.90.0.24.21   YES... MQ1 TO 21.01
D019 047        08.29  .31.34.0.22.31   NO... TEST AR NEGATIVE
D019 048        08.34  .35.U6.0.29.28   NO... CLEAR AR
D019 049        08.35  .79.U6.0.10.28   YES... BIG NR TO ARC
D019 050        08.90  .U1.U6.0.27.28   27.01 TO ARC
D019 051        08.U6 U.U7.28.0.14.05   LINE 14 TO LINE 05 & EXIT
D019 052        08.40  .44.44.0.28.31   TEST READY FIXED POINT 1 SLASH
D019 053        08.41  .48.96.3.09.28   0000001 TO -ARC
D019 054        08.92  .00.74.4.19.24   19.00-01 TO MQ0,1
D019 055        08.36  .44.44.0.28.31   TEST READY FLOATING POINT 2 SLASHS
D019 056        08.37  .48.48.5.21.31   TRANSFER
D019 057        08.48  .52.75.4.23.24   NR TO MQ0,1
D019 058        08.75  .90.95.1.27.31   NORMALIZE
D019 059        08.95  .02.U0.1.26.31   SHIFT OFF MARKER BIT
D019 060        08.U0  .37.39.1.09.25   0000U0 TO ID1
D019 061        08.39  .08.U7.0.24.31   TENS IN EXPONENT
D019 062        08.U7  .57.63.1.07.25   0000010 TO ID1
D019 063        08.43  .08.94.0.24.31   EXPONENT IN PN
D019 064        08.94  .95.98.7.26.28   PN1 TO -ARC
D019 065        08.98  .60.83.0.07.29   0000040 TO AR
D019 066        08.83  .85.86.0.28.21   AR TO 21.01
D019 067        08.32 U.45.58.0.14.05   LINE 14 TO LINE 05 ERROR 3 SLASHS
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D019 068      08.46  .24.26.0.29.08   SET TYPE-IN IND. EQUAL 0
D019 069      08.14  .U3.U3.3.21.31   ERROR S.R.
D019 070     Z08.17                   0000048
D019 071     Z08.87                   X6VZ94Y
D019 072     Z08.89                   U000000
D019 073     Z08.24                   1111111 TYPE-IN IND.
D019 074     Z08.50                   -V20WZ48
D019 075     Z08.55                   2809000
                .

D007 000                              TITLE-INPUT/OUTPUT SR  LINE 10

D007 001      10.59  .71.U5.0.07.22   0000014 TO BITOBESCHO
D007 002      10.30  .32.U5.0.09.05   SET IND. FOR EXIT POINT
D007 003      10.U5  .U6.06.0.07.05   SET TITLE IND.
D007 004      10.06  .10.24.4.29.09   CLEAR TLOFFCW0.1
D007 005      10.24  .39.55.0.29.09   CLEAR FICHCO
D007 006      10.55  .58.00.0.23.31   CLEAR 2 WORD REGISTERS
D007 007      10.00 W.U7.08.3.21.31   8-BIT EXTRACTOR S.R.
D007 008      10.U7  .23.24.0.28.27   TEST AR 0
D007 009      10.04  .10.13.0.09.27   YES... TEST TLOFFCW0.1 EQUAL 0
D007 010      10.05  .06.34.0.28.26   NO... 8-BIT CHARACTER TO PN
D007 011      10.34  .48.81.3.11.29
D007 012      10.81 U.83.84.2.26.27   TAB & 8-BIT CHARACTER TO ARC
D007 013      10.84 U.86.00.0.00.00   YES... DUMMY
D007 014      10.85  .99.08.0.00.00   NO... DUMMY
D007 015      10.08  .99.U0.3.07.29
D007 016      10.U0  .U1.00.0.28.27   SPACE
D007 017      10.01  .06.07.1.09.29   NO...
D007 018      10.07  .08.09.0.28.27   OPEN PARENTHESIS
D007 019      10.09  .77.78.0.05.07   YES... SET OPEN PAR. IND.
D007 020      10.10  .17.18.1.09.29   NO...
D007 021      10.18  .19.20.0.28.27   COMMA
D007 022      10.20  .30.78.0.00.00   YES... DUMMY
D007 023      10.21  .39.40.1.07.29   NO...
D007 024      10.40  .41.42.0.28.27   EQUAL
D007 025      10.42  .88.78.0.09.11   YES... SET EQUAL IND.
D007 026      10.43  .46.54.3.09.29   NO...
D007 027      10.54  .39.56.2.09.27   CLOSING PAR. & FICHCO TO ARC
D007 028      10.56  .89.26.0.09.11   YES... SET CLOSING PAR. IND.
D007 029      10.57  .48.51.1.09.29   NO... INCREMENT FICHCO
D007 030      10.51  .39.44.0.28.09   RESTORE FICHCO
D007 031      10.44  .57.58.3.09.29   0000006 TO -AR
D007 032      10.58  .59.94.0.22.31   TEST FOR FIVE CHARACTERS PICKED UP

D007 033      10.94  .95.00.0.00.00   NO... DUMMY
D007 034      10.95  .10.31.4.09.24   YES... TLOFFCW0.1 TO MQ0.1
D007 035      10.31  .12.68.1.26.31   SHIFT MQ 6 BITS
D007 036      10.68 W.74.75.3.23.31   SPECIAL EXTRACT
D007 037      10.75  .76.U2.5.24.30   MQ0.1 TO PN0.1
D007 038      10.U2  .10.00.4.26.09   PN0.1 TO TLOFFCW0.1
D007 039      10.13  .77.87.0.29.07   YES... CLEAR OPEN PAR. IND.
D007 040      10.14  .92.12.0.01.11   NO... SET EXIT SWITCH
D007 041      10.87 U.93.72.0.29.11   CLEAR 11.88 THRU 11.92 IND.
D007 042      10.72  .04.02.0.09.27   TEST ERROR SWITCH SET
D007 043      10.02  .32.82.0.05.27   NO... TEST IND. FOR EXIT POINT SET
D007 044      10.03  .04.15.0.29.09   YES... CLEAR ERROR SWITCH
D007 045      10.15 U.16.72.0.12.05   ERROR S.R.
D007 046      10.82  .24.24.0.21.31   NO... EXIT
D007 047      10.83 W.17.66.1.21.31   YES...EXIT
D007 048      10.12  .90.96.0.11.27   TEST I/O IND. SET
D007 049      10.96  .89.60.0.11.27   NO... TEST CLOSING PAR. IND. SET
D007 050      10.97  .04.35.0.07.09   YES... SET ERROR SWITCH
D007 051      10.35  .88.48.0.07.28   LEVCO TO ARC
D007 052      10.48  .52.71.3.07.29   DECREMENT LEVCO BY 1
D007 053      10.71  .88.13.0.28.07   RESTORE LEVCO
D007 054      10.60  .91.52.0.11.27   NO... TEST OUTPUT IND. SET
D007 055      10.61  .92.60.0.00.11   YES... SET EXIT SWITCH
D007 056      10.52  .88.64.0.11.27   NO... TEST EQUAL IND. SET
D007 057      10.53  .32.88.0.09.28   YES... 1000000 TO ARC
D007 058      10.64  .90.66.0.11.27   NO... TEST I/O IND. SET
D007 059      10.65  .91.64.0.07.11   YES...SET OUTPUT IND.
D007 060      10.66  .77.98.0.07.27   NO... TEST OPEN PAR. IND. SET
D007 061      10.67  .00.39.0.00.00   YES... DUMMY
D007 062      10.39  .58.88.0.07.28   0800000 TO ARC
D007 063      10.98  .U6.16.0.05.27   NO... TEST ONE WORD TITLE IND. SET
D007 064      10.99  .90.98.0.09.11   YES... SET I/O IND.
D007 065      10.16  .20.00.0.00.00   NO... DUMMY
D007 066      10.17  .88.U3.0.07.28   YES... LEVCO TO ARC
D007 067      10.U3  .52.86.1.07.29   INCREMENT LEVCO
D007 068      10.86  .88.11.0.28.07   RESTORE LEVCO
D007 069      10.11  .U1.U4.1.09.29   BUILD OUTPUT
D007 070      10.U4  .U6.88.0.29.05   CLEAR ONE WORD TITLE IND.
D007 071      10.88  .11.74.0.09.29   BUILD OUTPUT
D007 072      10.74  .76.77.1.09.29   BUILD OUTPUT
D007 073      10.77  .93.27.0.05.27   TEST CSP SWITCH SET
D007 074      10.27  .11.33.0.28.09   NO... AR TO TLOFFLW1
D007 075      10.28  .19.22.1.07.29   YES... PUT IN FUNCTION IND. BIT
D007 076      10.22  .11.73.0.28.09   STORE OUTPUT IN TLOFFCW1
```

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D007 077      10.73  .93.33.0.29.05   CLEAR CSP SWITCH
D007 078      10.33  .10.76.4.09.26   TLOFFCW0,1 TO PN0,1
D007 079      10.76 W.U1.93.3.21.31   NEXT STORE LOC. S.R.
D007 080      10.U1  .16.25.0.07.29   DUMMY STORE COMMAND TO AR
D007 081      10.25  .26.49.0.31.31   NEXT COMMAND FROM AR
D007 082      10.49  .76.45.0.09.28   NENUCO TO ARC
D007 083      10.45  .57.47.1.07.29   INCREMENT NENUCO
D007 084      10.47  .76.70.0.28.09   RESTORE NENUCO
D007 085      10.70  .10.38.4.29.09   CLEAR TLOFFCW0,1
D007 086      10.38  .39.69.0.29.09   CLEAR FICHCO
D007 087      10.69  .92.62.0.11.27   TEST EXIT SWITCH SET
D007 088      10.62  .67.00.0.00.00   NO... DUMMY
D007 089      10.63  .70.13.0.00.00   YES... DUMMY
D007 090      10.26  .90.78.0.29.11   CLEAR I/O IND.
D007 091      10.78  .10.36.4.09.27   TEST TLOFFCW0,1 EQUAL 0
D007 092      10.36  .50.00.0.00.00   YES... DUMMY
D007 093      10.37  .51.96.0.00.00   NO... DUMMY
D007 094     Z10.32                   0000000 IND. FOR EXIT POINT
D007 095     Z10.U6                   0000000 ONE WORD TITLE IND.
D007 096     Z10.93                   0000000 CSP SWITCH
D007 097     Z10.19                   0000002
D007 098     Z10.29                   02WV81Y
D007 099     Z10.79                   ZZZZZ00
D007 100     Z10.23                   0000007
D007 101     Z10.46                   0000017
D007 102     Z10.41                   00000YU
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D004 000                              LIBRARY SR  LINES 11 12

D004 001      11.05  .10.14.4.29.09   CLEAR TLOFFCW0,1
D004 002      11.14  .39.00.0.29.09   CLEAR FICHCO
D004 003      11.00 W.97.08.3.21.31   8-BIT EXTRACTOR S.R.
D004 004      11.97 W.16.35.0.28.26   8-BIT CHARACTER TO PN
D004 005      11.35  .48.68.3.05.29
D004 006      11.68  .70.86.2.26.27   TAB & 8-BIT CHARACTER TO AR
D004 007      11.86 U.88.00.0.00.00   YES... DUMMY
D004 008      11.87 U.89.02.0.00.00   NO... DUMMY
D004 009      11.02  .16.17.0.05.27   TEST S-SR SWITCH SET
D004 010      11.17  .18.20.0.28.27   NO... TEST AR 0
D004 011      11.18  .19.22.0.28.27   YES... TEST AR 0
D004 012      11.22 U.23.72.0.12.05   YES... ERROR S.R.
D004 013      11.23  .24.25.3.09.29   NO...
D004 014      11.20  .21.U3.0.29.05   YES... SET S-EX SWITCH

D004 015      11.21  .23.24.3.09.29   NO...
D004 016      11.24  .25.26.0.28.27   COMMA
D004 017      11.26  .39.U3.0.29.09   YES... CLEAR FICHCO
D004 018      11.27  .28.29.3.09.29   NO...
D004 019      11.29  .30.U5.0.28.27   OPEN PARENTHESIS
D004 020      11.U5  .16.56.0.09.05   YES... SET S-SR SWITCH
D004 021      11.U6  .28.30.3.09.29   NO...
D004 022      11.30  .39.00.2.09.27   SPACE 6 FICHCO TO AR
D004 023      11.01  .48.79.1.09.29   NO... INCREMENT FICHCO
D004 024      11.79  .39.41.0.28.09   RESTORE FICHCO
D004 025      11.41  .57.60.3.09.29   0000006 TO -AR
D004 026      11.60  .62.98.0.22.31   TEST AR NEGATIVE
D004 027      11.98  .U0.00.0.00.00   NO... DUMMY
D004 028      11.99 W.06.08.7.23.31   YES... SPECIAL EXTRACT
D004 029      11.08  .10.13.5.09.24   TLOFFCW0,1 TO MQ0,1
D004 030      11.13  .12.28.1.26.31   SHIFT MQ 6 BITS
D004 031      11.28  .30.78.5.24.30   MQ0,1 TO PN0,1
D004 032      11.78  .10.00.4.26.09   PN0,1 TO TLOFFCW0,1
D004 033      11.25  .26.31.0.28.27   CLOSING PARENTHESIS
D004 034      11.31  .11.75.0.09.28   YES... TLOFFCW1 TO ARC
D004 035      11.32  .34.37.3.09.29   NO...
D004 036      11.37  .38.42.0.28.27   OPEN PARENTHESIS
D004 037      11.42 U.43.72.0.12.05   YES... ERROR S.R.
D004 038      11.43  .48.49.3.09.29   NO...
D004 039      11.49  .50.52.0.28.27   SPACE
D004 040      11.52  .54.00.0.00.00   YES... DUMMY
D004 041      11.53 W.84.04.3.23.31   NO... SPECIAL EXTRACT
D004 042      11.04  .20.47.0.09.24   TLDIGSTO TO MQ0
D004 043      11.47  .08.65.1.26.31   SHIFT MQ 4 BITS
D004 044      11.65  .66.11.1.24.30   MQ0 TO PN0
D004 045      11.11  .20.00.0.26.09   PN0 TO TLDIGSTO
D004 046      11.75  .76.U0.1.09.29   BUILD OUTPUT
D004 047      11.U0  .U3.U4.1.09.29   BUILD OUTPUT
D004 048      11.U4  .11.19.0.28.09   STORE IN TLOFFCW1
D004 049      11.19  .20.63.6.09.26   TLDIGSTO TO PN1
D004 050      11.63 W.75.96.3.23.31   SPECIAL EXTRACT CHECK SUM
D004 051      11.96  .97.50.0.26.28   PN1 TO ARC
D004 052      11.50  .53.64.3.06.29   TEST CHECK SUM FOR CORRECT VALUES
D004 053      11.64 W.66.82.0.22.31   TEST AR NEGATIVE
D004 054      11.82 U.83.72.0.12.05   NO... ERROR S.R.
D004 055      11.83  .21.33.0.26.09   STORE CHECK SUM
D004 056      11.33  .04.38.1.26.31   SHIFT 2 BITS
D004 057      11.38  .39.51.0.25.26   ID1 TO PN1
D004 058      11.51 W.55.58.3.23.31   SPECIAL EXTRACT STARTING LOC
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D004 059      11.58   .59.61.0.09.24   U000000 TO MQ1
D004 060      11.61   .06.74.0.24.31   MULTIPLY 3 WORD TIMES
D004 061      11.74 U.76.80.0.26.28    PN1 TO ARC
D004 062      11.80   .21.40.0.09.26   PICK UP CHECK SUM
D004 063      11.40   .42.59.0.28.26   PICK UP STARTING LOC.
D004 064      11.59   .16.81.0.29.05   CLEAR SWITCH S-SR
D004 065      11.81   .10.34.5.09.25   TLOFFCW0,1 TO 100,1
D004 066      11.34 W.U7.93.3.21.31    NEXT STORE LOC. S.R.
D004 067      11.U7   .U4.96.0.09.29   DUMMY STORE COMMAND TO AR
D004 068      11.76   .U4.U4.0.31.31   NEXT COMMAND FROM AR
D004 069      11.10 W.U2.93.3.21.31    NEXT STORE LOC. S.R.
D004 070      11.U2   .90.76.0.09.29   DUMMY STORE COMMAND TO AR
D004 071      11.03   .10.39.4.29.09   CLEAR TLOFFCW0,1
D004 072      11.39   .76.77.0.09.28   NENUCO TO ARC
D004 073      11.77   .79.62.1.09.29   INCREMENT NENUCO
D004 074      11.62   .76.56.0.28.09   RESTORE NENUCO
D004 075      11.U3   .10.56.4.09.27   TEST TLOFFCW0,1 EQUAL 0
D004 076      11.56   .21.54.0.05.27   YES... TEST S-EX SWITCH EQUAL 0
D004 077      11.57   .39.45.0.29.09   NO... CLEAR FICHCO
D004 078      11.45   .47.67.0.00.31   SET READY
D004 079      11.84   .85.36.1.09.29   ADD 02 FOR NEXT WD. TIME
D004 080      11.36   .49.76.0.28.09   RESTORE DUPUSURUSTO
D004 081      11.09   .10.12.7.09.30   TLOFFCW0,1 TO -PN0,1
D004 082      11.12   .14.72.5.26.27   TEST PN0,1 EQUAL 0
D004 083      11.72   .76.03.0.09.28   YES... NENUCO TO ARC
D004 084      11.73   .75.06.3.09.29   NO... SRSTOLIM TO -AR
D004 085      11.06   .62.44.2.09.27   TEST AR 0 & ALGOSRSTOCO TO ARC
D004 086      11.44   .85.07.1.09.29   YES... 0200000 TO AR
D004 087      11.07   .10.46.4.09.26   TLOFFCW0,1 TO PN0,1
D004 088      11.46   .62.85.0.28.09   AR TO ALGOSRSTOCO
D004 089      11.85   .91.76.0.09.29   DUMMY STORE COMMAND TO AR
D004 090      11.54   .62.66.0.09.27   YES... TEST ALGOSRSTOCO EQUAL 0
D004 091      11.55   .56.00.0.00.00   NO... DUMMY
D004 092      11.66   .73.73.1.21.31   YES... EXIT. NO TAPE PROCEDURES
D004 093      11.67 U.68.07.0.12.05    NO... BRING IN SUBPROCEDURE PROCESSOR
D004 094      12.07 U.08.93.0.29.19    CLEAR LINE 19
D004 095      12.93 U.00.01.0.12.19    12.94-U7 TO 19.94-U7
D004 096      12.01   .05.71.4.09.31   ALPHA TYPE LINE 19
D004 097      12.71   .71.71.0.28.31   TEST READY
D004 098     Z12.U7                    YUV391U
D004 099     Z12.U6                    Z2VZV65
D004 100     Z12.U5                    X24U9YU
D004 101     Z12.U4                    -X349WUW
D004 102     Z12.U3                    -4V4U995

D004 103     Z12.U2                    65ZV272
D004 104     Z12.U1                    -696969U
D004 105     Z12.U0                    -9ZYW94U
D004 106     Z12.99                    ZKV4V29
D004 107     Z12.98                    VZ92V33
D004 108     Z12.97                    97Z6WY6
D004 109     Z12.96                    4WX97YX
D004 110     Z12.95                    -79193U2
D004 111     Z12.94                    232Z2U0
D004 112      12.91   .00.19.0.20.31   RETURN COMMAND USED AT 03.98
D004 113     Z11.93                    0000090 USED AT 02.70
D004 114     Z11.94                    -0000001 USED AT 01.91
D004 115     Z11.48                    00000YX
D004 116     Z11.69                    0000140 USED AT 02.36
D004 117     Z11.95                    00000W0 USED AT 02.94
D004 118     Z11.16                    0000000 S-SR SWITCH
D004 119     Z11.70                    005XU00 USED AT 02.66
D004 120     Z11.71                    07ZZ940 USED AT 02.66
D004 121     Z11.88                    0000000 EQUAL IND.
D004 122     Z11.89                    0000000 CLOSING PAR. IND.
D004 123     Z11.90                    0000000 I/O IND.
D004 124     Z11.91                    0000000 OUTPUT IND.
D004 125     Z11.92                    0000000 EXIT SWITCH
D004 126     Z11.U1                    0000400 USED AT 02.88
D004 127     Z11.15                    0000001  EDITOR MTA COUNTER
D004 128     Z12.26                    Y66V53X
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D018 000                               FORMAT SR  LINES 02 04 13

D018 001      13.00   .10.38.4.29.09   CLEAR TLOFFCW0,1
D018 002      13.38   .39.40.0.29.09   CLEAR FICHCO
D018 003      13.40   .44.46.0.29.21   CLEAR OPEN PARENTHESIS IND.
D018 004      13.46 W.U0.08.3.21.31    8-BIT EXTRACTOR S.R.
D018 005      13.U0   .44.50.0.28.26   8-BIT CHARACTER TO PN
D018 006      13.50   .55.57.3.12.29
D018 007      13.57   .58.60.0.28.27   TAB
D018 008      13.60   .61.U1.0.28.27   YES... TEST AR 0
D018 009      13.61   .77.77.2.21.31   NO... TRANSFER FOR PART OR ROUTINE
D018 010      02.77   .78.86.0.26.28   PN0 TO ARC
D018 011      02.86   .88.92.0.21.27   TEST FOR OPEN PARENTHESIS EQUAL 0
D018 012      02.92   .37.37.5.21.31   YES... RETURN
D018 013      02.93   .59.59.5.21.31   NO... RETURN
D018 014      13.37 U.54.55.0.28.27    TEST AR 0
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D018 055        13.55 W.66.66.1.21.31   YES...RETURN
D018 056        13.56  .61.62.3.09.29   NO...
D018 057        13.62  .63.64.0.28.27   OPEN PARENTHESIS
D018 058        13.64 U.68.69.0.29.21   YES... CLEAR 21.01-02-03
D018 059        13.65  .72.72.1.09.29   NO...
D018 060        13.72 U.74.53.0.28.27   COMMA
D018 061        13.53 U.55.46.0.00.00   YES...DUMMY
D018 062        13.54  .92.07.3.09.29   NO...
D018 063        13.07  .39.46.2.09.27   SPACE & FICHCO TO ARC
D018 064        13.47  .06.15.1.09.29   NO... INCREMENT FICHCO
D018 065        13.15  .39.48.0.28.09   RESTORE FICHCO
D018 066        13.48  .57.63.3.09.29   TEST FOR FIVE CHARACTERS PICK-UP
D018 067        13.63  .64.66.0.22.31   TEST AR NEGATIVE
D018 068        13.66  .67.46.0.00.00   NO... DUMMY
D018 069        13.67  .10.13.5.09.24   YES... TLOFFCWO.1 TO MQ0.1
D018 070        13.13  .12.26.1.26.31   SHIFT MQ 6 BITS
D018 071        13.26 W.74.03.3.23.31   SPECIAL EXTRACT
D018 072        13.03  .04.09.5.24.30   MQ0.1 TO PN0.1
D018 073        13.09  .10.46.4.26.09   PN0.1 TO TLOFFCWO.1
D018 074        13.69  .72.75.0.07.21   SET OPEN PAR. IND.
D018 075        13.75  .77.78.0.29.09   CLEAR PERIOD IND.
D018 076        13.78  .80.04.4.29.22   CLEAR 22.00-01
D018 077        13.04  .12.14.4.09.20   OVERFLOW BITS TO FORMAT T-LOC. #1
D018 078        13.14  .25.41.0.29.09   CLEAR INITIAL OVFL. IND.
D018 079        13.41  .42.46.4.29.20   CLEAR FORMAT T-LOC. #2
D018 080        13.59  .64.70.3.09.29
D018 081        13.70  .71.73.0.28.27   CLOSING PARENTHESIS
D018 082        13.73  .76.U4.5.20.26   YES... FORMAT T-LOC. #1 TO PN
D018 083        13.74  .78.79.3.09.29   NO...
D018 084        13.79  .80.07.0.28.27   COMMA
D018 085        13.08  .53.10.3.09.29   NO...
D018 086        13.10  .11.16.0.28.27   SPACE
D018 087        13.16  .17.46.0.00.00   YES... DUMMY
D018 088        13.17 W.74.76.3.23.31   NO... SPECIAL EXTRACT
D018 089        13.76  .78.80.0.26.28   PN0 TO ARC
D018 090        13.80  .81.82.3.09.29
D018 091        13.82  .83.86.0.28.27   C/R
D018 092        13.86  .87.88.0.05.21   YES... SET CARR IND.
D018 093        13.88  .92.94.0.09.28   0000002 TO ARC
D018 094        13.87  .06.11.3.09.29   NO...
D018 095        13.11  .12.18.0.28.27   DIGIT
D018 096        13.18  .22.24.4.21.27   YES... TEST TAB OR CARR IND SET
D018 097        13.19  .81.83.3.09.29   NO...
D018 098        13.83  .84.05.0.28.27   PERIOD

D018 099        13.05  .77.81.0.05.09   YES... SET PERIOD IND
D018 100        13.06  .07.12.3.09.29   NO...
D018 101        13.12  .13.20.0.28.27   SIGN
D018 102        13.20  .21.46.0.00.00   YES... DUMMY
D018 103        13.21  .28.30.3.09.29   NO...
D018 104        13.30  .31.32.0.28.27   TAB
D018 105        13.32  .34.52.0.09.21   YES... SET TAB IND.
D018 106        13.33  .36.39.1.09.29   NO... 0000024 TO AR
D018 107        13.39  .41.92.0.22.31   TEST AR NEGATIVE
D018 108        13.92 U.93.72.0.12.05   NO... ERROR S.R.
D018 109        13.93  .97.22.0.21.27   YES... TEST INDIV. DIG. COUNTER EQUAL 0
D018 110        13.22  .24.36.1.26.28   YES... PN0 TO ARC
D018 111        13.23  .28.31.0.09.28   NO... 0000001 TO ARC
D018 112        13.36  .37.46.0.28.21   AR TO INDIV. DIG. COUNTER
D018 113        13.31  .33.89.3.21.29   INDIV. DIG. COUNTER TO AR
D018 114        13.89  .90.91.0.28.27   TEST ARO
D018 115        13.91  .93.49.0.09.28   YES... 0000000 TO ARC
D018 116        13.49  .50.68.1.26.29   PN0 TO AR
D018 117        13.68  .69.77.0.28.21   AR TO INDIV. DIG. COUNTER
D018 118        13.77  .86.95.3.09.29   TEST FOR MAXIMUM NO. OF DIG. USED
D018 119        13.95  .97.45.0.22.31   TEST AR NEGATIVE
D018 120        13.45 U.46.72.0.12.05   NO... ERROR S.R.
D018 121        13.81  .82.94.0.09.28   PERIOD BITS TO ARC
D018 122        13.52  .57.94.0.09.28   TAB BITS TO ARC
D018 123        13.94  .97.98.0.21.27   TEST INDIV. DIG. COUNTER EQUAL 0
D018 124        13.98  .17.99.0.09.21   YES... 0000001 TO INDIV. DIG. COUNTER
D018 125        13.99  .U0.U3.4.20.26   NO... FORMAT T-LOC. #1 TO PN0.1
D018 126        13.U3 U.02.02.5.26.30   SHIFT PN 3 BITS
D018 127        13.02  .04.27.1.28.30   AR TO PN0
D018 128        13.27  .28.34.4.26.20   PN0.1 TO FORMAT T-LOC. #1
D018 129        13.34  .36.96.0.29.31   TEST FOR OVFL.
D018 130        13.96  .U6.01.0.28.09   NO... STORE CONTENTS
D018 131        13.97  .25.44.0.09.27   YES... TEST INITIAL OVFL. IND. SET
D018 132        13.44  .25.43.0.05.09   NO... SET INITIAL OVFL. IND.
D018 133        13.43  .46.71.5.26.20   PN0.1 TO FORMAT T-LOC. #2
D018 134        13.71  .72.96.4.09.20   OVERFLOW BITS & END BITS TO FORMAT T-LOC. #1
D018 135        13.01  .05.42.0.21.28   INDIV. DIG. COUNTER TO ARC
D018 136        13.42  .06.35.3.09.29   0000001 TO -AR
D018 137        13.35  .37.60.1.28.21   AR TO INDIV. DIGIT COUNTER
D018 138        13.U1  .U2.46.0.00.00   YES... DUMMY
D018 139        13.U2  .U6.99.0.09.28   NO... PICK-UP STORAGE
D018 140        13.24  .25.28.0.21.27   NO... TEST INDIV. DIG. COUNTER EQUAL 0
D018 141        13.25 U.26.72.0.12.05   YES... ERROR S.R.
D018 142        13.28  .48.51.0.09.28   YES... 0000001 TO ARC
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D018 103      13.29  .33.51.0.21.28   NO... INDIV. DIG. COUNTER TO ARC
D018 104      13.51  .53.58.1.22.29   TOTAL DIG. COUNTER TO AR
D018 105      13.58  .77.84.0.09.27   TEST PERIOD IND. SET
D018 106      13.84  .88.90.4.28.22   NO... AR TO #DIG. BEFORE & TOT. DIG. COUNTER
D018 107      13.85  .89.90.0.28.22   YES... AR TO TOT. DIG. COUNTER
D018 108      13.90  .91.94.0.29.28   CLEAR AR
D018 109      13.U4  .79.79.4.20.31   TRANSFER TO COMPLETE S.R.
D018 110      04.79 U.86.87.5.26.30   SHIFT PN 3 BITS
D018 111      04.87  .06.07.1.09.30   0000001 TO PN0
D018 112      04.07  .10.12.4.20.27   TEST FORMAT T-LOC. #2 EQUAL 0
D018 113      04.12  .14.15.0.29.31   YES... TEST FOR OVERFLOW
D018 114      04.13  .15.17.0.29.31   NO... TURN OFF OVERFLOW
D018 115      04.15 U.22.12.5.26.30   NO... SHIFT PN 3 BITS
D018 116      04.16  .18.24.4.26.20   YES... PN0,1 TO FORMAT T-LOC. #2
D018 117      04.17  .20.21.2.26.28   NO... PN0 TO ARC
D018 118      04.18  .20.21.2.26.28   YES... PN0 TO ARC
D018 119      04.21  .22.23.1.28.29   SHIFT AR 1 BIT
D018 120      04.23  .25.21.0.29.31   TEST FOR OVERFLOW
D018 121      04.22  .23.24.2.28.29   YES... AR TO AR
D018 122      04.24 W.30.32.5.20.25   FORMAT T-LOC. #2 TO ID0,1
D018 123      04.32 U.34.26.0.22.31   TEST AR NEGATIVE
D018 124      04.26  .06.08.5.25.25   NO... COMPLIMENT ID0,1
D018 125      04.27  .06.08.4.25.25   YES... ID0,1 TO ID0,1
D018 126      04.08 U.10.35.5.28.24   AR TO MQ
D018 127      04.35  .37.38.0.22.28   TOTAL DIGIT COUNTER TO ARC
D018 128      04.38 U.61.62.1.28.29   SHIFT AR 22 BITS
D018 129      04.62  .64.67.1.22.29   22.00 TO AR
D018 130      04.67  .71.72.0.21.27   TEST CARR IND. SET
D018 131      04.72  .74.75.0.28.24   NO... BUILD OUTPUT
D018 132      04.73  .U1.72.1.09.29   YES... PUT IN C/R IND. BIT
D018 133      04.75  .10.74.4.09.26   BUILD OUTPUT
D018 134      04.74  .76.77.1.09.28   BUILD OUTPUT
D018 135      04.77  .79.80.1.28.30   STORE OUTPUT
D018 136      04.80  .95.96.1.09.30   BUILD OUTPUT
D018 137      04.96 W.86.93.3.21.31   NEXT STORE LOC. S.R.
D018 138      04.86  .65.68.0.09.29   DUMMY STORE COMMAND TO AR
D018 139      04.81 W.93.93.3.21.31   NEXT STORE LOC. S.R.
D018 140      04.93  .66.68.0.09.29   DUMMY STORE COMMAND TO AR
D018 141      04.82 U.84.93.3.21.31   NEXT STORE LOC. S.R.
D018 142      04.83  .67.68.0.09.29   DUMMY STORE COMMAND TO AR
D018 143      04.71  .76.78.0.09.28   NENUCO TO ARC
D018 144      04.78  .79.48.1.09.29   INCREMENT NENUCO
D018 145      04.48  .76.U0.0.28.09   RESTORE NENUCO
D018 146      04.U0  .00.00.5.20.31   RETURN TO LINE 5


D018 147      Z13.U5                  9V6Z080  CONSTANT FOR LOAD NO. 2
D018 148      Z13.U6                  329ZV4V  CONSTANT FOR LOAD NO. 2
D018 149      Z13.U7                  YUU3U69  CONSTANT FOR LOAD NO. 2
                 *

D009 000                              CONSTANT AND DATA SR LINES 01 02 04 12 14

D009 001      14.U5  .U7.U4.0.29.31   TEST FOR FVERFLOW
D009 002      14.U4 W.96.08.3.21.31   NO... 8-BIT EXTRACTOR S.R.
D009 003      14.96  .93.94.0.28.27   TEST AR 0
D009 004      14.94  .53.53.2.21.31   YES... RETURN
D009 005      14.95  .96.98.0.28.26   NO... STORE 8-BIT CHARACTER
D009 006      14.98  .12.12.2.20.31   TRANSFER FOR PART OF ROUTINE
D009 007      02.12  .48.73.3.11.29
D009 008      02.73 U.53.68.2.26.27   TAB   & PN0 TO ARC
D009 009      02.68  .53.53.2.21.31   YES... RETURN
D009 010      02.69  .64.64.5.21.31   NO... RETURN
D009 011      02.53  .56.94.0.09.27   TEST CONSTANT IND. SET
D009 012      02.94  .66.66.1.21.31   NO...RETURN
D009 013      02.95  .76.20.0.07.28   YES... SRNENUCO TO ARC
D009 014      02.20  .78.21.3.07.29   DECREMENT SRNENUCO BY 2
D009 015      02.21  .76.94.0.28.07   RESTORE
D009 016      14.64  .99.U0.3.07.29
D009 017      14.U0  .U1.00.0.28.27   SPACE
D009 018      14.00  .U0.U5.0.00.00   YES... DUMMY
D009 019      14.01  .02.04.0.07.27   NO... TEST SCA SET
D009 020      14.04  .06.07.1.09.29   NO...
D009 021      14.05  .53.57.1.09.29   YES...
D009 022      14.07  .10.37.2.26.27   OPEN PARENTHESIS & PICK-UP 8-BIT CHARACTER
D009 023      14.37  .02.13.0.12.07   YES... SET SCA SWITCH
D009 024      14.38  .72.72.2.20.31   NO... TRANSFER FOR PART OF ROUTINE
D009 025      02.72  .23.78.3.09.29
D009 026      02.78  .39.48.2.09.27   COMMA   & FICHCO TO ARC
D009 027      02.48  .U5.U5.5.20.31   YES...RETURN
D009 028      02.49  .72.14.0.09.29   NO...INCREMENT FICHCO
D009 029      02.14  .36.36.5.20.31   RETURN
D009 030      14.36  .39.56.0.28.09   RESTORE FICHCO RETURN FROM L.02
D009 031      14.56  .57.58.3.09.29   TEST FOR 5 CHARACTERS PICKED-UP
D009 032      14.58  .60.60.0.22.31   TEST AR NEGATIVE
D009 033      14.60  .61.U5.0.00.00   NO... DUMMY
D009 034      14.61  .10.23.5.09.24   YES... TLOFFCW0,1 TO MQ0,1
D009 035      14.23  .12.39.1.26.31   SHIFT MQ 6 BITS
D009 036      14.39 W.74.75.3.23.31   SPECIAL EXTRACT
D009 037      14.75  .76.93.5.24.30   MQ0,1 TO PN0,1
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D009 038      14.93   .10.U5.5.26.09   PNO.1 TO TLOFFCW0.1
D009 039      14.57   .58.62.0.28.27   COMMA
D009 040      14.62   .69.70.0.07.27   YES... TEST COMMA IND. SET
D009 041      14.63   .67.68.1.07.29   NO...
D009 042      14.70   .69.U5.0.09.07   NO... SET COMMA IND.
D009 043      14.71   .02.03.0.29.07   YES... CLEAR SCA
D009 044      14.68   .10.73.2.07.27   CLOSING PARENTH. & PICK UP T012
D009 045      14.73   .10.11.0.28.27   YES... TEST AR EQUAL 0
D009 046      14.74 W.06.69.3.23.31    NO... SPECIAL EXTRACT
D009 047      14.69   .84.85.0.26.28   PICK UP 6-BIT CHARACTER
D009 048      14.85   .86.87.3.09.29   TEST FOR A DIGIT
D009 049      14.87   .89.90.0.22.31   TEST AR NEGATIVE
D009 050      14.90   .00.71.0.00.00   NO... DUMMY
D009 051      14.91   .69.76.0.07.27   YES... TEST COMMA IND. SET
D009 052      14.76   .09.78.0.07.28   NO... PICK UP T011
D009 053      14.77   .10.78.0.07.28   YES... PICK UP T012
D009 054      14.78 U.83.84.1.28.29    SHIFT AR 4 BITS
D009 055      14.84   .86.06.1.26.29   PNO TO AR
D009 056      14.06   .69.80.0.07.27   TEST COMMA IND. SET
D009 057      14.80   .09.U5.0.28.07   NO... STORE IN T011
D009 058      14.81   .10.U5.0.28.07   YES... STORE IN T012
D009 059      14.11   .09.14.0.07.27   YES... TEST T011 EQUAL 0
D009 060      14.12   .18.19.0.09.07   NO... SET SWITCH S1ST
D009 061      14.13   .69.U5.0.29.07   CLEAR COMMA IND.
D009 062      14.19 U.36.40.1.28.29    SHIFT AR 16 BITS
D009 063      14.40   .42.43.0.29.31   TEST FOR OVFL.
D009 064      14.43   .46.47.0.23.31   NO... CLEAR 2 WORD REGISTERS
D009 065      14.44   .50.71.0.00.00   YES... DUMMY
D009 066      14.47   .49.50.0.28.24   AR TO MQ1
D009 067      14.50   .55.65.1.07.25   0000640 TO ID1
D009 068      14.65   .08.89.0.24.31   MULTIPLY 8 WORD TIMES
D009 069      14.89   .37.97.1.09.25   0000UU0 TO ID1
D009 070      14.97   .08.08.0.24.31   MULTIPLY 8 WORD TIMES
D009 071      14.08   .19.25.1.07.25   0000010 TO ID1
D009 072      14.25   .08.42.0.24.31   MULTIPLY 8 WORD TIMES
D009 073      14.42   .18.20.0.07.27   TEST S1ST SET
D009 074      14.20   .26.29.0.07.27   NO... TEST S2ND SET
D009 075      14.21   .26.27.0.09.07   YES   SET S2ND
D009 076      14.27   .11.16.0.26.28   PN1 TO ARC
D009 077      14.16   .10.24.0.28.07   STORE IN T012
D009 078      14.24   .18.15.0.29.07   CLEAR S1ST
D009 079      14.14   .50.71.0.00.00   YES... DUMMY
D009 080      14.15   .09.19.0.07.28   NO... PICK UP T011
D009 081      14.29   .31.33.0.26.28   NO... PN1 TO ARC

D009 082      14.30   .31.32.0.26.28   YES... PN1 TO ARC
D009 083      14.32   .35.41.0.23.31   CLEAR 2 WORD REGISTERS
D009 084      14.41   .45.51.0.28.25   AR TO ID1
D009 085      14.51   .02.48.1.26.31   SHIFT ID 1 BIT
D009 086      14.48   .10.53.6.07.24   PICK UP T012
D009 087      14.53   .56.02.0.24.31   MULTIPLY 56 WORD TIMES
D009 088      14.02   .04.09.0.26.28   PNO TO ARC
D009 089      14.09   .26.31.0.29.07   CLEAR S2ND
D009 090      14.31   .10.33.0.29.07   CLEAR T012
D009 091      14.33   .09.10.0.28.07   STORE IN T011
D009 092      14.10 U.13.34.1.28.29    SHIFT AR 2 BITS
D009 093      14.34   .11.18.0.09.29   TLOFFCW1 TO AR
D009 094      14.18   .56.66.0.09.27   TEST CONSTANT IND. SET
D009 095      14.66   .74.79.1.09.29   NO... BUILD OUTPUT
D009 096      14.67   .74.79.1.07.29   YES... BUILD OUTPUT
D009 097      14.79   .76.82.1.09.29   BUILD OUTPUT
D009 098      14.82   .11.83.0.28.09   STORE IN TLOFFCW1
D009 099      14.83   .10.17.5.09.26   TLOFFCW0.1 TO PNO.1
D009 100      14.17 W.U1.93.3.21.31    NEXT STORE LOC. S.R.
D009 101      14.U1   .16.26.0.07.29   DUMMY STORE COMMAND TO AR
D009 102      14.26   .28.49.0.31.31   NEXT COMMAND FROM AR
D009 103      14.49   .39.52.0.29.09   CLEAR FICHCO
D009 104      14.52   .10.54.5.29.09   CLEAR TLOFFCW0.1
D009 105      14.54   .69.59.0.29.07   CLEAR COMMA IND.
D009 106      14.59   .02.22.0.29.07   CLEAR SCA
D009 107      14.22   .56.U2.0.09.27   TEST CONSTANT IND. SET
D009 108      14.U2   .09.92.0.29.07   NO... CLEAR T011
D009 109      14.U3   .U5.35.0.00.31   YES... SET READY
D009 110      14.35   .94.94.1.21.31   TRANSFER FOR PART OF ROUTINE
D009 111      14.86   .91.99.3.07.29   DECREMENT NENUCO
D009 112      14.99   .76.88.0.28.07   RESTORE SRNENUCO
D009 113      14.88 W.U6.72.0.21.31    NEXT NUMBER S.R.
D009 114      14.55   .57.72.0.12.31   GATE NUMERIC TYPE-IN
D009 115      14.72 U.73.20.0.08.05    BRING IN NO. CONVERSION ROUTINE
D009 116      14.28   .42.45.0.07.27   TEST BCD IND. SET
D009 117      14.45   .51.U6.0.28.20   NO... STORE IN 20.03
D009 118      14.46   .50.U7.0.28.20   YES... STORE IN 20.02
D009 119      14.U6   .72.72.1.20.31   TRANSFER
D009 120      14.U7   .85.85.1.20.31   TRANSFER
D009 121      14.03 U.04.74.0.12.05    BRING IN LINE 12 FOR ERROR S.R.
D009 122      14.92   .11.11.2.20.31   TRANSFER
D009 123      02.11   .76.88.0.09.28   NENUCO TO ARC
D009 124      02.88   .U1.08.0.11.29   INCREMENT NENUCO
D009 125      02.08   .76.89.0.28.09   RESTORE
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D009 126      02.89   .U5.U5.5.20.31   RETURN
D009 127      12.74   .09.61.0.29.07   CLEAR T011
D009 128      12.61   .10.72.0.29.07   CLEAR T012
D009 129      12.72   .56.65.0.10.09   SET CONSTANT IND.
D009 130      12.65   .U3.U3.3.21.31   ERROR S.R.
D009 131     Z12.82                    0000000 ASSIGN. STAT SWITCH
D009 132      01.17   .09.19.0.07.28   PICK UP T011
D009 133      01.19   .28.80.3.09.29   DECREMENT BY 1
D009 134      01.80   .09.02.0.28.07   RESTORE IN T011
D009 135      01.02   .03.06.0.28.27   TEST AR 0
D009 136      01.06   .30.34.4.20.27   YES... TEST 20.02-03 EQUAL 0
D009 137      01.07 W.10.88.5.21.31    NO... TRANSFER FOR PART OF ROUTINE
D009 138      01.34 U.35.54.0.29.19    YES... CLEAR LINE 19
D009 139      01.35   .60.65.0.07.09   NO... SET SALL
D009 140      01.65   .66.81.5.20.26   PICK UP STORAGE OF INPUT
D009 141      01.85 W.22.93.3.21.31    NEXT STORE LOCATION S.R.
D009 142      01.22   .77.57.0.01.29   DUMMY STORE COMMAND TO AR
D009 143      01.81 U.84.85.0.29.20    CLEAR 20.02-03
D009 144      01.57   .88.U4.0.31.31   NEXT COMMAND FROM AR
D009 145      01.U4   .U6.03.4.29.26   CLEAR PN0.1
D009 146      01.03   .42.51.0.29.07   CLEAR BCD IND.
D009 147      01.51   .60.86.0.09.27   TEST SALL SET
D009 148      01.86   .00.17.0.00.00   NO... DUMMY
D009 149      01.87   .60.34.0.29.09   YES... CLEAR SALL
D009 150      01.54   .87.14.0.09.07   SET LIBRARY IND.
D009 151      01.14   .76.U5.0.07.28   SRNENUCO TO ARC
D009 152      01.U5   .02.02.4.20.31   TRANSFER FOR PART OF ROUTINE
D009 153      04.02   .86.09.0.07.29   INCREMENT SRNENUCO BY 1
D009 154      04.09   .76.U4.0.28.09   RESTORE IN NENUCO
D009 155      04.U4   .86.55.0.07.29   INCREMENT SRNENUCO BY 1
D009 156      04.55   .76.65.0.28.07   RESTORE SRNENUCO
D009 157      04.65   .U5.U5.5.20.31   RETURN
D009 158      01.77   .00.U4.5.26.17   STORAGE DUMMY
D009 159      01.94   .76.U1.0.07.28   SRNENUCO TO ARC
D009 160      01.U1   .86.86.5.21.31   RETURN
D009 161      01.72   .42.17.0.09.07   SET BCD IND.
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D002 000                               OPEN PARENTHESIS SR  LINES 02 15

D002 001      15.00 U.06.06.0.29.20    CLEAR LINE 20
D002 002      15.06   .10.11.0.09.28   TLOFFCW0 TO ARC
D002 003      15.11   .14.15.3.05.29
D002 004      15.15 U.16.16.0.28.27    IF

D002 005      15.16   .34.78.6.07.26   YES... STORE TYPE CODE
D002 006      15.17   .27.19.0.05.26   NO... STORE CARR TYPE CODE
D002 007      15.19 U.21.21.3.05.29
D002 008      15.21 U.23.23.0.28.27    CARR
D002 009      15.23   .11.12.0.26.09   YES... PN1 TO TLOFFCW1
D002 010      15.24   .67.68.3.05.29   NO...
D002 011      15.68   .69.70.0.28.27   READ
D002 012      15.70   .75.07.0.07.28   YES... PICK UP TYPE CODE
D002 013      15.71   .92.74.3.07.29   NO...
D002 014      15.74   .75.76.0.28.27   TABS
D002 015      15.76   .19.23.3.07.30   YES... STORE TYPE CODE
D002 016      15.77   .84.79.3.07.29   NO...
D002 017      15.79   .80.81.0.28.27   BELLS
D002 018      15.81   .34.86.0.07.28   YES... PICK UP TYPE CODE
D002 019      15.82   .83.84.3.05.29   NO...
D002 020      15.84   .85.08.0.28.27   WRITE
D002 021      15.08   .23.10.0.07.28   YES... PICK UP TYPE CODE
D002 022      15.09   .42.44.3.05.29   NO...
D002 023      15.44   .57.58.0.28.27   PERIODS
D002 024      15.58   .19.23.0.07.30   YES... STORE TYPE CODE
D002 025      15.59   .66.62.3.07.29   NO...
D002 026      15.62   .63.64.0.28.27   PRINT
D002 027      15.64   .75.78.0.05.26   YES... STORE TYPE CODE
D002 028      15.65 U.66.72.0.12.05    NO... ERROR S.R.
D002 029      15.12   .39.47.0.09.28   FICHCO TO ARC
D002 030      15.47   .48.49.0.09.29   INCREMENT FICHCO
D002 031      15.49   .39.41.0.28.09   RESTORE FICHCO
D002 032      15.41 W.U3.08.3.21.31    8-BIT EXTRACTOR S.R.
D002 033      15.U3   .93.94.0.28.26   STORE 8-BIT CHARACTER
D002 034      15.94   .99.U0.3.07.29
D002 035      15.U0   .U1.12.0.28.27   SPACE
D002 036      15.13   .43.22.0.05.29   NO...
D002 037      15.22   .24.25.0.28.27   CLOSING PARENTHESIS
D002 038      15.25   .28.40.6.20.26   YES... DIG. STORE TO PN1
D002 039      15.26 W.45.80.3.23.31    NO... SPECIAL EXTRACT
D002 040      15.80   .83.85.1.26.28   STORE 6-BIT CHARACTER
D002 041      15.85   .86.87.3.09.29   TEST FOR DIGIT
D002 042      15.87 U.89.89.0.22.31    TEST AR NEGATIVE
D002 043      15.89 U.90.72.0.12.05    NO... ERROR S.R.
D002 044      15.90   .90.91.0.20.27   YES... TEST DI #1 SET
D002 045      15.91   .94.39.0.07.20   NO... SET DI #1
D002 046      15.92   .93.95.0.20.27   YES... TEST DI #2 SET
D002 047      15.95   .96.97.0.20.28   NO... DIG. STORE TO ARC
D002 048      15.96 U.97.72.0.12.05    YES... ERROR S.R.
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D002 049      15.97   .U3.U4.3.07.29   TEST FOR A 1 DIGIT
D002 050      15.U4   .U5.U6.0.28.27   TEST AR 0
D002 051      15.U6   .01.02.0.09.20   YES... SET DI #2
D002 052      15.U7 U.20.92.0.12.05    NO... ERROR S.R.
D002 053      15.02   .03.04.1.26.28   PN1 TO ARC
D002 054      15.04   .05.32.0.05.29   000000U TO AR
D002 055      15.32   .33.28.0.28.26   AR TO PN1
D002 056      15.28   .30.39.3.05.29   TEST FOR LARGEST POSSIBLE NO
D002 057      15.39 U.45.45.0.22.31    TEST AR NEGATIVE
D002 058      15.45 U.46.72.0.12.05    NO... ERROR S.R.
D002 059      15.46   .47.48.0.26.28   YES... PN1 TO ARC
D002 060      15.48   .52.12.0.28.20   AR TO DIG. STORE
D002 061      15.07   .11.99.0.28.09   AR TO TLOFFCW1
D002 062      15.99   .U0.U1.0.05.28   COMMAND FOR SPACE TEST TO ARC
D002 063      15.U1   .U2.69.0.05.29   INCREMENT AR
D002 064      15.69   .U0.12.0.28.05   RESTORE COMMAND
D002 065      15.37   .00.12.0.00.00   YES... DUMMY
D002 066      15.38 W.45.61.3.23.31    NO... SPECIAL EXTRACT
D002 067      15.50   .52.53.3.05.29   NO...
D002 068      15.51   .18.31.3.05.29   YES...
D002 069      15.31   .32.33.0.28.27   CLOSING PARENTHESIS
D002 070      15.33   .35.40.0.29.26   YES... CLEAR PN1
D002 071      15.34   .35.36.0.29.20   NO... CLEAR SWITCH S1
D002 072      15.53   .54.55.0.28.27   MAG. TAPE
D002 073      15.55   .72.73.0.09.28   YES... MAG. TAPE IND. BIT TO AR
D002 074      15.56   .09.60.3.09.29   NO...
D002 075      15.60   .34.35.0.28.27   PAPER TAPE
D002 076      15.35   .39.12.0.07.20   YES... SET SWITCH S1
D002 077      15.36 U.37.72.0.12.05    NO... ERROR S.R.
D002 078      15.73   .11.54.0.09.29   TLOFFCW1 TO AR
D002 079      15.54   .11.35.0.28.09   AR TO TLOFFCW1
D002 080      15.10   .11.99.0.28.09   AR TO TLOFFCW1
D002 081      15.U5   .U7.U7.2.20.31   TRANSFER TO STATEMENT STORE S.R.
D002 082      02.U7   .59.87.0.09.28
D002 083      02.67   .72.U0.0.09.29   INCREMENT FICHCO
D002 084      02.U0   .39.10.0.28.09   RESTORE
D002 085      02.10   .06.06.4.20.31   STATEMENT STORE S.R.
D002 086      15.40 U.44.57.0.29.20    CLEAR SWITCH S1, DI #1, & DI #2
D002 087      15.57   .11.U5.0.09.30   TLOFFCW1 TO PN1
D002 088     Z15.43                    0000021
D002 089      15.29   .00.54.5.26.17   DUMMY COMMAND
D002 090      15.U2 U.00.25.0.00.00    DUMMY CONSTANT
D002 091      15.86   .91.23.0.28.30   AR TO PN1
D002 092     Z15.20                    04X1413

D002 093     Z15.18                    000001W
D002 094     Z15.05                    000000U
D002 095     Z15.67                    05839YV
D002 096     Z15.52                    0000024
D002 097      15.72   .47.50.0.20.27   TEST SWITCH S1 SET
D002 098      15.78   .06.06.4.20.31   STATEMENT STORE S.R.
D002 099     Z15.83                    44Z63Y3
D002 100     Z15.42                    0V0Z991
D002 101      15.61   .63.72.0.26.28   PN1 TO ARC
D002 102     Z15.75                    0000080
D002 103     Z15.30                    0000010
D002 104     Z15.27                    0000110
D002 105     Z15.14                    0000656
D002 106     Z15.01                    00000ZZ
D002 107     Z15.63                    1V0X854
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D121 000                                MODIFIED AUTO-LOADER

D121 001      23.00  .01.01.1.19.31     STOP DA-1
D121 002      23.01  .04.17.6.21.31     TRANSFER CONTROL TO LOADER IN LINE 19.
D121 003      19.17 U.18.04.0.19.04     TRANSFER LOADER TO LINE 04
D121 004      19.04 U.09.09.0.19.23     FILL LINE 23 WITH LINE 19 FORMAT
D121 005     Z19.05                     00000X0
D121 006     Z19.06                     0000034
D121 007     Z19.07                     800000X
D121 008     Z19.08                     0000110
D121 009      19.09  .02.10.4.23.02     SET LINE 19 FORMAT
D121 010      19.10  .00.11.4.23.02     SET LINE 19 FORMAT
D121 011      19.11  .02.12.4.19.03     SET AR FORMAT
D121 012     Z19.03                     -8W00000
D121 013     Z19.02                     1000000
D121 014      19.12 U.17.18.0.19.20     SET FOR LINE NO. AND CHECK SUM PICKUP
D121 015     Z19.13                     0200000   INCREMENT TO 20.01
D121 016     Z19.14                     ZZZZZZZ
D121 017      19.15  .46.23.4.04.25     DUMMY-INITIAL PICK UP COMMAND
D121 018      19.18  .22.22.4.21.31     TRANSFER CONTROL TO LOADER IN LINE 04
D121 019      04.22  .23.24.0.20.28     PICK UP COMMAND TO AR
D121 020      04.24  .25.26.0.20.29     ADD INCREMENT 2x2 TO -8.
D121 021      04.26  .27.28.0.28.20     STORE MODIFIED PICK UP COMMAND
D121 022      04.28  .30.30.0.31.31     EXECUTE
D121 023      04.AR  .TT.23.4.04.25     PICK UP CHECK SUM AND LINE STORE COMMAND.
D121 024      04.23  .24.27.4.25.22     STORE IN 22.00 AND 22.01
D121 025      04.27  .28.29.0.22.28     CURRENT LINE STORE COMM. TO AR
D121 026      04.29  .30.30.3.20.29     SUBTRACT ALL Z-S
D121 027      04.30  .32.33.0.28.27     ZERO TEST DIFFERENCE FOR LAST LINE
D121 028      04.33  .36.20.0.20.28     IF ZERO-PICK UP 20.00
D121 029      04.20  .22.22.0.31.31     EXECUTE
D121 030      04.34  .37.37.0.23.31     NOT ZERO-CLEAR
D121 031      04.37 U.38.38.0.25.19     CLEAR LINE 19
D121 032      04.38  .41.41.0.15.31     READ TAPE
D121 033      04.41  .45.35.0.22.28     PICK UP CHECK NUMBER
D121 034      04.35  .35.35.0.28.31     TEST READY
D121 035      04.36  .37.31.0.28.27     ZERO TEST NUMBER AS CHECK SUM
D121 036      04.31  .32.42.0.28.28     ZERO-NOT CHECK SUM-WASTE COMMAND
D121 037      04.42  .44.21.0.22.28     PICK UP LINE STORE COMM.
D121 038      04.21  .20.20.0.29.31     RESET OVERFLOW
D121 039      04.32 U.33.40.3.19.29     NOT ZERO-SUBTRACT LINE SUM FROM CHECK SUM
D121 040      04.40  .41.42.0.28.27     ZERO TEST CHECK
D121 041      04.43  .44.44.0.06.31     NOT CHECKED-REVERSE TAPE
D121 042      04.44  .44.44.0.28.31     TEST READY

D121 043      04.45  .46.37.0.17.31     RING BELL
D121 044     Z04.46                     -3Y784Z5   BALANCER
D121 045      04.48 U.23.22.0.19.00       LINE TRANSFER COMM
D121 046     Z04.49                     240975Y   LINE CHECK SUM
D121 047      04.50 U.23.22.0.19.01
D121 048     Z04.51                     -334V3U4
D121 049      04.52 U.23.22.0.19.02
D121 050     Z04.53                     4446340
D121 051      04.54 U.23.86.0.19.03     STORE LINE 03
D121 052      04.86  .87.88.0.20.28     PICK UP COMMAND TO AR
D121 053      04.88  .89.24.0.20.29     ADD EXTRA INCREMENT TO SKIP T EQUALS 56
D121 054     Z04.55                     71Z5V6X
D121 055     Z04.57                     2151961   DATE-LINE CHECK SUM
D121 056      04.58 U.23.22.0.19.06
D121 057     Z04.59                     1716266
D121 058      04.60 U.23.22.0.19.07
D121 059     Z04.61                     V2X2VYU
D121 060      04.62 U.23.22.0.19.08
D121 061     Z04.63                     -570524Y
D121 062      04.64 U.23.22.0.19.09
D121 063     Z04.65                     -U7WUUXW
D121 064      04.66 U.23.22.0.19.10
D121 065     Z04.67                     -YW7VV0Z
D121 066      04.68 U.23.22.0.19.11
D121 067     Z04.69                     759Y313
D121 068      04.70 U.23.22.0.19.12
D121 069     Z04.71                     XU1WXY8
D121 070      04.72 U.23.22.0.19.13
D121 071     Z04.73                     W452Z06
D121 072      04.74 U.23.22.0.19.14
D121 073     Z04.75                     7969402
D121 074      04.76 U.23.22.0.19.17
D121 075     Z04.77                     Z972X37
D121 076      04.78 U.23.22.0.19.18
D121 077     Z04.79                     43XW862
D121 078      04.80 U.23.22.0.19.05
D121 079     Z04.81                     8XXV725
D121 080      04.82 W.84.89.4.21.31     MARK T EQUALS 84
D121 081      04.89 U.85.85.4.20.31-    RETURN TO MARK - BREAKPOINTED
D121 082      04.84 U.89.85.0.29.21     ON BP-CLEAR LINE 21 FOR PAPER TAPE SCRATCH PAD
D121 083      04.85 U.86.00.0.19.04-    STORE LINE 04
D121 084      04.38  .41.41.2.13.31     READ-MAGNETIC TAPE MASTER VERSION
D121 085      04.43  .70.44.2.04.31     REVERSE SEARCH MAG TAPE NO. 2
D121 086      04.45  .46.87.0.17.31     RING BELL
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D121 087      04.87  .89.90.0.20.28   1X2 TO -7 TO AR
D121 088      04.90 W.91.92.0.28.29   DOUBLE AR
D121 089      04.92  .94.90.0.22.31   TEST SIGN
D121 090      04.91  .93.93.2.13.31   READ MAG TAPE
D121 091      04.93  .98.93.0.28.31   TEST READY
D121 092      04.94 W.96.00.7.21.31   TRANSFER TO LOADER
D121 093     Z04.71                   59136V2   NEW LINE 12 CHECK SUM
D121 094      04.82 U.23.20.0.19.04-  STORE LINE 04

D088                                  INITIALIZER

D088 001      04.00  .15.18.0.04.22   SET COUNTER
D088 002      04.18  .19.22.0.01.23   0119 TO 2303
D088 003      04.22  .24.25.0.06.31   REWIND
D088 004      04.25  .26.33.0.04.28   LOAD AR
D088 005      04.33  .40.68.3.04.29   DECREMENT
D088 006      04.68  .71.33.0.22.31   SIGN TEST
D088 007      04.34 W.36.31.0.15.31   READ
D088 008      04.31  .33.35.0.00.31   SET READY
D088 009      04.35  .37.36.0.06.31   REWIND
D088 010      04.36  .39.46.1.23.28   23.03 TO AR
D088 011      04.46  .19.58.3.01.29   LESS 0119
D088 012      04.58  .59.60.0.28.27   ZERO TEST
D088 013      04.60  .63.80.0.22.28   COUNTER TO AR
D088 014      04.61  .62.00.0.00.00   LOOP
D088 015      04.80  .88.92.3.04.29   SUBTRACT 1
D088 016      04.92  .95.16.0.28.22   STORE
D088 017      04.16  .17.18.0.28.27   AR EQUAL ZERO
D088 018      04.19  .19.20.0.00.31   SET READY
D088 019      04.20  .69.70.0.21.12   MODE SWITCH TO STORAGE
D088 020      04.70  .73.74.0.21.27   ZERO TEST FOR MODE
D088 021      04.74 U.75.83.0.29.19   PAPER MODE CLEAR LINE 19
D088 022      04.75 U.76.77.0.18.05   MAG LINE 18 TO 05
D088 023      04.83 U.88.89.0.04.21   PICK UP OUTPUT
D088 024      04.89  .90.91.0.04.28
D088 025      04.91  .U3.50.0.28.19   STORE IN LINE 19
D088 026      04.50  .U4.51.4.21.19
D088 027      04.51  .U6.01.4.21.19
D088 028      04.01  .01.21.4.09.31   TYPE ALPHA
D088 029      04.21  .23.02.0.16.31
D088 030      04.02  .03.04.0.29.14   CLEAR 1403
D088 031      04.04 U.05.05.0.29.15   CLEAR LINE 15
D088 032      04.05 U.06.99.0.29.18   CLEAR LINE 18

D088 033      04.99 U.00.07.0.04.18   COUNTERS TO LINE 18
D088 034      04.10 U.11.78.0.09.04   LINE 09 TO 04
D088 035      04.03  .09.10.4.09.31   TYPE ALPHA
D088 036      04.77  .78.79.0.21.28   PICKUP NO FILE CODES
D088 037      04.79 U.82.82.7.28.28   REDUCE BY 1
D088 038      04.82  .06.02.0.28.07   STORE N
D088 039      04.07  .07.07.0.28.31   TEST READY
D088 040      04.08  .09.52.0.04.28   CARRAIGE RETURN CODE TO AR
D088 041      04.52  .U7.03.0.28.19   AR TO LINE 19
D088 042     Z04.U0                   0700000
D088 043     Z04.U1                   0000120
D088 044     Z04.U2                   0000120
D088 045     Z04.U3                   00ZU000
D088 046     Z04.U4                   0000120
D088 047      04.U5 U.U2.U2.0.21.31
D088 048     Z04.U6                   0000000
D088 049     Z04.U7                   0700000
D088 050     Z04.84                   X37U79Z
D088 051     Z04.85                   9V6Z07Z
D088 052     Z04.86                   VY7ZV4V-
D088 053     Z04.87                   U4Y6Z4Y
D088 054     Z04.90                   7Z4Z300
D088 055     Z04.15                   0100000
D088 056     Z04.26                   1X00000
D088 057     Z04.40                   0100000
D088 058     Z04.88                   0100000
D088 059     Z04.09                   YUYU000

D089                                  PROCESSING CONTROL

D089 060      09.78  .94.U0.0.29.22   SET TW TO ZERO
D089 061      09.U0  .U1.U4.3.06.28   0Z00000
D089 062      09.U4 W.09.00.5.21.31   DECREMENT TW
D089 063      09.09  .18.21.0.06.28   DUMMY COMMAND TO AR W00 20 4 16 26
D089 064      09.21  .22.27.1.22.29   ADD TW
D089 065      09.27  .29.29.0.31.31   PICK UP ENTRY
D089 066      09.20  .22.30.1.26.27   ZERO TEST EVEN HALF OF ENTRY
D089 067      09.30  .U1.U4.3.06.28   IF ZERO DECREMENT TW
D089 068      09.31 W.41.52.3.23.31   IF NOT ZERO EXTRACT ER
D089 069      09.52  .59.66.1.25.06   STORE ER
D089 070      09.66  .68.77.4.26.06   STORE ENTRY
D089 071      09.77  .89.28.1.06.28   EF
D089 072      09.28  .59.61.3.06.29   LESS ER
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D089 073      09.61  .63.63.0.22.31   SIGN TEST FOR IGNORE
D089 074      09.63  .99.U2.0.06.28   PLUS SET IGNORE CONSTANT
D089 075      09.64 W.89.U1.1.25.06   MINUS FR TO FP
D089 076      09.U1 W.U3.00.3.23.31   EXTRACT ENTRY TYPE
D089 077      09.00  .01.02.1.25.28   TYPE TO AR
D089 078      09.02  .06.11.3.06.29   80000000TO AR MINUS
D089 079      09.11  .13.24.0.22.31   SIGN TEST FOR TITLE
D089 080      09.24 U.25.59.0.12.04   PLUS TITLE
D089 081      09.25  .22.50.1.26.31   MINUS SHIFT ID RIGHT 11 BITS
D089 082      09.50  .51.62.1.25.28   BRING TO AR
D089 083      09.62  .65.69.1.06.29   ADD 0050000
D089 084      09.69  .70.27.1.06.29   ADD IGNORE CONSTANT AND EXECUTE
D089 085      09.U2  .70.U1.0.28.06   STORE IGNORE CONSTANT
D089 086      09.80 U.81.44.0.10.04   STATEMENT
D089 087      09.81 U.82.84.0.08.04   INPUT
D089 088      09.82 U.83.84.0.08.04   OUTPUT
D089 089      09.83 U.84.85.0.08.04   SUBSCRIPT
D089 090      09.84  .99.U2.0.06.28   DELETE IGNORE
D089 091      09.85 U.86.87.0.08.04   SUBROUTINE
D089 092      09.86 U.87.U0.0.08.04   FORMAT
D089 093      09.87 U.88.90.0.12.04   CONSTANTS
D089 094      09.88 U.89.92.0.08.04   DATA
D089 095      09.89 U.18.45.0.09.27   END
D089 096      09.91  .U1.U3.0.06.28   IGNORE INPUT
D089 097      09.92  .U1.U3.0.06.28   IGNORE OUTPUT
D089 098      09.93  .U1.U3.0.06.28   IGNORE SUBSCRIPT
D089 099      09.95  .U5.U7.0.07.06   IGNORE SUBROUTINE
D089 100      09.96  .U5.U7.0.08.04   IGNORE FORMAT
D089 101      09.98  .U1.U3.0.06.28   IGNORE DATA
D089 102      09.67  .U1.U3.0.06.28   0200000 TO AR
D089 103      09.U3  .U5.03.0.28.06   STORE IN ALPHA
D089 104      09.03  .04.07.3.28.28   NEGATE AR
D089 105      09.07 W.13.00.5.21.31   DECREMENT TW
D089 106      09.13  .70.47.0.06.27   TEST IGNORE DELETE
D089 107      09.47  .00.09.0.00.00   IF ZERO PICK UP NEXT ENTRY
D089 108      09.48  .U5.26.3.06.28   IF NOT ZERO ALPHA TO AR MINUS
D089 109      09.26  .01.05.1.06.29   ADD0200000
D089 110      09.05 W.15.00.5.21.31   DECREMENT TW
D089 111      09.15  .18.19.0.22.26   TW TO PN
D089 112      09.19 W.20.22.3.23.31   EXTRACT BIT 22
D089 113      09.22  .26.49.1.26.22   STORE
D089 114      09.49  .70.47.0.29.06   SET IGNORE DELETE EQUAL ZERO
D089 115      09.79  .U5.U7.0.07.06   0400000 TO ALPHA
D089 116      09.U7  .21.27.3.06.28   0200000 TO AR MINUS

D089 117      09.39  .U1.12.3.06.28   0200000 TO AR MINUS
D089 118      09.12 W.40.00.5.21.31   DECREMENT TW
D089 119      09.40  .50.41.0.22.26   TW TO PN
D089 120      09.41 W.20.35.3.23.31   EXTRACT LAST BIT
D089 121      09.35  .38.09.1.26.22   STORE TW
D089 122     Z06.U1                    0200000
D089 123     Z06.89                    0000000 EP
D089 124     Z06.19 W.00.36.4.16.26   802421U-
D089 125     Z02.41                    07ZZW00
D089 126     Z06.18 W.00.20.4.16.26   801421U-
D089 127     Z06.59                    0000000 ER
D089 128     Z06.60                    0000000 TEMP
D089 129     Z06.61                    0000000
D089 130     Z06.68                    0000000 ENTRY STORAGE
D089 131     Z06.69                    0000000
D089 132     Z02.U3                    Z800000
D089 133     Z06.06                    8000000
D089 134     Z06.65                    0050000
D089 135     Z06.70                    0000000 IGNORE DELETE CONSTANT
D089 136     Z06.99                    000U000
D089 137     Z06.U5                    0000000 ALPHA
D089 138     Z02.20                    0100000
D089 139     Z07.U5                    0400000
D089 140     Z06.01                    0200000
D089 141     Z08.U5                    0600000
D089 142     Z02.99                    00001ZW
D089 143     Z02.12                    02Y0000
                 .

D090                                   PROCEDURE INPUT-OUTPUT PROCESSING

D090 144      08.84  .92.93.5.26.06   ENTRY IN PN TO TEMP STORAGE
D090 145      08.93  .94.05.1.08.28   0000400 TO ARC
D090 146      08.05  .30.60.0.13.27   TEST FOR FULL TABLE
D090 147      08.60 W.90.68.2.21.31   IF ZERO OBTAIN ADDRESS
D090 148      08.90  .93.U1.0.06.29   ENTRY ODD TO AR PLUS
D090 149      08.U1 U.U4.75.1.28.25   STORE IN ID01
D090 150      08.75  .92.95.1.06.28   ENTRY EVEN TO ARC
D090 151      08.95 U.98.01.1.28.24   STORE IN MQ01
D090 152      08.01  .32.33.1.09.28   DUMMY COMMAND TO AR W 01 32 1 2413
D090 153      08.33  .41.44.1.08.29   INPUT OUTPUT LIST COUNTER TO AR PLUS
D090 154      08.44  .46.46.0.31.31   NEXT COMMAND FROM AR
D090 155      08.32  .34.44.1.09.29   3231020 TO AR PLUS AND EXECUTE
D090 156      08.81  .41.72.1.08.28   INPUT OUTPUT LIST COUNTER TO ARC
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D090 157      08.72  .97.17.1.06.29   ADD 0100000
D090 158      08.17  .41.70.1.28.08   STORE
D090 159      08.70  .88.89.1.06.28   FLAG LIST COUNTER TO AR
D090 160      08.89  .91.44.0.08.29   ADD DUMMY COMMAND W 99 23 4 15 26
D090 161      08.23  .57.58.0.06.30   INCREMENT INPUT OUTPUT COUNT
D090 162      08.58  .59.44.1.08.29   0002155 TO AR PLUS AND EXECUTE
D090 163      08.25 U.26.67.0.09.04   RETURN PROCESSING CONTROL
D090 164      08.61  .75.88.1.01.24   NOT ZERO ERROR INDICATOR TO MQ1
D090 165      08.88 W.25.72.1.21.31   TRF TO ERROR ROUTINE
D090 166     Z09.32 W.01.32.1.24.13   812070X
D090 167     Z09.34 U.50.49.0.01.00   3231020
D090 168     Z08.91 W.99.23.4.15.26   Y3171ZU-
D090 169     Z08.59                   0002155
D090 170     Z06.57                   0000040
D090 171     Z06.97                   0100000
D090 172     Z08.94                   0000400
D090 173     Z08.41                   0000000 INPUT OUTPUT LIST COUNTER
D090 174     Z01.75                   U7X9Y60
                .

D091                                  SUBSCRIPT PROCESSING

D091 175      08.85  .22.U7.1.26.28   ENTRY EVEN TO ARC
D091 176      08.U7 U.40.42.2.14.14   PRECESS 1400 TO 1419
D091 177      08.22  .23.49.4.26.28   ENTRY ODD TO ARC
D091 178      08.49 U.70.73.2.14.14   PRECESS 1450 TO 1469
D091 179      08.73 U.74.67.0.09.04   RETURN PROCESSING CONTROL
                .

D092                                  SUBROUTINE PROCESSING

D092 180      08.87  .92.14.5.26.06   STORE ENTRY NUMBER
D092 181      08.14  .U1.11.3.06.28   0200000 TO ARC MINUS
D092 182      08.11 W.13.00.5.21.31   DECREMENT TW
D092 183      08.13  .19.44.0.06.29   ADD DUMMY COMMAND W 00 36 4 16 26
D092 184      08.44  .46.46.0.31.31   PICK UP CHECK SUM AND START TIME
D092 185      08.36  .39.42.0.08.28   DUMMY COMMAND TO AR W 99 03 1 14 28
D092 186      08.42  .43.44.1.26.29   ADD CHECK SUM AND PICK UP CHANNEL IF ASGD
D092 187      08.03  .04.06.0.28.27   ZERO TEST AR
D092 188      08.06  .U4.00.1.18.28   IF ZERO NEXT AVAILABLE CHANNEL TO AR
D092 189      08.07  .08.10.1.26.29   IF NOT ZERO ADD START TIME
D092 190      08.10  .28.09.1.06.29   ADD 5Y00000 SUBROUTINE OP CODE
D092 191      08.09  .39.46.0.14.27   ZERO TEST FOR FULL TABLE
D092 192      08.46  .93.69.0.06.29   IF ZERO ENTRY ODD TO AR PLUS




D092 193      08.47  .65.67.0.09.24   IF NOT ZERO ERROR INDICATOR TO MQ1
D092 194      08.67 W.U6.72.1.21.31   TRF TO ERROR ROUTINE
D092 195      08.69 U.90.40.2.14.14   PRECESS 14.70 TO 14.89
D092 196      08.40  .92.19.1.06.28   ENTRY EVEN TO AR
D092 197      08.19 U.40.U6.2.14.14   PRECESS 14.20 TO 14.39
D092 198      08.U6 U.U7.79.0.09.04   RETURN PROCESSING CONTROL
D092 199      08.00  .02.04.1.28.20   STORE CHANNEL TEMPORARILY
D092 200      08.04  .U4.12.3.06.29   DECREMENT CHANNEL
D092 201      08.12  .16.28.5.26.21   CHECK SUM AND START TIME TO TEMP STORE
D092 202      08.28  .U1.U4.1.28.18   STORE NEW CHANNEL NUMBER 18 U1
D092 203      08.U4  .U4.15.1.28.18   STORE NEW CHANNEL NUMBER 18U4
D092 204      08.15  .18.29.6.20.25   CHANNEL NUMBER TO ID1
D092 205      08.29  .57.63.0.12.24   0000640 TO MQ1
D092 206      08.63  .52.16.0.24.31   MULTIPLY
D092 207      08.16  .18.30.0.26.28   CHANNEL X 100 TO AR
D092 208      08.30  .31.53.1.28.26   STORE IN ODD HALF OF PN
D092 209      08.53  .56.66.0.07.28   DUMMY COMMAND TO AR W 99 55 1 26 14
D092 210      08.66  .69.44.1.21.29   ADD CHECK SUM AND EXEC TO STORE CH IN SUB LIST
D092 211      08.55  .56.07.1.21.28   CHANNEL X 100 TO AR
D092 212     Z08.39 W.99.03.1.14.28   Y3035XW
D092 213     Z06.19 W.00.36.4.16.26   802421U-
D092 214     Z06.28                   5Y00000
D092 215     Z12.57                   0000640
D092 216     Z07.56 W.99.55.1.26.14   Y33774Y
D092 217     Z09.65                   94K9X30
                .

D093                                  FORMAT PROCESSING

D093 218      08.U0  .16.34.5.26.06   STORE ENTRY IN TEMP
D093 219      08.34  .U1.02.3.06.28   0200000 TO ARC MINUS
D093 220      08.02 W.54.00.5.21.31   DECREMENT TW
D093 221      08.54  .60.71.0.07.28   DUMMY COMMAND TO AR W 00 68 5 16 26
D093 222      08.71  .74.44.1.22.29   ADD TW AND EXECLUTE
D093 223      08.68  .70.78.5.26.21   STORE FIRST HALF OF FORMAT IN 2102-2103
D093 224      08.78  .U1.83.3.06.28   0200000 TO ARC MINUS
D093 225      08.83 W.86.00.5.21.31   DECREMTN TW
D093 226      08.86 U.87.30.0.05.04   LINE 05 TO 04
D093 227      05.30  .33.35.0.09.29   ADD DUMMY COMMAND W 00 37 5 16 26
D093 228      05.35  .37.37.0.31.31   NEXT COMMAND FROM AR
D093 229      05.37  .40.43.5.26.21   STORE LAST HALF OF FORMAT IN 2100-2101
D093 230      05.43  .45.48.3.21.31   OBTAIN ADDRESS
D093 231      05.44  .17.18.0.06.29   ENTRY ODD TO AR PLUS
D093 232      05.18  .27.69.0.12.27   ZERO TEST FOR FULL TABLE
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D093 233      05.69 U.78.79.2.12.12   IF ZERO PRECESS 12.70 TO 12.77
D093 234      05.70  .84.92.6.06.24   IF NOT ZERO ERROR INDICATOR TO MQ1
D093 235      05.92 W.29.72.1.21.31   TRF TO ERROR ROUTINE
D093 236      05.79  .16.19.0.06.28   ENTRY EVEN TO AR
D093 237      05.19 U.28.29.2.12.12   PRECESS 12.20 TO 12.27
D093 238      05.29 U.30.96.0.09.04   RETURN PROCESSING CONTROL
D093 239     Z07.60 W.00.68.5.16.26   804461U-
D093 240     Z09.33 W.00.37.5.16.26   802561U-
D093 241     Z06.84                   96Y4Z30

D094                                  CONSTANT ARRAY PROCESSING

D094 242      12.90  .92.38.5.26.06   STORE ENTRY IN TEMP
D094 243      12.38  .89.91.0.06.26   EP TO PN1
D094 244      12.91 W.89.22.1.21.31   TYPE ENTRY NO
D094 245      12.83 W.88.90.3.21.31   OBTAIN ADDRESS OF FIRST CONSTANT
D094 246      12.88  .92.09.4.06.26   ENTRY TO PN
D094 247      12.09 W.79.82.3.23.31   EXTRACT BITS 3-29 PN1
D094 248      12.82  .89.02.1.28.30   ADD ADDRESS TO ENTRY
D094 249      12.02 W.01.48.5.21.31   ENTER IN VARIABLE TABLE
D094 250      12.01 W.62.05.1.21.31   TYPE ADDRESS
D094 251      12.62  .68.96.4.06.26   ENTRY TO PN
D094 252      12.96 W.99.U0.3.23.31   EXTRACT NUMBER OF CONSTANTS
D094 253      12.U0  .U1.04.1.25.13   STORE
D094 254      12.04  .07.18.1.06.28   0008000 TO AR
D094 255      12.18  .59.33.1.06.29   ADD ER TO INCREMENT
D094 256      12.33  .59.81.1.28.06   STORE
D094 257      12.81  .97.98.3.06.28   0100000 TO AR MINUS
D094 258      12.98 W.U5.00.5.21.31   DECREMENT TW
D094 259      12.U5  .U6.46.0.22.28   TW TO AR
D094 260      12.46  .U2.U3.1.13.29   DUMMY TO AR PLUS W 00 00 0 16 28
D094 261      12.U3  .U5.U5.0.31.31   PICK UP CONSTANT
D094 262      12.00  .02.68.4.28.25   PUT CONSTANT IN ID
D094 263      12.68  .97.99.3.06.28   0100000 TO AR MINUS
D094 264      12.99 W.U1.00.5.21.31   DECREMENT TW
D094 265      12.U1 W.45.89.3.21.31   STORE CONSTANT
D094 266      12.45  .U1.U4.1.13.28   NUMBER OF CONSTANTS TO AR
D094 267      12.U4  .U5.30.3.13.29   DECREMENT
D094 268      12.30  .U1.02.1.28.13   STORE NEW N
D094 269      12.02  .04.06.0.28.27   ZERO TEST N FOR END
D094 270      12.06  .97.11.3.06.28   IF ZERO 0100000 TO AR MINUS
D094 271      12.07  .59.85.1.06.28   NOT ZERO ER TO AR
D094 272      12.85  .47.34.1.06.29   INCREMENT

D094 273      12.34  .59.U5.1.28.06   STORE NEW ER
D094 274      12.11 U.12.05.0.09.04   RETURN PROCESSING CONTROL
D094 275     Z13.U2                   800021W
D094 276     Z13.U1                   0000000 NUMBER OF CONSTANTS COUNTER
D094 277     Z13.U5                   0000004

D095                                  DATA ARRAY PROCESSING

D095 278      08.92 W.99.U2.3.23.31   EXTRACT DIMENSION BITS 4-11 OF PN1 TO ID1
D095 279      08.U2  .16.18.5.26.06   STORE ENTRY TEMPORARILY
D095 280      08.18  .19.24.1.25.28   DIMENSION ID1 TO ARC
D095 281      08.24 U.33.38.1.28.29   SHIFT AR 8 BITS
D095 282      08.38  .60.64.1.28.06   STORE IN TEMPORARY STORAGE
D095 283      08.64  .66.68.2.21.31   OBTAIN ADDRESS OF FIRST RESERVED LOCATION
D095 284      08.65  .16.35.4.06.26   ENTRY TO PN
D095 285      08.35  .37.45.1.28.30   ADD ADDRESS TO MAKE TABLE ENTRY
D095 286      08.45  .60.77.1.06.28   DIMENSION TO AR
D095 287      08.77  .81.62.1.26.20   ADDRESS TO TEMP STORE 2001
D095 288      08.62 U.73.74.1.28.29   SHIFT AR 10 BITS
D095 289      08.74  .75.76.1.28.30   ADD DIMENSION TO TABLE ENTRY
D095 290      08.76 W.82.48.5.21.31   STORE IN VARIABLE TABLE
D095 291      08.82  .89.98.1.06.26   EP TO PN1
D095 292      08.98  .U0.22.1.21.31   TYPE ENTRY NUMBER
D095 293      08.99  .U1.U3.1.20.26   2001 TO PN1
D095 294      08.U3 W.73.05.1.21.31   TYPE ADDRESS
D095 295      08.73 U.74.67.0.09.04   RETURN PROCESSING CONTROL

D096                                  TITLE PROCESSING

D096 296      12.59  .70.79.0.06.27   TEST IGNORE DELETE
D096 297      12.79  .88.95.1.06.28   IF ZERO FLAG LIST COUNTER TO AR
D096 298      12.80 U.81.67.0.09.04   IF NOT ZERO RETURN PROCESSING CONTROL
D096 299      12.95  .U1.52.1.06.29   ADD 0200000
D096 300      12.52  .88.92.1.28.06   STORE COUNTER
D096 301      12.92  .97.39.0.08.29   ADD DUMMY COMMAND W 98 80 5 26 15
D096 302      12.39  .41.47.0.08.30   INPUT OUTPUT LIST COUNTER TO PN PLUS
D096 303      12.47  .49.49.0.31.31   EXEC AR TO STORE IN PROC FLAG LIST
D096 304     Z06.U1                   0200000
D096 305     Z06.88                   0000000 FLAG LIST COUNTER
D096 306     Z08.97 W.98.80.5.26.15   Y25074Z-
D096 307     Z08.41                   0000000 INPUT-OUTPUT LIST COUNTER
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D097                                        CHARACTER PICKUP AND DETERMINATION

D097 308      07.55 U.59.59.0.06.20   EXTRACTORS TO LINE 20
D097 309      07.59  .60.62.1.22.24   CW TO MQ0
D097 310      07.62  .64.64.0.23.31   CLEAR MQ1
D097 311      07.64  .65.66.1.22.28   BC TO ARC
D097 312      07.66  .67.70.3.06.29   00000008 TO AR MINUS
D097 313      07.70  .71.71.0.22.31   SIGN TEST
D097 314      07.71  .16.88.1.26.31   IF PLUS SHIFT MQ 8 BITS
D097 315      07.72  .73.74.2.22.22   IF MINUS EXCHANGE AR WITH BC
D097 316      07.74  .75.77.3.28.28   NEGATE AR
D097 317      07.77  .92.93.0.26.31   SHIFT UNDER AR CONTROL
D097 318      07.93  .97.98.3.06.28   0100000 TO ARC MINUS
D097 319      07.98 W.U1.00.5.21.31   MARK TRF TO DECREMENT TW
D097 320      07.U1  .U2.U3.1.06.29   DUMMY COMMAND TO AR PLUS W 00 00 1 16 28
D097 321      07.U3  .U5.U6.0.31.31   NEXT COMMAND FROM AR
D097 322      07.00  .02.02.1.28.24   AR TO MQ0
D097 323      07.02  .05.07.0.22.28   BC TO AR
D097 324      07.07  .24.24.0.26.31   SHIFT UNDER AR CONTROL
D097 325      07.24  .25.26.0.22.28   BC TO AR
D097 326      07.26  .27.88.1.06.29   0000001X TO AR PLUS
D097 327      07.88  .89.91.1.28.22   AR TO BC
D097 328      07.91  .92.95.1.24.22   MQ0 TO CW
D097 329      07.95  .02.U4.1.26.31   SHIFT MQ 1 BIT
D097 330      07.U4  .U5.U6.2.24.28   ABS MQ1 TO ARC
D097 331      07.U6  .U7.03.0.28.24   AR TO MQ1
D097 332      07.03 U.07.08.0.28.21   AR TO 21.00-21.01-21.02
D097 333      07.08  .12.13.0.31.28   EXTRACT BITS 2-5 2100 TO ARC
D097 334      07.13  .14.15.3.06.29   000000U TO AR MINUS
D097 335      07.15  .17.17.0.22.31   SIGN TEST
D097 336      07.17 W.56.57.0.31.28   IF PLUS EXTRACT BITS 2-5 2100 TO AR
D097 337      07.18  .22.29.0.31.27   IF MINUS EXTRACT BITS 6-7 2102 AND ZERO TEST
D097 338      07.29  .33.34.0.31.27   IF ZERO EXTRACT BIT 8 2101 AND ZERO TEST
D097 339      07.30  .31.32.1.24.28   IF NOT ZERO MQ1 TO ARC
D097 340      07.34  .35.92.1.24.28   IF ZERO MQ1 TO ARC
D097 341      07.35  .39.40.0.06.21   IF NOT ZERO 0002000 TO 2103 FOR NUMERIC AND EXIT
D097 342      07.40  .44.47.0.06.28   EXIT DUMMY COMMAND TO AR 61 70 0 21 31
D097 343      07.32  .36.37.0.31.27   EXTRACT BITS 2-5 2100 AND ZERO TEST
D097 344      07.37  .38.39.3.06.29   IF ZERO 000000Z0 TO AR MINUS
D097 345      07.38  .42.43.3.06.29   IF NOT ZERO 00000Z1 TO AR MINUS
D097 346      07.43  .44.45.0.28.27   ZERO TEST AR
D097 347      07.45  .47.50.0.06.21   IF ZERO 0004000 TO 2103 FOR SLASH
D097 348      07.46  .51.40.0.06.21   IF NOT ZERO 0001000 TO 2103 FOR ALPHA AND EXIT
D097 349      07.39  .40.48.0.28.27   ZERO TEST AR

D097 350      07.48  .55.40.0.06.21   IF ZERO 0003000 TO 2103 FOR HP AND EXIT
D097 351      07.49  .51.92.0.24.28   IF NOT ZERO MQ1 TO ARC
D097 352      07.57  .58.20.0.31.29   EXTRACT BITS 6-7 TO AR PLUS
D097 353      07.20  .23.25.3.06.29   000001X TO AR MINUS
D097 354      07.25  .26.41.0.28.27   ZERO TEST AR
D097 355      07.41 U.42.82.0.10.04   IF ZERO LABEL RETURN STATEMENT ROUTINE
D097 356      07.42  .43.44.3.06.29   IF NOT ZERO 000000X TO AR MINUS
D097 357      07.44  .45.52.0.28.27   ZERO TEST AR
D097 358      07.52  .54.40.4.29.21   IF ZERO ZERO TO 2102 AND 2103 FOR CR AND EXIT
D097 359      07.53  .62.63.3.06.29   IF NOT ZERO 0000003 TO AR MINUS
D097 360      07.63  .64.81.0.28.27   ZERO TEST AR
D097 361      07.81  .83.86.0.29.21   IF ZERO ZERO TO 2103 FOR TAB
D097 362      07.82  .83.85.3.02.29   IF NOT ZERO 0000010 TO AR MINUS
D097 363      07.85  .86.89.0.28.27   ZERO TEST AR
D097 364      07.89  .90.40.4.29.21   IF ZERO ZERO TO 2102 AND 2103 FOR SPACE AND EXIT
D097 365      07.90  .91.92.0.24.28   IF NOT ZERO MQ1 TO ARC
D097 366      07.92 U.06.09.1.28.29   SHIFT AR 21 BITS
D097 367      07.09  .10.11.0.06.29   DUMMY COMMAND TO AR PLUS W V7 14 1 06 28
D097 368      07.11  .13.13.0.31.31   NEXT COMMAND FROM AR TO PICK UP CODE
D097 369      07.14  .18.22.1.28.21   AR TO 2102 TO STORE CODE
D097 370      07.22  .47.40.0.06.21   0004000 TO 2103 FOR SEP-OPR AND EXIT
D097 371      07.86  .90.40.0.06.21   -1000000 TO 2102 FOR TAB AND EXIT
D097 372      07.47  .51.54.1.21.29   DESC NO 2103 TO AR PLUS
D097 373      07.54  .55.11.1.22.29   MODE BASE 2203 TO AR PLUS AND EXECUTE
D097 374      07.11  .13.13.0.31.31   NEXT COMMAND FROM AR TO PROCESS CHARACTER
D097 375      07.50  .66.40.0.06.21   -7100000 TO 2102 AND EXIT
D097 376     Z06.67                   0000008
D097 377     Z06.97                   0100000
D097 378     Z06.U2 W.00.00.1.16.28   800061W
D097 379     Z06.27                   000001X
D097 380     Z06.56                   00000Z
D097 381     Z06.57                   0000040
D097 382     Z06.58                   0000030
D097 383     Z06.14                   000000U
D097 384     Z06.39                   0002000
D097 385     Z06.38                   00000Z0
D097 386     Z06.42                   00000Z1
D097 387     Z06.47                   0004000
D097 388     Z06.51                   0001000
D097 389     Z06.55                   0003000
D097 390     Z06.23                   000001X
D097 391     Z06.43                   000000X
D097 392     Z06.54                   0000001
D097 393     Z06.62                   0000003
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D097 394      Z02.83                          0000010
D097 395      Z06.63                          0005000
D097 396      Z06.10 W.V7.14.1.06.28          Z50Y4XW
D097 397      Z06.90                          -1000000
D097 398      Z06.00                          0V00000
D097 399      Z06.02                          0X00000
D097 400      Z06.04                          0Y00000
D097 401      Z06.11                          -2100000
D097 402      Z06.21                          -3500000
D097 403      Z06.40                          -2300000
D097 404      Z06.41                          -2200000
D097 405      Z06.45                          0W00000
D097 406      Z06.53                          -3100000
D097 407      Z06.77                          -4W00000
D097 408      Z06.U6                          -5600000
D097 409      Z06.U7                          0Z00000
D097 410      Z06.44 W.61.70.0.21.31          VX462VZ
D097 411      Z06.66                          -4600000
                 .

D098                                          SKIP ROUTINE

D098 412       07.12  .15.16.0.23.31          CLEAR PN0
D098 413       07.16  .17.19.1.22.26          BC TO PN1
D098 414       07.19 U.62.65.6.26.30          SHIFT PN 21 BITS
D098 415       07.65  .67.73.3.26.29          PN1 TO AR MINUS
D098 416       07.73  .75.75.0.22.31          SIGN TEST
D098 417       07.75 W.77.78.0.23.31          IF PLUS CLEAR PN
D098 418       07.76  .78.U7.1.28.26          IF MINUS AR TO PN0
D098 419       07.U7 U.37.V7.6.26.30          SHIFT PN 8 BITS
D098 420       07.97  .U1.01.0.26.22          PN1 TO BC ENTER CURRENT WORD PICKUP
D098 421       07.78  .80.83.0.28.25          AR TO ID0
D098 422       07.83  .87.99.0.06.24          8X3XWYW TO MQ1
D098 423       07.99  .40.33.0.24.31          MULTIPLY 20 BITS
D098 424       07.33 U.40.51.6.26.30          SHIFT PN 3 BITS
D098 425       07.51  .52.67.0.26.25          PN0 TO ID0 FRACTION PART
D098 426       07.67  .68.80.6.26.30          SHIFT PN 1 BIT
D098 427       07.80  .81.84.3.26.28          PN1 TO ARC MINUS INTEGER PART
D098 428       07.84 U.U5.05.2.28.29          SHIFT AR 20 BITS
D098 429       07.05  .20.27.3.02.29          0100000 TO AR MINUS
D098 430       07.27 W.36.00.5.21.31          MARK TRF TO DECREMENT TW
D098 431       07.36  .37.87.1.25.26          CLEAR PN1
D098 432       07.87  .12.79.0.24.31          MULTIPLY 6 BITS
D098 433       07.79 U.92.94.6.26.30          SHIFT PN 6 BITS

D098 434       07.94  .95.96.2.26.28          ABS PN1 TO ARC
D098 435       07.96  .27.U0.3.06.29          000001X TO AR MINUS
D098 436       07.U0  .U1.U2.1.28.28          COMPLEMENT AR
D098 437       07.U2  .U5.01.2.28.22          AR TO BC ENTER CURRENT WORD PICKUP
D098 438      Z06.87                          8X3XWYW
D098 439      Z02.20                          0100000
                 .

D099                                          CURRENT WORD PICKUP

D099 440       07.01  .03.04.0.06.28          DUMMY COMMAND TO AR W 00 21 1 16 28
D099 441       07.04  .06.11.1.22.29          TW TO AR PLUS EXECUTE AR
D099 442       07.11  .13.13.0.31.31          NEXT COMMAND FROM AR
D099 443       07.21  .22.23.1.28.24          AR TO MQ0
D099 444       07.23  .27.28.3.06.28          000001X TO ARC MINUS
D099 445       07.28  .29.31.1.22.29          BC TO AR PLUS
D099 446       07.31  .32.68.0.28.27          ZERO TEST AR
D099 447       07.68  .72.10.1.24.22          IF ZERO MQ0 TO CW
D099 448       07.69  .V2.68.0.26.31          IF NOT ZERO SHIFT UNDER AR CONTROL
D099 449      Z06.03  .00.21.1.16.28          801561W
D099 450       07.10  .11.55.0.29.22          SET INITIAL MODE AND ENTER CHAR PICKUP
                 .

D100                                          TABLE LOOKUP

D100 451       05.74  .75.77.1.28.20          STORE AR TO COUNTER
D100 452       05.77 W.79.80.3.23.31          EXTRACT BITS 32-58 OF PN TO ID
D100 453       05.80  .81.82.1.25.28          ID1 TO ARC
D100 454       05.82  .83.85.1.06.29          DUMMY COMMAND TO AR PLUS 21 56 0 00 28
D100 455       05.85  .86.89.1.28.20          AR TO TEMP STORE
D100 456       05.89  .92.94.4.26.24          PN TO MQ
D100 457       05.94  .95.96.1.20.28          COUNTER TO ARC
D100 458       05.96  .97.98.1.06.29          0100000 TO AR PLUS
D100 459       05.98 U.U1.U1.1.28.20          STORE AR TO COUNTER
D100 460       05.U1  .U2.U3.1.20.29          TEMP STORE TO AR PLUS
D100 461       05.U5  .U7.U7.0.31.31          NEXT COMMAND FROM AR
D100 462       05.U3  .U4.U5.1.28.25          STORE AR TEMP
D100 463       05.36  .37.38.0.28.27          ZERO TEST AR
D100 464       05.38  .39.90.0.28.25          IF ZERO SET ID1 TO ZERO AND EXIT
D100 465       05.39  .40.42.1.28.26          IF NOT ZERO AR TO PN0
D100 466       05.42  .44.45.1.25.28          TEMP TO AR
D100 467       05.45  .46.47.1.06.29          1Y16000 TO AR PLUS
D100 468       05.47  .49.49.0.31.31          NEXT COMMAND FROM AR
D100 469       05.78  .79.81.4.28.26          AR TO PN1
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D100 470      05.81  .82.84.7.24.30   MQ TO PN MINUS
D100 471      05.84  .86.87.3.23.31   EXTRACT BITS 32-58 PN TO ID
D100 472      05.87 U.90.90.4.26.27   ZERO TEST PN
D100 473      05.90  .92.91.4.20.31   IF ZERO-FOUND-RETURN TO MARK LINE 04
D100 474      05.91  .92.93.0.20.27   IF NOT ZERO ZERO TEST COUNTER
D100 475      05.93  .95.90.0.29.25   IF ZERO SET ID1 TO ZERO AND EXIT
D100 476      05.94  .95.96.1.20.28   IF NOT ZERO LOOP
D100 477     Z06.83  .21.56.0.00.28   153801W
D100 478     Z06.46  .30.22.0.00.00   1Y16000
D100 479     Z02.79                   ZZZZZZY
D100 480     Z02.85                   ZZZZZZY
               .

D101                                  VARIABLE TABLE STORE

D101 481      05.48  .98.99.0.15.27   ZERO TEST FOR FULL TABLE
D101 482      05.99  .U0.U7.1.26.28   IF ZERO PN0 TO ARC
D101 483      05.U0  .58.68.0.07.24   IF NOT ZERO ERROR INDICATOR TO MQ1
D101 484      05.68  .72.72.1.20.31   TRANSFER TO ERROR ROUTINE
D101 485      05.U7 U.70.U3.2.15.15   PRECESS 1500 TO 1549
D101 486      05.83  .85.49.4.26.28   PN1 TO AR
D101 487      05.49 U.U0.U2.2.15.15   PRECESS 1550 TO 1599
D101 488      05.U2  .U4.U3.4.20.31   RETURN TO MARK LINE 04
D101 489     Z07.58                   V5X1X90 VAR VARIABLE TABLE OVERFLOW
               .

D102                                  DECREMENT TW AND OR READ PAPER TAPE

D102 490      05.00  .02.05.1.22.29   TW TO AR PLUS
D102 491      05.05  .06.07.1.28.22   STORE IN TW
D102 492      05.07  .09.10.0.22.31   TEST FOR NEGATIVE
D102 493      05.10  .12.11.4.20.31   IF PLUS RETURN TO MARK LINE 04
D102 494      05.11  .11.11.0.28.31   IF MUNUS TEST UNTIL READY
D102 495      05.12  .14.16.0.15.31   READ PHOTO TAPE
D102 496      05.16  .16.16.0.28.31   WAIT FOR READY
D102 497      05.17  .U7.01.1.19.28   CHECK SUM TO ARC
D102 498      05.01 U.02.06.3.19.29   SUM LINE 19 TO AR MINUS
D102 499      05.06  .07.14.0.28.27   TEST FOR ZERO
D102 500      05.14 U.15.21.0.19.16   IF ZERO COPY LINE 19 TO LINE 16
D102 501      05.15  .16.56.0.17.31   IF NOT ZERO RING BELL
D102 502      05.56  .58.12.0.16.31   HALT TO ALLOW MANUAL TAPE REVERSE
D102 503      05.21  .22.00.1.06.28   6U00000 TO ARC
D102 504     Z06.22                   6U00000
               .

D103                                  DECREMENT TW AND OR READ MAG TAPE

D103 505      05.00  .02.05.1.22.29   T22.02 TO AR PLUS
D103 506      05.05  .06.07.1.28.22   AR TO T 22.02
D103 507      05.07  .09.10.0.22.31   SIGN TEST AR
D103 508      05.10  .12.11.4.20.31   IF PLUS RETURN TO MARK IN LINE 04
D103 509      05.11  .11.11.0.28.31   IF MINUS READY TEST
D103 510      05.12 U.15.14.1.13.31   WRITE FILE CODE
D103 511      05.14  .16.16.0.00.31
D103 512      05.16  .15.15.0.00.00
D103 513      05.15  .20.17.1.30.31
D103 514      05.17  .06.01.1.07.28   N TO ARC
D103 515      05.01  .00.56.0.00.00
D103 516      05.56  .72.75.1.04.31   SEARCH TAPE REV
D103 517      05.75  .75.75.0.28.31   READY TEST
D103 518      05.76  .54.53.3.06.29   0000001 TO AR MUNUS
D103 519      05.53  .52.55.0.28.27   ZERO TEST AR
D103 520      05.55  .67.62.1.06.28   IF ZERO 0000008 TO ARC
D103 521      05.62  .60.60.7.28.28   REDUCE AR BY 1
D103 522      05.60  .63.61.0.28.27   ZERO TEST AR
D103 523      05.61  .63.64.1.13.31   IF ZERO READ TAPE
D103 524      05.64  .64.64.0.28.31   TEST READY
D103 525      05.65  .U7.13.1.19.28   19U7 TO AR
D103 526      05.13 U.14.21.3.19.29   SUM LINE 19 TO AR MINUS
D103 527      05.21  .22.23.0.28.27   ZERO TEST AR
D103 528      05.23  .06.09.1.07.28   IF ZERO N TO ARC
D103 529      05.24  .40.58.1.04.31   IF NOT ZERO SEARCH TAPE REV
D103 530      05.58  .59.71.0.17.31   RING BELL
D103 531      05.71  .72.61.0.16.31   HALT AND GO BACK TO READ TAPE
D103 532      05.09  .25.22.1.05.31   SEARCH TAPE FWD
D103 533      05.22  .26.27.7.28.28   REDUCE AR BY 1
D103 534      05.27  .27.27.0.28.31   READY TEST
D103 535      05.28  .30.08.0.28.27   ZERO TEST AR
D103 536      05.08 U.09.20.0.19.16   IF ZERO TRF LINE 19 TO LINE 16
D103 537      05.20  .22.00.1.06.28   6U00000 TO ARC
D103 538     Z07.06                   0000000 NUMBER OF FILE CODES
               .

D104                                  CHARACTER PROCESSING CODES 0 AND 4

D104 539      00.70  .71.93.0.21.27   TEST DESCRIPTIVE NUMBER FOR ZERO
D104 540      00.93  .94.30.0.21.27   IF ZERO TEST CODE
D104 541      00.94  .46.46.5.21.31   IF NOT ZERO TRF TO LINE 05
D104 542      00.30  .10.10.4.21.31   IF ZERO SET INITIAL MODE GO TO CHARACTER PICKUP
```

```
D104 543      00.31  .34.36.0.21.28   IF NOT ZERO CODE TO AR
D104 544      00.36 U.37.37.0.09.04   PROCESS ING CONTROL TO LINE 04
D104 545      00.37 W.39.11.1.21.31   MARK TRF TO LIST STORE AND EXIT
D104 546      00.98  .53.87.1.06.29   ADD -3100000
D104 547      00.87  .89.U0.0.28.27   ZERO TEST FOR MINUS
D104 548      00.U0  .49.81.0.06.28   IF ZERO STATEMENT MODE TO AR
D104 549      00.U1  .40.42.3.06.29   IF NOT ZERO SUBTRACT -2300000
D104 550      00.42  .44.46.0.28.27   ZERO TEST FOR CLOSE BRACKET
D104 551      00.46  .48.13.0.29.06   IF ZERO RESET BRACKET FLAG
D104 552      00.47  .97.04.1.06.29   IF NOT ZERO ADD 0100000
D104 553      00.04  .06.12.0.28.27   ZERO TEST FOR OPEN BRACKET
D104 554      00.12  .48.13.3.29.06   IF ZERO SET BRACKET FLAG
D104 555      00.13  .14.18.0.21.28   IF NOT ZERO CODE TO AR
D104 556      00.18 W.10.11.1.21.31   TRF TO LIST STORE AND GO TO CHARACTER PICKUP
D104 557      00.81  .39.44.3.06.29   SUBTRACT 0002000
D104 558      00.44  .46.49.0.28.27   ZERO TEST FOR FOR MODE
D104 559      00.49  .85.U3.0.06.27   IF ZERO ZERO TEST FOR SUBSCRIPT FLAG
D104 560      00.50  .54.18.0.21.28   IF NOT ZERO CODE TO AR
D104 561      00.U4  .61.75.1.07.24   IF NOT ZERO ERROR INDICATOR TO MQ1
D104 562      00.U3  .U6.24.4.06.25   IF ZERO CLEAR PN SET IP MINUS
D104 563      00.75 W.55.72.1.21.31   TRF TO ERROR ROUTINE
D104 564      00.07 U.08.13.0.07.04
D104 565      00.74  .46.46.5.21.31   TRF TO LINE 05
D104 566     210.57  .07.07.0.21.31   07072VZ
D104 567     207.61                   Y099Y50
D104 568      05.46  .49.50.0.06.28   STATEMENT MODE TO AR
D104 569      05.50  .51.54.3.06.29   SUBTRACT 0001000
D104 570      05.54  .56.66.0.28.27   ZERO TEST FOR PROCEDURE CALL MODE
D104 571      05.66  .70.95.0.21.28   IF ZERO CODE TO AR
D104 572      05.67  .70.86.2.21.28   IF NOT ZERO CODE TO AR
D104 573      05.86  .98.98.0.21.31   TRF TO LINE 00
D104 574      05.95  .U7.59.3.06.29   SUBTRACT 0200000
D104 575      05.59  .61.72.0.28.27   ZERO TEST FOR COMMA
D104 576      05.72  .84.84.1.21.31   IF ZERO TRF TO LINE 01
D104 577      05.73  .11.97.1.06.28   IF NOT ZERO -2100000 TO AR
D104 578      05.97  .98.U4.3.21.29   SUBTRACT CODE
D104 579      05.U4  .U6.32.0.28.27   ZERO TEST FOR EQUAL
D104 580      05.32  .49.51.0.15.27   IF ZERO TEST FOR FIRST TIME
D104 581      05.33  .90.03.1.06.29   IF NOT ZERO
D104 582      05.51  .57.63.0.10.28   IF ZERO REENTRY COMMAND TO AR
D104 583      05.52  .49.57.0.29.15   IF NOT ZERO SET ZERO
D104 584      05.57  .13.13.0.21.31   RETURN TO LINE 00
D104 585      05.63 U.64.U6.0.17.04   TRF LINE 17 TO 04
D104 586      05.U6  .60.60.4.21.31   TRF TO STATEMENT PROCESSING

D104 587      05.03  .05.25.0.28.27   ZERO TEST FOR MINUS
D104 588      05.25  .U3.U3.0.20.31   IF ZERO TRF TO SET FOR NEG NUMBER
D104 589      05.26  .34.86.0.21.28   IF NOT ZERO CODE TO AR
D104 590      01.84  .48.U4.0.06.27   TEST BRACKET FLAG
D104 591      01.U4  .10.10.4.21.31   ZERO TRF TO CHARACTER PICKUP
D104 592      01.U5  .13.13.0.21.31   NOT ZERO STORE IN LIST
                 .

D105                                  CHARACTER PROCESSING CODE 1

D105 593      00.71  .75.29.0.06.22   SET MODE BASE TO 6
D105 594      00.29  .51.52.0.06.20   SET CHARACTER COUNTER TO 1
D105 595      00.52  .17.66.0.29.06   CLEAR TEMP 2 ODD
D105 596      00.66  .16.22.0.21.06   STORE CHARACTER IN TEMP 2
D105 597      00.22  .24.43.0.31.26   EXTRACT BITS 2-5  21.00 TO PNC
D105 598      00.43  .46.48.0.31.30   EXTRACT BITS 6-7 2102 TO PN PLUS
D105 599      00.48  .49.53.0.29.26   CLEAR PN ODD
D105 600      00.53  .92.05.4.26.06   STORE 6 BIT CHAR IN TEMP 1
                 .

D106                                  CHARACTER PROCESSING CODES 2 AND 3

D106 601      00.72  .75.10.0.23.31   CLEAR PN
D106 602      00.10  .12.24.0.31.26   EXTRACT 4 BIT CHARACTER TO PN
D106 603      00.24  .85.57.0.06.20   SET HOLLOW POINT COUNT TO 1
D106 604      00.57  .92.U6.4.26.06   STORE PN IN TEMP 1
D106 605      00.U6  .35.02.0.06.22   SET MODE BASE TO 12
D106 606      00.73  .76.51.0.23.31   CLEAR PN
D106 607      00.51  .55.57.0.29.20   SET HOLLOW POINT COUNT TO ZERO
                 .

D107                                  CHARACTER PROCESSING CODES 7 AND 8

D107 608      00.77  .79.90.0.20.28   CHAR COUNTER TO AR
D107 609      00.78  .79.90.0.20.28   CHAR COUNTER TO AR
D107 610      00.90  .91.92.3.06.29   SUBTRACT 7
D107 611      00.92  .94.05.0.22.31   SIGN TEST
D107 612      00.05  .07.55.4.21.31   IF PLUS TRANSFER TO CHARACTER PICKUP
D107 613      00.06  .07.09.1.06.29   IF MINUS INCREMENT
D107 614      00.09  .11.14.1.28.20   STORE NEW CHARACTER COUNT
D107 615      00.14  .16.23.4.06.26   TEMP 2 TO AR
D107 616      00.23 U.40.60.6.26.30   SHIFT PN 8 BITS
D107 617      00.60  .62.63.1.21.30   ADD 8 BIT CHARACTER
D107 618      00.63  .16.41.4.26.06   STORE 8 BIT CHARACTER WORD IN TEMP 2
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D107 619      00.41  .64.65.3.06.29   SUBTRACT 6 FROM CHAR COUNT IN AR
D107 620      00.65  .67.67.0.22.31   SIGN TEST
D107 621      00.67  .51.55.4.21.31   IF PLUS TRANSFER TO CHARACTER PICKUP
D107 622      00.68  .92.97.4.06.26   IF MINUS TEMP 1 TO AR.
D107 623      00.97 U.02.19.6.26.30   SHIFT PN 6 BITS
D107 624      00.19  .20.21.0.31.30   EXTRACT BITS 2-5 2100 TO PN PLUS
D107 625      00.21  .22.54.0.31.30   EXTRACT BITS 6-7 2102 TO PN PLUS
D107 626      00.54  .92.05.4.26.06   STORE 6 BIT CHARACTER WORD IN TEMP 1
D107 627      00.79  .86.75.6.06.24   ALPHA TO MQ
D107 628      00.83  .86.75.6.06.24   ALPHA TO MQ
D107 629      00.75 W.55.72.1.21.31
D107 630     Z06.86                   99X3X30
D107 631      00.7. U.77.20.0.17.04   LINE 17 TO 04
D107 632      00.80 U.81.2.  .0.17.04 LINE 17 TO 04
D107 633      00.20  .46.46.4.20.31   TRF TO IDENT PROCESSING
                •

D108                                  CHARACTER PROCESSING CODE 14

D108 634      00.84  .85.88.0.06.27   ZERO TEST SUBSCRIPT FLAG
D108 635      00.88  .92.96.4.06.24   IF ZERO TEMP 1 TO MQ
D108 636      00.89  .91.08.3.20.28   IF NOT ZERO HOLLOW POINT COUNTER TO AR. MINUS
D108 637      00.08  .10.34.0.22.31   SIGN TEST
D108 638      00.34  .36.55.4.21.31   IF PLUS TRF TO CHAR PICKUP 0455
D108 639      00.35  .92.96.4.06.24   IF MINUS TEMP 1 TO MQ
D108 640      00.96  .08.U5.1.26.31   SHIFT MQ 4 BITS
D108 641      00.U5  .U6.11.4.24.25   COPY MQ TO ID
D108 642      00.11  .12.17.6.06.24   U00000 TO MQ1
D108 643      00.17  .06.25.0.24.31   MULTIPLY
D108 644      00.25  .28.45.0.31.30   EXTRACT BITS 2-5 21.00 TO PN PLUS
D108 645      00.45  .92.U2.4.26.06   STORE PN IN TEMP 1
D108 646      00.U2  .16.27.0.06.28   SCALE COUNTER TO AR
D108 647      00.27  .54.62.1.06.29   0000001 TO AR PLUS
D108 648      00.62  .16.34.0.28.06   STORE SCALE COUNTER
                •

D109                                  CHARACTER PROCESSING CODE 15

D109 649      00.85  .87.91.1.20.28   HOLLOW POINT COUNTER TO AR
D109 650      00.91  .94.95.3.06.29   SUBTRACT 1
D109 651      00.95  .U7.00.1.28.20   STORE
D109 652      00.00  .02.02.0.22.31   SIGN TEST
D109 653      00.02  .13.15.0.06.28   IF PLUS 000032 TO AR
D109 654      00.03  .92.99.0.06.28   IF MINUS TEMP 1 TO AR

D109 655      00.99  .17.38.1.28.06   STORE SCALE FACTOR
D109 656      00.38  .92.34.4.29.06   SET TEMP 1 TO ZERO
D109 657      00.15  .16.34.4.28.06   SET SCALE FACTOR AND COUNTER TO 50
                •

D110                                  CHARACTER PROCESSING CODES 12 AND 16

D110 658      00.82  .85.32.0.06.27   ZERO TEST FOR SUBSCRIPT FLAG
D110 659      00.86  .85.32.0.06.27
D110 660      00.32  .48.58.0.06.27   IF ZERO ZERO TEST BRACKET FLAG
D110 661      00.33  .92.01.0.06.28   IF NOT ZERO TEMP 1 EVEN TO AR
D110 662      00.01 U.12.26.1.28.29   SHIFT AR 10 BITS
D110 663      00.26  .27.61.1.08.29   ADD INDICATOR BIT 000200
D110 664      00.61 W.74.20.1.21.31   PUT NUMBER IN THE LIST
D110 665      00.58  .59.64.3.20.28   IF ZERO HOLLOW POINT COUNT TO AR MINUS
D110 666      00.59  .92.01.0.06.28   IF NOT ZERO TEMP 1 EVEN TO AR
D110 667      00.64  .66.55.0.22.31   SIGN TEST FOR INTEGER
D110 668      00.55  .16.39.1.06.28   IF PLUS SCALE COUNTER TO AR
D110 669      00.56  .57.69.0.29.28   IF MINUS SET SCALE FACTOR TO ZERO
D110 670      00.69 U.70.28.0.08.04   COPY LINE 08 TO 04
D110 671      00.28 W.37.75.2.21.31   GET ADDRESS
D110 672      00.39  .17.69.3.06.29   SUBTRACT SCALE FACTOR
D110 673      08.37  .39.08.1.28.20   ADDRESS TO 20.02
D110 674      08.08  .49.50.1.06.28   STATEMENT MODE TO AR
D110 675      08.50  .51.52.3.06.29   SUBTRACT 1
D110 676      08.52  .53.56.0.28.27   ZERO TEST FOR PROCEDURE CALL MODE
D110 677      08.56  .49.20.0.15.27   IF ZERO ZERO TEST FIRST TIME FLAG
D110 678      08.57  .59.79.1.20.28   IF NOT ZERO ADDRESS TO AR
D110 679      08.79  .20.20.1.20.31   PUT ADDRESS IN LIST
D110 680      08.20  .45.48.0.17.28   IF ZERO DUMMY COMMAND TO AR
D110 681      08.21 U.22.45.0.17.04   IF NOT ZERO TRF TO ID PROCESSING
D110 682      08.48 U.49.60.0.17.04   TRF TO ID PROCESSING
                •

D111                                  CHARACTER PROCESSING CONSTANTS

D111 683     Z06.85                   0000000 FOR SUBSCRIPT FLAG
D111 684     Z06.92                   0000000 TEMP 1
D111 685     Z06.93                   0000000
D111 686     Z06.12                   U000000
D111 687     Z06.91                   0007000
D111 688     Z06.07                   0008000
D111 689     Z06.16                   0000000 TEMP 2
D111 690     Z06.17                   0000000
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D111 691      Z06.54                    0000001
D111 692      Z06.63                    0005000
D111 693      Z06.94                    0000001
D111 694      Z06.13                    0000032
D111 695      Z06.75                    0006000
D111 696      Z06.51                    0001000
D111 697      Z08.27                    0000200
D111 698      Z06.64                    0006000
D111 699      Z06.48                    0000000 BRACKET FLAG
D111 700      Z06.35                    000W000
D111 701      Z06.49                    0000000 STATEMENT MODE
D111 702      Z06.97                    0100000
D111 703      Z06.90                    -1000000
D111 704      Z06.40                    -2300000
                •

D112 040       03.19  .20.74.0.02.29   ADD 01X2-8 TO WD COUNTER

D112 680      Z02.20                    0100000 1X2-8
D112 044       03.74  .U0.06.0.28.18   WD*01 @ AR TO WD COUNTER
D112 048       03.06  .24.39.3.06.29   SUBT. 100X2-8 EX WD COUNTER
D112 712      Z06.24                    6400000 100X2-8
D112 052       03.39  .41.42.0.22.31   TEST LINE FILLED
D112 056       03.42  .24.66.0.06.20   YES. 100X2-8 TO INTERMIN STORE, GO TO LINE PREP
D112 060       03.43  .72.92.0.06.28   NO. RELX2-18 TO ARC
D112 748      Z06.72                    0000000 RELATIVE NUMBER STORAGE
D112 064       03.92  .94.93.4.20.31   RETURN TO RATOR
D112 000                                PROGRAM CONSTANT
D112 001       03.77  .78.80.4.28.25   PROGRAM CONSTANT TO ID1D
D112 002       03.80 U.85.91.0.29.20   CLEAR FLAGS
D112 003       03.91  .U0.10.0.18.21   WD COUNTER TO INTERMIN STORE
D112 004      Z18.U0                    0700000 WD COUNTER X2-8 INITIAL
D112 005       03.10  .12.23.0.21.28   WD COUNTER TO ARC
D112 006       03.23  .25.30.0.06.29   DUMMY COPY PROG. CONST. TO AR6
D112 007       06.25  .00.70.0.25.18   DUMMY COPY
D112 008       03.30  .32.38.0.31.31   NC EX AR
D112 009       03.70  .72.73.0.21.28   WD COUNTER @ 21.0 TO ARC
D112 010       03.73  .75.76.3.29.20   SET FLAG GO TO CH.WD TO REL CONVERSION
D112 011       03.11  .16.19.0.21.28   WD COUNTER @ 21.00 TO ARC
                •

D113 012                                OUTPUT PUNCH

D113 013       05.02  .03.04.0.01.02   FORMAT @ 01.03 TO 02.03 %OUTPUT-PUNCH¤
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D113 014      Z01.03                    8000000 FORMAT CORRECTION
D113 015       05.04  .23.31.0.09.28   LEADER CONSTANT %00000U0¤ TO ARC %OUTPUT-PUNCH¤
D113 016      Z09.23                    0000U00 LEADER CONSTANT
D113 017       05.31 U.34.34.7.28.28   DECREMENT LEADER CONSTANT %OUTPUT-PUNCH¤
D113 018       05.34 U.36.40.0.28.27   TEST LEADER CONSTANT %OUTPUT-PUNCH¤
D113 019       05.41  .01.31.0.10.31   NOT 0. PUNCH LINE 19 %OUTPUT-PUNCH¤
D113 020       05.40  .41.47.1.25.28   0 RETURN TO ARC %OUTPUT-PUNCH¤
D113 021       05.02 W.00.40. .01.31   WRITE LINE 19 ON MAGNETIC TAPE %OUTPUT-MAGNETIC¤
D113 022       05.40  .40.40.0.28.31   READY %OUTPUT-MAGNETIC¤
D113 023       05.41  .43.47.1.25.28   RETURN TO ARC %OUTPUT-MAGNETIC¤
D113 024       05.47  .49.49.0.31.31   NC EX AR OUTPUT
                •

D114 025                                LINE PREPARATION

D114 026       03.26  .U0.66.0.18.20   WD COUNTER TO INTERMIN STORE START END ROUTINE
D114 027       03.66  .U2.01.6.18.25   CH PRESENT CVA TO ID1
D114 028      Z18.U2                    0000120 CH PRESENT X2-23 INITIAL
D114 029       03.01  .10.16.1.26.31   SHIFT CH PRESENT 5 RIGHT
D114 030       03.16  .17.20.0.25.28   CH PRESENT X2-28 TO ARC
D114 031       03.20  .32.85.0.06.29   DUMMY COPY CHANNEL TO AR6
D114 032       06.32 U.20.W5.0.19.00   DUMMY COPY
D114 033       03.85  .88.94.0.20.29   WDX2-8 OR 100X2-8 @ 200.0 TO AR*
D114 034       03.94  .U7.17.0.28.18   COPY COMMAND @ AR TO 18.U7
D114 035       03.17  .17.17.0.28.31   READY.
D114 036       03.18 U.19.U7.0.18.19   LINE 18 TO LINE 19
D114 037       03.U7  .24.41.0.19.27   TEST 19.00-03 NON-ZERO
D114 038       03.21  .U3.53.0.06.28   0. BINARY FLOAT.PT.0 @ 06.U3 TO ARC
D114 039      Z06.U3                    000007Z BINARY FLOATING POINT ZERO
D114 040       03.53  .00.22.0.28.19   000007Z @ AR TO 19.00
D114 041       03.22  .33.34.0.06.25   NOT 0. RETURN TO CATOR COMMAND TO ID.
D114 042       06.33  .62.62.3.20.31   RETURN TO CATOR
D114 043       03.34  .35.54.0.29.28   PREPARE FOR CHECK SUM
D114 044       03.54 U.55.56.3.19.29   NEGATIVE SUM LINE 19 TO AR6
D114 045       03.56  .U6.00.1.28.19   LINE BALANCER @ AR TO 19.U6
D114 046       03.00  .02.02.5.20.31   TRANSFER TO OUTPUT
                •

D115 047                                CHWD TO REL CONVERSION

D115 048       03.76  .U0.U1.0.18.28   WD COUNTER TO ARC
D115 049       03.U1  .U2.59.0.18.29   CH PRESENT TO AR*
D115 050       03.59  .71.44.3.06.29   SUBT 09X2-23 FROM CH PRESENT
D115 051      Z06.71                    0000120 9X2-23
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D115 052      03.44  .47.75.0.23.31   PREPARE FOR MULTIPLICATION
D115 053      03.75  .77.82.0.02.25   W800040 CONSTANT %100X2-761X2-22¤ TO ID.
D115 054     Z02.77                   W800040 MULTIPLIER
D115 055      03.82  .83.87.0.28.24   CH-09. WD @ AR TO MQ
D115 056      03.87  .46.27.0.24.31   MULTIPLY
D115 057      03.27 U.52.63.4.26.30   SHIFT RELATIVE NUMBER 12 LEFT
D115 058      03.63 W.69.84.3.23.31   EXTRACT RELATIVE NUMBER X2-18
D115 059     Z02.69                   00ZZW00 EXTRACTOR
D115 060      03.84  .85.36.0.25.28   RELATIVE X2-18 @ ID1 TO ARC
D115 061      03.36  .40.45.0.20.27   TEST FORMAT FLAG NON-ZERO
D115 062      03.46  .72.93.0.28.06   NOT 0. RELATIVE @ AR TO 06.72
D115 063      03.45  .47.48.0.20.27   0. TEST PROGRAM CONSTANT FLAG NON-ZERO
D115 064      03.49  .72.11.0.28.06   NOT 0. RELATIVE @ AR TO 06.72
D115 065      03.48  .50.51.0.20.27   0. TEST DATA ARRAY FLAG NON-ZERO
D115 066      03.52  .57.57.2.20.31   NOT 0. GO TO DATA ARRAY
D115 067      03.51  .53.52.4.20.31   0. GO TO RATOR
                 .

D116 068                              FORMATS

D116 069      03.93  .U0.04.0.18.28   WD COUNTER TO ARC
D116 070      03.04  .06.08.4.28.25   ARC TO IDID
D116 071      03.08  .31.81.0.06.29   ADD 04X2-8 TO AR6
D116 072     Z06.31                   0400000 04X2-8
D116 073      03.81  .U0.15.0.28.18   WD*04 @ AR TO WD COUNTER
D116 074      03.15  .16.33.1.26.31   WD COUNTER X2-8 TO X2-12
D116 075      03.33  .34.35.0.25.28   WD COUNTER X2-12 TO ARC
D116 076      03.35  .36.37.0.06.29   DUMMY NC EX AR TO AR6
D116 077      06.36  .42.W7.0.31.31   NC EX AR
D116 078      03.37  .40.41.0.28.03   NC EX AR @ AR TO 03.40
D116 079      03.41  .U0.14.0.18.28   WD604 @ WD COUNTER TO ARC
D116 080      03.14  .37.40.0.06.29   DUMMY COPY FORMAT TO AR6
D116 081      06.37 U.00.97.0.21.18   DUMMY STORE
D116 082      03.97  .U0.06.0.18.28   WD COUNTER TO ARC
                 .

D117 083                              CONVERSION ROUTINE

D117 084      02.75  .78.89.0.23.31   PREPARE FOR CONVERSION
D117 085      02.89  .92.96.4.06.24   BINARY INTEGER TO MQ0.1
D117 086      02.96  .U7.10.2.13.20   SF @ AR TO 20.3, 71X2-28 @ 3.U7 TO AR
D117 087     Z13.U7                   0000047 71X2-28
D117 088      02.10  .12.28.4.24.27   TEST BINARY INTEGER NON-ZERO
D117 089      02.28  .U3.06.0.13.28   0. SPECIAL ADDR TO ARC

D117 090     Z13.U3                   0002600 SPECIAL ADDR. BINARY FLOATING POINT 0
D117 091      02.06  .08.07.4.20.31   GO TO RATOR
D117 092      02.29  .V2.34.0.27.31   NOT 0. NORMALIZE BINARY INTEGER
D117 093      02.34  .35.36.2.20.20   EXP @ AR TO 20.3, SF @ 20.3 TO AR
D117 094      02.36  .38.39.0.22.31   TEST SF NEGATIVE
D117 095      02.39  .40.42.0.28.27   NO. TEST SF NON-ZERO
D117 096      02.40  .79.93.4.06.25   YES. 10X2-4 TO ID1
D117 097     Z06.79                   U000000 10X2-4
D117 098      02.93  .95.98.0.06.29   ADD 1X2-28 TO SF
D117 099     Z06.95                   0000001 1X2-28
D117 100      02.98  .U0.U1.0.03.20   -4X2-28 TO FIX
D117 101     Z03.U0                   -0000004 -4X2-28
D117 102      02.U1  .56.07.0.24.31   MULTIPLY
D117 103      02.07  .11.16.2.20.20   SF TO 20.3, EXP @ 20.3 TO AR
D117 104      02.16  .20.21.1.20.29   ADD FIX TO EXP
D117 105      02.21  .22.29.4.26.24   BINARY INTEGER TO MQ0.1
D117 106      02.43  .81.86.4.06.25   SF NOT 0. 10-7X2-23 TO ID.
D117 107     Z06.81                   X6WZ94Y 10-7X2-23
D117 108      02.86  .88.91.3.05.29   SUBT 7X2-28 FROM SF.
D117 109     Z05.88                   0000007 7X2-28
D117 110      02.91  .96.U1.0.06.20   23X2-28 TO FIX
D117 111     Z06.96                   0000017 23X2-28
D117 112      02.42  .44.50.4.24.26   SF IS 0. BINARY INTEGER TO PN
D117 113      02.50 U.52.53.3.23.31   EXTRACT T2-T9
D117 114     Z02.51                   0000ZZ EXTRACTOR
D117 115      02.53  .55.56.0.20.30   ADD EXP TO PN6
D117 116      02.56  .57.58.0.26.28   FLOATING POINT NUMBER TO ARC
D117 117      02.58  .76.80.3.05.29   SUBT BINARY FLOAT. POINT 1 FROM AR
D117 118     Z06.76                   800007Z BINARY FLOAT POINT ONE
D117 119      02.80  .81.30.0.28.27   TEST NR NON-ZERO FOR FL. PT 1
D117 120      02.30  .U4.06.0.13.28   0. SPECIAL ADDR TO ARC
D117 121     Z13.U4                   0002U00 SPECIAL ADDR. BINARY FLOATING POINT 1
D117 122      02.31  .54.81.1.06.29   NOT 0. SUBT 01X2-1 FROM AR
D117 123      02.81  .82.87.0.28.27   TEST NR NON-ZERO FOR FL. PT. 2
D117 124      02.87  .U6.06.0.13.28   0. SPECIAL ADDR TO ARC
D117 125     Z13.U6                   0002400 SPECIAL ADDR. BINARY FLOATING POINT 2
D117 126      02.88  .89.92.0.26.28   NOT 0. FLOATING POINT NUMBER TO ARC
D117 127      02.92  .77.77.3.20.31   GO TO PROGRAM CONSTANT
                 .

D118 128                              RESERVE DATA ARRAY

D118 129      02.68 U.73.74.0.29.20   CLEAR FLAGS
D118 130      02.74  .76.78.0.28.21   DATA ARRAY DIMENSION TO STORAGE
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D118 131      02.78  .U1.U6.0.18.28   SPECIAL CH AVAILABLE @ 18.U1 TO ARC
D118 132     Z18.U1                   0000000 SPECIAL CH AVAIL X2-23
D118 133      02.U6  .00.08.0.28.27   TEST CH AVAILABLE NON-ZERO
D118 134      02.09  .24.26.0.06.29   NOT 0. 100X2-8 TO AR*
D118 135      02.26  .30.35.3.29.20   SET DATA ARRAY FLAG
D118 136      02.35  .U1.27.0.29.18   CLEAR SPECIAL CH AVAILABLE
D118 137      02.27  .44.44.3.20.31   GO TO CH.WD TO REL CONVERSION
D118 138      02.08  .U3.57.0.18.28   0. DATA COUNTER TO ARC
D118 139     Z18.U3                   00ZU000 DATA COUNTER X2-18 INITIAL
D118 140      02.57  .60.76.3.21.29   SUBT. DIMENSION FROM DATA COUNTER
D118 141      02.76  .U3.U4.1.28.18   AR TO DATA COUNTER
D118 142      02.U4  .U5.04.4.28.25   DATA COUNTER TO ID0.1
D118 143      02.04  .08.11.6.06.24   1/100X2-10 TO MQ1
D118 144     Z06.08                   0000U27 1/100X2-10
D118 145      02.11  .56.70.0.24.31   MULTIPLY
D118 146      02.70  .71.72.0.26.28   CHX2-28 @ PN1 TO ARC
D118 147      02.72 U.78.82.0.28.29   SHIFT CH 5 LEFT
D118 148      02.82  .U4.71.3.06.29   SUBT 01X2-23 FROM CH IN AR
D118 149     Z06.U4                   0000020 1X2-23
D118 150      02.71  .U4.67.0.28.18   AR TO CH AVAILABLE
D118 151     Z18.U4                   0000120 CH AVAILABLE X2-23 INITIAL
D118 152      02.67  .71.90.0.06.29   09X2-23 TO AR*
D118 153      02.90  .U2.84.3.18.29   SUBT CH PRESENT FROM CH AVAILABLE
D118 154      02.84  .86.94.0.22.31   TEST TOO LARGE ERROR
D118 155      02.94  .U3.U5.0.18.28   NO. DATA COUNTER TO AR
D118 156      02.U5  .U7.U6.4.20.31   GO TO RATOR
D118 157      02.95  .98.U0.6.06.24   YES. LGE TO MQ1
D118 158     Z06.98                   U397950 ALPHA ERROR CODE LGE
D118 159      02.U0  .72.72.1.20.31   GO TO RATOR
                *

D119 160                              CHANNEL AVAILABLE S.R.

D119 161      03.62  .U2.U3.3.18.28   CH PRESENT -TO ARC
D119 162      03.U3 U.U5.61.3.06.29   01X2-23 @ 06.U4 -TO AR*
D119 163      03.61  .65.95.1.28.28   RECOMPLEMENT CH PRESENT
D119 164      03.95  .U2.50.3.28.18   -AR TO CH PRESENT
D119 165      03.50  .53.55.1.28.28   COMPLEMENT CH PRESENT
D119 166      03.55  .71.86.0.06.29   09X2-23 @ 06.71 TO AR*
D119 167      03.86  .U4.24.0.18.29   CH AVAILABLE TO AR*
D119 168      03.24  .26.28.0.22.31   TEST FOR TOO LARGE ERROR
D119 169      03.29  .98.58.6.06.24   YES. LGE TO MQ1
D119 170      03.58  .72.72.1.20.31   GO TO ERROR
D119 171      03.28  .74.U5.0.06.27   NO. TEST END PROGRAM FLAG NON-ZERO

D119 172     Z06.74                   0000000 END FLAG
D119 173      03.U6  .U8.U7.4.20.31   NOT 0. GO TO RATOR. END OF PROGRAM
D119 174      03.U5 U.U1.57.0.29.18   0. CLEAR LINE 18.00-U0
D119 175      18.U5  .U2.U2.0.21.31   TRANSFER TO 00.U2  OF LYZER-LATOR
D119 176      03.57  .61.67.0.20.27   TEST FORMAT FLAG NON-ZERO
D119 177      03.68 U.73.78.0.29.20   NOT 0. GO TO FORMAT
D119 178      03.67  .72.88.0.06.28   0. RELX2-18 @ 06.72 TO ARC
D119 179      03.88  .90.89.4.20.31   GO TO RATOR
                *

D120 180                              CONSTANT ARRAY

D120 181      03.32  .36.76.3.29.20   NO. SET FLAG GO TO CH.WD TO REL CONVERSION
D120 182      03.90 U.95.96.0.29.20   CLEAR FLAGS
D120 183      03.96  .U0.U1.0.18.28   WD COUNTER TO ARC. GO TO CH.WD TO REL CONVERSION
D120 184      03.89 U.94.98.0.29.20   CLEAR FLAGS
D120 185      03.98  .U0.07.0.18.21   WD COUNTER TO INTERMIN STORE
D120 186      03.07  .08.09.0.21.28   WD COUNTER TO ARC.
D120 187      03.09  .20.30.0.06.29   DUMMY COPY CONSTANT ARRAY TO AR6
D120 188      06.20  .00.79.0.25.18   DUMMY COPY
D120 189      03.79  .80.83.0.21.28   WD COUNTER @ 21.0 TO ARC
D120 190      03.83  .97.99.0.06.29   ADD 01X2-8 TO WD COUNTER
D120 191     Z06.97                   0100000 1X2-8
D120 192      03.99  .U0.06.0.28.18   WD*01 @ AR TO WD COUNTER
D120 193      03.68 U.73.78.0.29.20   CLEAR FLAGS
D120 194      03.78  .U0.05.0.18.28   WD COUNTER TO ARC
D120 195      03.05  .07.12.0.28.27   TEST WD COUNTER EQUALS 0
D120 196      03.12  .20.38.0.02.29   0. 01X2-8 @ 02.20 TO AR*
D120 197      03.38  .U0.13.0.28.18   AR TO WD COUNTER
D120 198      03.13  .30.71.0.06.29   NOT 0. 03X2-8 @ 06.30 TO AR*
D120 199     Z06.30                   0300000 03X2-8
D120 200      03.71  .24.25.3.06.29   SUBT 100X2-8 Ex WD COUNTER
D120 201      03.25  .27.31.0.22.31   TEST LINE FILLED
D120 202      03.31  .33.42.3.29.20   YES. SET FLAG GO TO LINE PREPARATION
                *

D122                                  ERROR ROUTINE ENTRY

D122 002      01.72  .73.79.0.01.28   PICK UP DUMMY RETURN COMMAND
D122 004      01.73  .89.42.0.01.28   DUMMY - PICKUP SKIP OUTPUT DUMMY
D122 006      01.89  .04.40.0.00.00   DUMMY - SKIP OUTPUT
D122 008      01.42  .02.58.0.28.05   STORE SKIP OUTPUT DUMMY IN 05.02
D122 010      01.58  .89.14.0.06.26   PICK UP ENTRY NO.
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D123                                        ALPHA TYPEOUT ROUTINE

D123 012      01.13  .19.79.0.01.28  PICK UP RETURN TO MARK AS RETURN COMM
D123 014      01.79  .98.90.1.27.31  NORMALIZE
D123 016      01.90  .90.90.0.28.31  TEST READY
D123 018      01.91  .U6.10.4.24.19  MQ TO 19.U6 AND 19.U7
D123 020      01.10  .15.17.4.09.31  TYPE ALPHA IDENTIFIER
D123 022      01.17  .19.19.0.31.31  NEXT COMM FROM AR
                 .

D124                                        CONVERSION ENTRY FOR 2 TO -18

D124 024      01.05 U.14.14.6.26.30  SHIFT PN 4 BITS LEFT
D124 026      01.14  .15.24.0.01.20  CARRIAGE RETURN FORMAT TO 20.03
D124 028     Z01.15                  W004400
D124 030      01.22  .23.24.0.01.20  TAB FORMAT TO 20.03
D124 032     Z01.23                  WOOW400
                 .

D125                                        CONVERSION AND NUMBER TYPEOUT

D125 034      01.24  .26.28.3.23.31  EXTRACT PN 14 BITS
D125 036     Z02.25                  0003ZZZ-
D125 038      01.28  .29.31.0.01.30  ADD 1X2 TO -15
D125 040     Z01.29                  0002000
D125 042      01.31  .33.33.0.23.31  CLEAR EVEN WORD
D125 044      01.33  .35.37.1.01.25  100 X 2 TO -10 TO ID
D125 046     Z01.35                  1900000
D125 048      01.37  .55.93.1.25.31  DIVIDE 55 WT
D125 050      01.93  .94.96.6.24.26  MQ0 TO PN 1
D125 052      01.96  .98.98.3.23.31  EXTRACT FRACTION TO ID
D125 054     Z02.97                  07ZZZZZ-
D125 056      01.98  .99.U1.0.01.24  MULTIPLIER TO MQ
D125 058     Z01.99                  V400000
D125 060      01.U1  .06.02.0.24.31  MULTIPLY 6 WT
D125 062      01.02 W.05.07.3.23.31  EXTRACT FRACTION TO ID
D125 064     Z02.05                  007ZZZZ-
D125 066      01.07  .06.16.0.24.31  MULTIPLY 6 WT
D125 068      01.16  .18.40.3.23.31  EXTRACT REMAINDER TO ID
D125 070     Z02.17                  0007ZZZ-
D125 072      01.40 U.43.60.1.29.24  CLEAR MQ
D125 074      01.60  .60.60.0.28.31  TEST READY
D125 076      01.61 U.62.87.0.29.19  CLEAR LINE 19
D125 078      01.87  .U7.01.5.26.19  PN TO 19.U7

D125 080      01.01  .03.06.0.20.02  STORE FORMAT FOR TYPE OUT
D125 082      01.06  .08.19.0.09.31  TYPE LINE 19
D125 084      01.19  .21.20.4.20.31  RETURN TO MARK IN LINE 04
D125 086      01.08  .15.49.0.01.20  CARRIAGE RETURN FORMAT TO 20.03
D125 088      01.49 U.56.60.6.26.30  SHIFT STARTER NO 3 BITS LEFT
                 .

D126                                        STARTER NO. ROUTINE

D126 090      01.45  .51.64.0.06.28  PICK UP 1 X 2 TO -16
D126 092      01.64  .67.68.0.01.29  ADD CURRENT STARTER NO
D126 094     Z01.67                  0000000   STARTER NO LOCATION
D126 096      01.68 U.71.71.1.28.24  HOLD STARTER NO IN BOTH SIDES OF MQ
D126 098      01.71  .74.92.3.01.29  SUBTRACT MAXIMUM
D126 100     Z01.74                  0029000
D126 102      01.92  .67.70.1.24.01  STORE NEW STARTER NO
D126 104      01.70  .71.18.0.28.27  ZERO TEST STARTER NO MINUS MAX
D126 106      01.18  .65.72.0.01.24  ZERO-PICK UP ERROR INDICATOR
D126 108     Z01.65                  V2Z3W10 TOO MANY STARTER NO ST1
                 .

D127                                        BETA ENTRY TO LIST STORE

D127 110      01.20  .21.25.1.01.25  PICK UP BETA RETURN COMM
D127 112      01.21  .59.59.1.21.31  DUMMY-RETURN TO BETA
D127 114      01.59 U.60.66.0.07.04  RESTORE CHAR PICKUP ROUTINE TO LINE 04
D127 116      01.66  .70.70.0.21.31  TRANSFER TO CHARACTER PROCESSING
                 .

D128                                        LIST STORE SUBROUTINE

D128 118      01.11  .19.25.1.01.25  PICK UP RETURN TO MARK AS RETURN COMM
D128 120      01.25 U.28.32.1.28.26  HOLD LIST ENTRY IN BOTH SIDES OF PN
D128 122      01.32  .34.36.0.01.28  PICK UP LIST CTR
D128 124     Z01.34                  0000000      LIST CTR LOC
D128 126      01.36  .37.38.1.28.24  HOLD LIST CTR IN MQ1
D128 128      01.38  .39.41.0.01.29  ADD DUMMY STORE COMM
D128 130      01.39  .45.00.1.26.11  DUMMY-STORE ENTRY IN LINE 11
D128 132      01.41  .43.43.0.31.31  NEXT COMM FROM AR
D128 134      01.00  .01.04.1.24.28  PICK UP LIST CTR
D128 136      01.04  .20.26.0.02.29  ADD 1 X 2 TO -8
D128 138      01.26  .34.47.0.28.01  STORE NEW LIST CTR
D128 140      01.47  .48.50.0.01.29  ADD 195 X 2 TO -8
D128 142     Z01.48                  W300000
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D128 144        01.50   .52.52.0.22.31  TEST SIGN
D128 146        01.52   .53.17.1.25.28  PLUS - PICK UP RETURN COMM - EXECUTE
D128 148        01.53   .53.53.0.28.31  MINUS - TEST READY
D128 150        01.54 U.44.76.0.29.19   CLEAR LINE 19 - WORDS 00 THRU 43
D128 152        01.76   .34.43.0.29.01  RESET LIST CTR EQUAL ZERO
D128 154        01.43 U.00.44.0.11.19   SYMBOL LIST TO LINE 19
D128 156        01.44 U.U7.12.0.29.11   CLEAR SYMBOL LIST
D128 158        01.12   .34.34.3.20.31  NON MARK TRANSFER TO CHECK SUM-OUTPUT ROUTINE
                  .

D129                                    LABEL TABLE STORE ROUTINE

D129 160        01.46   .50.56.0.13.27  ZERO TEST TOP OF LABEL TABLE
D129 162        01.57   .63.72.0.01.24  SET - PICK UP ERROR INDICATOR
D129 164       Z01.63                   U3X1W10   L41
D129 166        01.56   .59.80.4.26.28  NOT SET - PICK UP PN1
D129 168        01.80 U.U1.U2.2.13.13   PRECESS IN HIGH ORDER WORD
D129 170        01.U2   .U4.30.2.26.28  PICK UP PN0
D129 172        01.30 U.51.19.2.13.13   PRECESS IN LOW ORDER WORD
                  .

D130                                    IDENTIFIER PROCESSING - GO TO

D130 174        01.95   .97.U0.0.10.30  ADD ADDRESS OF TOP OF LABEL TABLE
D130 176        01.U0   .U2.55.3.10.28  PICK UP -20 X 2 TO -8
D130 178        01.55 W.69.74.5.21.31   MARK TO TABLE SEARCH
D130 180        01.69   .71.81.1.25.27  ZERO TEST LABEL TABLE ENTRY
D130 182        01.82   .84.86.4.25.26  FOUND - MOVE ENTRY TO PN
D130 184        01.86 W.69.78.3.23.31   EXTRACT STARTER NO TO ID
D130 186        01.78   .80.62.4.25.24  MOVE ID TO MQ
D130 188        01.81   .16.51.4.06.24  NOT FOUND - 8 BIT IDENT
D130 190        01.51 W.83.13.1.21.31   MARK TO ALPHA TYPE OUT
D130 192        01.83 W.88.45.1.21.31   MARK TO STARTER NO ROUTINE
D130 194        01.88   .92.94.5.06.26  PICK UP 6-BIT IDENT
D130 196        01.94   .95.97.2.24.30  ADD STARTER NO
D130 198        01.97 W.U3.46.1.21.31   MARK TO LABEL TABLE STORE
D130 200        01.U3   .U4.U6.6.24.26  STARTER NO TO PN1
D130 202        01.U6 W.62.08.1.21.31   MARK TO HEX TYPE OUT
D130 204        01.62   .64.27.0.06.28  PICK UP 6 X 2 TO -16
D130 206        01.27   .49.09.0.28.06  SET DICTIONARY MODE
D130 208        01.09   .11.20.2.24.28  PICK UP STARTER NO
                  .

D131                                    IDENTIFIER PROCESSING - PROCESS CALL

D131 210        02.47   .51.59.0.06.24  1 X 2 TO -16 TO MQ1
D131 212        02.59   .62.64.4.25.26  PROCEDURE TABLE ENTRY TO PN
D131 214        02.64 W.15.38.3.23.31   EXTRACT NO OF I-O ENTRIES
D131 216       Z02.15                   0000300
D131 218        02.38   .49.55.3.29.15  SET PC FIRST TIME FLAG
D131 220        02.55   .77.19.1.25.01  STORE PC TALLY X 2 TO -22
D131 222        02.19 W.23.32.3.23.31   EXTRACT T OF FIRST I-O ENTRY
D131 224       Z02.23                   ZZ00000
D131 226        02.32   .35.45.2.25.28  PICK UP T
D131 228        02.45   .49.52.1.24.06  SET PROCEDURE CALL MODE
D131 230        02.52 W.69.73.3.23.31   EXTRACT STARTER NO.
D131 232        02.73   .U4.65.0.03.29  ADD DUMMY TO T
D131 234        03.U4   .50.82.0.13.28  DUMMY-PICK UP I-O ENTRY
D131 236        02.65   .69.14.0.28.03  HOLD PC I-O PICK UP COMM
D131 238        02.14   .15.18.1.25.28  PICK UP STARTER NO.
D131 240        02.18   .20.20.1.21.31  MARK BETA TO LIST STORE
                  .

D132                                    IDENTIFIER PROCESSING - IDENT NOT FOUND

D132 242        02.61   .16.60.4.06.24  PICK UP 8- BIT IDENT
D132 244        02.60 W.62.13.1.21.31   MARK TO ALPHA TYPEOUT
D132 246        02.62   .94.44.0.08.28  PICK UP 1 X 2 TO -18
D132 248        02.44 W.48.68.2.21.31   MARK TO CATOR FOR DATA ADDRESS
D132 250        02.48   .51.54.0.28.22  HOLD ADDRESS
D132 252        02.54   .92.22.5.06.26  PICK UP 6-BIT IDENT
D132 254        02.22   .25.33.2.28.30  ADD ADDRESS
D132 256        02.33 W.46.48.5.21.31   MARK TO STORE ENTRY IN VARIABLE TABLE
D132 258        02.46   .47.49.0.22.26  PICK UP ADDRESS
D132 260        02.49 W.63.05.1.21.31   MARK TO CONVERSION AND TYPEOUT
D132 262        02.63 U.64.68.0.09.04   CALL IN LINE 09
                  .

D133                                    STATEMENT PROCESSING

D133 264        10.44   .45.52.0.10.22  SET BIT COUNTER EQUAL 18
D133 266       Z10.45                   0000012
D133 268        10.52   .55.59.4.26.28  PICK UP LABEL INDICATOR
D133 270        10.59   .60.88.5.26.06  STORE ENTRY IN CHANGE ENTRY
D133 272        10.88   .90.91.0.22.31  TEST SIGN - LABEL IND
D133 274        10.91   .93.58.1.29.24  NOT SET - CLEAR STARTER NO TEMP STORAGE
                  .

D134                                    LABEL PROCESSING
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D134 276      10.92 U.93.01.0.07.04   SET-DO CURRENT WORD PICK UP-PROCESS LABEL
D134 278      10.82  .92.94.4.06.26   PICK UP 6 BIT IDENT
D134 280      10.94  .97.U0.0.04.30   ADD ADDRESS OF TOP OF LABEL TABLE
D134 282     Z10.97                   3200100
D134 284      10.U0  .U2.02.3.04.28   -20X2 TO -8 TO AR
D134 286     Z10.U2                   1400000
D134 288      10.02 W.08.74.5.21.31   MARK TO TABLE SEARCH
D134 290      10.08  .09.12.1.25.27   ZERO TEST LABEL TABLE ENTRY
D134 292      10.12  .16.24.4.06.24   NOT FOUND - PICK UP 8-BIT IDENT
D134 294      10.24 W.34.13.1.21.31   MARK TO ALPHA TYPEOUT
D134 296      10.34 W.43.45.1.21.31   MARK TO STARTER NO ROUTINE
D134 298      10.43  .92.18.5.06.26   PICK UP 6-BIT IDENT
D134 300      10.18  .19.36.1.24.30   ADD STARTER NO
D134 302      10.36  .83.84.0.02.30   ADD LABEL FOUND INDICATOR BIT
D134 304      10.84  .86.95.4.26.25   HOLD ENTRY IN ID
D134 306      10.95  .97.U4.0.24.26   STARTER NO TO PN
D134 308      10.U4 W.06.08.1.21.31   MARK TO HEX TYPEOUT
D134 310      10.06  .08.31.4.25.26   ENTRY BACK TO PN
D134 312      10.31 W.58.46.1.21.31   MARK TO LABEL TABLE STORE
D134 314      10.13  .92.25.5.06.26   FOUND - PICK UP 6-BIT IDENT
D134 316      10.25  .27.78.1.25.30   ADD STARTER NO
D134 318      10.78  .83.10.0.02.30   ADD LABEL FOUND INDICATOR BIT
D134 320      10.10  .13.15.4.26.28   MOVE TO AR
D134 322      10.15 U.18.21.1.28.24   STORE IN BOTH SIDES OF MQ
D134 324      10.21  .23.41.1.20.28   PICK UP TABLE SEARCH CTR
D134 326      10.41  .42.77.0.04.29   ADD DUMMY
D134 328      10.42  .U0.04.1.24.13   DUMMY - STORE MQ IN LABEL TABLE
D134 330      10.77  .79.79.0.31.31   NC FROM AR
D134 332      10.04  .07.58.1.25.24   STARTER NO TO MQ1
                 .

D135                                  STATEMENT TYPE BREAKDOWN

D135 334      10.58  .60.79.5.06.26   PICK UP STATEMENT
D135 336      10.79 W.U7.05.3.23.31   EXTRACT TYPE
D135 338     Z02.U7                   0000320
D135 340      10.05  .07.09.1.25.28   PICK UP TYPE
D135 342      10.09  .11.14.0.28.22   HOLD TYPE X 2 TO -24
D135 344      10.14  .15.16.1.24.29   ADD STARTER NO
D135 346      10.16 U.18.11.1.21.31   MARK TO LIST STORE ROUTINE
D135 348      10.17  .35.37.0.22.28   PICK UP TYPE
D135 350      10.37 U.46.46.2.28.29   SHIFT TYPE TO 2 TO -16
D135 352      10.46  .48.61.0.29.06   RESET BRACKET FLAG  .
D135 354      10.61  .63.81.3.04.29   SUBTRACT 20 X 2 TO -16 FROM TYPE



D135 356     Z10.63                   0014000
D135 358      10.81  .85.23.0.29.06   RESET FOR-SUBSCRIPT FLAG
D135 360      10.23  .25.26.0.22.31   TEST SIGN
D135 362      10.26  .88.98.0.06.22   PLUS - END ROUTINE - PICK UP FLAG LIST CTR
D135 364      10.27  .47.49.1.06.29   MINUS - ADD 4 X 2 TO -16
D135 366      10.49  .52.55.0.22.31   TEST SIGN
D135 368      10.55  .60.85.5.06.26   PLUS - CARR TABS ETC - PICK UP STATEMENT
D135 370      10.56  .58.77.0.04.29   MINUS-ADD STATEMENT PICK UP DUMMY - DISTRIBUTE
D135 372      10.64  .47.48.0.05.28   DO-   4X2 TO -16 TO AR
D135 374      10.65  .67.48.0.29.28   IF-   CLEAR AR TO ZERO
D135 376      10.66  .90.19.3.29.10   FOR-   SET FIRST IDENTIFIER FLAG
D135 378     Z10.90                   0000000
D135 380      10.19  .39.48.0.06.28   2 X 2 TO -16 TO AR
D135 382      10.67  .55.48.0.06.28   GO TO-   3X2 TO -16 TO AR
D135 384      10.68  .69.48.0.29.28   READ-   CLEAR AR TO ZERO
D135 386      10.69  .75.48.0.06.28   STOP-   6X2 TO -16 TO AR
D135 388      10.70  .74.48.0.29.28   WRITE-   CLEAR AR TO ZERO
D135 390      10.71  .63.48.0.06.28   PRINT-   5X2 TO -16 TO AR
D135 392      10.72  .75.48.0.06.28   RETURN-   6X2 TO -16 TO AR
D135 394      10.74  .75.48.0.29.28   ASSIGNMENT- CLEAR AR TO ZERO
D135 396      10.48  .49.51.0.28.06   STORE STATEMENT MODE
D135 398      10.51  .60.73.5.06.26   PICK UP STATEMENT
D135 400      10.73 W.U2.U5.3.23.31   EXTRACT NO OF CHARACTERS TO SKIP
D135 402     Z02.U2                   2000000
D135 404      10.U5  .00.03.1.25.28   NO X 2 TO -4 TO AR
D135 406      10.03 U.04.12.0.07.04   CALL IN SKIP ROUTINE - PROCESS STATEMENT
                 .

D136                                  -BEGIN-STATEMENT

D136 408      10.75 W.83.45.1.21.31   BEGIN - MARK TO STARTER NO. ROUTINE
D136 410      10.83  .88.93.0.06.28   PICK UP FLAG LIST CTR
D136 412      10.93  .U1.77.0.04.29   ADD DUMMY - EXECUTE
D136 414      10.U1  .98.U6.5.15.26   DUMMY - PICK UP FLAG LIST ENTRY
D136 416      10.U6  .U7.20.2.24.30   ADD STARTER NO TO ENTRY
D136 418      10.20  .49.86.0.14.27   ZERO TEST PROCEDURE TABLE
D136 420      10.87  .01.38.0.04.24   SET-PROC TABLE FULL - PICK UP ERROR IND
D136 422     Z10.01                   U7V3W10   PT1
D136 424      10.38 W.69.72.1.21.31   MARK TO ERROR
D136 426      10.86  .87.89.4.26.28   NOT SET - PN1 TO AR
D136 428      10.89 U.U0.11.2.14.14   PRECESS INTO PROC TABLE
D136 430      10.11  .20.39.1.26.28   PN0 TO AR
D136 431      10.39 U.50.53.2.14.14   PRECESS INTO PROC TABLE
D136 432      10.53  .18.47.1.09.28   PICK UP PROC BEGIN-END CTR
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D136 433      10.47  .51.60.1.06.29   ADD 1X2 TO -16
D136 434      10.60  .18.50.1.28.09   STORE NEW PBE CTR
D136 435      10.50  .51.62.1.24.28   PICK UP STARTER NO
D136 436      10.62 W.72.11.1.21.31   MARK TO LIST STORE ROUTINE
                 .

D137                                  -CARR - TABS - BELLS ETC.

D137 438      10.85 W.13.33.3.23.31   EXTRACT NUMBER
D137 440     Z02.13                   0000002
D137 442      10.33  .35.40.2.25.28   PICK UP NUMBER
D137 444      10.40 U.51.62.2.28.29   SHIFT NUMBER TO 2 TO -18
                 .

D138                                  -END-STATEMENT

D138 446      10.98  .99.35.0.04.28   PICK UP DUMMY
D138 448      10.99  .99.76.0.15.26   DUMMY - FLAG LIST ENTRY ODD TO PN1
D138 450      10.35  .36.77.0.22.29   ADD FLAG LIST CTR - EXECUTE
D138 452      10.76 W.83.96.3.23.31   EXTRACT INDICATOR BIT
D138 454      10.96  .99.U7.1.25.27   TEST INDICATOR BIT
D138 456      10.U7 U.W0.20.0.29.15   NOT SET-INDEPENDENT PROC.-CLEAR VARIABLE TABLE
D138 458      10.00  .29.35.0.04.28   PICK UP DUMMY-
D138 460      10.29  .98.07.4.29.15   DUMMY-CLEAR FLAG LIST ENTRY
D138 462      10.07  .12.28.0.22.28   PICK UP FLAG LIST CTR
D138 464      10.28  .U1.32.3.06.29   REDUCE FLAG LIST CTR BY 2
D138 466      10.32  .88.U3.0.28.06   STORE FLAG LIST CTR
D138 468      10.U3 U.44.22.0.11.04   CALL IN LINE 11
D138 469      09.94  .14.16.0.09.27   ZERO TEST STATEMENT PARENTHESIZERS CTR
D138 470     Z09.14                   0000000  SPN CTR
D138 471      09.17  .14.42.0.29.09   NOT ZERO RESET SPN CTR
D138 472      09.42  .53.54.0.04.24   PICK UP ERROR IND
D138 473     Z09.53                   V2U7Y50  SPN
D138 474      09.54 W.16.72.1.21.31   MARK TO ERROR ROUTINE
D138 475      09.16  .18.36.1.09.28   ZERO-PICK UP PROCESS BEGIN-END CTR
D138 476     Z09.18                   0000000  PBE CTR
D138 477      09.36  .51.76.3.06.29   SUBTRACT 1X2 TO -16
D138 478      09.76  .79.90.0.23.31   CLEAR REGISTERS
D138 479      09.90  .18.37.1.28.09   STORE PBE CTR
D138 480      09.37  .43.44.0.09.20   PICK UP 2 CARR RET FORMAT
D138 481     Z09.43                   5X10000
D138 482      09.44 W.59.60.1.21.31   MARK TO TYPE OUT
D138 483      09.59 U.60.80.0.10.04   RECALL LINE 10
D138 484      10.80 U.U1.30.0.29.13   CLEAR LABEL TABLE



D138 485      10.30 U.51.69.0.29.13   CLEAR LABEL TABLE
                 .

D139                                  END-STATEMENT- CHECK LABELS DECLARED

D139 486      11.22  .23.25.0.29.22   SET TALLY EQUAL ZERO
D139 487      11.25  .28.28.0.23.31   MINUS-CLEAR REGISTERS
D139 488      11.28  .31.42.0.08.28   PICK UP DUMMY
D139 489      08.31  .81.02.2.13.28   DUMMY-PICK UP HIGH ORDER LABEL TABLE ENTRY
D139 490      11.42  .47.77.0.22.29   ADD TALLY
D139 492      10.77  .79.79.0.31.31   NC FROM AR
D139 494      11.02  .03.14.0.28.27   ZERO TEST LABEL TABLE ENTRY
D139 496      11.14  .16.24.0.00.00   NOT SET - THROUGH-
D139 498      11.15  .17.41.1.28.26   SET HOLD ENTRY IN PN1
D139 500      11.41 W.83.01.3.23.31   EXTRACT LABEL FOUND INDICATOR BIT
D139 502      11.01  .03.05.0.25.27   ZERO TEST BIT
D139 504      11.05  .06.08.6.09.24   NOT SET-PICK UP ERROR IND
D139 506     Z09.06                   U3X1W20     LA2
D139 508      11.08 W.11.13.1.21.31   MARK TO ALPHA TYPEOUT
D139 510      11.11 W.51.26.3.23.31   EXTRACT ALL BUT STARTER NO
D139 512      11.26 W.31.08.1.21.31   MARK TO HEX TYPEOUT
D139 514      11.31 W.06.73.1.21.31   MARK TO ERROR ROUTINE TO TERMINATE OUTPUT
D139 516      11.06  .07.10.0.22.28   SET - PICK UP TALLY
D139 518      11.10  .20.21.0.02.29   ADD 1
D139 520      11.21  .23.30.0.28.22   STORE TALLY
D139 522      11.30  .U2.09.3.10.29   SUBTRACT 20
D139 524      11.09  .11.24.0.22.31   TEST SIGN
D139 526      11.24 U.25.94.0.09.04   PLUS-CALL IN LINE 09
                 .

D140                                  IDENTIFIER PROCESSING-DICTIONARY ENTRY

D140 528      17.83  .92.99.5.06.26   PICK UP IDENT
D140 530      17.99  .U2.04.3.10.28   -20X2 TO -8
D140 532      11.04  .41.72.2.12.30   ADD ADDRESS OF TOP OF DICTIONARY
D140 534     Z12.41                   2700LWD
D140 536      17.72  .74.74.5.20.31   NON MARK TRANS TO TABLE SEARCH
D140 538      11.27  .29.33.1.25.27   MODE 6 - ZERO TEST DICTIONARY ENTRY
D140 540      11.33  .40.U5.6.12.24   NOT FOUND-PICK UP ERROR IND
D140 542     Z12.40                   94V3W20  DT2
D140 544      17.U5 W.17.72.1.21.31   MARK TO ERROR
D140 546      11.34  .36.19.0.00.00   FOUND - WASTE COMMAND
D140 548      11.16  .17.18.1.25.27   MODE 0-1-ZERO TEST DICTIONARY ENTRY
D140 550      11.18 U.19.40.0.17.04   NOT FOUND - RECALL LINE 17
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D140 552      11.19  .21.23.2.25.28   FOUND - PICK UP ENTRY
D140 554      11.23  .26.35.3.08.29   SUBTRACT 20 X 2 TO -24
D140 556     Z08.26                   0000140
D140 558      11.35  .36.38.0.28.27   ZERO TEST
D140 560      11.38  .64.13.0.06.28   NOT SET-END-PICK UP 6X2 TO -16
D140 562      11.13  .49.32.0.28.06   SET DICTIONARY MODE
D140 563      11.32  .51.07.3.06.28   -1 X 2 TO -16 TO AR
D140 564      11.39  .43.29.1.08.29   SET-NOT END-ADD 7X2 TO -24
D140 565     Z08.43                   0000070
D140 566      11.29  .31.36.0.28.27   ZERO TEST
D140 567      11.37  .39.17.2.25.28   SET-NOT BEGIN-PICK UP ENTRY
D140 568      11.17  .20.20.1.21.31   MARK BETA TO LIST STORE ROUTINE
D140 569      11.36  .51.07.0.06.28   ZERO-BEGIN- 1X2 TO -16 TO AR
D140 570      11.07  .14.40.1.09.29   ADD SPN CTR
D140 572      11.40  .43.12.0.25.20   HOLD DICTIONARY ENTRY IN 20.03
D140 574      11.12  .14.43.1.28.09   STORE NEW SPN CTR
D140 576      11.43  .90.00.0.06.28   PICK UP TAB CODE
D140 578      11.00 W.03.11.1.21.31   MARK TO LIST STORE ROUTINE
D140 580      11.03  .07.17.0.20.28   PICK UP HELD DICTIONARY ENTRY
                *

D141                                  CHARACTER PROCESSING-CODES 6 AND 10-IDENT. PRO

D141 001      17.46  .48.53.0.06.27   TEST BRACKET FLAG
D141 003      17.54 W.58.83.4.21.31   SET-MARK RETURN FROM SUBSCRIPT TABLE SEARCH
D141 005      17.83  .92.99.5.06.26   PICK UP IDENTIFIER
D141 007      17.99  .U2.04.3.10.28   -20X2 TO -8 TO AR
D141 009      17.04  .09.72.0.06.30   ADD ADDRESS OF TOP OF SUBSCRIPT TABLE
D141 011     Z06.09                   13001W0    14.19
D141 013      17.72  .74.74.5.20.31   NON MARK TRANSFER TO TABLE SEARCH
D141 015      17.58  .59.63.1.25.27   ZERO TEST SUBSCRIPT TABLE ENTRY
D141 017      17.64  .67.17.2.25.28   FOUND - PICK UP ENTRY
D141 019      17.17  .20.20.1.21.31   MARK BETA TO LIST STORE ROUTINE
D141 021      17.63  .72.U5.6.03.24   NOT FOUND - PICK UP ERROR IND
D141 023     Z03.72                   92Y9Y20    BRK
D141 025      17.U5 W.17.72.1.21.31   MARK TO ERROR ROUTINE
                *

D142                                  PROCESSING MODE BREAKDOWN

D142 027      17.53  .43.44.0.10.28   BRACKET FLAG NOT SET - PICK UP DUMMY
D142 029      17.44  .49.50.0.06.29   ADD STATEMENT MODE
D142 031      17.50  .52.52.0.31.31   NC FROM AR - DISTRIBUTE
D142 033      17.18 W.71.94.4.21.31   0-ASSIGNMENT-MARK RETURN FROM I-O TABLE SEARCH

D142 035      17.19  .49.67.0.15.27   1-PROCEDURE CALL-TEST PC FIRST TIME FLAG
D142 037      17.20 W.78.99.4.21.31   2-FOR-MARK RETURN FROM SUBSCRIPT TABLE SEARCH
D142 039      17.21 U.22.95.0.01.04   3-GO TO-CALL IN LINE 01
D142 041      17.22 W.28.43.4.21.31   4-DO-MARK RETURN FROM PROCEDURE TABLE SEARCH
D142 043      17.23  .37.51.0.02.30   5-PRINT-ADD ADDRESS OF TOP OF FORMAT TABLE
D142 045     Z02.37                   1V00180    12.27
D142 047      17.24 W.27.U7.4.21.31   6-DICTIONARY-MARK RETURN FROM DICTIONARY SEARCH
D142 049      17.78  .83.86.1.25.27   ZERO TEST SUBSCRIPT TABLE ENTRY
D142 051      17.86  .90.18.0.29.10   NOT FOUND-RESET FIRST IDENT FLAG
D142 053      17.87  .90.64.0.10.27   FOUND-TEST FIRST IDENT FLAG
D142 055      17.65  .85.88.3.29.06   SET-SET FOR-SUBSCRIPT FLAG
D142 057      17.88  .90.64.0.29.10   RESET FIRST IDENT FLAG
D142 059      17.94  .U1.10.0.10.28   PICK UP DUMMY-10.U1
D142 061      17.10  .88.50.0.06.29   ADD FLAG LIST CTR-EXECUTE
D142 063      17.U6  .U7.01.1.26.22   HOLD FLAG LIST ENTRY
D142 065      17.01  .02.09.0.29.25   CLEAR IDO
D142 067      17.09 W.15.26.3.23.31   EXTRACT N-NO OF INPUTS AND OUTPUTS
D142 069      17.26  .27.30.1.25.27   ZERO TEST NUMBER
D142 071      17.30  .32.31.4.20.31   ZERO-RETURN TO MARK IN THIS LINE
D142 073      17.31  .32.35.4.25.24   NOT ZERO-MOVE TO MQ
D142 075      17.35  .28.98.1.26.31   SHIFT 14 BITS LEFT IN MQ
D142 077      17.98 W.05.06.3.23.31   EXTRACT T IN PN
D142 079      17.06  .09.12.2.26.28   PICK UP T
D142 081      17.12  .24.32.0.02.29   ADD MODIFIER
D142 083     Z02.24                   00001U0
D142 085      17.32  .33.84.2.24.29   ADD NX2 TO -8
D142 087      17.84  .92.08.5.06.26   PICK UP IDENT
D142 089      17.08  .11.47.2.28.30   ADD ADDRESS OF TOP OF I-O TABLE
D142 091      17.47  .57.72.3.24.28   -N TO AR
D142 093      17.71  .73.74.1.25.27   ZERO TEST I-O TABLE ENTRY
D142 095      17.75  .77.17.2.25.28   FOUND-PICK UP ENTRY
D142 097      17.74 W.76.77.4.21.31   NOT FOUND-MARK RETURN FROM MASTER I-O TABLE SRCH
D142 099      17.77  .79.81.1.22.26   PICK UP FLAG LIST ENTRY
D142 101      17.81 W.83.90.3.23.31   EXTRACT DEPENDENT PROCEDURE INDICATOR BIT
D142 103      17.90  .91.96.1.25.27   ZERO TEST BIT
D142 105      17.96  .98.97.4.20.31   ZERO-RETURN TO MARK IN THIS LINE
D142 107      17.97  .U0.10.0.06.28   NOT ZERO-PICK UP DUMMY
D142 109      06.U0  .97.U6.4.15.26   DUMMY-PICK UP PREVIOUS FLAG LIST ENTRY
D142 111      17.76  .77.U0.1.25.27   ZERO TEST MASTER I-O TABLE ENTRY
D142 113      17.U1  .U3.17.2.25.28   FOUND-PICK UP ENTRY
D142 115      17.U0 W.02.29.4.21.31   NOT FOUND-MARK RETURN FROM VARIABLE TABLE SEARCH
D142 117      17.29  .34.38.3.06.28   -49X2 TO -8 TO AR
D142 119     Z06.34                   3100000
D142 121      17.38  .92.42.5.06.26   PICK UP IDENT
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D142 123      17.42  .65.72.0.03.30   ADD ADDRESS OF TOP OF VARIABLE TABLE
D142 125     Z03.65                   30001Y0   15.48
D142 127      17.02  .03.13.1.25.27   ZERO TEST VARIABLE TABLE ENTRY
D142 129      17.14  .15.17.1.25.28   FOUND-PICK UP ENTRY
D142 131      17.13 W.16.U7.4.21.31   NOT FOUND-MARK RETURN FROM DICTIONARY SEARCH
D142 133      17.U7 U.64.U3.0.11.04   CALL IN LINE 11 FOR DICTIONARY SEARCH
D142 135      17.40  .42.83.4.21.31   MARK FOR RETURN FROM SUBSCRIPT TABLE SEARCH
D142 137      17.41  .43.48.1.25.27   ZERO TEST SUBSCRIPT TABLE ENTRY
D142 139      17.49  .51.17.1.25.28   FOUND-PICK UP ENTRY
D142 141      17.48 W.56.62.4.21.31   NOT FOUND-MARK RETURN FROM PROCESS TABLE SEARCH
D142 143      17.62  .92.43.5.06.26   PICK UP IDENT
D142 145      17.43  .47.59.0.03.30   ADD ADDRESS OF TOP OF PROCSS TABLE
D142 147     Z03.47                   31001W0   14.49
D142 149      17.59  .64.72.3.03.28   -10X2 TO -8 TO AR
D142 151     Z03.64                   0U00000
D142 153      17.56  .57.69.1.25.27   ZERO TEST PROCESS TABLE ENTRY
D142 155      17.70 U.71.47.0.02.04   FOUND-CALL IN LINE 02 TO SET UP PROC CALL
D142 157      17.69 U.70.61.0.02.04   NOT FOUND-CALL IN LINE 02 TO ASSIGN NEW VARIABLE
                .

D143                                  IDENTIFIER PROCESSING FOR PROCESS CALLS

D143 159      17.60  .68.67.0.28.04   STORE EXIT COMMAND IN LINE -04.68
D143 161      17.67  .69.89.0.03.28   PC FLAG NOT SET-PICK UP I-O PICK UP COMM
D143 163      17.89  .97.03.0.06.29   ADD 1X2 TO -8
D143 165      17.03  .69.50.0.28.03   STORE MODIFIED PICK UP COMM-EXECUTE
D143 167      17.82  .83.11.2.28.26   I-O TABLE ENTRY TO PN
D143 169      17.11 W.13.39.3.23.31   EXTRACT ADDRESS IN PN
D143 171      17.39  .41.57.2.26.28   PICK UP ADDRESS
D143 173      17.57 W.68.11.1.21.31   MARK EXIT TO LIST STORE
D143 175      17.68 W.85.94.4.21.31   FLAG SET-EXIT COMM-MARK RETURN FROM I-O TBL SRCH
D143 177      17.85  .87.92.1.25.27   ZERO TEST I-O TABLE ENTRY
D143 179      17.93  .95.45.0.25.20   FOUND- HOLD ENTRY IN 20.03
D143 181      17.92 W.95.77.4.21.31   NOT FOUND-MARK RETURN FROM MASTER I-O TABLE SRCH
D143 183      17.95  .97.U2.1.25.27   ZERO TEST MASTER I-O TABLE ENTRY
D143 185      17.U3  .U7.45.0.25.20   FOUND-HOLD ENTRY IN 20.03
D143 186      17.U2 W.00.29.4.21.31   NOT FOUND-MARK RETURN FROM VARIABLE TABLE SEARCH
D143 187      17.00  .01.15.1.25.27   ZERO TEST VARIABLE TABLE ENTRY
D143 188      17.16  .19.45.0.25.20   FOUND-HOLD ENTRY IN 20.03
D143 189      17.15 W.27.83.4.21.31   NOT FOUND-MARK RETURN FROM SUBSCRIPT TABLE SRCH
D143 190      17.27 U.28.38.0.09.04   CALL IN LINE 09
D143 191      09.38  .41.56.1.25.27   ZERO TEST SUBSCRIPT TABLE ENTRY
D143 192      09.57  .59.10.0.25.20   FOUND-HOLD ENTRY IN 20.03
D143 193      09.10 U.11.45.0.17.04   RECALL LINE 17

D143 194      09.56 U.57.61.0.02.04   NOT FOUND-CALL IN LINE 02
D143 195      09.68  .49.08.0.06.28   PICK UP MODE INDICATOR
D143 196      09.08  .51.58.3.06.29   SUBTRACT 1 X 2 TO -16
D143 197      09.58  .60.70.0.28.27   ZERO TEST
D143 198      09.71  .75.51.2.22.28   NOT ZERO-NOT PROC.CALL-PICK UP ENTRY
D143 199      09.51  .53.20.1.21.31   MARK BETA TO LIST STORE ROUTINE
D143 200      09.70  .75.10.0.22.20   ZERO-PROC. CALL-HOLD ENTRY IN 20.03
D143 201      17.45  .49.55.0.29.15   RESET PC FIRST TIME FLAG
D143 202      17.55  .57.73.3.06.28   -1 X 2 TO -22 TO AR
D143 203      17.73  .77.25.1.01.29   ADD N TALLY
D143 205     Z01.77                   0000000
D143 207      17.25  .27.36.1.28.27   ZERO TEST TALLY
D143 209      17.36  .49.91.0.29.06   NOT SET-RESET ASSIGNMENT MODE
D143 211      17.37  .77.91.0.28.01   SET-STORE TALLY
D143 213      17.91  .95.17.0.20.28   PICK UP ENTRY FOR LIST
                .

D144                                  IDENTIFIER PROCESSING - FORMAT

D144 215     Z02.37                   1V00180   12.27
D144 217      17.51  .53.61.4.21.31   MARK RETURN FROM FORMAT TABLE SEARCH
D144 219      17.61  .66.72.3.02.28   -8X2 TO -8 TO AR
D144 221     Z02.66                   0800000
D144 223      17.52  .53.79.1.25.27   ZERO TEST FORMAT TABLE ENTRY
D144 225      17.79  .U2.05.6.03.24   NOT FOUND-PICK UP ERROR IND
D144 227     Z03.U2                   96V3W20  FT2
D144 229      17.05 W.80.72.1.21.31   MARK TO ERROR ROUTINE
D144 231      17.80  .49.64.0.29.06   FOUND-RESET ASSIGNMENT MODE
                .

D145                                  IDENTIFIER PROCESSING - DO MODE

D145 233      17.28  .29.33.1.25.27   DO-ZERO TEST PROCEDURE TABLE ENTRY
D145 235      17.33  .80.U5.6.06.24   NOT FOUND-PICK UP ERROR IND
D145 237     Z06.80                   U7V3W20  PT2
D145 239      17.34  .36.66.4.25.26   FOUND-ENTRY TO PN
D145 241      17.66 W.69.14.3.23.31   EXTRACT STARTER NO
                .

D146                                  END OFF ROUTINE

D146 001      09.89  .18.45.0.09.27   ZERO TEST PROC BEGIN-END CTR
D146 004      09.46  .50.60.6.06.24   NOT ZERO-PICK UP ERROR IND
D146 007     Z06.50                   U792950   PBE
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D146 010      09.60 W.45.72.1.21.31   MARK TO ERROR
D146 013      09.45 U.46.29.0.12.04   ZERO-CALL IN LINE 12
D146 016      12.29  .89.93.0.01.28   PICK UP SKIP OUTPUT DUMMY
D146 019      12.93  .02.32.3.05.29   SUBTRACT 05.02
D146 022      12.32  .34.42.0.28.27   ZERO TEST
D146 025      12.42  .43.56.0.17.31   ZERO-RING BELL
D146 028      12.56  .58.56.2.16.31   HALT
D146 031      12.43  .26.28.0.08.28   NOT ZERO-PICK UP END CODE
D146 034      12.28 W.37.11.1.21.31   MARK TO LIST STORE ROUTINE
D146 037      12.37  .45.49.0.11.17   ZERO TEST LIST-11.45
D146 040      12.50 W.49.53.1.21.31   NOT ZERO-MARK TO LIST OUTPUT-RET COMM LEFT IN ID
D146 043      12.49 W.84.90.3.21.31   ZERO-MARK TO CATOR FOR CONSTANT ARRAY
D146 046      12.84  .87.89.2.28.26   LOCATION TO PN
D146 049      12.89 W.94.05.1.21.31   MARK TO CONV AND CR TYPEOUT
D146 052      12.94  .U3.U6.0.18.26   LAST DATA RESERVATION LOC TO PN 1
D146 055      12.U6 U.00.05.1.21.31   MARK TO CONV AND CR TYPEOUT
D146 058      12.U7 U.W0.33.0.18.27   ZERO TEST CATOR WORKING LINE
D146 061      12.14  .74.08.3.29.06   NOT ZERO-SET CATOR END FLAG
D146 064      12.08 W.53.26.3.21.31   MARK TO CATOR OUTPUT
D146 067      12.13 U.14.72.0.09.04   ZERO-CALL IN LINE 09
D146 070      09.72  .U2.U6.0.18.28   PICK UP CHANNEL NO.
D146 073      09.U6  .U4.04.0.06.29   ADD 1X2 TO -23
D146 076      09.04  .U2.U5.0.28.18   STORE MODIFIED CHANNEL NO.
D146 079      09.U5 U.U6.53.0.12.04   RECALL LINE 12
D146 082      12.53  .67.86.0.04.28   PICK UP DUMMY
D146 085      12.67 U.00.10.0.14.19   DUMMY-SUBROUTINE CHANNEL LIST TO LINE 19
D146 088      12.86  .86.86.0.28.31   TEST READY
D146 091      12.87  .89.99.0.31.31   NEXT COMMAND FROM AR
D146 094      12.10  .96.63.0.08.19   DUMMY COMMAND TO 19.96
D146 097      08.96 U.12.01.0.19.18   DUMMY-SUBROUTINE CHANNEL LIST TO LINE 18
D146 100      12.63  .97.05.0.09.19   DUMMY COMMAND TO 19.97
D146 103      09.97  .20.20.1.21.31   DUMMY-TRANSFER TO LYZER AT 01.20
D146 106      12.05  .06.44.0.29.28   CLEAR AR
D146 109      12.44 U.45.58.3.19.29   NEGATIVE CHECK SUM OF LINE 19
D146 112      12.58  .98.17.1.28.19   STORE CHECK SUM BALANCER
D146 115      12.17  .19.31.1.01.25   PICK UP RETURN COMMAND
D146 118      12.31 W.35.02.5.21.31   MARK TO OUTPUT
D146 121      12.35  .35.35.0.28.31   TEST READY
D146 124      12.36  .69.15.0.12.27   ZERO TEST SCRATCH PAD MODE INDICATOR
D146 127      12.16  .69.03.0.12.21   NOT ZERO-PICK UP SCRATCH PAD MODE IND.
D146 130      12.15  .48.66.0.01.28   ZERO-PICK UP 195X2 TO -8-LEADER CTR
D146 133      12.66 U.05.12.0.10.31   PUNCH
D146 136      12.12  .97.48.3.06.29   DECREMENT AR BY 1X2 TO -8
D146 139      12.48  .50.65.0.28.27   ZERO TEST AR



D146 142      12.65 U.66.51.0.00.31   ZERO-SET READY
D146 145      12.51  .69.03.0.12.21   PICK UP SCRATCH PAD MODE INDICATOR
                 .

D147                                  PAPER-TAPE MASTER

D147 148      12.03  .06.64.0.07.21   HOLD NUMBER OF FILES-PAPER TAPE MASTER
D147 151      12.64 U.76.97.0.09.23   PICK UP ALPHA TYPEOUT INFORMATION
D147 154     Z09.75                   U3Y6X1X  LOAD
D147 157     Z09.74                   9ZV4VWX-  NO.
D147 160     Z09.73                   6ZOZU80  3
D147 163      12.97 U.00.19.0.23.19   PLACE IN LINE 19
D147 166      12.19  .24.56.4.09.31   ALPHA TYPE OUT
                 .

D148                                  MAGNETIC-TAPE MASTER

D148 169      12.03  .05.54.2.13.31   READ MASTER TAPE-MAGNETIC TAPE MASTER
D148 172      12.54  .54.54.0.28.31   TEST READY
D148 175      12.55  .06.78.0.07.21   HOLD NUMBER OF FILES
D148 178      12.78 W.99.00.7.21.31   TRANSFER TO LYZER-LATOR LOADER
D148 181     Z12.73                   2739V26-  LINE BALANCER
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D274 000                                    DRUM PREPARATION ROUTINE

D274 001      02.00  .57.01.1.19.28
D274 002      02.01 U.02.02.3.19.29
D274 003      02.02  .03.03.0.28.27
D274 004      02.03 W.88.89.6.21.31   SEE PAGE 5 WD 89
D274 005      02.17 U.18.04.0.19.02
D274 006      02.04 U.17.18.0.19.20   PPR LOADER
D274 007     Z02.13                   0200000
D274 008     Z02.14                   ZZZZZZZ
D274 009      02.15  .46.23.4.02.25
D274 010      02.18  .22.22.2.21.31
D274 011      02.24  .25.26.0.20.29
D274 012      02.26  .27.28.0.28.20
D274 013      02.28  .30.30.0.31.31
D274 014      02.23  .24.27.4.25.22
D274 015      02.27  .28.29.0.22.28
D274 016      02.29  .30.30.3.20.29
D274 017      02.30  .32.33.0.28.27
D274 018      02.33  .36.20.0.20.28   YES
D274 019      02.20  .22.22.0.31.31
D274 020      02.34  .37.37.0.23.31   NO
D274 021      02.37 U.38.38.0.25.19
D274 022      02.38  .41.41.0.15.31   CHANGED IN MAG. TAPE MODE
D274 023      02.41  .45.35.0.22.28
D274 024      02.35  .35.35.0.28.31
D274 025      02.36  .37.31.0.28.27   AR ZERO %
D274 026      02.31  .32.42.0.28.28   YES
D274 027      02.42  .44.21.0.22.28
D274 028      02.21  .20.20.0.29.31   OVRFLW%
D274 029      02.32 U.33.40.3.19.29   NO
D274 030      02.40  .41.42.0.28.27   AR ZERO% IF YES SEE 42
D274 031      02.43  .44.44.0.06.31   NO CHANGED IN MAG TAPE MODE N EQUAL 5
D274 032      02.44  .44.44.0.28.31
D274 033      02.45  .46.37.0.17.31
D274 034      02.05  .05.05.0.28.31
D274 035      02.06  .09.08.0.02.28
D274 036     Z02.09                   0000008
D274 037      02.08 W.08.10.7.28.28
D274 038      02.10  .11.07.0.28.27   16 D. C. DELAY
D274 039     `02.07  .09.11.2.13.31

D274 040      02.11  .11.11.0.28.31
D274 041      02.12 U.00.00.7.21.31   START AGAIN
D274 042      02.48 U.23.22.0.19.14
D274 043     Z02.49                   U4X7350
D274 044      02.50 U.23.22.0.19.17
D274 045     Z02.51                   1WU7047-
D274 046      02.52 U.23.22.0.19.07
D274 047     Z02.53                   20Y7146-
D274 048      02.54 U.23.74.0.19.06
D274 049     Z02.55                   0V3U3U5
D274 050      02.74  .75.76.0.20.28
D274 051      02.76  .77.24.0.20.29
D274 052      02.58 U.23.22.0.19.05
D274 053     Z02.59                   9Y05U34-
D274 054      02.60 U.23.22.0.19.04
D274 055     Z02.61                   3Z78U8V
D274 056      02.62 U.23.22.0.19.03
D274 057     Z02.63                   V46V445
D274 058      02.64 U.23.22.0.19.15
D274 059     Z02.65                   VY9W76X
D274 060      02.66 U.23.22.0.19.01
D274 061     Z02.67                   18759U1-
D274 062      02.68 U.23.22.0.19.00
D274 063     Z02.69                   Y1042W0
D274 064      02.70 U.23.22.0.19.13
D274 065     Z02.71                   8316X78
D274 066      02.72 U.23.81.0.19.08
D274 067     Z02.73                   76YUWWV
D274 068      02.81  .84.97.0.02.28   PRECESS LN 19 - 08 -
D274 069      02.84 U.00.75.0.19.09
D274 070      02.97  .99.99.0.31.31
D274 071      02.75  .77.82.0.28.21
D274 072      02.82  .84.98.0.08.31
D274 073      02.98  .U0.99.0.00.31
D274 074      02.99 U.U1.83.0.01.01
D274 075      02.83  .85.U0.0.08.31
D274 076      02.U0  .U2.U1.0.00.31
D274 077      02.U1  .U5.77.0.21.28
D274 078      02.77  .U2.U3.0.02.29
D274 079     Z02.U2                   0000001
D274 080      02.U3  .U5.U5.0.28.21
D274 081      02.U5  .U6.U7.3.02.29
D274 082      02.U6 U.00.75.0.19.13
D274 083      02.U7  .21.V6.2.21.27
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D274 084      02.96  .97.80.0.00.00
D274 085      02.80 U.U0.U4.0.19.16
D274 086      02.U4  .U6.85.0.21.27
D274 087      02.85 U.90.86.4.09.31
D274 088      02.86  .86.86.0.28.31
D274 089      02.87  .90.91.0.02.28
D274 090      02.91  .U2.92.1.18.29
D274 091      02.92  .U2.93.0.28.18
D274 092      02.93 U.94.48.0.13.02
D274 093      02.89 U.17.17.6.20.31   FROM PAGE 1 WD TIME 3 BP TEST
D274 094      02.88 W.94.17.0.29.21   CLEAR 2102
D274 095     Z02.94                   3938207 2ND BALANCER

D275 000                              STATEMENT TYPE FINDER ROUTINE

D275 001      00.77  .78.92.0.06.25   A00 A04 BEGIN
D275 002      06.78 U.21.92.0.18.28   0077
D275 003      00.72  .U7.74.0.12.19   A00 FROM A04
D275 004      08.83 U.20.69.0.17.19
D275 005      00.74  .U7.U7.6.21.31   GO TO 19U7
D275 006      17.49  .51.80.0.22.26   G05
D275 007      17.80 W.U5.83.3.23.31   G05
D275 008      17.83  .87.88.0.28.21   G05
D275 009      17.88  .89.98.3.26.29   G05 S@H MINUS L@J
D275 010      17.98  .99.00.2.28.27   G05 G06 S@H EQUAL TO L@J %
D275 011      17.00  .01.14.0.25.27   G05 YES ANYTHING IN L@J LIST %
D275 012      17.14  .16.34.0.20.27   G05.1 NO FINISHED %
D275 013      17.34  .U2.U2.0.21.31   G05.1 YES GO TO FINISH ROUTINE
D275 014      17.35  .02.79.0.07.24   G05.2 NO SET DUMMIES
D275 015      07.02  .66.66.3.21.31   0386
D275 016      17.79  .82.19.0.22.28   G02 GO TO DECRE J BY 1
D275 017      17.19  .21.21.0.21.31   G05.2 DECRE J BY 1
D275 018
D275 019      17.15  .U3.05.0.25.10   G05.3 NO. INTO STORE
D275 020      17.05  .02.25.1.26.31   G05.3 SHIFT 1 PLACE
D275 021      17.25  .27.02.0.25.27   G05.3 ONLY 1 IN STACK %
D275 022      17.02  .39.03.0.08.17   G05.3 YES SET S@2 IND.
D275 023     Z17.39                   0000000 S@2 IND. REGISTER
D275 024      17.03 U.06.18.0.07.30   G05.3 NO
D275 025     Z07.04                   0X00000 0696
D275 026     Z07.05                   Z000000 03U4 1701
D275 027      17.18  .19.20.0.26.27   G05.3 L@J EQUAL TO TAB %
D275 028      17.21 U.15.79.0.07.24   G05.3 NO DECRE J BY 1

D275 029      07.13  .45.11.0.08.28   0068
D275 030     Z07.14                   0100000 0068-0609-0638-06U0-1869
D275 031      00.11  .13.13.6.21.31   GO TO G07
D275 032      17.13  .16.17.0.28.22   G07 L@J-4 INTO L@J-3
D275 033      17.17  .19.24.0.22.28   G07
D275 034      17.24  .25.29.0.28.26   G07
D275 035      17.29  .30.31.0.17.21   G07 SET RETURN
D275 036      17.30  .53.53.3.21.31   G07
D275 037      17.31 W.39.43.3.23.31   G07
D275 038      17.43  .45.08.0.22.31   G07 L@J EQUAL TO THETA @ 1%
D275 039      17.09  .11.11.3.21.31   G07.1 YES GO TO LATOR
D275 040      17.08  .11.16.3.07.29   G07 NO
D275 041     Z07.11                   7200000 INCRE AND TRANSF 1800
D275 042      17.16  .18.32.0.22.31   G07 COMM EQUAL TRANSFR %
D275 043      17.32  .35.09.0.22.28   G07.1 NO GO TO LATOR
D275 044      17.33  .35.10.0.26.27   G07 YES NOT UNCON. TRANSF %
D275 045      17.10  .11.56.0.22.28   G07 YES
D275 046      17.56  .58.58.5.21.31   G01 GO TO LATOR
D275 047      17.11  .27.27.3.21.31   G07.2 NO GO TO D02
D275 048      03.27  .39.65.0.17.27   D02 FROM G07.2 S@2 SET %
D275 049      03.65  .67.00.0.22.28   D02.1 NO PICK UP L@J
D275 050      03.00  .54.54.5.21.31   D02.1 GO TO LATER
D275 051      03.66 U.68.68.1.25.28   D02 YES PICK UP CC
D275 052      03.68  .72.76.2.21.21   D02 EXCHANGE CC
D275 053      03.76  .79.92.0.28.20   D02 HOLD PRESENT CC.
D275 054      03.92  .93.U5.1.26.29   D02 ADD TR CODE
D275 055      03.U5  .06.00.0.17.21   D02 D02.1 SET LATOR RETURN
D275 056      17.06  .37.37.3.21.31   G09 DUMMY RETURN 0300
D275 057      03.37  .39.40.2.20.17   D02 BACK FROM LATOR CLEAR S@2
D275 058      03.40  .44.53.0.28.21   D02 RESTORE CC
D275 059      03.53 U.30.U3.0.07.24   D02
D275 060     Z07.28                   0100000 0353
D275 061      07.29  .45.34.0.08.28   0353
D275 062      03.U3  .U6.02.0.22.28   D02 PICK UP L@J-1
D275 063      03.02  .21.21.0.21.31   D02 A02 GO TO DECRE J BY 1
D275 064      00.34  .60.60.3.21.31   GO TO D02
D275 065      03.60  .64.U2.0.28.22   D02 STORE L@J-4
D275 066      03.U2  .U3.01.2.10.28   D02 PICK UP COUNTER
D275 067      03.01  .04.94.7.28.28   D02 DECRE STOR
D275 068      03.94  .95.98.0.28.27   D02 STOR EMPTY
D275 069      03.98  .77.77.0.21.31   D02.1 YES GO TO PICK UP NT STMT
D275 070      03.99  .U3.U4.0.28.10   D02 NO SET STOR
D275 071      03.U4  .17.17.6.21.31   D02 G07 RETURN TO LOOP
D275 072
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D275 073
D275 074      17.01  .03.04.0.21.28   G06 NO
D275 075      17.04  .05.22.1.07.29   G06
D275 076      17.22  .23.26.2.21.27   G06 S#H EQUAL TO TAB %
D275 077      17.26  .U4.46.0.06.10   G06.1 YES SET SWITCH
D275 078      17.27 U.36.37.0.28.29   G06 NO SHIFT
D275 079      17.37  .38.47.0.28.26   G06
D275 080      17.47 W.60.23.3.23.31   G06
D275 081      17.23  .62.62.2.21.31   G06 GO TO C01
D275 082
D275 083      17.20  .U4.46.0.29.10   G05.4 YES CLEAR SWITCH
D275 084      17.46  .57.57.0.21.31   G05.4 GO TO A13
D275 085      00.57  .U4.70.0.09.27   A13 FROM G TELO EMPTY %
D275 086      00.70  .U4.54.0.10.27   A13 YES B@S SET %
D275 087      00.54  .21.21.6.21.31   A13 NO
D275 088      00.55  .65.77.0.29.06   A00 YES
D275 089      00.71 U.U6.39.2.09.26   A13.1 NO TELO INTO PN
D275 090      00.39  .U4.79.4.29.09   A13.1 CLEAR TELO
D275 091      00.79  .82.82.4.21.31   A13.1 E09
D275 092      04.82  .U6.39.0.10.21   E09
D275 093      08.98  .70.70.0.21.31
D275 094      04.39  .00.00.5.21.31   E09 GO TO SNAPSHOT BUILDER
D275 095
D275 096      02.62  .64.65.0.25.27   C01 FROM G LABELED %
D275 097      02.66  .68.07.0.21.28   C07 YES
D275 098      02.07  .58.U3.1.26.17   C07 STORE PN SET IND.
D275 099      02.U3 U.U7.U7.2.25.09   C07 SET TELO NO. 1 AND 1.5
D275 100      02.U7  .21.33.0.28.26   C07
D275 101      02.13 W.28.70.3.21.31   C07 GO TO PICK UP ROUTINE
D275 102      02.28  .29.79.0.02.29   C07
D275 103      02.29 U.U0.01.0.13.28   C07 DUMMY PICK UP
D275 104      02.01  .14.14.1.21.31   C07 B18 GO TO B18
D275 105      01.14  .15.62.0.28.27   B18 B18.1 FROM C LABEL ENTRY ZERO %
D275 106      01.63  .64.69.2.21.21   B18.1 NO EXCHANGE WITH
D275 107      01.69  .87.49.0.28.01   B18.1 C.C. AND SET IN
D275 108      01.49  .50.75.0.06.21   B18.1 LABEL TABLE
D275 109      06.50  .79.79.1.21.31   0149
D275 110      01.75  .58.58.5.21.31   B18.1 GO TO LATOR
D275 111      01.79  .87.40.0.01.28   B18.1
D275 112      01.40  .44.62.0.28.21   B18.1 B18
D275 113      01.62  .U5.09.0.09.26   B18 YES SET IN LABEL TABLE
D275 114      01.09  .10.34.0.01.26   B18
D275 115      01.10  .U0.U6.0.24.13   B18 DUMMY STORE
D275 116      01.34  .U5.36.0.09.26   B18

D275 117      01.36 W.55.70.3.21.31   B18 GO TO STORER ROUTINE
D275 118
D275 119      02.65 W.68.69.3.23.31   C01 NO
D275 120      02.69  .70.71.2.26.28   C01
D275 121      02.71  .72.79.0.07.29   C01
D275 122      07.72  .80.02.0.25.28   0271
D275 123      02.79  .81.81.0.31.31   C01 DISTRIBUTE
D275 124
D275 125      02.02  .32.79.0.07.29   C02 1-3
D275 126      07.32  .79.85.0.06.28   0202
D275 127     Z06.79                   7500000 MARK PLACE 0647 0279
D275 128
D275 129      02.06  .48.79.0.07.29   C03 4-7
D275 130      07.48  .81.96.0.06.28   0206
D275 131     Z06.81                   5500000 STOP
D275 132
D275 133      02.10  .49.79.0.07.29   C04 8-11
D275 134      07.49  .U1.20.0.29.07   0210
D275 135
D275 136      02.14  .31.34.2.07.27   C05 12 OR 13 %
D275 137     Z07.31                   Z000140 0214
D275 138
D275 139      02.18  .22.81.0.08.25   C06 C02.1 16-19
D275 140      08.22 U.21.V7.0.18.28   0218
D275 141
D275 142
D275 143      02.U6  .58.92.0.17.27   C14 IND SET %
D275 144      02.93  .58.65.1.17.26   C14 C01 YES IND INTO PN
D275 145      02.92  .96.76.0.17.28   C14 NO DUMMY CC PICKUP
D275 146     Z17.96                   6100008 USED AT 0292
D275 147      02.76  .80.82.2.21.21   C14 EXCHANGE
D275 148      02.82  .84.78.1.28.24   C14 STORE PRESENT CC
D275 149      02.78  .82.48.0.17.21   C14 GO TO LATOR
D275 150      17.82  .80.80.2.21.31   G10 DUMMY RETURN 0278
D275 151      02.80  .84.50.1.24.21   C14 STORAGE INTO CC

D276 000                              H INCREMENTER

D276 001      00.89  .90.92.0.00.25   A01 A01 INCREMENT H BY 1
D276 002      00.90 U.21.96.0.18.28   A04
D276 003      00.92  .93.94.0.20.28   A04
D276 004      00.94  .95.96.0.07.29   A04
D276 005     Z07.95                   0100000 0094 1887
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D276 006      00.96  .97.98.0.28.20   A04
D276 007      00.98  .99.U0.3.06.29   A04
D276 008     Z06.99                   3Y00000 LENGTH OF BLOCK 0098
D276 009      00.U0  .U1.U2.2.20.27   A04 LIMIT OF TAPE %
D276 010      00.U3  .U4.U5.0.25.29   A04 NO
D276 011      00.U5  .U7.U7.0.31.31   A04 PICK UP S@H

D277 000                              J MODIFICATION ROUTINES

D277 001      00.07 U.24.25.2.22.22   A01 INCREMENT J BY 1
D277 002      00.25 U.28.28.1.28.26   A01
D277 003      08.29  .44.89.1.26.08   0028
D277 004      00.28 U.31.31.1.08.24   A01
D277 005      00.31  .32.33.0.20.28   A01 A02 A03
D277 006      00.33  .34.35.3.24.29   A01 A02 A03
D277 007      00.35  .36.38.0.28.20   A01 A02 A03
D277 008      00.38  .39.40.2.24.29   A01 A02 A03
D277 009      00.40  .42.42.0.31.31   A01 A02 A03
D277 010      00.21 U.28.31.2.22.22   A02 DECREMENT J BY 1
D277 011      00.87  .88.89.0.28.22   A02
D277 012      00.12 U.24.24.2.22.22   A03 DECREMENT J BY 2
D277 013      00.24 U.27.27.0.08.24   A03
D277 014      08.25 U.47.85.1.08.26   0024
D277 015     Z08.26                   0200000 0024-0447-0611
D277 016      00.27  .28.29.0.20.26   A03
D277 017      00.29  .31.31.3.23.31   A03
D277 018      00.85  .89.93.1.26.28   A03
D277 019      00.93  .95.95.4.21.31   A03 E01 GO TO E01
D277 020      04.95  .96.98.0.25.27   E01 FROM A03 STORAGE OF
D277 021      04.98  .U0.U5.7.26.22   E01 L@J-4 AND L@J-5
D277 022      04.99 U.U2.U5.1.26.22   E01 IN THEIR PROPER
D277 023      04.U5  .U6.U7.0.21.28   E01 SEQUENCE

D278 000                              TAPE READ ROUTINE

D278 001      00.U2 U.U3.05.0.29.19   A17 YES
D278 002      00.05  .07.46.0.15.31   A17 TAPE READ ROUTINE
D278 003      00.46  .49.66.0.29.20   A17 CLEAR J
D278 004      00.66  .67.18.0.29.28   A17
D278 005      00.18  .18.18.0.28.31   A17
D278 006      00.19 U.20.30.3.19.29   A17 CHECK SUM LINE INPUT
D278 007      00.30  .16.36.2.06.27   A17 CHECK SUMMED%

D278 008      00.36 U.41.74.0.29.23   A17 YES CLEAR 23
D278 009      00.37  .52.52.4.21.31   A17 E13 NO
D278 010      04.52  .58.43.4.08.31   E13 FROM A17
D278 011      04.43  .45.53.0.16.31   E13 HALT WRONG CHECK SUM
D278 012      04.53  .U2.U2.0.21.31   E13

D279 000                              IF STATEMENT PROCESSOR

D279 001      02.87  .65.74.0.02.06   C02.2 IF SET IF INDICATOR
D279 002      02.74  .U1.23.0.12.07   C02.2 C04.3
D279 003     Z08.77                   0201020 TO BE STORED IN

D280 000                              FOR STATEMENT PROCESSOR

D280 001      02.88  .U1.67.0.10.07   C02.3 FOR
D280 002     Z08.93                   0000600 TO BE STORED IN
D280 003      02.67  .83.51.0.07.28   C02.3
D280 004     Z07.83                   0000600 FOR STMT SUBTRACTOR 0081
D280 005      02.51  .86.23.0.28.07   C02.3 C04.3 SET FOR INDICATOR

D281 000                              PRINT STATEMENT PROCESSOR

D281 001      02.20  .U1.23.0.09.07   C04.1 C04.3 PRINT
D281 002     Z08.U1                   0100020 TO BE STORED IN

D282 000                              ASSIGNMENT STATEMENT PROCESSOR

D282 001      02.23  .10.84.0.29.08   C04.3 ASSIGN.
D282 002      02.84  .42.70.0.07.20   C04.3
D282 003     Z07.42                   0000600 FOR STMT SUBTRACTOR 0168
D282 004      02.70  .89.89.0.21.31   C04.3 GO TO ASSIGN PROCESS
D282 005      00.76  .78.78.1.21.31   A04
D282 006      01.78  .79.80.0.28.21   B01 A04 STORE S@H
D282 007      01.80  .81.82.0.21.27   B01 B06 B@T SET%
D282 008      01.83  .84.U2.3.06.29   B06 YES
D282 009      01.82  .84.84.0.22.31   B01 B05 NO S@H EQUAL OPERATOR %
D282 010      01.85  .86.88.0.22.26   B01 YES S@H EQUALS OPERATOR
D282 011      01.88  .89.90.3.07.26   B01
D282 012      01.90  .92.93.2.26.29   B01
D282 013      01.93  .96.96.3.23.31   B01
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D282 014      01.96   .98.99.2.25.27   B01 B02 L@J-1 EQUAL OPEN PARA %
D282 015      01.99   .03.05.0.21.28   B02 YES
D282 016      01.05   .07.07.0.21.31   B01 B02 GO TO A01 INCRE J BY 1
D282 017      01.U0   .U1.U3.3.25.29   B01 NO
D282 018      01.U3   .U5.U5.0.22.31   B01 B03 P S@H GREATER THAN P L@J-1%
D282 019      01.U6   .U7.01.0.26.27   B01 B04 S@H EQUAL TAB
D282 020      01.02   .03.05.0.21.28   B01 NO
D282 021      01.01   .81.81.0.21.31   B04 YES THRU WITH ASSIGN STMT
D282 022      00.81   .83.65.0.07.28   A12
D282 023      00.65   .86.88.3.07.29   A12
D282 024      00.88   .04.13.2.08.27   A12 FOR STMT%
D282 025      00.13 U.14.41.0.18.19   A12 YES FOR PROCESSOR

D282 026      00.14 U.15.41.0.17.19   A12 NO

D282 027      00.41   .62.62.6.21.31   A12 G02 H01 GO TO G02 OR H01
D282 028      17.62 U.78.79.0.17.24   G02
D282 029     Z17.76                   0100000
D282 030      17.77   .45.84.0.08.28   G02
D282 031      00.84   .65.62.0.06.27   A16 ASSIGN OR PRINT STMT %
D282 032      00.63   .64.55.0.28.22   A16 A00 NO
D282 033      00.62   .64.48.0.28.22   A16 YES
D282 034      00.48   .51.72.0.21.28   A16 A00
D282 035
D282 036      01.84   .85.86.3.06.29   B05 NO S@H NOT EQUAL OPERATOR
D282 037      01.86   .87.91.0.28.27   B05 B06 S@H EQUAL OPEN PARENTHESIS %
D282 038      01.91   .94.95.0.22.28   B05 YES S@H EQUALS CLOSE PARA
D282 039      01.95   .98.04.3.07.29   B05
D282 040      01.04   .42.U1.0.02.26   B05
D282 041      01.U1   .U3.U4.2.22.27   B05 B08 L @ J-1 EQUAL TO OPEN PARA %
D282 042      01.U4 U.07.18.0.08.24   B05 YES
D282 043      01.18   .21.21.0.21.31   B05 A02 GO TO A02 DECRE J BY 1
D282 044
D282 045      01.92   .93.94.1.06.29   B06 NO
D282 046      01.94   .95.97.0.28.27   B06 B07 S@H EQUAL KEY8D %
D282 047      01.98   .U0.U2.3.07.29   B06 NO
D282 048      01.U2   .U4.U4.0.21.31   B06 A06
D282 049      00.U4   .U5.00.2.21.27   A06 A07 FROM B06 S@H EQUAL OPEN BRACT%
D282 050      00.01   .03.07.2.21.27   A07 A01 B@T SET% NO S@H NOT EQUAL OPEN BRACT
D282 051      00.08   .09.10.3.08.29   A07
D282 052      00.10   .11.06.2.21.27   A07 A01 S@H EQUAL CLOSING BRACKET%
D282 053      00.06 U.07.60.0.06.19   A07
D282 054      00.60   .68.68.6.21.31   A07 F02 GO TO SUBSCRIPT PROCESSOR
D282 055      00.00   .04.44.2.20.27   A06 YES B@T SET %
D282 056      00.45 U.46.45.0.17.31   Z01 YES ERROR
D282 057      00.44   .50.50.1.21.31   A06 B19 NO GO TO B
D282 058      01.50   .51.60.2.22.20   B19 PUT J INTO LAMBDA
D282 059      01.60 U.63.02.0.28.21   B19 GO TO B01
D282 060
D282 061      01.97   .U1.38.0.07.28   B07 YES
D282 062      01.38   .42.71.3.07.29   B07
D282 063      01.71   .U4.U4.2.21.31   B07 C08
D282 064      02.U4   .U7.04.2.21.27   C08 FOR STMT %
D282 065      02.04   .07.07.0.21.31   GO TO A01 YES
D282 066      02.05   .10.11.0.08.27   C08 NO B@S SET %
D282 067      02.11   .10.32.0.00.08   C08 NO SET B@S
D282 068      02.32   .38.43.0.08.28   C08
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D282 069      Z08.38                          5800000 GATE INPUT 0258
D282 070       02.12  .14.15.0.20.28          C08 YES
D282 071       02.15  .17.19.0.08.29          C08 BUILD ST I COMMAND
D282 072      Z08.17                          8Y00000 0215
D282 073       02.19 U.24.24.2.23.23          C08
D282 074       02.24  .26.27.0.20.28          C08
D282 075       02.27  .31.58.1.08.29          C08
D282 076      Z08.31                          0000400 0227
D282 077       02.58  .38.43.2.08.20          C08 INCREMENT I
D282 078       02.43 U.48.49.2.23.23          C08 GATE INPUT COMMAND
D282 079       02.49  .94.09.0.17.21          C08 GO TO LATOR
D282 080       17.94  .U2.U2.2.21.31          G08 DUMMY USED AT 0249
D282 081       02.U2  .U6.04.0.20.28          C12
D282 082
D282 083       01.U5  .U7.00.0.22.28          B08 NO
D282 084       01.00  .02.03.3.20.29          B08
D282 085       01.03  .05.06.2.22.27          B08 B09 L@J EQUAL TO I %
D282 086       01.06  .07.08.1.08.29          B09 YES
D282 087       01.08  .10.11.3.20.29          B09
D282 088       01.11  .14.15.2.20.27          B08 B10 L@ J-2 EQUAL TO 1-1%
D282 089       01.15  .16.17.0.29.24          B08 YES CLEAR B@A
D282 090       01.17  .18.19.3.08.29          B08
D282 091      Z08.18                          0000400 0117
D282 092       01.19  .22.22.0.28.20          B08 B11 DECREMENT I BY 1
D282 093       01.16  .18.22.0.28.24          B10 B11 NO SET B @ A
D282 094       01.22  .24.25.0.08.28          B11
D282 095      Z08.24                          UU00000 0122-0123
D282 096       01.25 W.34.67.3.23.31          B11
D282 097       01.67  .70.73.0.22.29          B11 SEE 73
D282 098       01.73  .74.28.0.26.27          B11
D282 099       01.28  .81.81.0.21.31          B11 A12
D282 100       01.29  .30.51.2.20.27          B11 L@J-1 EQUAL TO EXPON SIGN %
D282 101       01.51  .52.55.0.24.27          B11 B08 B10 YES B@A SET %
D282 102       01.55  .56.58.0.06.29          B08 NO BUILD ST 1 PLUS 1
D282 103       01.56  .57.58.0.07.29          B10 YES BUILD ST I
D282 104       01.58  .62.64.0.28.23          B11
D282 105       01.64  .65.66.0.22.28          B11
D282 106       01.66  .67.68.0.06.29          B11
D282 107      Z06.67                          3900000- 0166
D282 108       01.68  .69.70.0.28.23          B11 BUILD CA L@J-2
D282 109       01.70  .71.72.0.22.28          B11
D282 110       01.72  .73.74.3.07.29          B11
D282 111      Z07.73                          0002Y00 ADDR OF CONST 2 0172
D282 112       01.74  .75.76.2.07.27          B11 B12 L@J EQUAL 2%
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D282 113      Z07.75                          4W03200- MY-A- 0174
D282 114       01.76  .80.89.2.23.23          B11 YES BUILD MY ACCUM.
D282 115       01.89  .09.09.0.21.31          B11 A03 GO TO A03 DECRE J BY 2
D282 116       00.09  .10.12.3.20.21          A03 GO TO DECRE J BY 2
D282 117       01.77  .80.81.0.07.23          B12 NO BUILD LOG
D282 118      Z07.80                          5Y00000 0177
D282 119       01.81  .86.86.0.21.31          B12 A05
D282 120       00.86  .88.91.0.07.28          A05 FROM B12
D282 121      Z07.88                          4W00000- 0086
D282 122       00.91  .95.99.0.22.29          A05
D282 123       00.99 U.U4.U6.2.23.23          A05 BUILD MY L@ J
D282 124       00.U6  .00.03.0.08.28          A05
D282 125      Z08.00                          5700000 EXP 0006
D282 126       00.03 U.08.09.2.23.23          A05 A03 BUILD EXPONENTIAL
D282 127
D282 128       01.07  .10.12.0.08.27          B09 B13 B@S SET %
D282 129       01.12  .10.39.2.22.08          B09 NO SET B @ S
D282 130       01.39  .40.41.1.08.29          B09
D282 131      Z08.40                          UU00000 0139
D282 132       01.41  .43.44.2.22.27          B09 L@J-1 EQUAL TO EXPON SIGN %
D282 133       01.45  .46.47.0.06.29          B09.1 NO
D282 134      Z06.46                          3900000- 0145 1771
D282 135       01.47  .49.52.0.28.23          B09.1 BUILD CA L@J
D282 136       01.52  .53.54.0.22.28          B09.1
D282 137       01.44  .45.54.0.22.28          B09 YES
D282 138       01.54  .55.59.2.22.20          B09 B17 PUT L@J-2 INTO ADDR OF N.O.
D282 139       01.59  .79.79.3.21.31          B17 D03
D282 140       03.79  .89.90.1.07.29          D03
D282 141      Z07.89                          0V00000- 0188
D282 142       03.90 U.91.85.0.16.19          D03 PUT ROUTINE IN LN. 19
D282 143       03.85  .87.87.6.21.31          D03 YES GO TO B 55
D282 144       08.55 W.90.91.2.22.27          L@J EQU OPEN PARA %
D282 145       08.59 U.96.84.0.29.23          YES CLEAR 28
D282 146       08.52  .86.86.0.20.28          I INTO ACC
D282 147       08.54  .83.85.3.07.29
D282 148       08.53 U.87.88.2.20.27          HAS I BEEN INCRE %
D282 149       08.56  .02.02.1.21.31          NO GO TO B01
D282 150       08.57  .18.90.3.08.29          YES DECRE I BY 1
D282 151       08.58  .86.88.0.28.20          RESTORE I
D282 152       08.60  .57.57.1.21.31          NO GO TO E03
D282 153       01.57  .60.61.1.06.29          B17
D282 154      Z06.60                          UU00000 0159 0123
D282 155       01.61  .62.64.2.22.27          B17 B11 L@J-1 EQUAL TO EXPON %
D282 156       01.65  .67.67.4.21.31          B17 D03 NO GO TO D03
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D282 157      04.67  .69.69.0.22.31   E03 E05 L@J-1 EQUAL THETA @ 1%
D282 158      04.69  .70.71.1.28.26   E03 NO
D282 159      04.71  .73.73.3.23.31   E03
D282 160      04.73  .74.75.0.29.21   E03
D282 161      04.75  .76.92.0.26.27   E03 E04 L@J-1 EQUAL THETA @ 3%
D282 162      04.92 U.93.04.0.06.19   E04 NO PROCEDURE CALL
D282 163      04.93  .96.97.0.28.29   E03 YES
D282 164      04.97 U.99.14.0.20.28   E03
D282 165      04.14 U.17.19.0.08.24   E03
D282 166      08.15  .45.95.0.08.28   0414
D282 167     Z08.16                   0100000 0414
D282 168      04.19  .21.21.0.21.31   E03 A02 GO TO DECRE J BY 1
D282 169      00.95  .U3.U3.4.21.31   A08 E02 GO TO E
D282 170      04.U3  .08.U7.2.08.22   E02
D282 171     Z08.08                   0000000 0004
D282 172      04.U7  .22.27.0.08.21   E01 RTN COM SET
D282 173      04.07  .11.11.3.21.31   E01 GO TO LATOR
D282 174
D282 175      04.70  .73.74.0.22.28   E05
D282 176      04.74  .76.76.0.22.31   E05 E06 L@J-2 EQUAL THETA @ 1%
D282 177      04.77  .78.84.0.00.00   E06
D282 178      04.76  .77.80.1.07.29   E05 NO
D282 179     Z07.77                   0V00000- 0476
D282 180      04.80  .82.84.2.22.27   E05 E06 L@J-2 EQUAL OPEN PARA %
D282 181      04.84  .86.87.0.22.28   E06
D282 182      04.87  .90.91.1.06.29   E06
D282 183     Z06.90                   WZ00000 0487
D282 184      04.91  .92.93.2.06.27   E06 L@J-2 EQUAL - %
D282 185     Z06.92                   3703200- CS 2400 0491
D282 186      04.94 U.95.94.0.17.31   Z01 NO ERROR
D282 187      04.85  .87.88.2.07.26   E05
D282 188      07.87 U.U6.00.0.06.28   0485
D282 189      04.88  .90.90.3.23.31   E05
D282 190      04.90  .93.96.1.07.30   E05 PRECEDENCE OF L@J-1
D282 191     Z07.93                   Y000000 0490
D282 192      04.96  .97.U0.0.26.27   E05 E07 EQUAL TO 2%
D282 193      04.U0  .U1.U2.1.07.29   E05 YES
D282 194      04.U2  .U4.U4.0.31.31   E05
D282 195      04.00  .01.02.0.22.29   E05
D282 196      04.02  .04.04.0.21.31   E05 A10
D282 197      00.04  .08.09.2.08.23   A10 A03 FROM E05
D282 198      04.01  .16.36.1.26.31   E05 IF STMT
D282 199      04.36  .37.38.1.25.29   E05
D282 200      04.38  .40.40.0.31.31   E05 GO TO A11
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D282 201      00.51  .55.56.0.06.28   FROM E05 EQUAL
D282 202     Z06.55                   3200000- 0051 0052
D282 203      00.52  .55.59.0.06.28   FROM E05 GREATER THAN
D282 204      00.53  .58.59.0.07.28   FROM E05 LESS THAN
D282 205     Z07.58                   3100000- 0053
D282 206      00.59  .61.49.0.22.29   A11 BUILD SEQUENCE FOR
D282 207      00.49  .64.67.2.07.23   A11 IF COMMANDS
D282 208     Z07.64                   000U000 TP 0062
D282 209      00.56  .57.58.0.22.29   A11
D282 210      00.58  .64.67.2.06.23   A11
D282 211     Z06.64                   000V000 TNZ 0058
D282 212      00.67 U.68.73.0.17.19   A11
D282 213      00.73  .38.38.6.21.31   A11 G04 GO TO G04
D282 214      17.38  .39.40.2.23.20   G04 STORE TRANSF COMMAND
D282 215      17.40  .42.09.0.17.21   G04 SET RETURN AND GO TO LATOR
D282 216      17.42  .36.36.6.21.31   G04 RETURN COMMAND
D282 217      17.36  .39.41.0.20.28   G04 PICK UP TRANSF COMMAND
D282 218      17.41  .44.44.0.21.29   G04 ADD COMMAND COUNTER
D282 219      17.44 U.47.48.2.17.22   G04 STORE IN L@J LIST
D282 220     Z17.45                   1000001-
D282 221      17.48  .49.52.0.29.28   G04 CLEAR AR
D282 222      17.52  .78.09.0.17.21   G04 SET RETURN AND GO TO LATOR
D282 223      17.78  .62.62.6.21.31   G04 DUMMY RETURN COMMAND
D282 224
D282 225      04.U1  .U2.U6.0.22.28   E07
D282 226      04.U6  .02.02.0.21.31   E07 A10
D282 227      00.02  .03.04.1.20.29   A10 FROM E07
D282 228      01.13  .14.21.3.20.29   B13 YES
D282 229      01.21  .22.23.2.22.27   B13 B14 L@J-2 EQUAL TO I %
D282 230      01.23  .24.26.1.08.29   B13 YES
D282 231      01.26  .27.30.0.28.27   B13 B11 L@J-1 EQUAL TO EXPON.SIGN%
D282 232      01.30  .69.70.0.00.00   B11 YES PAGE 3 SEE B11
D282 233      01.31  .32.33.1.08.29   B13 NO
D282 234     Z08.32                   2500000 0131
D282 235      01.33  .34.42.0.28.27   B13 B15 L@J-1 EQUAL TO MINUS %
D282 236      01.43  .45.46.3.06.29   B13 NO
D282 237     Z06.45                   1500000 0143
D282 238      01.46  .47.53.2.22.27   B13 B09 B16 L@J-1 EQUAL TO DIVIDE %
D282 239      01.53  .54.76.0.06.29   B16 YES BUILD DV L@J
D282 240     Z06.54                   4300000- 0153
D282 241      01.42  .43.48.0.22.28   B15 YES
D282 242      01.48  .51.76.0.06.29   B15 BUILD SU L@J
D282 243     Z06.51                   3200000- 0148 1750
D282 244
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D282 245      01.24  .26.27.0.20.28   B14
D282 246      01.27  .28.32.0.08.29   B14 BUILD ST I
D282 247     Z08.28                   8Y00000 0127
D282 248      01.32  .34.35.2.20.23   B14
D282 249      01.35  .36.37.1.08.29   B14 INCREMENT I BY 1
D282 250     Z08.36                   0000400 0135
D282 251      01.37  .38.39.2.22.20   B14 B09 SEE B09 PAGE 4
D282 252
D282 253      04.86  .U5.57.0.28.04   E11
D282 254      04.57  .75.75.0.21.31   E11 A09
D282 255      00.75  .76.78.0.07.28   A09
D282 256     Z07.76                   0W00000 0075
D282 257      00.78  .79.80.3.21.29   A09
D282 258      00.80  .83.82.2.21.27   A09 S@H EQUAL TO CLOSE PARA %
D282 259      00.82  .91.91.1.21.31   B05 YES GO TO B05
D282 260      00.83  .85.85.1.21.31   B01 NO GO TO B01

D283 000                              SUBSCRIPTS PROCESSOR

D283 001      06.68  .69.70.0.29.21   F02 FROM A07 CLEAR I REGISTER
D283 002      06.70  .71.75.0.20.28   F02 LAMBDA
D283 003      06.75  .76.77.3.20.29   F02
D283 004      06.77  .79.82.0.28.27   F02 LAMBDA EQUAL TO J %
D283 005      06.82  .85.91.2.21.21   F02.1 YES CLEAR B@T
D283 006      06.91  .94.U3.1.21.29   F02.1 ADD L @ LAMBDA
D283 007      06.U3  .U5.27.0.28.26   F02.1
D283 008      06.27 W.61.63.3.23.31   F02.1
D283 009      06.63  .67.69.1.26.22   F02.1 I PLUS L@ LAMBDA INTO L@J
D283 010      06.69  .89.89.0.21.31   F02.1 A01 EXIT
D283 011      06.83  .87.35.0.22.26   F02 NO
D283 012      06.35 W.47.48.3.23.31   F02
D283 013      06.48  .49.52.0.25.27   F02 L@J EQUAL NUMERIC %
D283 014      06.53  .54.57.0.22.28   F02.2 YES
D283 015      06.57  .59.73.0.22.31   F02.2 F03 L@ J-1 EQUAL THETA @ 1%
D283 016      06.73  .04.05.3.07.29   F02.2 NO
D283 017      06.05  .06.10.0.28.27   F02.2 L@J-1 EQUAL OPEN BRACT%
D283 018      06.10  .11.32.1.26.28   F02.2 YES
D283 019      06.11  .26.28.3.08.29   F02.2 NO
D283 020      06.28  .31.32.3.26.27   F02.2 L@J-1 EQUAL COMMA%
D283 021      06.33 U.34.33.0.17.31   Z01 NO ERROR
D283 022      06.32  .34.47.0.21.29   F02.2 YES
D283 023      06.47  .50.31.0.28.21   F02.2 RESTORE LAMBDA
D283 024      06.31  .33.34.0.22.28   F02.2



D283 025      06.34  .35.06.3.07.29   F04
D283 026     Z07.35                   0X00000 0634
D283 027      06.06  .07.42.0.28.27   F04 L@ J-2 EQUAL OPEN BRACK%
D283 028      06.42 U.16.01.0.07.24   F04 YES
D283 029      06.01 U.07.38.2.22.22   F04
D283 030      06.38  .31.31.0.21.31   A01 GO TO DECRE J
D283 031      06.43  .41.U0.3.07.29   F04 NO
D283 032      06.U0  .U1.06.0.28.27   F04 L@ J-2 EQUAL COMMA %
D283 033      06.U1  .U4.07.2.00.22   F05
D283 034      06.07  .09.39.0.22.28   F04 NO
D283 035      06.39  .U5.02.0.10.04   F04 PATCH INTO 04 U5
D283 036      08.97  .29.29.6.21.31
D283 037      06.02  .12.12.0.21.31   GO TO A03 DECRE J BY 2
D283 038      06.29  .18.40.0.07.28   F04
D283 039      06.40  .U5.70.0.28.04   F04 PATCH INTO 04U5
D283 040
D283 041      06.74  .U7.03.1.09.29   F03
D283 042     Z08.U7                   WV00000
D283 043      06.03  .06.08.3.22.27   F03 L@J-1 EQUAL PLUS %
D283 044      06.08  .09.10.0.06.06   F03.1 GO TO F02.2 YES
D283 045      06.09  .58.15.2.07.29   F03. NO
D283 046      06.15  .19.20.3.26.27   F03 L@ J-1 EQUAL - %
D283 047      06.20  .21.32.3.28.28   F03 YES
D283 048      06.21 U.22.21.0.17.31   Z01 NO ERROR
D283 049
D283 050      06.52 W.77.80.3.23.31   F02 NO
D283 051      06.80  .81.86.0.25.27   F02 L@J EQUAL SUBSCRIPT %
D283 052      06.86 U.87.86.0.17.31   Z01 NO ERROR
D283 053      06.87  .89.95.0.21.27   F02 YES FIRST OF PAIR%
D283 054      06.95  .99.36.0.22.28   F02.3 YES PICK UP L@J
D283 055      06.36  .37.39.2.22.21   F04 RESTORE I-REGISTER
D283 056      06.96  .43.49.0.22.26   F02 NO
D283 057      06.49  .53.61.0.21.28   F02
D283 058      06.61  .62.88.0.28.26   F02
D283 059      06.88 W.56.58.7.23.31   F02
D283 060      06.58  .59.72.0.26.28   F02
D283 061      06.72  .74.94.3.26.29   F02
D283 062      06.94  .95.97.2.26.27   F02 EQUAL SIGN %
D283 063      06.98 U.99.98.0.17.31   Z01 NO ERROR
D283 064      06.97  .01.36.1.08.29   F02 YES ADD PAIR IND.

D284 000                              FOR STATEMENT COMMAND BUILDER

D284 001      18.62  .86.67.2.22.07   H01
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D284 002      18.67 U.75.69.2.22.22   H01
D284 003      18.69 U.16.63.0.07.24   H01
D284 004      07.15  .45.22.0.08.28   0642 1869
D284 005      18.63  .21.21.0.21.31   H01 DECRE J BY 1
D284 006      00.22  .U1.U1.6.21.31   GO TO H01
D284 007      18.U1  .U2.U3.0.28.26   H01
D284 008      18.U3  .U4.U5.0.28.22   H01
D284 009      18.U5 W.52.64.3.23.31   H01
D284 010      18.64  .66.70.0.25.27   H01 I EQUAL SUBSCRIPT %
D284 011      18.71  .72.73.1.25.30   H01 YES
D284 012      18.73  .76.78.6.22.24   H01
D284 013      18.78  .79.U7.0.22.26   H01
D284 014      18.U7 W.67.85.3.23.31   H01
D284 015      18.65  .67.74.0.25.27   H01 L@J EQUAL TO DIGIT %
D284 016      18.74  .07.U6.3.07.30   H02 NO
D284 017     Z07.07                   0800000 1874
D284 018      18.U6  .12.U2.0.08.28   H02
D284 019      18.U2  .U4.66.1.24.29   H02
D284 020      18.66  .67.72.1.24.29   H02 COMM PLUS I
D284 021      18.72  .75.79.0.26.27   H02 L@J EQUAL TO KEYBD %
D284 022      18.79  .11.76.2.08.23   H02.1 YES
D284 023     Z08.11                   5800000 GATE INPUT 1879
D284 024      18.80  .03.84.2.08.23   H02. NO ST INTO 2300
D284 025      18.75  .27.U0.0.07.28   H01 YES
D284 026     Z07.27                   86ZZY00 -ST-B 1875
D284 027      18.U0 U.U3.84.1.24.29   H01 ADD I
D284 028      18.84  .87.76.0.22.29   H01 ADD L@J
D284 029      18.76  .22.81.5.24.07   H01 STORE IN M0
D284 030      18.81  .82.83.0.18.21   H01 SET RETURN
D284 031      18.82  .86.86.6.21.31   H01 DUMMY RETURN
D284 032      18.83  .11.11.3.21.31   H01 GO TO LATOR
D284 033      18.86  .22.85.4.07.26   H03
D284 034      18.85  .86.87.1.26.28   H03
D284 035      18.87  .95.96.1.07.29   H03
D284 036      18.96  .98.U4.0.28.26   H03 INCRE COUNTER
D284 037      18.U4  .U7.00.3.10.29   H03
D284 038     Z08.99                   0300000
D284 039      18.00  .11.88.2.07.27   H03 LIMIT %
D284 040      18.89  .90.95.0.22.28   H03.1 NO
D284 041      18.95  .15.15.0.21.31   H03.1 GO TO DECRE J BY 1
D284 042      00.15  .U2.21.4.07.24   DECRE J BY 1
D284 043     Z07.U2                   0100000 0015
D284 044      07.U3  .45.60.0.08.28   0015
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D284 045      18.68  .72.99.0.28.22   H04 L@J-4 INTO L@J-3

D284 046      18.99  .U0.78.5.26.24   H04
D284 047
D284 048      18.88  .89.91.1.26.29   H03 YES BUILD INCREMENT
D284 049      18.91  .95.97.0.28.22   H03 STORE IN L@J
D284 050      18.97  .30.92.0.06.28   H03 TR-INC-
D284 051     Z06.30                   000W000 1897
D284 052      18.92  .96.77.0.21.29   H03 ADD COMMAND COUNTER
D284 053      18.77  .82.94.0.28.22   H03 STORE IN L@J-1
D284 054      18.94  .61.93.0.07.28   H03
D284 055     Z07.61                   1000002- 1894
D284 056      18.93  .15.15.4.21.31   H03 GO TO E10
D284 057      04.15 U.32.35.2.22.22   E10 FROM H03
D284 058      04.35 U.38.62.1.28.26   E10
D284 059      04.62 U.67.81.1.04.24   E10
D284 060      04.65  .44.77.1.26.08   E10
D284 061     Z04.66                   ZZ00000-
D284 062      04.81  .31.31.0.21.31   E10 GO TO A01 INCREMENT J BY 1
D284 063
D284 064      18.70 U.71.71.0.17.19   H01.1 G03 NO
D284 065      17.71  .46.55.0.06.28   G03 FROM H01.1
D284 066      17.55  .59.64.0.22.29   G03
D284 067      17.64  .U5.57.2.06.23   G03 BUILD CA L@J
D284 068     Z06.U5                   8Y00000 04U2 1759
D284 069      17.57  .60.61.0.22.29   G03
D284 070      17.61  .64.65.2.23.23   G03 BUILD ST L@J-3
D284 071      17.65  .66.09.0.17.21   G03 GO TO LATOR
D284 072      17.66  .60.60.6.21.31   G03 DUMMY RETURN
D284 073      17.60  .64.67.0.07.28   G03
D284 074      17.67  .68.69.0.21.29   G03 TNN-CC
D284 075      17.69  .72.89.2.22.22   G03
D284 076      17.89 U.93.95.1.17.24   G03
D284 077      17.91  .44.60.1.26.08   G03 DUMMY PICKUP INITIAL
D284 078     Z17.92                   ZZ00000-
D284 079      17.95 U.04.63.2.22.22   G03
D284 080      17.63 U.66.99.1.28.26   G03
D284 081      17.99  .31.31.0.21.31   G03 INCRE J BY 1
D284 082      17.68  .69.70.0.22.28   G03 BACK FROM LINE 0
D284 083      17.70  .72.73.0.17.29   G03
D284 084     Z17.72                   3500000-
D284 085      17.73  .58.59.2.07.22   G03 BUILD AD DIFF INTO L@J-1
D284 086      17.59  .60.74.0.22.29   G03
D284 087      17.74  .28.84.2.08.22   G03 BUILD SI LIM INTO L@J-3
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D284 088      17.84   .79.81.0.22.29   G03
D284 089      17.81   .85.86.2.17.22   G03 BUILD ST VAR INTO L@J-2
D284 090     Z17.85                    3900000-
D284 091      17.86   .87.12.0.22.29   G03
D284 092      17.12   .75.87.2.17.22   G03 BUILD CA VAR INTO L@J
D284 093     Z17.75                    1000005-
D284 094      17.87 U.94.95.1.17.24   G03 GO TO INCRE J BY 1
D284 095      17.93   .44.77.1.26.08   G03 DUMMY PICK UP FINAL


D285 000                               PROCESS CALL PROCESSOR

D285 001      04.04   .06.20.0.23.28   E04 PICK UP 2302
D285 002      04.20 U.25.27.0.29.23   E04 CLEAR LINE 23
D285 003      04.27   .28.31.2.20.23   E04
D285 004      04.31   .37.40.0.28.08   E04 STORE J INTO J-BAR
D285 005      04.40   .03.09.6.08.25   E04 STORE J INTO K
D285 006     Z08.03                    3900000- CA 0403 1884
D285 007      04.09   .10.11.0.22.29   E04 BUILD CA L@ J-1
D285 008      04.11 U.14.16.1.28.26   E04
D285 009      04.16   .19.36.0.08.28   E04 STORE INTO L @ K PLUS 2
D285 010      08.19   .46.05.1.26.08   0416
D285 011      04.05   .07.10.0.22.28   E04
D285 012      04.10   .12.13.0.08.29   E04 BUILD ST L@J
D285 013     Z08.12                    8Y00000 0410
D285 014      04.13 U.16.17.1.28.26   E04
D285 015      04.17   .20.36.0.08.28   E04 STORE INTO L@K PLUS 3
D285 016      08.20   .47.08.1.26.08   0417
D285 017      04.08 U.19.21.2.22.22   E04
D285 018      04.21   .22.U4.0.06.28   E04
D285 019      06.22   .18.58.0.07.28   0421
D285 020      07.18 U.U7.U7.0.21.28   0629 0622-04U5-
D285 021      04.U4   .U5.06.0.28.04   E04 PATCH 04U5
D285 022      04.06   .24.24.0.21.31   E04 A03 DECRE J BY 2
D285 023      04.58   .U5.22.0.28.04   E04 REPLACE PATCH AT 04U5
D285 024      04.22   .23.26.0.22.28   E04
D285 025      04.26   .27.28.1.08.29   E04
D285 026      04.28   .31.32.2.22.27   E04 L@J EQUAL TO EQUAL SIGN%
D285 027      04.32 U.36.60.1.08.26   E04.1 YES
D285 028     Z08.34                    2100000- 0433
D285 029     Z08.35                    2100000- 0433
D285 030      04.60   .66.36.0.06.28   E04.1 STORE EQUAL INTO L@K PLUS 1
D285 031      06.66 W.45.03.1.26.08   0460
D285 032      04.03   .33.34.3.08.28   E04.1


D285 033     Z08.33                    0100000 0418-0614
D285 034      04.34   .35.37.1.25.29   E04.1
D285 035      04.37   .41.42.0.28.25   E04.1
D285 036      04.42 U.48.48.2.22.22   E04.1
D285 037      04.48 U.40.81.0.07.24   E04.1
D285 038     Z07.38                    0100000 0637
D285 039      07.39   .45.50.0.08.28   0637
D285 040      00.50   .52.61.0.28.22   L@J-4 INTO L@J
D285 041      00.61   .33.33.4.21.31   GO TO E04
D285 042      04.33   .39.41.3.08.29   E04 NO
D285 043     Z08.39                    0V00000 0433
D285 044      04.41   .43.46.2.25.27   E04 L@J EQUAL OPEN PARA %
D285 045      04.47   .26.40.3.08.29   E04 NO K-2
D285 046      04.46   .50.55.0.22.28   E04.1 YES
D285 047      04.55 U.64.79.0.28.29   E04.1 SHIFT RELATIVE NUMBER
D285 048      04.79   .81.83.2.25.26   E04.1
D285 049      04.83   .84.89.0.28.26   E04.1
D285 050      04.89 W.U0.70.3.21.31   E04.1 GO TO PICK UP ROUTINE
D285 051      02.U0 U.48.49.4.21.31   C11 E04.1
D285 052      04.49   .69.U2.0.07.29   E04.1
D285 053      07.69 U.U1.12.0.13.28   0420
D285 054      04.12   .15.18.2.22.20   E04.1 TR COMMAND
D285 055      04.18   .22.23.2.26.22   E04.1
D285 056      04.23   .25.25.2.28.25   E04.1
D285 057      04.25   .37.37.6.21.31   E04.1 GO TO F01
D285 058      06.37   .53.71.0.07.28   F01
D285 059      07.53 U.47.U4.0.08.28   0637
D285 060      06.71   .73.76.1.25.29   F01 K PLUS 2
D285 061      06.76   .78.78.0.31.31   F01
D285 062      06.U4   .U5.U6.1.28.26   F01
D285 063      06.U6   .14.16.1.08.29   F01
D285 064     Z08.14                    XZ00000 06U6
D285 065      06.16   .41.U7.2.08.27   F01 IS THIS EQUAL SIGN %
D285 066     Z08.41                    7500000 MT 0622-0616
D285 067      06.U7 U.24.24.2.23.23   F01.1 YES PRECESS 23
D285 068      06.04   .07.18.1.25.22   F01.1 STORE K IN L@J
D285 069      06.18 U.19.51.0.17.19   F01.1 GO TO G01
D285 070      17.51   .90.09.0.17.21   G01 SET DUMMY RETURN
D285 071      17.90   .50.50.6.21.31   G01 DUMMY RETURN
D285 072      17.50   .51.53.0.20.28   G01 TR STORAGE PICK UP
D285 073      17.53   .54.56.0.17.21   G01 SET RETURN
D285 074      17.54   .28.28.6.21.31   G01 DUMMY RETURN
D285 075      17.28 U.29.25.0.06.19   G01 RETURN TO LN. 6 F01.2
D285 076      06.25   .27.12.0.22.25   F01.2 RESTORE K
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D285 077
D285 078       06.00  .01.23.1.26.28   F01 NO
D285 079       06.23 U.28.41.2.23.23   F01 PRECESS LINE 23
D285 080       06.41  .42.12.0.28.27   F01 LIST FULL %
D285 081       06.13  .42.62.0.08.21   F01.2 YES LIST IS FULL
D285 082       08.42  .25.25.6.21.31   0613
D285 083       06.62  .63.14.0.25.22   F01.2 KEEP K IN L@J
D285 084       06.14  .11.11.3.21.31   F01.2 GO TO LATOR
D285 085       06.12  .13.17.2.25.28   F01 NO
D285 086       06.17  .33.24.1.08.29   F01 K PLUS 1
D285 087       06.24  .30.30.4.21.31   F01 GO TO E12
D285 088       04.30  .31.44.0.28.25   E12 FROM F01
D285 089       04.44  .41.50.3.07.29   E12 INCREMENT K
D285 090      Z07.41                    0200000 0643
D285 091       04.50  .37.61.3.08.29   E12
D285 092       04.61  .63.24.2.20.27   E12 A04.1 K-1 LESS THAN J BAR %
D285 093       04.24  .27.U7.2.26.22   E12 NO
                 .

D286 000                               DO AND GO TO ROUTINES

D286 001       02.86  .U2.09.0.06.21   C02.1 DO
D286 002       06.U2  .96.96.2.21.31   0286
D286 003       02.09  .11.11.3.21.31   C02.1 GO TO LATOR
D286 004       02.96  .74.81.0.07.25   C03.1 C02.1 GO TO STMT
D286 005       07.74 U.21.88.0.18.28   0270
D286 006       02.81  .92.92.0.21.31   C02.1 A04 INCREMENT H BY 1
D286 007       00.68 U.77.23.0.28.29   A14
D286 008       00.29  .25.32.0.28.26   A14
D286 009       00.32  .35.43.0.28.21   A14
D286 010       00.43  .00.00.2.21.31   A14 C09
D286 011       02.00 W.36.70.3.21.31   C09 GO TO PICK UP ROUTINE
D286 012       02.36  .43.79.0.07.29   C09
D286 013       07.43 U.U1.08.0.13.28   0236
D286 014       02.08  .12.16.0.28.27   C09 REG. EMPTY %
D286 015       02.16  .19.25.0.21.26   C09 YES
D286 016       02.25  .52.53.0.07.26   C09
D286 017       07.52  .U0.26.1.24.13   0225
D286 018       02.53 W.55.70.3.21.31   C09 GO TO STORER ROUTINE
D286 019       02.55 U.57.59.1.21.28   C09
D286 020       02.59 U.62.64.1.28.24   C09
D286 021       02.64  .65.75.0.29.28   C09
D286 022       02.75 U.78.79.0.26.29   C09
D286 023       02.26  .27.31.0.08.28   C09 PICK UP DUMMY

D286 024      Z08.27                    XZ00000 0226-0424
D286 025       02.17  .21.31.1.08.29   C09 NO
D286 026       02.31  .98.48.0.18.21   C09
D286 027       18.98  .50.50.2.21.31   H05 DUMMY USED AT 0231
D286 028       02.48 W.50.58.5.21.31   C09 GO TO TR UNC. BUILDER
D286 029       02.50  .77.77.0.21.31   C05.2 A00 GO TO H INCREMENTOR
                 .

D287 000                               READ AND WRITE STATEMENTS

D287 001       02.99  .U0.U1.0.09.23   C03.4 WRITE
D287 002      Z08.92                    8100000 THE 8 FOLLOWING WDS
D287 003       02.97  .U0.U1.0.10.23   C03.2 C03.4 READ
D287 004      Z08.U0                    7Z00000 THE 8 FOLLOWING WDS
D287 005       02.U1  .U2.81.0.09.25   C03.4 C02.1
D287 006       08.U2 U.21.67.0.18.28   LINE 09 U0-U7
D287 007       00.47  .54.54.4.21.31   GO TO E08
D287 008       04.54  .57.59.0.28.26   E08
D287 009       04.59 W.61.63.3.23.31   E08 ZZ00000
D287 010       04.63  .20.29.1.26.31   E08 SHIFT 10 PLACES
D287 011       04.29  .44.45.0.06.28   E08 ST. L NO. 22
D287 012      Z06.44                    88ZZX60 -ST-L NO.22 0429
D287 013       04.45  .47.51.1.25.29   E08 ADD DIMENTION
D287 014       04.51  .53.56.1.26.29   E08 ADD START LOC
D287 015       04.56  .23.64.2.08.23   E08 STORE AND ST.B NO 22
D287 016      Z08.23                    8700160 ST-B NO 22 0461
D287 017       04.64  .65.68.0.26.29   E08 ADD START LOC
D287 018       04.68  .70.72.0.28.23   E08 STORE
D287 019       04.72  .73.78.0.29.28   E08 CLEAR A R
D287 020       04.78  .83.83.2.21.31   E08 GO TO C10
D287 021       02.83  .89.98.0.06.23   C10 FROM E08
D287 022      Z06.89                    8700170 -ST-B NO. 23 0283
                 .

D288 000                               RETURN STATEMENT

D288 001       02.21  .94.98.0.07.28   C04.2 C02.1 RETURN
D288 002      Z07.94                    5600000 RETURN TO MARK 0794
                 .

D289 000                               STOP STATEMENT

D289 001       02.98  .U2.09.0.10.21   C03.3 C02.1 STOP
D289 002       08.94  .77.77.0.21.31   LINE 10 U0-U7
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D290 000                                    PROCEDURE BEGIN PROCESSOR

D290 001      02.34 W.40.42.0.21.31         C05.1 A01 BEGIN OF PROCEDURE
D290 002      00.42  .90.69.0.07.00         A01 FROM C 05.1
D290 003      07.90 U.21.84.0.18.28         0042
D290 004      00.69  .70.07.0.07.28         A01 INCREMENT J BY 1
D290 005     Z07.70                         0000140 0069
D290 006      00.64 U.73.26.0.28.29         A01 BACK FROM A04
D290 007      00.26  .73.73.3.21.31         A01 D01
D290 008      03.73  .90.91.0.18.00         D01 PLACE PATCH
D290 009      18.90 U.21.96.0.18.28         H06 DUMMY USED AT 0373
D290 010      03.91  .U5.U7.0.28.09         D01
D290 011      03.U7  .57.57.2.21.31         D01 C13
D290 012      02.37  .58.U7.0.29.17         C13 FROM D01 CLEAR IND
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D291 000                                    STATEMENT PARENTHESIZER BEGIN

D291 001      02.35  .39.41.0.22.29         C05.2 BEGIN STMT PARENTHESIZER
D291 002      02.41  .43.50.0.28.22         C05.2
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D292 000                                    BELLS-PERIODS-C/R-TABS ROUTINE

D292 001      00.97  .99.U1.2.21.21         A15
D292 002      00.U1 U.10.16.0.28.29         A15 SHIFT NO. OF CR BLS TBS PRDS
D292 003      00.16  .13.17.1.08.29         A15
D292 004     Z08.13                         5000000 0016
D292 005      00.17  .19.20.1.21.29         A15
D292 006      00.20  .46.46.2.21.31         A15 C15
D292 007      02.46  .47.98.2.28.28         C15 C03.3 FROM 0020 A15
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D293 0                                      EXTRACTORS-SWITCHES-INDICATORS-CONSTANTS

D293 000     Z02.30                         0100000
D293 001     Z02.38                         0100000
D293 002     Z02.42                         ZZZZW00
D293 003     Z02.47                         0000200
D293 004     Z02.56                         0000210
D293 005     Z02.60                         ZZ00000
D293 006     Z02.68                         0003000
D293 007     Z02.72                         00ZZZZZ
D293 008     Z02.77                         000012O

D293 009     Z02.89                         0Z00000-
D293 010     Z02.94                         Z000000
D293 011     Z02.95                         Z000000
D293 012      02.U5                         000000Z
D293 013     Z06.65                         000000b0 IND FOR IF NOT EQUAL ZERO MEANS IF
D293 014     Z07.22                         0000000 T-LOC 1876 1886
D293 015     Z07.23                         0000000 T-LOC 1876 1886
D293 016     Z07.33                         0000000 STOR 0632-0629
D293 017     Z07.86                         0000000 IND FOR FOR STMT 0084
D293 018     Z07.U1                         0000000 TYPE IND 04U0-0197-0287-0288-0220-022
D293 019     Z08.10                         0000000 B-S 0107-0112-0205-0211
D293 020     Z08.21                         0000000 TR 0120-0217
D293 021     Z08.37                         0000000 T-LOC K STORAGE
D293 022     Z17.58                         0000000 IND 0207 02U6 0251 0237
D293 023     Z17.97                         0000000 TR COMM LOC TO 1ST STEP
D293 024     Z06.26                         3208800
D293 025     Z06.56                         8Y00400 0155
D293 026     Z06.84                         0X00000 0183
D293 027     Z06.85                         0W00000 0184
D293 028     Z06.93                         0400000 0192
D293 029     Z07.00                         0100000 03U3
D293 030      07.01  .45.63.0.08.28         03U3
D293 031     Z07.30                         8Y00000 ST-B
D293 032     Z07.57                         8Y00000 0156
D293 033     Z07.82                         0300000
D293 034     Z07.98                         0V00000 0195
D293 035     Z07.U0                         0500000 0198
D293 036     Z07.U6                         6700000 PRINT 04U2
D293 037      07.U7  .42.50.0.21.31         04U2
D293 038     Z08.01                         0000001 0672
D293 039      08.02  .75.75.0.21.31         04U7
D293 040      08.04  .45.97.0.08.28         0088
D293 041      08.05  .45.87.0.08.28         0104
D293 042     Z08.06                         0100000 0104
D293 043     Z08.07                         0000400 0106
D293 044     Z08.09                         0Y00000 0008
D293 045     Z08.30                         ZZ00000- 0028
D293 046     Z08.43                         0000140
D293 047     Z08.68                         36XY1Z5 FOLLOWING WDS TO BE
D293 048     Z08.69                         -753Z697 TYPED FROM LINE 19
D293 049     Z08.70                         -UVYXV3W
D293 050     Z08.71                         -9Z2YUU9  -TYPE KEY
D293 051     Z08.72                         72696UZ NUMBERS-
D293 052     Z08.73                         Y3Z697X
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D293 053      Z08.74                        VZV45UV-
D293 054      Z08.75                        V3Z8Y7X
D293 055       08.76 U.83.59.0.08.23        THE 8 FOLLOWING WDS
D293 056      Z08.78                        0000280 LINE 12 U0-U7
D293 057      Z08.79                        69ZZZU0
D293 058      Z08.80                        6400100
D293 059      Z08.81                        00005Y0
D293 060      Z08.82                        Y0000Y0
D293 061       08.84  .85.85.0.16.31        THE 8 FOLLOWING WDS
D293 062       08.85  .33.33.0.21.31        TO BE STORED IN
D293 063       08.86 U.U2.06.0.07.05        LINE 11 U0-U7
D293 064       08.87 U.U0.U2.0.08.05
D293 065       08.88 W.U3.U5.1.24.21
D293 066       08.89 U.01.78.1.24.28
D293 067       08.90 U.U2.17.0.07.05
D293 068       08.91 U.00.39.1.24.28
D293 069      Z08.95                        0000000
D293 070      Z08.96                        0000000
D293 071      Z08.U3                        0000000
D293 072      Z08.U4                        0000000
D293 073      Z08.U5                        0000000
D293 074      Z08.U6                        0000000
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D294 000                                    FINISH ROUTINE BOOTSTRAP

D294 001       01.20 U.21.93.0.16.01        B99 FINISH ROUTINE BOOTSTRAP
D294 002       08.61 U.98.99.0.16.23        THESE SEVEN COMMANDS TO BE
D294 003      Z86 2                         -9ZV4VWX STORED IN LINE 16 WDS 93-99
D294 004      Z08.63                        U3Y6X1X
D294 005       08.64 W.00.98.4.09.31        TYPE -LOAD NO. 4-
D294 006      Z08.65                        6Z13U80
D294 007       08.66  .98.98.0.16.31
D294 008       08.67 U.00.96.0.23.19
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D212 000                                    LLL SECOND LOADER FOR PKG 3

D212 001       02.48  .51.91.0.02.28        LLL01 SET UP LINE CLEAR
D212 002       02.91  .93.U7.0.31.31        LLL02 EXECUTE LINE CLEAR
D212 003       02.51 U.W0.50.0.29.09        LLL03 CLEAR LINE 09 UP TO U0
D212 004       02.30  .71.91.0.02.29        LLL04 CLEAR LINE 10 UP TO U0
D212 005       02.31  .71.91.0.02.29        LLL05 CLEAR LINE 11 UP TO U0
D212 006       02.32  .71.91.0.02.29        LLL06 CLEAR LINE 12 UP TO U0
D212 007       02.33 U.34.35.0.29.13        LLL07 CLEAR LINE 13
D212 008       02.35  .37.83.0.02.28        LLL08 SET UP CLEAR LINE 16
D212 009       02.83  .85.99.0.31.31        LLL09 EXECUTE LINE CLEAR
D212 010       02.37 U.93.45.0.29.16        LLL10 CLEAR LINE 16  00-92 U0-U7
D212 011       02.45 U.54.78.0.02.20        LLL11 LOAD LINE 20
D212 012      Z02.50                        0000600 LLL12  TO 20 2
D212 013      Z02.53                        3X00000 LLL 13  TO 20 1
D212 014       02.78 U.81.87.0.29.20        LLL14 CLEAR 20 3 AND 20 0
D212 015       02.87 U.98.18.0.02.22        LLL15 LOAD LINE 22
D212 016       02.18  .10.19.0.29.08        LLL16 CLEAR 08 10
D212 017       02.19  .25.83.0.02.28        LLL17 SET UP CLEAR LINE 17
D212 018       02.25 U.00.00.0.29.17        LLL18 CLEAR LINE 17 U0-U7
D212 019      Z02.71                        0001001 04LLL
D212 020       02.92  .01.01.0.12.31        LLL20 TYPE IN DDD TAB DDD TAB S
D212 021       02.01  .01.01.0.28.31        LLL21 WAIT
D212 022       02.02  .04.07.6.23.24        LLL22 LOAD TYPE-IN TO MQ
D212 023       02.07  .06.14.1.26.31        LLL23 SHIFT OFF LEADING GARBAGE
D212 024       02.14  .15.17.0.02.25        LLL24 LOAD 1 X 2 - 24TH
D212 025       02.17  .08.26.0.24.31        LLL25 FORM DESTINATION
D212 026       02.26  .27.29.1.02.25        LLL26 LOAD 10 X 2 - 4TH
D212 027       02.29  .08.38.0.24.31        LLL27 TENS IN WD
D212 028       02.38  .39.41.1.02.25        LLL28 LOAD 1 X 2 - 4TH
D212 029       02.41  .10.52.0.24.31        LLL29 FORM WD
D212 030       02.52  .53.54.2.26.28        LLL30 CC TO AR
D212 031       02.54  .56.58.0.28.21        LLL31 CC TO Z100
D212 032       02.58  .59.60.0.24.26        LLL32 LIMIT TO PN
D212 033       02.60  .61.62.0.02.24        LLL33 MULT COMPRESS TO MQ
D212 034       02.62  .64.65.3.23.31        LLL34 D1 TO 1D
D212 035       02.65  .06.72.0.24.31        LLL35 MULT X 10
D212 036       02.72  .74.75.3.23.31        LLL36 10D1 PLUS D2 TO 1D
D212 037       02.75  .06.82.0.24.31        LLL37 MULT X 10
D212 038       02.82  .83.84.2.26.28        LLL38 INTEGER X 2 - 12 AR
D212 039       02.84  .85.86.3.02.29        LLL39 MINUS 794 LIMIT OF COMMANDS
D212 040       02.86  .88.88.0.22.31        LLL40 IF LESS 794 GO TO LLL42
D212 041       02.88  .85.90.0.02.28        LLL41 REL LIM SET TO 794
D212 042       02.89  .85.90.0.02.29        LLL42 ADD 794 FOR REL LIM
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D212 043      02.90   .91.04.2.28.24   LLL43 REL TO MQ
D212 044      02.04   .08.11.4.02.25   LLL44 1/100 TO 1D
D212 045      02.11   .24.36.0.24.31   LLL45 MULT FOR CH X 2 MINUS 29TH
D212 046      02.36   .37.40.6.26.30   LLL46 SHIFT ONE LEFT TO DESTINATION
D212 047      02.40   .42.44.7.26.25   LLL47 FRACTION CH TO 1D 1
D212 048      02.44   .45.46.2.26.28   LLL48 DESTINATION TO AR
D212 049      02.46   .47.49.0.02.24   LLL49 100 TO MQ
D212 050      02.49   .16.66.0.24.31   LLL50 MULT FOR WD X 2 MINUS 8TH
D212 051      02.66   .68.68.3.23.31   LLL51 GARBAGE OUT OF WD
D212 052      02.68   .69.70.2.26.29   LLL52 MAKE CHWD IN AR
D212 053      02.70   .74.76.0.02.29   LLL53 PLUS DUMMY STORE
D212 054      02.76 U.77.77.0.14.18   LLL54 FIX LINE 18
D212 055      02.77 U.78.79.0.29.14   LLL55 CLEAR LINE 14
D212 056      02.79   .U3.03.2.28.09   LLL56 STORE IN 09 U3 AS COMMAND LIMIT
D212 057      02.74 W.00.99.0.25.09   53LLL DUMMY STORE
D212 058      02.93   .U2.21.6.18.25   LLL78 CH TO 1D1
D212 059      02.21   .10.56.1.26.31   LLL79 SHIFT TO DESTINATION
D212 060      02.56   .57.69.2.25.28   LLL80 DESTINATION TO AR
D212 061      02.69   .U0.16.2.18.29   LLL81 ADD WD
D212 062      02.16   .20.57.2.28.21   LLL82 CHWD TO CC IN 21 00
D212 063      02.57   .U3.64.2.18.28   LLL83 REL LAST TO AR
D212 064      02.64 U.71.84.2.28.29   LLL84 SHIFT TO MINUS 12TH TO LLL 39
D212 065      02.03   .06.12.0.21.27   LLL57 MAG TAPE MODE TO LLL 67
D212 066      02.12 U.00.10.0.02.19   LLL58 COPY TYPEOUT TO LINE 19
D212 067      02.13   .05.06.0.02.00   LLL67 CHANGE READ PT TO READ MT
D212 068      02.10   .12.20.4.09.31   LLL59 TYPE MOUNT NO 2 OUTPUT
D212 069     Z02.U7                    U4Y624Y LLL 59.1 TYPES
D212 070     Z02.U6                    -VY7ZV4V LLL 59.2 MOUNT
D212 071     Z02.U5                    9V6ZOVZ LLL 59.3 NO
D212 072     Z02.U4                    X37U79Z LLL 59.4 2
D212 073     Z02.U3                    7Z4Z3YU LLL 59.5 OUTPUT
D212 074      02.24 U.28.55.0.29.21   LLL61 CLEAR LINE 21 NOT CC
D212 075      02.20 U.U3.24.0.02.23   LLL60 LOAD LINE 23 WITH LLL63-66
D212 076      02.55   .57.U1.7.21.31   LLL62 TO LINE 23 LLL 63
D212 077      02.U1 U.U2.U2.0.15.02   LLL63 LINE 15 TO LINE 2 IS LL LINE 2
D212 078      02.U2 U.U3.U3.0.29.15   LLL64 CLEAR LINE 15
D212 079      02.99   .U4.U4.0.16.31   LLL65 HALT
D212 080      02.U0   .77.77.0.21.31   LLL66 TO LL TO READ NO 2 OUTPUT
D212 081      02.05   .07.46.1.13.31   67LLL READ MAG TAPE PATCH FOR LL
D212 082      02.06   .10.23.2.21.28   LLL68 LOAD FILE COUNTER
D212 083      02.23   .40.42.1.04.31   LLL69 REVERSE A FILE
D212 084      02.42   .42.42.0.28.31   LLL70 WAIT
D212 085      02.43   .44.59.7.28.28   LLL71 DECREMENT
D212 086      02.59   .60.22.0.28.27   LLL72 TEST DONE NO TO LLL69
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D212 087      02.22   .15.81.0.02.28   LLL73 LOAD TIMER TO WAIT 16 DRUM CYCLES
D212 088      02.81   .82.28.7.28.28   LLL74 DECREMENT
D212 089      02.28   .30.80.0.28.27   LLL75 THRU WAITING TO LLL76
D212 090      02.80 U.U2.24.0.02.23   LLL76 FILL LINE 23 WITH 63 65 66 77 TO 61
D212 091      02.98 U.U3.U4.0.29.15   LLL77 CLEAR LINE 15 TO LLL 66
D212 092      02.94 U.12.12.6.21.31   15LLL LINE 22 PRELOAD
D212 093     Z02.95                    0000140 15LLL
D212 094     Z02.96                    UU00000 15LLL
D212 095     Z02.97                    7500000 15LLL
D212 096      02.00   .02.92.0.21.27   LLL19 TO LLL78 IF MAG TAPE SCRATCH PAD
D212 097     Z02.15                    0000010 24 LLL
D212 098     Z02.27                     U000000 26 LLL
D212 099     Z02.39                    1000000 28 LLL
D212 100     Z02.61                    Y400000 33 LLL
D212 101     Z02.63                    Z000000 34 LLL
D212 102     Z02.73                    ZZ00000 36 LLL
D212 103     Z02.85                    31U0000 39 LLL
D212 104     Z02.08                    Z5X0000 44 LLL
D212 105     Z02.09                    0000014 44 LLL
D212 106     Z02.47                    6400000 49 LLL
D212 107     Z02.67                    00ZZZZZ 51 LLL
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D266 000                               LTR FIRST COMMAND FINDER

D266 001      03.11   .12.13.0.28.27   LTR 01 AR NOT ZERO TO LTR 08
D266 002      03.13   .14.16.4.23.27   LTR 02 23.2,3 NOT ZERO TO LTR 06
D266 003      03.16   .17.18.0.23.27   LTR 03 23.1 NOT ZERO TO LTR 05
D266 004      03.18   .20.32.2.23.23   LTR 04 SWITCH 23.0 AND AR TO LTR 09
D266 005      03.19 U.32.32.2.23.23   LTR 05 23.1 TO AR 23.0 TO 23.3 TO LTR 09
D266 006      03.17   .19.71.0.02.02   LTR 06 DUMMY TO LTR 07
D266 007      03.71 U.76.11.2.23.23   LTR 07 PRECESS 23.3 TO AR TO LTR 01
D266 008      03.14   .16.32.0.01.01   LTR 08 DUMMY TO LTR 09
D266 009      03.32 U.35.35.0.21.03   LTR 09 R.C. TO 3.34, 21.1 TO 3.33, TO BUILDER
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D267 000                               BLD BUILD ARITHMETIC COMMAND

D267 001      03.35 U.38.38.0.28.26   BLD 01 AR TO PNPN
D267 002      03.38   .41.41.3.23.31   BLD 02 NOT REL TO 1D1 NOT 1 TO
D267 003     Z02.39                    ZZ001ZZ 02 BLD
D267 004     Z02.40                    ZZZZY00 02 BLD 04 P24
D267 005      03.41   .43.43.0.22.31   BLD 03 ARITHMETIC TO BLD 05
D267 006      03.43   .44.45.3.07.29   BLD 04 NOT ARITH TO NAR 01
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D267 007     Z07.44                        5X00000 04 BLD
D267 008      03.44 U.47.47.7.26.21        BLD 05 AR TO 21.1 REL TO 21.2 I TO AR
D267 009      03.47  .48.49.2.28.27        BLD 06 INDEXED TO BLD 08
D267 010      03.49  .50.67.2.21.21        BLD 07 CLEAR 21.2 REL TO AR TO BLD 15
D267 011      03.50  .55.55.3.23.31        BLD 08 I BOTH TO ID I ODD TO PN
D267 012     Z02.52                        00001Y0 08 BLD
D267 013     Z02.54                        0000001 08 BLD
D267 014      03.55  .56.57.0.25.27        BLD 09 I BOTH TO BLD 14
D267 015      03.57  .60.61.0.26.27        BLD 10 I ODD TO BLD 13
D267 016      03.61  .62.64.0.07.29        BLD 11 I EVEN FIX
D267 017     Z07.62                        50132Y0- 11 BLD
D267 018      03.64  .66.67.2.21.21        BLD 12 I TO 21.02 REL TO AR TO BLD 15
D267 019      03.62  .63.64.0.07.29        BLD 13 I ODD FIX
D267 020     Z07.63                        60132X0- 13 BLD
D267 021      03.58  .59.64.0.07.29        BLD 14 I BOTH FIX
D267 022     Z07.59                        40132XZ- 14 BLD
D267 023      03.67  .69.69.3.21.31        BLD 15 MARK BLD 16 CONVERT REL TO CHWD
D267 024      05.68 U.70.70.3.21.25        BLD 16 CHWD TO AR -OPREL TO AR
D267 025      05.70  .71.72.0.07.29        BLD 17 ADD 4X
D267 026     Z07.71                        4X00000 17 BLD
D267 027      05.72  .74.74.0.22.31        BLD 18 OP STORE TO BLD 34
D267 028      05.74  .77.78.4.21.26        BLD 20 OP TO PN
D267 029      05.78  .83.84.2.25.28        BLD 22 CHWD TO AR
D267 030      05.84  .86.87.3.23.31        BLD 23 OP TO ID1
D267 031     Z02.85                        0Z00000 23 BLD
D267 032      05.87  .14.U4.1.26.31        BLD 24 OP TO NN POSITION
D267 033      05.U4  .U5.U6.0.28.27        BLD 27 CHWD ZERO TO SPL 01
D267 034      05.U7  .21.22.2.25.29        BLD 28 OP TO AR
D267 035      05.02  .06.07.0.21.27        BLD 29 NOT INDEXED TO BLD 33
D267 036      05.08 U.11.11.6.21.25        BLD 30 AR TO ID1 INDEX TO AR
D267 037      05.11  .08.20.1.26.31        BLD 31 SHIDT 4 R IN ID1
D267 038      05.20  .21.22.0.25.29        BLD 32 COMBINE INDEXED ARITH OR %ID1B
D267 039      05.07  .08.22.0.07.29        BLD 33 ADD ARITH DUMMY
D267 040     Z07.08                        014013W 33 BLD
D267 041      05.75  .78.79.0.21.27        BLD 34 STORE INDEXED TO BLD
D267 042      05.79  .81.92.0.07.26        BLD 35 SOURCE IS 12.5
D267 043      05.92  .93.17.2.25.30        BLD 36 PLUS CHWD
D267 044      05.17 W.45.83.3.23.31        BLD 37 SOURCE TO ID
D267 045      05.83  .10.U1.1.26.31        BLD 37.1 SHIFT TO DEST
D267 046      05.U1  .U5.14.0.07.28        BLD 37.2 STORE BLANK TO AR TO SPL 07
D267 047     Z07.U5                        00556ZX- 37 BLD
D267 048      05.80  .81.85.2.25.30        BLD 38 2WD PLUS CH IN PN
D267 049      05.85  .87.89.0.26.25        BLD 39 TO ID
D267 050      05.89  .10.U0.1.26.31        BLD 40 5 RIGHT INDEXED STORE

D267 051      05.U0  .U2.U3.2.21.28        BLD 41 INDEX TO AR
D267 052      05.U3  .U4.20.0.07.29        BLD 42 PLUS DUMMY TO BLD 32
D267 053     Z07.U4                        VZZW000 42 BLD
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D268 000                                   CVT CONVERT REL TO CHWD

D268 001      03.69  .71.72.0.28.26        CVT 01 REL TO PN1
D268 002      03.72  .74.74.3.23.31        CVT 02 FLAG TO ID1
D268 003     Z02.73                        3800200 02 CVT
D268 004      03.74  .75.77.0.25.27        CVT 03 SPECIAL NR TO CVT 17
D268 005      03.77  .78.80.4.07.25        CVT 04 1/100 TO ID
D268 006     Z07.78                        70W0000 04 CVT
D268 007     Z07.79                        000051Y- 04 CVT
D268 008      03.80  .81.83.0.07.29        CVT 05 REL PLUS 100/256
D268 009     Z07.81                        0000190 05 CVT
D268 010      03.83  .85.87.0.28.24        CVT 06 REL TO MQ
D268 011      03.87  .36.20.0.24.31        CVT 07 MULTIPLY REL LEAVE 100 IN MQ1
D268 012      03.20  .21.22.6.26.30        CVT 08 CHANNEL ONE LEFT IS DESTINATION
D268 013      03.22  .24.26.7.26.25        CVT 09 FRACTION TO ID1
D268 014      03.26  .27.29.2.26.28        CVT 10 CHANNEL TO AR
D268 015      03.29  .12.42.0.24.31        CVT 11 MULTIPLY TIMES 100 IS WD
D268 016      03.42 W.45.46.3.23.31        CVT 12 NOT WD TO ID1
D268 017     Z02.45                        000ZZZZ 12 CVT 10 TYP
D268 018      03.46  .47.48.0.28.24        CVT 13 DESTINATION TO MQ
D268 019      03.48 U.54.54.2.28.29        CVT 14 LEFT TO SOURCE
D268 020      03.54  .55.56.2.26.29        CVT 15 PLUS WORD IS CHWD
D268 021      03.56  .58.57.5.20.31        CVT 16 RETURN TO LINE 05
D268 022      03.78 U.89.89.2.28.29        CVT 17 SPECIAL NR 10L IN AR TO TT
D268 023      03.89  .91.93.3.07.29        CVT 18 SUBTRACT ACCUMULATOR LIMIT
D268 024     Z07.91                        0900000 18 CVT
D268 025      03.93  .95.95.0.22.31        CVT 19 ACCUMULATORS TO CVT 22
D268 026      03.95  .96.97.0.07.29        CVT 20 ADD PICK UP DUMMY
D268 027     Z07.96                        66V819W 20 CVT
D268 028      03.97  .99.99.0.31.31        CVT 21 PICK UP SPECIAL NUMBER ADDRESS
D268 029     Z12.U2                        0000280 21 CVT ZERO 2900
D268 030     Z12.U3                        69ZZZU0 21 CVT ONE 06.U6
D268 031     Z12.U4                        6400100 21 CVT TWO 1700
D268 032     Z12.U5                        00005Y0 21 CVT AMQ 2400
D268 033     Z12.U6                        64000Y0 21 CVT EP TYPER 16 U0
D268 034     Z12.U7                              21 CVT
D268 035      03.96  .99.56.0.07.29        CVT 22 SPECIAL ACCUMULATOR ADDRESS TO CVT 16
D268 036     Z07.99                        3V7ZZY0- 22 CVT
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D269 000                                    NAR NONARITHMETIC COMMANDS

D269 001      03.45  .47.51.0.22.31         NAR 01 NOT STD COMMAND TO NAR 04
D269 002      03.52  .84.97.0.07.29         NAR 02 PICK UP DUMMY STD TO AR TO NAR 03
D269 003     Z07.84                         6X0Z17W 02 NAR
D269 004      11.U0 U.85.85.0.16.31                 02 NAR HALT
D269 005      11.U1 U.33.33.0.21.31                 02 NAR RETURN
D269 006      11.U2 U.U0.06.0.07.05                 02 NAR EXP
D269 007      11.U3 U.U0.U2.0.08.05                 02 NAR KEYBD
D269 008      11.U4 W.U3.U5.1.24.21                 02 NAR SQT
D269 009      11.U5 U.01.78.1.24.28                 02 NAR NEG
D269 010      11.U6 U.U0.17.0.07.05                 02 NAR LOG
D269 011      11.U7 U.00.39.1.24.28  NAR 02 ABS
D269 012      03.15  .22.22.5.21.31  NAR 03 TO PLACER PLA 01
D269 013      03.51  .53.59.2.26.26  NAR 04 NOT STD OP TO PN1 REL TO AR
D269 014      03.59 W.61.63.3.23.31  NAR 05 OP TO ID1
D269 015     Z02.61                  ZZ00000 05 NAR 04 TYP
D269 016      03.63  .16.81.1.26.31  NAR 06 SHIFT TO NN POSITION
D269 017      03.81  .83.84.2.25.26  NAR 07 OP TO AR REL TO PN1
D269 018      03.84  .85.97.0.07.29  NAR 08 SWITCH DUMMY TO AR NC 05 OP
D269 019     Z07.85                  65006VZ- 08 NAR
               .

D270 000                                    PLA PLACE COMMAND ON DRUM

D270 001      05.22 U.25.25.0.28.25  PLA 01 COMMAND TO IDID
D270 002      05.25  .26.27.0.07.28  PLA 02 DUMMY TO AR
D270 003     Z07.26                  8063329 02 PLA
D270 004      05.27  .28.29.0.21.29  PLA 03 PLUS C.C.
D270 005      05.29  .31.31.0.31.31  PLA 04 STORE COMMAND ON DRUM
D270 006      05.99  .U1.U1.3.21.31  PLA 05 TRA TO PLA 06
D270 007      03.U1  .U2.U6.3.07.29  PLA 06 MINUS FIRST DATA ADDR
D270 008      03.U6  .00.04.2.21.27  PLA 07 CC TO AR, NOT END TO PLA 09
D270 009      03.04  .05.04.0.17.31  PLA 08 NO MORE ROOM ERROR
D270 010      03.05  .06.07.0.07.29  PLA 09 ADD INCR AND TESTER TO CC
D270 011     Z07.06                  9Y00000 09 PLA
D270 012      03.07  .09.09.0.22.31  PLA 10 AROUND CORNER TO PLA 18
D270 013      03.09  .10.12.1.07.29  PLA 11 FIX C.C.
D270 014     Z07.10                  9X00000- 11 PLA
D270 015      03.12  .20.21.2.28.21  PLA 12 STORE CC
D270 016      03.21  .22.23.0.29.28  PLA 13 CLEAR AR
D270 017      03.23 U.28.28.2.23.23  PLA 14 PRECESS NEXT COMMAND
D270 018      03.28  .29.30.0.28.27  PLA 15 NOT FINISHED TO PLA 17
D270 019      03.30  .33.34.0.03.21  PLA 16 RESTORE 21.1 EXECUTE RETURN

D270 020      03.31  .33.35.0.03.03  PLA 17 DUMMY TO BUILDER BLD 01
D270 021      03.10 U.16.24.2.28.29  PLA 18 SHIFT D TO SOURCE
D270 022      03.24  .25.82.0.07.29  PLA 19 BUILD TRA COMMAND
D270 023     Z07.25                  041U156- 19 PLA
D270 024      03.82 U.85.88.2.21.25  PLA 20 TRA TO ID1 CC TO AR
D270 025      03.88  .68.97.0.07.29  PLA 21 BUILD STORE TRA
D270 026     Z07.68                  8164729 21 PLA
D270 027      03.U0  .09.12.0.07.29  PLA 22 FIX CC TO PLA 12
D270 028     Z07.09                  1W9V8X8- 22 PLA
               .

D271 000                                    IDN OBTAIN REFERENCE NUMBER LOCATION

D271 001      03.70 W.73.75.3.23.31  IDN 01 LINE TO ID
D271 002      03.75  .36.06.1.26.31  IDN 02 SHIFT TO SOURCE
D271 003      03.06  .07.08.2.25.28  IDN 03 SOURCE TO AR
D271 004      03.08  .09.25.1.26.31  IDN 04 SHIFT TO DESTINATION
D271 005      03.25  .27.36.2.26.29  IDN 05 WD TO AR
D271 006      03.36  .37.39.2.25.30  IDN 06 DEST TO PN PLUS
D271 007      03.39  .41.40.2.20.31  IDN 07 RETURN TO LINE 2
               .

D272 000                                    SPL SPECIAL COMMAND DISTRIBUTOR

D272 001      05.U6  .02.13.6.21.26  SPL 01 21.2 TO PN1
D272 002      05.13  .24.39.1.26.31  SPL 02 SHIFT OP TO DESTINATION
D272 003      05.39  .55.56.2.25.28  SPL 03 OP TO AR
D272 004      05.56  .58.59.3.23.31  SPL 04 I EVEN TO ID1
D272 005     Z02.57                  1000010 04 SPL
D272 006      05.59  .18.90.1.26.31  SPL 05 SHIFT TO 0008000
D272 007      05.90  .92.14.0.07.29  SPL 06 BLANK TO AR
D272 008     Z07.92                  VZZ0800- 06 SPL
D272 009      05.14  .15.16.2.25.29  SPL 07 PLUS I EVEN OR ID1
D272 010      05.16  .17.19.2.26.29  SPL 08 PLUS INDES OR PN1
D272 011      05.19  .21.22.3.07.29  SPL 09 ADD-8000000 TO PLA 01
D272 012     Z07.21                  8000000 09 SPL
               .

D273 000                                    PDD SPECIAL COMMANDS BY DIGITS DD

D273 001      05.01  .03.40.2.26.28  P01 01 SUBROUTINES REL TO AR
D273 002      05.40 W.60.77.3.21.31  P01 02 CONVERT
D273 003      05.60  .65.66.2.07.25  P01 03 CHWD TO ID COMMAND TO AR
D273 004     Z07.65                  0009890 03 P01
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D273 005      05.66  .02.14.1.26.31   P01 04 SHIFT CHWD 1R IN 1D TO SPL 07
D273 006      05.04  .12.52.0.07.28   P04 01 CR BLANK TO AR TO P09 02
D273 007     Z07.12                   2208000 01 P04
D273 008      05.05  .26.52.0.06.28   P05 01 PER BLANK TO AR TO P09 02
D273 009      05.06  .16.52.0.07.28   P06 01 BELL BLANK TO AR TO P09 02
D273 010     Z07.16                   0009000 01 P06
D273 011      05.03  .17.52.0.07.28   P09 01 TAB BLANK TO AR TO P09 02
D273 012     Z07.17                   6208000 01 P09
D273 013      05.52  .55.57.0.26.25   P09 02 REL TO ID
D273 014      05.57  .20.14.1.26.31   P09 03 REL 10 R IN 1D TO SPL 07
D273 015      05.10  .11.15.2.26.28   P10 01 PRINT REL TO AR
D273 016      05.15 W.18.69.3.21.31   P10 02 CONVERT
D273 017      05.18  .19.22.0.07.29   P10 03 ADD PRINT BLANK TO PLA 01
D273 018     Z07.19                   042V137 03 P10
D273 019      05.21 W.52.23.3.23.31   P21 01 INCREMENT IODD TO PNO
D273 020      05.23  .24.26.0.07.28   P21 02 BLANK TO AR
D273 021     Z07.24                   0000ZY0 02 P21
D273 022      05.26 U.12.12.6.26.30   P21 03 46 LEFT TO PN1 SET TO P42 06
D273 023      05.24  .28.30.0.21.28   P24 01 MARK PLACE C.C. TO AR
D273 024      05.30  .32.33.2.28.26   P24 02 CC TO PNO
D273 025      05.33  .34.35.0.07.29   P24 03 ADD TESTER
D273 026     Z07.34                   9Y00000 03 P24
D273 027      05.35 W.40.41.3.23.31   P24 04 WD TO ID DEST TO PN
D273 028      05.41  .43.45.0.22.31   P24 05 AROUND CORNER TO P24 07
D273 029      05.45  .46.48.0.07.28   P24 06 MARK BLANK TO AR
D273 030     Z07.46                   0106890 06 P24
D273 031      05.46  .47.48.0.07.28   P24 07 MARK AROUND CORNER TO AR
D273 032     Z07.47                   WZ868U0- 07 P24
D273 033      05.48  .02.53.1.26.31   P24 08 SHIFT TO HALF WD
D273 034      05.53 U.12.12.6.26.30   P24 09 SHIFT TO HALF SOURCE TO P42 06
D273 035      05.34  .U0.22.0.12.28   P34 01 PUNCH BLANK TO PLA 01
D273 036      12.U0 U.83.59.0.08.23   P3502 PUNCH BLANK
D273 037      05.36  .40.22.0.07.28   P35 01 READ BLANK TO PLA 01
D273 038      07.40 U.07.59.0.09.23   P35 01.1 READ BLANK
D273 039      05.42  .45.88.0.07.28   P42 01 BASE SET BLANK TO AR
D273 040     Z07.45                   ZZZZZZ2- 01 P42
D273 041      05.88 W.90.91.3.23.31   P42 02 I ODD TO IDO
D273 042     Z02.90                   00ZZY10 02P42 02P43 08TYP
D273 043      05.91  .08.U2.1.26.31   P42 03 SHIFT TO T2
D273 044      05.U2  .U4.U5.2.26.29   P42 04 ADD I
D273 045      05.U5 U.12.12.6.26.30   P42 05 REL 7 LEFT
D273 046      05.12  .14.16.2.25.29   P42 07 ADD I ODD SET TO SPL 08
D273 047      05.43  .20.86.3.07.28   P43 01 DIF SET TO AR
D273 048      05.86 W.90.95.3.23.31   P43 02 I ODD TO ID

D273 049      05.95  .04.U2.1.26.31   P43 03 SHIFT TO SET TO P42 04
D273 050      05.44  .50.86.0.07.28   P44 01 LIM SET BLANK TO AR TO P43 02
D273 051     Z07.50                   ZZZZZY1- 01 P44
D273 052      05.49  .51.96.0.26.27   P49 01 CHWD NOT ZERO TO 649 01.2
D273 053      05.96  .51.88.0.07.28   P49 01.1 STORE BASE BLANK TO AR TO P42 02
D273 054     Z07.51                   000X7Z2 01 P49
D273 055      05.97  .44.44.3.21.31   P49 01.2 TO REGULAR STORE
D273 056      05.50  .54.86.0.07.28   P50 01 STORE DIF BLANK TO P43 02
D273 057     Z07.54                   000X7Y0 01 P50
D273 058      05.51  .55.86.0.07.28   P51 01 STORE LIM BLANK TO P43 02
D273 059     Z07.55                   000X7Y1 01 P51
                 *

D264 000                              TRA  TRC  BUILD TRANSFER COMMAND

D264 001      05.58 U.61.62.2.07.26   TRA 01 CC TO PN TRA BLANK TO AR
D264 002     Z07.60                   041U136 01 TRA
D264 003      05.62  .64.65.3.23.31   TRA 02 WD OP TO ID CH IN PN
D264 004     Z02.63                   ZZZZ000 02 TRA
D264 005      05.65 U.76.77.6.26.30   TRA 03 DESTINATION TO SOURCE
D264 006      05.77  .79.98.2.25.29   TRA 04 WD OP TO AR
D264 007      05.98  .31.32.2.26.29   TRA 05 SOURCE TO AR
D264 008      05.32 U.35.22.0.21.03   TRA 06 FIX RETURN COMMAND
D264 009      05.54 U.57.62.2.07.26   TRC 01 CC TO PN1 TRC BLANK TO AR TO TRA 02
D264 010     Z07.56                   0400137 01TRC
                 *

D265 000                              TYP TYPE REFERENCE NR AND BUILD SNAPSHOT

D265 001      05.00  .03.28.0.02.03   TYP 01 2D.T FORMAT
D265 002     Z02.03                   0310000 01 TYP
D265 003      05.28  .30.31.0.08.31   TYP 02 TYPE ID NR
D265 004      05.31  .32.82.0.21.26   TYP 03 CC TO PNO
D265 005      05.82 W.60.61.7.23.31   TYP 04 WDWD TO IDID
D265 006     Z02.60                   ZZ00000 04 TYP
D265 007      05.61  .67.69.0.07.24   TYP 05 1/10 PLUS TEN TO MQ
D265 008     Z07.67                   199U000 05 TYP
D265 009      05.69 U.10.47.6.26.30   TYP 06 SHIFT D7 TO D1
D265 010      05.47  .32.73.0.24.31   TYP 07 FORM D2 PLUS FRACTION
D265 011      05.73 W.90.99.7.23.31   TYP 08 FRACTION TO IDID
D265 012     Z02.91                   00ZZ200 08 TYP
D265 013      05.93  .08.76.0.24.31   TYP 09 FORM D3
D265 014      05.76 W.44.67.7.23.31   TYP 10 GARBAGE TO ID
D265 015     Z02.44                   0002ZZZ 10 TYP
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D265 016      05.67  .03.37.0.07.03   TYP 11 3DPW3DC FORMAT
D265 017     Z07.03                   003Y004 11 TYP
D265 018      05.37  .37.37.0.28.31   TYP 12 READY
D265 019      05.38  .40.71.0.08.31   TYP 13 TYPE
D265 020      05.71  .73.81.2.26.28   TYP 14 BEGIN LOC TO AR
D265 021      05.81 U.00.09.6.26.30   TYP15 SNAPSHOT LOC TO PN1
D265 022      05.09  .11.94.2.26.29   TYP 16 SNAPSHOT LOC TO AR
D265 023      05.94 W.33.55.3.23.31   TYP 17 D2D3 TO ID1
D265 024     Z02.33                   00000ZZ 17 TYP
D265 025      05.55 U.80.63.6.26.30   TYP 18 D1 LEFT TO H2
D265 026      05.63  .63.63.0.28.31   TYP 19 READY
D265 027      05.64  .66.77.0.07.28   TYP 20 SNAPSHOT BLANK TO TRA 04
D265 028     Z07.66                   8005800- 20 TYP
D265 029      02.22 U.23.22.0.17.31   DISTRIBUTE ON END DING
D265 030     Z12.01                   0201020  0287
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D213 000                                  OPP OP PKG DUMP SELECTOR LOADER

D213 001      01.00  .57.01.3.19.28       OPP 01 -19 57 TO AR
D213 002      01.01 U.02.02.1.19.29       OPP 02 SUM LINE 19
D213 003      01.02  .05.03.0.28.27       OPP 03 TEST READ OK NO TO OPP 01
D213 004      01.03  .04.04.6.21.31       OPP 04 READ OK TO OPP 05
D213 005      01.04 U.05.05.0.19.01       OPP 05 TO LINE 1
D213 006      01.05 W.20.07.1.21.31       OPP 06 CONTROL TO LINE 1 MARK OPP 13
D213 007      01.07 U.11.11.1.04.29       OPP 07 SUM L.L. PKG 3 WORDS
D213 008      01.11  .12.13.3.01.29       OPP 08 MINUS BALANCER
D213 009     Z01.12                       XXXXXXX BALANCE LL 04.8-10
D213 010      01.13  .14.15.0.28.27       OPP 09 LIL. IN MEMORY NO TO OPP 11
D213 011      01.15  .17.08.0.01.20       OPP 10 SET DUMP CHECK 20 1
D213 012      01.08  .97.98.0.17.28       OPP 10 1 STARTING COMMAND TO AR
D213 013      01.98  .00.64.0.28.09       OPP 10 2 STARTING COMMAND TO 09 00 TO OPP 36
D213 014      01.16  .18.18.1.20.31       OPP 11 DUMP TO OPP 12 NO DUMP TO OP 13
D213 015      01.18  .21.64.0.29.20       OPP 12 DUMP CLEAR DUMP CHECK 20.1 TO OPP 36
D213 016      01.20  .22.24.0.01.20       OPP 13 NO DUMP SET COUNT BLOCKS 20.2
D213 017     Z01.22                       0000005 BLOCK COUNTER OPP 13
D213 018      01.24  .25.25.0.15.31       OPP 14 READ A BLOCK
D213 019      01.25  .25.25.0.28.31       OPP 15 WAIT
D213 020      01.26  .30.31.0.20.28       OPP 16 BLOCK COUNT
D213 021      01.31  .32.34.7.28.28       OPP 17 DECREMENT
D213 022      01.34  .38.40.0.28.20       OPP 18 RESTORE BLOCK COUNT
D213 023      01.40  .42.23.0.28.27       OPP 19 TEST TO READ ANOTHER BLOCK
D213 024      01.23  .39.38.0.01.28       OPP 20 OPL SUM TO AR
D213 025      01.38 U.39.27.3.19.29       OPP20.1 MINUS SUM OPL IN L19
D213 026      01.27  .28.29.0.28.27       OPP 21 READ OK NO TO OPP 23 &T OR MT
D213 027      01.29 U.30.32.0.19.05       OPP 22 READ OK LDR TO LINE 5 TO OPP 24
D213 028      01.32  .34.00.5.21.31       OPP 24 TO OP PKG LOADER IN LINE 5
D213 029      01.30  .32.62.0.06.31       OPP 23 REVERSE TAPE TO OPP 25 PT
D213 030      01.30  .35.35.2.04.31       OPP 23 REVERSE TO FILE TO OPP 26 MT
D213 031      01.62  .70.25.0.01.20       OPP 25 LOAD 2 BLOCKS TO READ 1 TO OPP 15
D213 032     Z01.70                       0000002 OPP 25
D213 033      01.35 W.60.50.1.21.31       OPP 26 TO WAIT SR MARK OPP 32
D213 034      01.50  .51.52.0.01.28       OPP 27 LOAD TIMER
D213 035     Z01.51                       0000010 OPP 27
D213 036      01.52  .52.52.0.28.31       OPP 28 WAIT FOR READY
D213 037      01.56  .58.53.7.28.28       OPP 29 DECREMENT TIMER
D213 038      01.53  .54.55.0.28.27       OPP 30 WAIT ENUFF TO RETURN
D213 039      01.55  .57.56.1.20.31       OPP 31 RETURN
D213 040      01.60  .66.24.0.01.20       OPP 32 BLOCK COUNTER TO 20.2 TO OPP 14
D213 041     Z01.66                       0000006 OPP 32 EXTRA BLOCK COUNTER
D213 042      01.64  .75.78.0.01.20       OPP 36 LINE 0 CHECKSUM TO 20.3

D213 043     Z01.75                       0000000 LINE 0 SUM TABLE
D213 044      01.78 W.82.68.1.21.31       OPP37 TO READ TAPE
D213 045      01.82 U.83.85.0.19.00       OPP 38 FILL LINE 00 OP PKG APPENDIX
D213 046      01.85  .91.92.0.01.20       OPP 39 LINE 4 SUM
D213 047     Z01.91                       4444444 LINE 4 SUM DUMP
D213 048      01.92 W.94.68.1.21.31       OPP 40 TO READ TAPE
D213 049      01.94 U.95.96.0.19.04       OPP 41 FILL LINE 4 DUMPER
D213 050      01.96  .99.00.0.01.20       OPP 42 LINE 5 SUM
D213 051     Z01.99                       5555555 LINE 5 SUM SR LOADER
D213 052      01.00 W.02.68.1.21.31       OPP 43 TO READ TAPE
D213 053      01.02 U.03.04.0.19.05       OPP 44 FILL LINE 5 SR LOADER
D213 054      01.04  .19.21.0.01.20       OPP 45 LINE 7 SUM
D213 055     Z01.19                       7777777 LINE 7 SUM PROGRAM LOADER
D213 056      01.21 W.28.68.1.21.31       OPP 46 TO READ TAPE
D213 057      01.28 U.29.33.0.19.07       OPP 47 FILL LINE 7 PROGRAM LOADER
D213 058      01.33  .39.41.0.01.20       OPP 48 LINE 6 SUM
D213 059     Z01.39                       6666666 LINE 6 SUM OP PKG LOADER
D213 060      01.41 W.54.68.1.21.31       OPP 49 TO READ TAPE
D213 061      01.54 U.55.61.0.19.06       OPP 50 FILL LINE 0 OP PKG LOADER
D213 062      01.61  .65.73.0.20.27       OPP 51 20.1 CHECK LOAD SRS OR NOT
D213 063      01.73 W.67.68.4.21.31       OPP 52 NO SRS SO DUMP LL NOT IN TO DUM01
D213 064      01.74  .00.00.5.21.31       OPP 53 SRS MAYBE DUMP LL WAS IN TO SRL 01
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D214 000                                  SHO FILLER FOR OP LINE NINE

D214 001     Z00.01                       8201140- SHO 01 INCREMENT 123
D214 002      00.02 U.69.12.0.08.23       SHO 02 TXR 865
D214 003      00.03 W.85.44.1.21.31       SHO 03 READY
D214 004      00.04 U.85.85.0.15.31       SHO 04 READ TAPE
D214 005      00.05 W.85.44.1.21.31       SHO 05 READY
D214 006      00.06 U.69.26.0.08.22       SHO 06 TRA 865
D214 007      00.00 U.01.07.0.19.05       SHO 07 FOR FINDING NO 4 WITH MTSR
D214 008      00.07  .08.08.5.21.31       SHO 08 TRANSFER TO LINE 5
D214 009      00.08  .24.09.2.04.31       SHO 09 REVERSE TO OP LOADER  TO FILE
D214 010      00.09  .09.09.0.28.31       SHO 10 WAIT
D214 011      00.10  .11.12.0.05.28       SHO 11 LOAD 15 REVOLUTION DELAY TIMER
D214 012     Z00.11                       000000Z SHO 11 TIMER
D214 013      00.12  .13.14.0.28.27       SHO 12 DELAY NOT DONE TO SHO 14
D214 014      00.14  .16.16.2.13.31       SHO13 READ OP PKG PREFIX
D214 015      00.15  .16.12.7.28.28       SHO 14 DECREMENT AR TO SHO 12
D214 016      00.16  .16.16.0.28.31       SHO 15 WAIT
D214 017      00.17  .00.00.7.21.31       SHO 16 TRANSFER TO OPP 01 IN 23 00
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D215 000                                SRL SUBROUTINE LOADER

D215 001      05.00 U.07.07.0.00.09     SRL 01 LOAD OP PKG TO L09
D215 002      05.07 U.08.08.0.18.00     SRL 02 S.R. TABLE TO L00
D215 003      05.08  .10.10.1.21.31     SRL 03 TO SRL 04
D215 004      01.10  .14.17.0.01.28     SRL 04 ST TABLE CHECKER
D215 005      01.17  .19.03.0.31.31     SRL 05 EXECUTE
D215 006      01.14 U.12.36.0.00.27     SRL 06 ANY SRS
D215 007      01.36  .37.44.0.29.20     SRL 07 NO SRS CLEAR Z0.1 TO SRL 09
D215 008      01.44  .70.70.5.21.31     SRL 09 TO SRL 15
D215 009      01.37  .46.49.0.01.28     SRL 08 SET BLOCK COUNTER TO SRL 11
D215 010      01.37  .38.42.2.05.31     SRL 08 SOME SRS SEARCH TO FILE TO SRL 10
D215 011      Z01.46                    0000007 SKIP TO SRS COUNTER
D215 012      01.42 W.70.40.5.21.31     SRL 10 GO TO WAIT IN LINE 5 MARK SRL 15
D215 013      01.49  .51.58.0.15.31     SRL 11 READ ONE BLOCK PAPER TAPE
D215 014      01.58  .58.58.0.28.31     SRL 12 WAIT
D215 015      01.59  .60.44.0.28.27     SRL 13 SRS NEXT GO TO SRL 09 NO TO SRL 14
D215 016      01.45  .46.49.7.28.28     SRL 14 DECREMENT AND READ ANOTHER BLOCK
D215 017      05.70 U.71.71.0.29.18     SRL 15 CLEAR L18
D215 018      05.71 U.72.72.0.29.17     STL 16 CLEAR L17
D215 019      05.72  .76.03.0.29.20     SRL 17 SET SR COUNT 20 0 TO ZERO
D215 020      05.03 U.12.12.0.00.27     SRL 18 SR TABLE ZERO
D215 021      05.12 W.77.62.5.21.31     SRL 19 NO MORE SRS
D215 022      05.13  .15.15.0.15.31     SRL 20 READ A S.R.
D215 023      05.15  .91.18.0.05.28     SRL 21 LOAD TIMER
D215 024      Z05.91                    0000020 TIMER FOR READ SRS
D215 025      05.18  .20.22.7.28.28     SRL 22 DECREMENT
D215 026      05.22  .24.24.0.28.31     SRL 23 READY TEST NO TO SRL 25
D215 027      05.25  .04.01.1.19.28     SRL 24 READY HERE SUM TO AR TO SRL 27
D215 028      05.24  .27.17.0.28.27     SRL 25 CHECK TIMER NOT ZERO TO SRL 22
D215 029      05.17  .20.20.0.00.31     SRL 26 OUT OF SRS HERE SET READY TO SRL 33
D215 030      05.05  .07.07.0.31.31     SRL 27 EXECUTE
D215 031      05.01 U.02.02.3.19.29     SRL 27 SUBTRACT LINE
D215 032      05.02  .03.04.0.28.27     SRL 28 TEST READ ERROR
D215 033      05.04  .08.48.0.20.28     SRL 29 OK PICK UP COUNTER TO SRL 48
D215 034      05.05  .37.90.0.05.28     SRL 30 ERROR CHECK TO AR
D215 035      Z05.37                    Z000123 SLR 30 END SR CHECK
D215 036      05.90  .07.06.3.19.29     SRL 31 MINUS END CHECK
D215 037      05.06  .08.20.0.28.27     SRL 32 END OR ERROR TEST
D215 038      05.20  .28.28.4.21.31     SRL 33 END TO 4.28 SRL 64
D215 039      05.21  .23.27.0.06.31     SRL 34 ERROR PT REVERSE TAPE
D215 040      05.21  .28.30.0.20.21     SRL 34 ERROR MT LOAD COUNTER
D215 041      05.27 W.13.40.5.21.31     SRL 35 TO WAIT MARK SRL 20
D215 042      05.30  .32.32.2.04.31     SRL 3A REVERSE TO FILE

D215 043      05.32  .34.40.5.21.31     SRL 37 WAIT
D215 044      05.33  .35.60.2.13.31     SRL 38 READ A BLOCK
D215 045      05.60  .12.15.0.21.27     SRL 39 COUNTER DONE
D215 046      05.16  .20.64.0.21.28     SRL 40 PICK UP COUNTER 21.0
D215 047      05.40  .41.42.0.05.28     SRL 41 LOAD TIMER
D215 048      Z05.41                    0000010 TIMER SRL 41
D215 049      05.42  .42.42.0.28.31     SRL 42 WAIT FOR READY
D215 050      05.46  .48.43.7.28.28     SRL 43 DECREMENT
D215 051      05.43  .44.45.0.28.27     SRL 44 TEST TIMER
D215 052      05.45  .47.46.5.20.31     SRL 45 RETURN TO MARK
D215 053      05.64  .66.68.7.28.28     SRL 46 DECREMENT COUNTER
D215 054      05.68  .72.32.0.28.21     SRL 47 STORE COUNTER TO READ ANOTHER
D215 055      05.48  .49.50.1.05.29     SRL 48 INCREMENT COUNTER
D215 056      Z05.49                    0000001 SRL 48
D215 057      05.50  .52.53.0.28.20     SRL 49 STORE COUNTER
D215 058      05.53  .54.55.0.05.28     SRL 50 PICK UP DUMMY
D215 059      05.54  .23.33.0.00.27     SRL 51 STORE SR TEST NO TO SRL 20
D215 060      05.55  .04.05.0.19.29     SRL 52 PLUS SR CHECKSUM
D215 061      05.14  .00.05.0.05.29     SRL 53 YES STORE IT
D215 062      Z05.00                    0027001 FIX TO PICK UP RELL
D215 063      05.52  .55.57.0.28.24     SRL 54 REL TO MQ
D215 064      05.57  .58.61.6.05.25     SRL 55 1/100 TO ID
D215 065      Z05.58                    0000040 SRL 55 ONE HUNDREDTH
D215 066      05.61  .36.98.0.24.31     SRL 56 CH AS DESTINATION
D215 067      05.98  .01.03.0.26.28     SRL 57 CH TO AR
D215 068      05.03  .04.05.0.05.29     SRL 58 PLUS DUMMY. STORE SR
D215 069      05.04 U.W0.W1.0.19.09     SRL 59 STORE SR
D215 070      05.01  .02.55.0.05.28     SRL 60 CLEAR TABLE
D215 071      05.02 W.23.23.0.29.00     SRL 61 CLEAR SR TABLE NR FROM CKSM TO SR SRL 18
D215 072      05.62  .66.66.5.20.31     SRL 62 GO TO 77 ON BP-NO DUMP
D215 073      05.66  .68.68.4.21.31     SRL 63 TO DUMP ROUTINE MARK WD 67
D215 074      04.28  .82.29.4.04.25     SRL 64 LOAD TYPEOUT
D215 075      Z04.82                    V7X400 0 SRL 64
D215 076      Z04.83                    2X9Y5X7- SRL 64
D215 077      04.29  .02.34.4.25.19     SRL 65 LOAD TYPEOUT
D215 078      04.34  .84.35.4.04.25     SRL 66 LOAD TYPEOUT
D215 079      Z04.84                    Z26WZ97- SRL 66
D215 080      Z04.85                    679757Z SRL 66
D215 081      04.35  .04.38.4.25.19     SRL 67 LOAD TYPEOUT
D215 082      04.38  .86.44.4.04.25     SRL 68 LOAD TYPEOUT
D215 083      Z04.86                    3WXY9Y7-SRL 68
D215 084      Z04.87                    V2Z4X2Y- SRL 68
D215 085      04.44  .06.49.4.25.19     SRL 69 LOAD TYPEOUT
D215 086      04.49  .51.53.4.09.31     SRL 70 TYPE ALFA
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D215 087      04.53  .55.65.0.16.31   SRL 71 HALT
D215 088      04.65  .67.13.5.21.31   SRL 72 TO READ A SR SRL 20
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D216 000                              DUM PROGRAM DUMPING ROUTINE

D216 001      04.68 U.69.69.0.07.19   DUM 01 LOADER TO L19
D216 002      04.69  .70.U7.0.04.28   DUM 02 LOAD LEADER TIMER
D216 003     Z04.70                   0000090 DUM 02
D216 004      04.U7 U.24.92.0.04.02   DUM 03 SET FORMAT
D216 005     Z04.03                   8000000
D216 006     Z04.02                   0000000
D216 007     Z04.01                   0000000
D216 008     Z04.00                   0400000
D216 009      04.72  .01.08.0.10.31   DUM 04 PUNCH LEADER AND LINE 19
D216 010      04.08  .10.12.7.28.28   DUM 05 DECREMENT
D216 011      04.12  .14.71.0.28.27   DUM 06 TEST LEADER DONE
D216 012      04.71  .73.72.4.20.31   DUM 07 DONE RETURN
D216 013      04.67  .76.77.0.04.21   DUM 08 SET CH TO 18
D216 014     Z04.76                   0000240 DUM 08
D216 015      04.77  .78.79.0.04.28   DUM 09 DUMMY TO AR
D216 016      04.79  .80.U5.0.21.29   DUM 10 PLUS CH
D216 017      04.U5  .U7.U7.0.31.31   DUM 11 EXECUTE AT U7
D216 018      04.78 U.W0.24.0.00.27   DUM 12 TEST LINE CH FOR ZERO
D216 019      04.04  .16.60.0.04.21   DUM 13 CH IS ZERO SET CH TO 9 TO DUM 56
D216 020     Z04.16                   0000120 DUM 13 CH IS 9 AS SOURCE
D216 021     Z04.45                   0000120 DUM 13
D216 022      04.05 U.06.06.0.29.07   DUM 14 CLEAR LINE 07
D216 023      04.06  .46.79.0.04.28   DUM 15 DUMMY TO AR TO ADD CH DUM 10
D216 024      04.46 U.W0.29.0.00.07   DUM 16 LINE CH TO LINE 07
D216 025      04.09 U.14.14.0.29.22   DUM 17 CLEAR LINE 22
D216 026      04.14  .16.96.4.21.31   DUM 18 MARK 15 TO LINE PREP
D216 027      04.96  .97.U5.0.04.28   DUM 19 DUMMY TO EXECUTE DUM 11
D216 028      04.97 U.24.40.0.07.27   DUM 20 TEST WORDS 0-3 FOR ZERO
D216 029      04.20  .91.92.0.04.28   DUM 21 ZERO PICK UP FP ZERO FOR 03
D216 030     Z04.91                   000002Z DUM 21
D216 031      04.21  .22.24.0.29.28   DUM 22 CLEAR AR TO DUM 24
D216 032      04.92  .03.21.0.28.07   DUM 23 FP ZERO TO LINE 07
D216 033      04.24 U.25.25.3.07.29   DUM 24 MINUS SUM LINE 07
D216 034      04.25  .29.30.1.28.22   DUM 25 SUM TO 22.1 TO BALANCE
D216 035      04.30  .32.37.6.21.25   DUM 26 CH TO 101 CVA
D216 036      04.37  .10.48.1.26.31   DUM 27 SHIFT TO DESTINATION
D216 037      04.48  .49.50.0.25.28   DUM 28 CH BACK TO AR
D216 038      04.50  .51.52.0.04.29   DUM 29 PLUS DUMMY



D216 039      04.52  .54.55.0.22.29   DUM 30 PLUS LAST TIME SET NN TO 66
D216 040      04.55  .58.59.0.28.22   DUM 31 EXECUTION COMMAND TO 22.2 TO DUM 33
D216 041      04.51 U.W0.85.0.19.00   DUM 32 BLANK EXECUTION COMMAND
D216 042      04.59  .60.61.3.28.28   DUM 33 NEGATE EXECUTION COMMAND
D216 043      04.61  .63.U4.1.28.22   DUM 34 MINUS COMMAND TO BALANCE
D216 044      04.U4 U.00.10.0.22.07   DUM 35 LINE 22 TO LINE 07
D216 045      04.10  .10.10.0.28.31   DUM 36 WAIT FOR PUNCHING
D216 046      04.11 U.12.69.0.07.19   DUM 37 LINE 7 TO 19 TO DUM 19 PUNCHER
D216 047      04.15  .16.18.0.21.28   DUM 38 FROM PUNCHER CH TO AR
D216 048      04.18  .19.26.3.04.29   DUM 39 DECREMENT CH
D216 049     Z04.19                   0000020 DUM 39 DUM 54
D216 050      04.26  .28.31.0.28.21   DUM 40 RESTORE CH
D216 051      04.31  .32.36.3.04.29   DUM 41 MINUS 9 AND 1/2
D216 052     Z04.32                   0000130 DUM 41
D216 053      04.36  .39.39.0.22.31   DUM 42 TEST CH IS NINE
D216 054      04.39  .50.77.0.01.01   DUM 43 CH NOT NINE TO DUM 09
D216 055      04.40  .42.43.0.04.22   DUM 44 CH IS NINE SET 22.2 TO NN 01
D216 056     Z04.42                   0001000 DUM 44
D216 057      04.43  .46.47.0.22.29   DUM 45 SET LAST FLAG
D216 058      04.47  .54.56.0.04.28   DUM 46 DUMMY TO AR
D216 059      04.56 U.57.63.0.29.07   DUM 47 CLEAR LINE 7
D216 060      04.63  .64.U5.0.21.29   DUM 48 PLUS CH TO EXECUTE DUM11
D216 061      04.54 U.W0.W0.0.00.07   DUM 49 CH TO LINE 7 TO DUM 57
D216 062      04.U0 W.U2.96.4.21.31   DUM 50 MARK U2 TO LINE PREP DUM 19
D216 063      04.U2  .U6.57.0.23.27   DUM 51 TEST LAST BEING PUNCHED TO DUM 53
D216 064      04.57  .60.64.0.21.28   DUM 52 CH TO AR
D216 065      04.58  .U7.13.0.29.07   DUM 53 LAST BEING PUNCHED TO DUM 59
D216 066      04.64  .19.33.0.04.29   DUM 54 INCREMENT CH
D216 067      04.33  .36.60.0.28.21   DUM 55 STORE CH
D216 068      04.60  .62.63.0.04.28   DUM 56 DUMMY TO AR TO DUM 48
D216 069      04.62 U.W0.60.0.01.27   DUM 57 CH PLUS ONE TEST ZERO TO DUM 44
D216 070      04.41  .42.43.0.29.22   DUM 58 NO SO PUNCH CH NOT LAST TO DUM 45
D216 071      04.13  .22.27.0.04.28   DUM59 SET LEADER COUNTER FOR TRAILER
D216 072     Z04.22                   0000180 DUM 59 TRAILER COUNTER
D216 073      04.27  .70.17.0.28.04   DUM 60 PLACE TRAILER COUNTER
D216 074      04.17 W.93.10.4.21.31   DUM 61 MARK SET READY TO LINE PUNCH
D216 075      04.93  .95.23.0.00.31   DUM 62 SET READY AFTER TRAILER
D216 076      04.23  .77.77.5.21.31   DUM 63 TO REV 01


D217 000                              REA TAPE READING SUBROUTINE

D217 001      01.68 U.69.69.0.29.19   REA 01 CLEAR BEFORE READ
D217 002      01.69  .71.71.0.15.31   REA 02 READ TAPE
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D217 003      01.71  .71.71.0.28.31   REA 03 WAIT
D217 004      01.72  .75.76.0.20.28   REA 04 SUM TO AR
D217 005      01.76 U.77.77.3.19.29         05 MINUS L 19
D217 006      01.77  .78.79.0.28.27         06 READ N G TO 08
D217 007      01.79  .81.80.1.20.31         07 RETURN WOTH GOOD L19
D217 008      01.80  .82.67.0.06.31         08P REVERSE 1 BLOCK
D217 009      01.67  .67.67.0.28.31         09 WAIT TO REA 01
D217 010      01.81 W.83.50.1.21.31         10 WAIT
D217 011      01.83  .84.63.2.13.31   REA 11 READ 1 BLOCK MAG TAPE
D217 012      01.63  .63.63.0.28.31   REA 11 1 WAIT
D217 013      01.84  .87.88.0.01.20         12 SELECTOR LOADER SUM TO 20.3
D217 014     Z01.87                   1111111 SELECTOR LOADER SUM
D217 015      01.88 W.90.67.1.21.31         13 TO REA 09
D217 016      01.90 U.91.64.0.19.01         14 START OVER WITH LOADING
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D218 000                               REV MAGAZINE REWINDER

D218 001      05.77  .81.74.0.20.27   REV 01 TEST IF ANY SRS READ
D218 002      05.74 U.75.00.0.06.05   REV 01 1 TO OPL 01
D218 003      05.75  .78.79.0.05.24   REV 01 2 SET MQQ NON ZERO TO REV 06
D218 004      05.77  .82.93.2.04.31   REV 01 REVERSE TO FILE
D218 005      05.93 W.09.40.5.21.31   REV 02 WAIT
D218 006      05.09  .13.35.0.20.27   REV 03 WERE SR READ
D218 007      05.35 W.76.40.5.21.31   REV 04 NO WAIT TO REV 17
D218 008      05.36  .38.35.2.04.31   REV 05 YES REVERSE ANOTHER FILE
D218 009      05.79  .80.82.6.05.24   REV 06 SET 23 1 COUNT  24
D218 010      05.81                   0000024 REV 06 TIMER
D218 011      05.82  .84.84.0.06.31   REV 07 REVERSE TAPE
D218 012      05.84 W.92.43.5.21.31   REV 08 WAIT 24 REV
D218 013      05.92  .93.23.0.15.31   REV 09 READ TAPE
D218 014      05.23 W.22.56.0.00.31   REV 10 SET READY
D218 015      05.56  .58.59.0.06.31   REV 11 REVERSE TAPE
D218 016      05.59  .61.63.0.23.28   REV 12 PRELOAD TO AR
D218 017      05.63  .80.83.3.05.29   REV 13 MINUS SAME
D218 018      05.83  .85.76.0.28.27   REV 14 READ ANY TAPE YES TO REV 01
D218 019      05.76  .90.94.0.24.27   REV 15 NO CHECK IF NO TAPE LAST TIME
D218 020      05.94  .78.80.0.05.20   REV 16 NO DONE REWINDING SET COUNT
D218 021     Z05.78                   0000006 REV 17 PT
D218 022      05.95  .96.79.0.29.24   REV 17 TAPE LAST TIME CLEAR MQQ TO REV 06
D218 023      05.80  .82.97.0.01.01   REV 18 DUMMY TO READ TAPE
D218 024      05.97  .99.38.0.15.31   REV 19 READ TAPE
D218 025      05.38  .38.38.0.28.31   REV 19 1 WAIT FOR TAPE READING
D218 026      05.39  .40.28.0.01.01   REV 19 2 DUMMY TO REV 20




D218 027      05.28  .30.31.0.20.28   REV 20 COUNTER
D218 028      05.31  .32.34.7.28.28   REV 21 DECREMENT
D218 029      05.34  .38.44.0.28.20   REV 22 STORE
D218 030      05.44  .46.96.0.28.27   REV 23 ALL OVER TEST NO TO READ
D218 031      05.96 U.97.00.0.06.05   REV 24 YES OP LOADER
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D219 000                               LDR OBJECT PROGRAM LOADER

D219 001      05.00  .01.01.0.29.28   LDR 01 CLEAR AR
D219 002      05.01 U.02.02.1.19.29   LDR 02 SUM LINE 19
D219 003      05.02  .05.03.0.28.27   LDR 03 LOADER READ NG TO LDR 01
D219 004      05.03  .04.04.6.21.31   LDR 04 READ OK TO LINE 19
D219 005      05.04 U.05.05.0.19.05   LDR 05 LOADER TO LINE 05
D219 006      05.05  .06.06.5.21.31   LDR 06 CONTROL TO LINE 05
D219 007      05.06  .07.07.0.15.31   LDR 07 READ FIRST BLOCK OF PROGRAM
D219 008      05.07  .01.08.0.29.02   LDR 08 CLEAR TEMP
D219 009      05.08  .02.09.4.29.02   LDR 09 CLEAR TEMP
D219 010      05.09  .U7.10.0.29.00   LDR 10 CLEAR TEMP
D219 011      05.10  .U7.11.0.29.01   LDR 11 CLEAR TEMP
D219 012      05.11  .52.13.0.02.06   LDR 12 SET MARK LEVEL
D219 013      05.12  .14.16.4.05.25   LDR 14 CONSTANTS
D219 014      05.13 U.23.17.0.29.08   LDR 13 CLEAR MARKS
D219 015     Z05.14                   U000004 14 LDR
D219 016     Z05.15                   WZV1216 14 LDR
D219 017      05.16  .U0.17.4.25.09   LDR 15 TO LINE 09
D219 018      05.17  .18.20.4.05.25   LDR 16 CONSTANTS
D219 019     Z05.18                   W800007 16 LDR
D219 020     Z05.19                   9UVY131 16 LDR
D219 021      05.20  .U0.21.4.25.10   LDR 17 TO LINE 10
D219 022      05.21  .22.24.4.05.25   LDR 18 CONSTANTS
D219 023     Z05.22                   ZU0000U 18 LDR
D219 024     Z05.23                   Y69594V 18 LDR
D219 025      05.24  .U0.25.4.25.11   LDR 19 TO LINE 11
D219 026      05.25  .26.28.4.05.25   LDR 20 CONSTANTS
D219 027     Z05.26                   9W4000Y 20 LDR
D219 028     Z05.27                   UVWW866 20 LDR
D219 029      05.28  .U0.29.4.25.12   LDR 21 TO LINE 12
D219 030      05.29  .30.32.4.05.25   LDR 22 CONSTANTS
D219 031     Z05.30                   W350011 22 LDR
D219 032     Z05.31                   8000081 22 LDR
D219 033      05.32  .U0.33.4.25.13   LDR 23 TO LINE 13
D219 034      05.33  .34.36.4.05.25   LDR 24 CONSTANTS
D219 035     Z05.34                   Z424014 24 LDR
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D219 036     Z05.35                          VYVW29V 24 LDR
D219 037      05.36  .U0.37.4.25.14          LDR 25 TO LINE 14
D219 038      05.37  .38.40.4.05.25          LDR 26 CONSTANTS
D219 039     Z05.38                          9896818 26 LDR
D219 040     Z05.39                          8Y1VXV6 26 LDR
D219 041      05.40  .U0.41.4.25.15          LDR 27 TO LINE 15
D219 042      05.41  .42.44.4.05.25          LDR 28 CONSTANTS
D219 043     Z05.42                          800007Z- 28 LDR
D219 044     Z05.43                          X3W22X0 28 LDR
D219 045      05.44  .U0.45.4.25.16          LDR 29 TO LINE 16
D219 046      05.45  .46.48.4.05.25          LDR 30 CONSTANTS
D219 047     Z05.46                          800007Y 30 LDR
D219 048     Z05.47                          9XW5VYV 30 LDR
D219 049      05.48  .U0.49.4.25.17          LDR 31 TO LINE 17
D219 050      05.49  .52.54.4.05.25          LDR 32 CONSTANTS
D219 051     Z05.52                          0000400 32 LDR
D219 052     Z05.53                          001BW00 32 LDR
D219 053      05.54  .U2.55.4.25.18          LDR33 TO LINE 18
D219 054      05.55  .U6.99.4.25.18          LDR 34 TO LINE 18
D219 055      05.99 U.00.51.0.29.08          LDR 35 CLEAR INDEX ONE
D219 056      05.51 U.64.50.0.29.08          LDR 36 CLEAR ACCUMULATORS AND HOLDS
D219 057      05.50  .56.58.4.05.25          LDR 37 CONSTANTS
D219 058     Z05.56                          ZZZZZ00 37 LDR
D219 059     Z05.57                          8V61304- 37 LDR
D219 060      05.58  .U0.59.4.25.08          LDR 38 TO LINE 08
D219 061      05.59  .60.60.0.29.28          LDR 39 CLEAR AR
D219 062      05.61 U.62.64.1.19.29          LDR 40 SUM LINE U9
D219 063      05.62  .64.U7.0.31.31          LDR 41 EXECUTE AR WT U7
D219 064      05.60  .60.60.0.28.31          LDR 42 WAIT FOR TAPE READ IN
D219 065      05.64  .U6.62.2.19.27          LDR 43 READ OK EXECUTE 19.U6 NN65 LDR47
D219 066      05.63  .64.97.0.17.31          LDR 44 READ NG DING
D219 067      05.97  .97.96.0.01.01          LDR 45 WAIT TWO
D219 068      05.96  .95.63.0.01.01          LDR 46 WAIT TWO MORE GO BACK TO DING
D219 069      05.65  .67.59.0.15.31          LDR 47 READ MORE PROGRAM TO LDR 39
D219 070      05.74 U.75.76.1.00.29          LDR 48 SUM LINE ZERO
D219 071      05.67 U.68.68.1.01.29          LDR 49 PLUS LINE ONE
D219 072      05.68 U.69.69.1.02.29          LDR 50 PLUS LINE TWO
D219 073      05.69 U.70.70.1.03.29          LDR K1 PLUS LINE THREE
D219 074      05.70 U.71.71.1.04.29          LDR 52 PLUS LINE FOUR
D219 075      05.71 U.72.72.1.06.29          LDR 53 PLUS LINE SIX
D219 076      05.72 U.73.73.1.07.29          LDR 54 PLUS LINE SEVEN
D219 077      05.73 U.74.74.1.08.29          LDR 58 PLUS LINE EIGHT
D219 078      05.66  .75.67.1.05.28          LDR 59 BALANCE TO ZERO
D219 079     Z05.75                          XXXXXXX BALANCE OP PKG



D219 080      05.76  .77.78.0.28.27          LDR L0 TEST OP PKG IN MACHINE
D219 081      05.78  .84.86.4.05.22          LDR 61 SET LINE 22 FOR START TO LDR 68
D219 082      05.84 U.04.26.0.09.22          61 LDR RESUME TO 0900
D219 083      05.86  .16.16.4.21.31          LDR 68 TRANSFER TO MANUAL MODE
D219 084      05.85 U.00.00.0.21.31          61 LDR GO TO MANUAL
D219 085      05.79 U.00.77.0.05.19          LDR 62 COPY TYPEOUT TO LINE 19
D219 086      05.77  .80.80.4.09.31          LDR 63 TYPE MOUNT OP PKG ON READER
D219 087     Z05.U7                          U4Y6Z4Y 63 LDR
D219 088     Z05.U6                          VY7ZV4V- 63 LDR
D219 089     Z05.U5                          9V6ZZ71 63 LDR
D219 090     Z05.U4                          7500000 63 LDR
D219 091      05.80  .81.81.0.16.31          LDR 64 HALT
D219 092      05.81  .81.81.0.28.31          LDR 65 WAIT
D219 093      05.82  .84.88.0.15.31          LDR 66 READ OPP
D219 094      05.88  .88.88.0.28.31          LDR 69 WAIT
D219 095      05.89  .57.83.3.19.28          LDR 67 SUM NEGATIVE TO AR
D219 096      05.83  .84.90.1.19.29          LDR 68.1 SUM LINE 19 SHOULD BE ZERO
D219 097      05.90  .91.91.0.28.27          LDR 71 OPP READ NG TO LDR 73
D219 098      05.91 U.92.93.0.19.01          LDR 72 OPP TO LINE 01
D219 099      05.92  .94.81.0.06.31          LDR 73 REVERSE TAPE TRY AGAIN
D219 100      05.93  .20.20.1.21.31          LDR 74 TO OPP LOAD OP PKG
D219 101     Z05.98                          9999999 BALANCER
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D220 000                                     OPL OP PACKAGE LOADER

D220 001      05.00 U.01.01.0.15.31          OPL 01 READ TAPE
D220 002      05.01  .02.05.0.05.21                INITIALIZE 21.2 IS 000000U
D220 003     Z05.02                          000000U OPL 02
D220 004      05.05  .11.14.0.05.21                INITIALIZE 21.3 TO PICK UP LINE 17 CS
D220 005      05.11  .U0.40.4.05.25                LINE 17 CONSTANTS TO ID
D220 006      05.14  .19.20.0.21.28                PICK UP 21.3 / ECEXUTE
D220 007      05.40  .41.43.3.05.29                DECREMENT PICK UP
D220 008     Z05.41                          DZ00000          DECREMENT
D220 009      05.43  .47.03.0.28.21                STORE PICKUP
D220 010      05.03  .05.07.0.21.28          OPL 03 COUNT TO AR
D220 011      05.07  .08.10.7.28.28          OPL 04 DECREMENT
D220 012      05.10  .14.15.0.28.21          OPL 05 RESTORE
D220 013      05.15  .16.17.0.28.27          OPL 06 TEST DONE PUTTING AWAY CONSTANTS
D220 014      05.18  .19.20.0.05.29          OPL 08 ADD DUMMY
D220 015      05.20  .22.22.0.31.31          OPL 09 EXECUTE
D220 016      05.19  .U0.14.4.25.08          OPL 10 CONSTANTS TO LINE 8 PLUS COUNT
D220 017     Z05.U1                          9XW5VYV OPL 10
D220 018     Z05.U0                          800007Y OPL 10
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D220 019      Z05.99                    X3W22X0 OPL 10
D220 020      Z05.98                    800007Z- OPL 10
D220 021      Z05.97                    8Y1VXV6 OPL 10
D220 022      Z05.96                    9896818 OPL 10
D220 023      Z05.95                    VYVW29V OPL 10
D220 024      Z05.94                    Z424014 OPL 10
D220 025      Z05.93                    8000081 OPL 10
D220 026      Z05.92                    W350011 OPL 10
D220 027      Z05.91                    UVWW866 OPL 10
D220 028      Z05.90                    9W4000Y OPL 10
D220 029      Z05.89                    Y69594V OPL 10
D220 030      Z05.88                    ZU0000U OPL 10
D220 031      Z05.87                    9UVY131 OPL 10
D220 032      Z05.86                    W800007 OPL 10
D220 033      Z05.85                    WZV1216 OPL 10
D220 034      Z05.84                    '1000004 OPL 10
D220 035       05.17  .51.14.0.05.21          INITIALIZE 10.3 21.3 LINE ZERO READ
D220 036       05.51 U.79.80.4.05.25          LINE ZERO CHECK AND CLL TO ID
D220 037      Z05.77                    XXXXXXX LINE 00 BALANCE
D220 038      Z05.75                    1111111 01
D220 039      Z05.73                    2222222 02
D220 040      Z05.71                    3333333 03
D220 041      Z05.69                    4444444 04
D220 042      Z05.67                    6666666 06
D220 043      Z05.65                    7777777 07
D220 044      Z05.63                    8888888 LINE 08 BALANCE
D220 045       05.80  .41.48.3.05.29          DECREMENT PICKUP
D220 046       05.48  .51.52.0.28.21          STORE PICKUP
D220 047       05.52  .60.24.0.25.05          CLL TO W T 60
D220 048       05.24  .27.25.4.25.28    OPL 15 CHECK SUM TO AR
D220 049       05.25  .25.25.0.28.31    OPL 16 WAIT
D220 050       05.26 U.27.27.3.19.29    OPL 17 MINUS L19
D220 051       05.27  .28.60.0.28.27          READ OK YES CLL
D220 052       05.78 U.61.22.0.19.00          CLL TO LINE ZERO
D220 053       05.76 U.61.22.0.19.01          CLL TO 9LINE 01
D220 054       05.74 U.61.22.0.19.02          CLL TO LINE 02
D220 055       05.72 U.61.22.0.19.03          CLL TO LINE 03
D220 056       05.70 U.61.22.0.19.04          CLL TO LINE 04
D220 057       05.68 U.61.22.0.19.06          CLL TO LINE 06
D220 058       05.66 U.61.22.0.19.07          CLL TO LINE  07
D220 059       05.22 U.23.23.0.29.19    OPL 13 CLEAR L19
D220 060       05.23  .25.14.0.15.31    OPL 14 READ TAPE TO OPL 02 2
D220 061       05.61  .63.54.0.06.31          REVERSE TAPE
D220 062       05.54  .54.54.0.28.31          WAIT FOR READY

D220 063       05.55 U.56.56.0.29.19          CLEAR LINE 19
D220 064       05.56  .58.24.0.15.31          READ TAPE
D220 065       05.64 U.61.06.0.19.08    OPL 19
D220 066       05.28  .28.28.0.28.31    OPL 21 WAIT
D220 067       05.29  .30.31.0.05.28    OPL 22 LOAD TIMER
D220 068      Z05.30                    0000010 OPL 22
D220 069       05.31  .32.33.0.28.27    OPL 23 TEST WAIT 16 REV
D220 070       05.33  .35.37.0.05.28    OPL 24 LOAD BLOCK COUNTER
D220 071      Z05.35                    0000006 OPL 24 BLOCK COUNTER
D220 072       05.34  .36.31.7.28.28    OPL 25 DECREMENT TO TEST WAIT
D220 073       05.37  .38.38.2.13.31    OPL 26 READ A BLOCK
D220 074       05.38  .38.38.0.28.31    OPL 27 WAIT
D220 075       05.39  .40.42.7.28.28    OPL 28 DECREMENT COUNT
D220 076       05.42  .44.36.0.28.27    OPL 29 TEST READ SOME MORE TO OPR 26
D220 077       05.36  .38.00.0.04.04          START OVER
D220 078       05.47  .50.79.0.01.01    OPL 33 DUMMY TO TRY AGAIN REVERSE TO FILE
D220 079       05.06 U.07.04.0.29.19    OPL 34 HERE WHEN THRU LOADING CLEAR L19
D220 080       05.04  .09.09.0.23.31    OPL 35 CLEAR
D220 081       05.09  .11.08.0.29.31    OPL 36 OFLO OFF
D220 082       05.08 U.20.32.0.06.20    OPL 37 EXTSACTORS
D220 083       05.32  .U2.U4.4.05.18    OPL 38 INDEX REG FIX
D220 084      Z05.U2                    0000400 OPL 38
D220 085      Z05.U3                    0018W00 OPL 38
D220 086       05.U4  .U6.12.4.05.18    OPL 39 INDEX REG FIX
D220 087      Z05.U6                    0000400 OPL 39
D220 088      Z05.U7                    0018W00 OPL 39
D220 089       05.12  .13.16.0.05.22    OPL 40 LOAD RESUME COMMAND
D220 090       05.13 U.04.26.0.09.22    OPL 41 RESUME AT 0900
D220 091       05.16  .00.00.0.21.31    OPL 43 TO MANUAL MODE
D220 092       05.61  .81.28.2.04.31    OPL 20 M TAPE REVERSE TO FILE
                 .

D221 000                                MAN MANUAL MODE

D221 001       00.00  .69.29.0.00.28    MAN 01 PICK UP MANUAL MODE
D221 002       00.29  .92.92.1.21.31    MAN 02 TO NXT 03 OBEY
D221 003       00.69 U.39.59.0.08.23    MAN 03 HOLD TRANSFER TO 8.35
D221 004       08.35 U.00.U2.0.08.05    MAN 04 KEYBOARD
D221 005       08.36 U.66.11.0.06.23    MAN 05 TRANSFER NOT ZERO TO MAN 051 06 62
D221 006       06.62 U.U2.40.1.17.31    MAN 051 PUNCH SWITCH ON TO NXT TO MAN 22
D221 007       01.40  .69.92.0.06.28    MAN 052 PICK UP TRA TO MAN 07
D221 008       06.69 U.42.26.0.08.22    MAN 053 TRA TO MAN 07
D221 009       08.37 U.64.85.0.08.22    MAN 06 RESUME AT 08.61 TO NXT 01
D221 010      Z08.38                    -800X952 MAN 07 SET 122 BASE EQUAL AMQ
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D221 011      08.39 U.42.10.0.04.23   MAN 08 TRANSFER NOT NEG TO 04.38 MAN 26
D221 012     Z08.40                   -5015340 MAN 09 122 CA 0900
D221 013     Z08.41                   -9809860 MAN 10 TRA TO 58 AT 06.48 MAN 11
D221 014      06.48 U.51.58.1.24.26   MAN 11 AMQ TO PNPN
D221 015      06.58 W.89.12.3.23.31   MAN 12 EXTRACT NOT BCD AND BP ZZZZ700
D221 016     Z02.89                   ZOZZ700 MAN 12 MAN 17
D221 017      06.12  .13.21.2.25.28   MAN 13 EXTRACTED TO AR
D221 018      06.21  .23.68.3.06.29   MAN 14 MINUS BLANK SNAPSHOT
D221 019     Z06.23                   8005000 MAN 14
D221 020      06.68  .71.73.6.25.27   MAN 15 SS BLANK TO AR TEST NOT SS TO MAN 24
D221 021      06.73  .U1.U2.2.06.30   MAN 16 ADD BP TO SS
D221 022     Z06.U1                   0000800 MAN 16
D221 023      06.U2 W.89.78.3.23.31   MAN 17 EXTRACT BP CARRY IF ANY
D221 024      06.78  .81.99.4.26.29   MAN 18 RECOMBINE SS CHANGED BP STATUS
D221 025      06.99 U.U2.03.1.28.24   MAN 19 SNAPSHOT TO AMQ
D221 026      06.03  .13.04.0.08.28   MAN 20 PICK UP TRA COMMAND
D221 027      08.13 U.67.26.0.06.22   MAN 20 1 TRA TO 06 63 MAN 22
D221 028      06.04  .92.92.1.21.31   MAN 21 EXECUTE TRANSFER TO 06.63 MAN 22
D221 029     Z06.63                   -1010140 MAN 22 122 STORE 0900
D221 030      06.64 U.39.26.0.08.22   MAN 23 TRANSFER TO 08.35 MAN 04
D221 031      06.74  .96.04.0.08.28   MAN 24 PICK UP TRA 08.34 TO MAN 21 TO MAN 25
D221 032      08.96 U.38.26.0.08.22   MAN 24 1 TRA TO 08 34 MAN 25
D221 033      08.34  .80.43.0.06.23   MAN 25 TYPE FP AND CR TO TRA 04
D221 034     Z06.80                   -000007Z MAN 25
D221 035      04.38  .81.89.0.02.22   MAN 26 FILL MAN 30 FOR NEXT
D221 036      01.89  .31.31.4.21.31   MAN 27 TRA TO MAN 28
D221 037      04.31  .52.45.0.02.06   MAN 28 RESET MARK LEVEL
D221 038     Z02.52                   0900000 MAN 27
D221 039      04.45  .48.16.0.23.31   MAN 29 CLEAR AMQ TO PRT 34 NXT 01 MAN 30
D221 040     Z02.81                   -5016140 MAN 30 122 TRA 0900
D221 041      01.00  .09.89.0.08.22   MAN 30 START HERE ANY TIME TO MAN 26 MAN 31
D221 042      08.09  .00.00.0.21.31   MAN 31 GO TO MAN 01
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D222 000                              NXT NEXT COMMAND INTERROGATION

D222 001      01.85 U.90.90.2.22.22   NXT 01 NEXT
D222 002      01.90  .92.92.0.22.31   NXT 02 TEST NO OBEY
D222 003      01.92  .94.99.0.31.31   NXT 03 OBEY
D222 004      01.93  .94.95.2.06.21   NXT 04 PICK UP DUMMY
D222 005      06.94 U.U6.01.0.08.23   04 NXT PICK UP INDEX
D222 006      01.95  .98.99.2.31.29   NXT 05 BUILD INDEX PICK UP
D222 007      01.99  .U1.U1.0.31.31   NXT 06 PICK UP INDEX TO NDX 01



D223 000                              NDX INDEXED COMMAND

D223 001      01.01  .02.03.2.21.28   NDX 01 INDEXED OR SPECIAL COMMAND
D223 002      01.03  .04.05.2.28.29   NDX 02 SET OFLO IF SPECIAL
D223 003      01.05  .07.07.0.29.31   NDX 03 TEST SPECIAL COMMAND
D223 004      01.07  .09.09.3.21.31   NDX 04 NO TO 3.09 NDX 05
D223 005      03.09  .10.11.2.28.29   NDX 05 SET NOT STORE
D223 006      03.11  .13.13.0.29.31   NDX 06 TEST IF NOT STORE
D223 007      03.13  .14.14.0.21.26   NDX 07 STORE
D223 008      03.15  .17.17.3.23.31   NDX 08 DESTINATION TO PN0 SET 1D0
D223 009     Z02.16                   ZZZZZZ0 08 NDX X
D223 010      03.14  .16.17.0.29.25   NDX 09 NOT STORE CLEAR 1D0 PN0
D223 011      03.17  .18.19.0.28.29   NDX 10 SET NOT 11
D223 012      03.19  .20.21.0.28.29   NDX 11 SET NOT 12
D223 013      03.21  .22.23.0.29.31   NDX 12 TEST NOT BOTH TO NDX 15
D223 014      03.23  .24.28.2.23.21   NDX 13 COMMAND TO 21.0 11 TO AR
D223 015      03.28  .29.30.0.23.29   NDX 14 ADD 12 TO NDX 18
D223 016      03.24  .26.26.0.22.31   NDX 15 TEST FOR 11
D223 017      03.26  .28.30.6.23.21   NDX 16 COMMAND TO 21.0 12 TO AR
D223 018      03.27  .28.30.2.23.21   NDX 17 COMMAND TO 21.0 11 TO AR
D223 019      03.30  .31.32.6.06.26   NDX 18 1 TO DN1 .37 TO AR
D223 020     Z06.31                   3700000 18 NDX
D223 021      03.32  .34.35.3.23.31   NDX 19 REL TO 1D1 1 TO PN1
D223 022     Z02.33                   0077W00 19 NDX X
D223 023      03.35  .36.37.2.21.29   NDX 20 ADD COMMAND
D223 024      03.37  .39.40.2.28.30   NDX 21 ADD TO 1
D223 025      03.40  .42.42.0.29.31   NDX 22 TEST 2 LINE JUMP NDX 27
D223 026      03.42  .43.45.0.06.30   NDX 23 NOT 2 LINE SET ONE LINE
D223 027     Z06.43                   6400000 23 NDX
D223 028      03.45  .47.47.0.29.31   NDX 24 TEST ONE LINE JUMP
D223 029      03.47  .49.50.1.06.30   NDX 25 NO JUMP FIX
D223 030     Z06.49                   9V00000- 25 NDX
D223 031      03.48  .49.50.0.04.30   NDX 26 ONE LINE JUMP
D223 032     Z04.49                   0100021 26 NDX
D223 033      03.43  .47.50.0.06.30   NDX TWO LINE JUMP
D223 034     Z06.47                   0100042 27 NDX
D223 035      03.50  .53.53.1.21.31   NDX 28 TO 1.53 NDX 29
D223 036      01.53  .54.55.0.04.28   NDX 29 PICK UP DUMMY
D223 037      04.54 U.00.0*.0.09.28   29 NDX INDEX DUMMY
D223 038      01.55  .56.57.1.25.27   NDX 30 TEST STORE NDX 34
D223 039      01.57 W.59.64.3.23.31   NDX 31 WD OP SS TO 1D1
D223 040     Z02.59                   ZZZY1Y0 31 NDX X
D223 041      01.64  .65.67.1.25.29   NDX 32 BUILD COMMAND
D223 042      01.67  .69.69.0.31.31   NDX 33 OBEY INDEXED COMMAND
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D223 043      01.58  .60.60.0.21.31   NDX 34 STORE TO 0.60 NDX 35
D223 044      00.60  .62.63.3.23.31   NDX 35 WD CH TO PN
D223 045     Z02.61                   00ZZZZ0 35 NDX X
D223 046      00.63  .66.67.0.06.28   NDX 36 STORE DUMMY
D223 047      06.66 U.W7.85.1.24.09   36 NDX STORE DUMMY
D223 048      00.67 U.70.71.0.26.29   NDX 37 BUILD STORE COMMAND
D223 049      00.71  .75.75.1.21.31   NDX 38 TO NDX 39 1.75
D223 050      01.75  .77.77.0.31.31   NDX 39 OBEY INDEXED STORE
                 .

D224 000                              SPL SPECIAL NONARITHMETIC COMMANDS

D224 001      01.08  .10.10.2.21.31   SPL 01 YES TO 2.10 SPL 02
D224 002      02.10  .11.12.2.00.26   SPL 02 SPL TO PN1 PICK UP SWITCH
D224 003      00.11 U.21.21.1.24.20   02 SPL OP SWITCH DUMMY
D224 004      02.12  .14.14.3.23.31   SPL 03 OP TO 1D1
D224 005     Z02.13                   001Z000 SPL 03
D224 006      02.14  .15.17.2.25.29   SPL 04 OP TO SWITCH
D224 007      02.17  .19.19.0.31.31   SPL 05 A TO 21.0 NEXT OP PLUS 21
                 .

D225 000                              ADD ADD OPERAND TO ACCUMULATOR

D225 001      01.74  .77.77.0.21.31   ADD 01 TO 0.77 ADD 02
D225 002      00.77  .79.80.0.24.27   ADD 02 TEST A NOT ZERO
D225 003      00.80  .82.82.1.21.31   ADD 03 ZERO TO 1.82 CLA 01
D225 004      00.81  .82.83.2.28.27   ADD 04 TEST X NOT ZERO
D225 005      00.83  .85.85.1.21.31   ADD 05 ZERO TO 1.85 NXT 01
D225 006      00.84  .85.86.0.28.21   ADD 06 X TO 21.1
D225 007      00.86  .87.88.1.24.21   ADD 07 A TO 21.3
D225 008      00.88  .89.90.1.30.28   ADD 08 EXP X
D225 009      00.90  .91.92.3.30.29   ADD 09 EXP X MINUS EXP A
D225 010      00.92  .94.94.0.22.31   ADD 10 TEST A LESS THAN X TO ADD 14
D225 011      00.94  .95.96.3.28.28   ADD 11 EXP A MINUS EXP X
D225 012      00.96  .97.U0.0.31.25   ADD 12 X TO 1D1 X SMALLER
D225 013      00.U0  .U1.U2.1.24.21   ADD 13 A TO 21.1
D225 014      00.95  .99.U2.0.31.25   ADD 14 A TO 1D1 A SMALLER
D225 015      00.U2  .U3.U4.3.06.29   ADD 15 MINUS ONE
D225 016     Z06.U3                   0000001 15 ADD
D225 017      00.U4  .43.28.0.26.31   ADD 16 SHIFT SMALLER
D225 018      00.28  .29.30.0.25.28   ADD 17 SMALLER TO AR
D225 019      00.30  .31.32.1.28.28   ADD 18 COMPLEMENT
D225 020      00.32  .33.34.0.31.25   ADD 19 LARGER TO 1D1
D225 021      00.34  .01.36.1.26.31   ADD 20 SHIFT ONE

D225 022      00.36  .37.38.0.25.30   ADD 21 SIGN AND NR TO PN1
D225 023      00.38  .39.41.1.26.29   ADD 22 ADD LARGER
D225 024      00.41  .44.44.0.23.31   ADD 23 CLEAR REGISTERS
D225 025      00.44  .45.46.1.28.28   ADD 24 UNCOMPLEMENT
D225 026      00.46  .47.48.0.28.24   ADD 25 SUM TO MQ1
D225 027      00.48  .49.50.1.30.28   ADD 26 EXP LARGER TO AR
D225 028      00.50  .51.52.3.06.29   ADD 27 FIX EXP MINUS ONE TO NOR 01
D225 029     Z06.51                   0000001 27 ADD
                 .

D226 000                              NSU INVERSE SUBTRACT

D226 001      01.66  .67.69.3.24.26   NSU 01 INVERSE SUBTRACT
D226 002      01.69 U.72.72.3.28.24   NSU 02 CHANGE SIGN OF A
D226 003      01.72  .73.74.4.26.28   NSU 03 RESTORE X TO ADD 01
                 .

D227 000                              SUB SUBTRACT OPERAND FROM ACCUMULATOR

D227 001      01.68  .70.71.3.28.28   SUB 01 SUBTRACT CHANGE SIGN
D227 002      01.71  .73.74.1.28.28   SUB 02 UNCOMPL TO ADD 01
                 .

D228 000                              NOR GENERAL NORMALIZATION ROUTINE

D228 001      00.52  .53.54.0.24.27   NOR 01 NORMALIZE TEST SUM
D228 002      00.54  .56.83.0.23.31   NOR 02 SUM ZERO TO ADD 05
D228 003      00.55  .42.66.0.27.31   NOR 03 NORMALIZE MAX 21
D228 004      00.66  .67.68.0.24.26   NOR 04 MQ1 TO PN1
D228 005      00.68  .69.70.0.28.21   NOR 05 EXPONENT TO 21.1
D228 006      00.70  .71.72.0.06.30   NOR 06 ADD ROUNDOFF
D228 007     Z06.71                   0000080 06 NOR
D228 008      00.72  .74.74.0.29.31   NOR 07 ROUND TO ONE HALF TEST
D228 009      00.75  .77.07.0.06.26   NOR 08 SET EQUAL ONE HALF
D228 010     Z06.77                   8000000 08 NOR
D228 011      00.07  .66.68.7.28.28   NOR 09 DECREMENT EXP TO NOR 05
D228 012      00.74  .75.76.0.26.21   NOR 10 PN1 TO 21.3
D228 013      00.76  .77.78.0.31.27   NOR 11 TEST LIMIT TO NOR 13
D228 014      00.78  .79.80.0.27.28   NOR 12 COMBINE NR TO ADD 03
D228 015      00.79  .81.20.0.22.31   NOR 13 TEST OFLO TO NOR 15
D228 016      00.20  .79.80.0.29.28   NOR 14 UNDERFLO TO ADD 03
D228 017      00.21 W.02.U0.1.21.31   NOR 15 OFLO EXIT
D228 018      01.U0  .19.13.0.02.28   NOR 16 OFLO TYPE 02
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D229 000                                    MUL MULTIPLY

D229 001      01.68   .04.04.0.21.31        MUL 01 MULTIPLY ENTRY OP 12
D229 002      00.04   .05.06.3.06.21        MUL 02 MULTIPLY X TO 21.1 -128 TO AR
D229 003     Z06.05                         0000080- 0Z MUL
D229 004      00.06   .07.08.1.24.21        MUL 03 A TO 21.3
D229 005      00.08   .09.10.0.30.29        MUL 04 PLUS EXP X
D229 006      00.10   .11.12.0.30.29        MUL 05 PLUS EXP A
D229 007      00.12   .13.14.0.31.25        MUL 06 X TO 1D1
D229 008      00.14   .15.16.0.31.24        MUL 07 A TO MQ1
D229 009      00.16   .39.56.0.24.31        MUL 08 MULT 20 BITS
D229 010      00.56 U.59.59.4.26.24         MUL 09 PRODUCT TO MQ
D229 011      00.59   .02.62.0.27.31        MUL 10 NORMALIZE PRODUCT
D229 012      00.62   .63.64.0.26.27        MUL 11 TEST EQUAL ZERO
D229 013      00.64   .67.83.0.23.31        MUL 12 CLEAR A TO ADD 05
D229 014      00.65   .65.68.4.24.26        MUL 13 PRODUCT TO PN TO NOR 05


D231 000                                    NDV INVERSE DIVIDE  REVERSE DIVIDE

D231 001      01.76   .79.80.0.28.21        NDV 01 X TO 21.3
D231 002      01.80   .81.83.1.24.21        NDV 02 A TO 21.1
D231 003      01.83   .86.86.0.23.31        NDV 03 CLEAR 2 WD REGISTERS
D231 004      01.86   .88.88.3.21.31        NDV 04 TO DIV 03 3.88


D230 000                                    DIV DIVIDE

D230 001      01.70   .71.73.3.24.24        DIV 01 INTERCHANGE X AND A
D230 002      01.73   .75.76.1.24.24        DIV 02 TO REVERSE DIVIDE OP 06
D230 003      03.88   .89.91.2.31.27        DIV 03 A ZERO TEST
D230 004      03.91   .08.00.0.00.28        DIV 04 A ZERO ERROR
D230 005      03.92   .93.94.0.31.25        DIV 05 LOAD A
D230 006      03.94   .95.96.0.31.26        DIV 06 LOAD X
D230 007      03.96 U.98.98.2.28.27         DIV 061 X ZERO TEST
D230 008      03.98   .64.64.0.21.31        DIV 062 X ZERO TO MUL 12
D230 009      03.99   .47.39.1.25.31        DIV 07 DIVIDE X BY 32 A
D230 010      03.39   .40.41.2.24.24        DIV 08 QUOTIENT TO AR CLEAR MQ0
D230 011      03.41   .43.44.2.08.24        DIV 09 Q TO MQ1 123 TO AR
D230 012     Z08.43                         000007V DIV 09
D230 013      03.44   .45.46.3.30.29        DIV 10 SUBTRACT EXPONENT
D230 014      03.46   .49.49.0.21.31        DIV 13 TO 0.49 DIV 14
D230 015      00.49   .51.52.1.30.29        DIV 14 PLUS EXP X TO NOR 01


D232 000                                    SQT SQUARE ROOT OF ACCUMULATOR

D232 001      01.U5   .U7.U7.2.21.31        SQT 01 TRA TO 2.U7
D232 002      02.U7   .21.29.0.06.28        SQT 02 64 TO AR
D232 003      02.09   .11.25.0.30.25        SQT 03 EXP TO 1D1
D232 004      02.25   .02.50.1.26.31        SQT 04 DIVIDE BY TWO
D232 005      02.50   .53.54.4.25.29        SQT 05 EQUALS EXP ANSWER
D232 006      02.54   .55.56.0.31.25        SQT 06 B TO 1D
D232 007      02.56   .05.68.1.26.31        SQT 07 B/8
D232 008      02.68   .69.73.2.28.21        SQT 08 EXP TO 21.1
D232 009      02.73 U.76.84.0.25.26         SQT 09 B08 TO PN1 CLEAR TE
D232 010      02.84   .86.87.0.22.31        SQT 10 EXP ODD TEST TO SQT 13
D232 011      02.87   .99.U0.2.26.30        SQT 11 B04 IN PN
D232 012      02.U0   .U1.U2.0.04.28        SQT 12 1Y77976 TO AR
D232 013     Z04.U1                         1Y77976 12 SQT
D232 014      02.88   .91.U2.0.00.28        SQT 13 0YX4309 TO AR
D232 015     Z00.91                         0YX4309 13 SQT
D232 016      02.U2   .U5.U6.2.25.29        SQT 14 ADD TO FORM R0/4
D232 017      02.U6   .02.04.5.26.21        SQT 15 R2/4 TO 21.3
D232 018      02.04   .05.07.0.26.27        SQT 16 R2 NOT ZERO TO SQT 18
D232 019      02.07   .64.64.0.21.31        SQT 17 ZERO EXIT HERE
D232 020      02.08   .13.15.1.28.25        SQT 18 R0/4 TO 1D
D232 021      02.15   .53.70.1.25.31        SQT 19 EQUALS R2/4R0
D232 022      02.70   .72.74.0.24.29        SQT 20 ADD TO R0/4 EQUALS R1/2
D232 023      02.74   .75.97.0.28.25        SQT 201 R 162 TO 1D
D232 024      02.97   .98.U1.4.21.26        SQT 21 R2/4 R0 PN CLEAR TE AND IP
D232 025      02.U1   .U3.U3.0.22.31        SQT 22 OPERAND NEGATIVE TO SQT 24
D232 026      02.U3   .57.57.1.25.31        SQT 23 R2/2R1 TO MQ0
D232 027      02.U4 W.02.04.1.2.31          SQT 24 NEGATIVE ERROR
D232 028      02.57   .58.60.2.24.29        SQT 25 EQUALS R
D232 029      02.60   .61.62.2.21.24        SQT 26 R TO MQ1 EXP TO AR
D232 030      02.62   .65.65.0.21.31        SQT 27 EXIT TO MUL 13
D232 031      01.04   .09.13.0.01.28        SQT 28 SEG E990R TYPE 0Y


D233 000                                    SET SET INDEX REGISTER

D233 001      02.21   .22.24.2.06.25        SET 01 SET REGISTER CLEAR 1D0 PU DUMMY
D233 002      06.22 W.U2.79.1.26.08         01 SET STORE INDEX
D233 003      02.24   .25.26.0.26.25        SET 02 PN1 TO 1D1
D233 004      02. 6   .11.42. .26.31        SET 03 SHIFT 6 RIGHT
D233 005      02.42   .43.45.4.25.26        SET 04 1D1 TO PN1 WITH SIGN
D233 006      02.45 W.47.49.3.23.31         SET 05 REL TO 1D1
D233 007     Z02.47                         ZZZZZ00 SET 05
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D233 008      02.49   .01.53.1.26.31   SET 06 SHIFT EVEN RIGHT
D233 009      02.53   .05.64.1.26.31   SET 07 SHIFT EVEN 3 ODD 2
D233 010      02.64   .65.66.4.26.29   SET 08 ADD DESTINATION PLUS BASE
D233 011      02.66   .68.69.2.25.29   SET 09 ADD KEY
D233 012      02.69   .71.71.0.22.31   SET 10 TEST BASE
D233 013      02.71   .77.77.4.21.31   SET 11 NOT BASE TO 4.77 SET 17
D233 014      02.72   .73.75.2.25.21   SET 12 REL TO AR STORE TO 21.1
D233 015      02.75   .76.78.2.28.21   SET 13 REL TO 21.0
D233 016      02.78   .79.80.0.06.29   SET 14 PLUS 100
D233 017     Z06.79                    0000190 14 SET
D233 018      02.80   .82.82.0.21.31   SET 15 TO INC 23
D233 019      04.77   .79.83.2.25.25   SET 17 REL TO AR STORE TO 1D1
D233 020      04.83 U.86.88.1.28.26    SET 18 REL TO PNPN
D233 021      04.88   .89.90.2.25.28   SET 19 STORE TO AT
D233 022      04.90   .92.92.1.21.31   SET 20 TO 1.92 NXT 03
                 *

D234 000                               AXR STORE ACCUMULATOR IN INDEX REGISTER

D234 001      02.48   .51.21.1.24.27   AXR 01 A ZERO TO SET 01
D234 002      02.22   .71.71.3.21.31   AXR 01 1 TRA TO 03 71 AXR 02
D234 003      03.71   .79.86.1.24.21   AXR 02 AMQ TO 21.3
D234 004      03.86   .01.05.0.26.21   AXR 03 SAVE PN1
D234 005      03.05   .07.12.0.04.28   AXR 04 119 TO AR
D234 006     Z04.07                    0000076 04 AXR
D234 007      03.12   .19.22.3.30.29   AXR 05 MINUS EXP A
D234 008      03.22   .27.29.1.24.25   AXR 06 AMQ TO 1D1
D234 009      03.29   .31.33.0.22.31   AXR 07 TEST SHIFT TO AXR 09
D234 010      03.33   .35.U0.2.28.27   AXR 08 TEST VALID TO AXR 11
D234 011      03.34   .24.U0.0.26.31   AXR 09 SHIFT OFF EXCESS
D234 012      03.U1   .10.00.0.00.28   AXR 10 INVALID TOO LARGE PICK UP 0W
D234 013      03.U0   .U1.U7.0.25.26   AXR 11 REL TO PN
D234 014      03.U7 W.31.36.3.23.31    AXR 12 EXTRACT FRACTIONAL PART
D234 015     Z02.11                    003ZZZZ- 12 AXR
D234 016      03.16   .17.18.2.21.30   AXR 13 ADD SAVED PN
D234 017      03.18   .21.21.2.21.31   AXR 14 TO SET REGISTERS SET 01
D234 018      03.00 W.02.13.1.21.31    AXR 15 TO ERROR ALARM
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D235 000                               INC INCREMENT INDEX REGISTER

D235 001      02.23   .25.25.1.21.31   INC 01 INCREMENT INDEX TO 1.25
D235 002      01.25   .26.27.0.31.26   INC 02 I AND I2 TO PN
D235 003      01.27   .29.29.3.23.31   INC 03 I TO 1D

D235 004     Z02.28                    002ZZZZ 03 INC X
D235 005      01.29   .30.31.1.26.27   INC 04 TEST I2 TO INC 07
D235 006      01.31   .32.34.6.23.26   INC 05 I1 TO PN1
D235 007      01.34   .36.37.0.03.26   INC 06 I1 STORE DUMMY
D235 008      03.36   .U4.79.1.26.08   06 INC I1 STORE DUMMY
D235 009      01.32   .33.35.0.23.26   INC 07 I2 TO PN 1
D235 010      01.35   .36.37.0.06.26   INC 08 I2 STORE DUMMY
D235 011      06.36   .U5.79.1.26.08   08 INC I2 STORE DUMMY
D235 012      01.37   .09.47.1.26.31   INC 09 SHIFT I TO DESTINATION
D235 013      01.47   .48.50.2.25.30   INC 10 BUILD STORE COMMAND
D235 014      01.50   .52.52.3.23.31   INC 11 REL TO PN1
D235 015     Z02.51                    ZZ003ZZ 11 INC X
D235 016      01.52   .55.55.3.21.31   INC 12 TO 3.55 INC 13
D235 017      03.55   .56.61.6.26.21   INC 13 STORE TO 21.1 REL TO AR
D235 018      03.61   .62.65.0.23.29   INC 14 INCREMENT
D235 019      03.65   .66.68.4.28.26   INC 15 TO PNPN
D235 020      03.68   .69.70.3.28.28   INC 16 NEGATE BASE
D235 021      03.70   .71.72.1.23.29   INC 17 PLUS LIMIT
D235 022      03.72   .74.74.0.22.31   INC 18 BASE GREATER THAN LIMIT TO INC 22
D235 023      03.74 U.77.77.3.26.21    INC 19 REL TO 21 0 AND AR JUNK TO 21 3
D235 024      03.77   .79.80.0.06.29   INC 20 REL PLUS 100
D235 025      03.80   .82.82.0.21.31   INC 21 TO INC 23
D235 026      03.75   .76.79.4.00.25   INC 22 LIMIT EXCEEDED SET 1D0
D235 027      03.79   .87.87.0.21.31   INC 22 1 TO INC 37 TO CLEAR INDEX
D235 028      00.82   .83.85.2.28.24   INC 23 REL PLUS 100 TO M0
D235 029      00.85   .86.89.4.06.25   INC 24 16100 TO 1D1D
D235 030     Z06.86                    70W0000 24 INC
D235 031     Z06.87                    0000S1Y- 24 INC
D235 032      00.89   .36.18.0.24.31   INC 25 MULT REL X 16100
D235 033      00.18   .20.22.7.26.25   INC 26 FRACTION TO 1D1
D235 034      00.22   .23.24.6.26.30   INC 27 FORM INTEGER
D235 035      00.24   .25.27.2.26.28   INC 28 INTEGER TO AR
D235 036      00.27   .12.40.0.24.31   INC 29 FRACTION X 100 15 WD
D235 037      00.40   .42.42.3.23.31   INC 30 WD TO PN
D235 038     Z02.41                    002 ZZZ 30 INC X
D235 039      00.42   .43.45.2.28.30   INC 31 PLUS DESTINATION
D235 040      00.45 U.51.51.2.28.29    INC 32 SHIFT TO SOURCE
D235 041      00.51   .54.58.0.29.25   INC 33 CLEAR 1D0 FOR TRANSFER
D235 042      00.58   .59.61.2.26.29   INC 34 PLUS CHWD
D235 043      00.61   .68.73.0.21.29   INC 35 PLUS REL
D235 044      00.73 U.76.87.1.28.26    INC 36 TO PNPN
D235 045      00.87   .89.93.2.21.28   INC 37 PICK UP STORE COMMAND
D235 046      00.93   .99.99.1.21.31   INC 38 TO 1.99 NXT 06
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D236 000                                    IAR ARITHMETIC WITH INDEX FOR OPER

D236 001      02.30 U.45.46.2.23.23         IAR 01 I2 HERE CHANGE TO I1
D236 002      02.46  .67.67.4.21.31         IAR 02 I1 HERE TRA TO 4.67
D236 003      04.67  .72.92.0.23.26         IAR 03 I1 TO PNO
D236 004      04.92 W.98.U3.7.23.31         IAR 04 REL TO 1D0 OP TO 1D1
D236 005     Z02.98                         00ZZW00 04 IAR
D236 006     Z02.99                         000003Z 04 IAR
D236 007      04.U3  .U4.U7.6.25.24         IAR 05 REL TO MQ1 OP TO AR
D236 008      04.U7 U.31.33.2.28.29         IAR 06 SHIFT OP TO NN
D236 009      04.13  .14.15.0.04.29         IAR 07 ADD OP SWITCH DUMMY D
D236 010      04.14  .U4.64.0.20.28         07 IAR N TC AR NEXT IS OP
D236 011      04.15  .17.19.2.04.25         IAR 08 D TO 1D1 11Q TO AR
D236 012     Z04.17                         000006Y 08 IAR
D236 013      04.19  .W6.43.0.27.31         IAR 09 NORMALIZE REL
D236 014      04.43  .45.47.2.24.29         IAR 10 COMBINE NR N
D236 015      04.47  .52.56.2.20.20         IAR 11 N TO 20.0 AMQ TO AR
D236 016      04.56 U.59.88.1.28.24         IAR 12 RESTORE AMQ TO SET 19 EXECUTE 1D1

D237 000                                    KBD TYPEWRITER INPUT TO ACCUMULATOR

D237 001      01.U2  .U2.U2.0.28.31         KBD 01 WAIT FOR READY
D237 002      01.U3 U.U4.U4.0.06.19         KBD 02 LINE 6 TO LINE 19
D237 003      01.U4  .65.65.0.17.31         KBD 03 DING
D237 004      01.65  .68.94.7.29.23         KBD 04 CLEAR AND MARK
D237 005      01.94  .96.97.0.12.31         KBD 05 GATE TYPE
D237 006      01.97  .U0.U1.0.23.31         KBD 06 CLEAR 2 WORD
D237 007      01.U1  .U1.32.6.21.31         KBD 07 TO LINE 6 IN LINE 19
D237 008      06.32  .32.32.0.28.31         KBD 08 WAIT NO SLASH
D237 009      06.33  .36.42.4.23.24         KBD 09 23.0.1 TO MQ
D237 010      06.42  .43.44.0.29.28         KBD 10 CLEAR AR TO KBD 27
D237 011      06.28  .32.32.0.28.31         KBD 11 WAIT ONE SLASH
D237 012      06.29  .45.94.3.06.28         KBD 12 MINUS ONE TO AR
D237 013      06.90  .00.48.4.19.24         KBD 13 19.00.01 TO MQ TO KBD 27
D237 014      06.24  .32.32.0.28.31         KBD 14 WAIT TWO SLASH FP HERE
D237 015      06.25  .36.45.4.23.24         KBD 15 23.0.1 TO MQ
D237 016      06.37  .90.49.1.27.31         KBD 16 NORMALIZE TO MARKER
D237 017      06.41  .02.54.1.26.31         KBD 17 SHIFT OFF MARKER
D237 018      06.46  .57.67.1.06.25         KBD 18 TEN TO 1D
D237 019     Z06.57                         0000000 18 KBD
D237 020      06.59  .08.78.0.24.31         KBD 19 TENS IN EXCESS FIFTY
D237 021      06.70  .85.89.1.06.25         KBD 20 ONE TO 1D
D237 022     Z06.85                         0000010 20 KBD

D237 023      06.81  .08.99.0.24.31         KBD 21 EQUALS EXCESS FIFTY
D237 024      06.91  .U1.U6.3.26.28         KBD 22 MINUS EXPONENT
D237 025      06.98  .01.34.0.06.29         KBD 23 PLUS 62
D237 026     Z06.01                         0000040 23 KBD
D237 027      06.26  .37.38.0.28.21         KBD 24 STORE DECIMAL SCALE
D237 028      06.30  .64.64.5.21.31         KBD 25 TO KBD 35 08.64
D237 029      06.20 W.U3.13.1.21.31         KBD 26 3 SLASH TO ERROR TYPE RESTART
D237 030      06.44  .51.51.5.21.31         KBD 27 TO KBD 28 08.51
D237 031      08.51  .V4.72.0.27.31         KBD 28 NORMALIZE FOR COUNT
D237 032      08.72 U.75.75.0.28.25         KBD 29 COUNT TO 1D1
D237 033      08.75  .04.88.1.26.31         KBD 30 DIVIDE BY 4
D237 034      08.88  .89.91.0.25.21         KBD 31 STORE DECIMAL SCALE
D237 035      08.91  .92.95.4.23.24         KBD 32 23.0.1 TO MQ
D237 036      08.95  .V2.49.1.27.31         KBD 33 NORMALIZE
D237 037      08.49  .02.64.1.26.31         KBD 34 SHIFT OFF MARKER BIT
D237 038      08.64  .68.71.4.24.26         KBD 35 BCD TO PN
D237 039      08.71  .72.74.4.08.24         KBD 36 LOAD COMPRESSED MULT
D237 040     Z08.73                         UW9Z426 36 KBD
D237 041      08.74 W.76.87.7.23.31         KBD 37 -Z0Z00Z0 Y1Y01Y0
D237 042     Z02.76                         Y1Y01Y0 37 KBD
D237 043     Z02.77                         Z0Z00Z0- 37 KBD
D237 044      08.87  .06.94.0.24.31         KBD 38 TIMES TEN
D237 045      08.94  .97.97.3.23.31         KBD 39 7Z00Z00 ZY00Y00
D237 046     Z02.95                         7Z00Z00 39 KBD
D237 047     Z02.96                         ZY01Y00 39 KBD
D237 048      08.97  .12.04.0.24.31         KBD 40 TIMES TEN SQUARED
D237 049      08.04  .07.07.3.23.31         KBD 41 3ZZZ000 7ZZY000
D237 050     Z02.05                         ZZZZ000- 41 KBD
D237 051     Z02.06                         ZZZY000 41 KBD
D237 052      08.07  .18.26.0.24.31         KBD 42 TIMES TEN CUBED
D237 053      08.26  .27.29.0.26.25         KBD 43 PN1 TO 1D1
D237 054      08.29  .30.42.1.29.25         KBD 435 CLEAR 1D0 PNO NOT 1P
D237 055      08.42  .41.86.0.24.31         KBD 44 TIMES TEN SEVENTH
D237 056      08.86  .89.90.0.06.28         KBD 45 72 TO AR
D237 057     Z06.89                         0000048 45 KBD
D237 058      08.90 U.93.93.4.26.24         KBD 46 BINARY NR TO MQ
D237 059      08.93  .V2.24.0.27.31         KBD 47 NORMALIZE
D237 060      08.24  .26.28.4.24.25         KBD 48 NR TO 1D
D237 061      08.28  .29.30.2.21.21         KBD 49 EXP TO 21.1 S.F.TO AR
D237 062      08.30  .32.32.0.22.31         KBD 50 S.F.NEG TO KBD 61
D237 063      08.32  .40.44.0.28.27         KBD 51 S.F.NOT ZERO TO KBD 55
D237 064      08.44  .45.48.0.21.28         KBD 52 EXP TO AR
D237 065      08.48 U.49.50.0.29.19         KBD 53 CLEAR L19
D237 066      08.50  .52.52.0.21.31         KBD 54 TO NOR D1
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D237 067      08.45   83.01.1.02.29   KBD 55 S.F.MINUS 7
D237 068      08.51   .52.08.0.08.21  KBD 56 23 TO 21.2 IS EXP FIX
D237 069     Z08.52                   0000017 56 KBD
D237 070      08.08   .09.12.0.06.24  KBD 57 M NUS 7 S.F.TO MQ
D237 071     Z06.09                   X6VZ94Y 57 RED
D237 072      08.12   .13.27.2.21.21  KBD 58 SWITCH S.F.AND EXP
D237 073      08.27   .30.31.1.21.29  KBD 59 ADD EXP FIX
D237 074      08.31   .54.90.0.24.31  KBD 60 TIMES S.F.TO KBD 46
D237 075      08.33   .45.47.1.06.29  KBD 61 S.F.PLUS ONE
D237 076      08.47   .02.06.0.06.21  KBD 62 MINUS 4 TO 21.2 EXP FIX
D237 077     Z06.02                   0000004- 62 KBD
D237 078      08.06   .11.12.0.08.24  KBD 63 PLUS ONE S.F.TO MQ TO KBD 58
D237 079     Z08.11                   U000000 63 KBD
D237 080      01.13   .15.09.0.00.31  KBD 64 SET READY
D237 081      01.09   .11.44.0.08.31  KBD 65 TYPE ERROR
D237 082      01.44   .44.44.0.28.31  KBD 66 READY WAIT
D237 083      01.45   .47.46.1.20.31  KBD 67 RETURN TO KBD 02
                .

D238 000                              PRT PRINT ACCUMULATOR

D238 001      01.43   .44.48.1.24.20  PRT 00 STORE A
D238 002      01.48   .51.51.3.2 .31  PRT 01 PRINT A TO 3.51
D238 003      03.51   .52.53.0.29.25  PRT 02 CLEAR 1D0 AND 1P
D238 004      03.53   .55.56.1.24 2.  PRT 03 A TO 21.3
D238 005      03.56   .57.58.0.24.27  PRT 04 A TEST NOT ZERO TO PRT 08
D238 006      03.58   .60.63.0.29.21  PRT 05 CLEAR D..
D238 007      03.63 U.67.67.2.25. 5   PRT 06 CLEAR PN AR
D238 008      03.67   .76.76.4.21.31  PRT 07 TO 4.76 PRT
D238 009      03.59 U.62.62.0.06.26   PRT 08 CONSTANT TO PN 5-16 LOG 2
D238 010     Z06.60                   Z000000 08 PRT
D238 011     Z06.61                   0000001 08 PRT
D238 012      03.62   .63.64.1.30.25  PRT 09 EXP TO 1D1
D238 013      03.64   .65.66.0.06.24  PRT 10 LOG 2 TO MQ1
D238 014     Z06.65                   4X00000 10 PRT
D238 015      03.66   .15.82.0.24.31  PRT 11 EXP LOG 2 TO PN PLUS
D238 016      03.82   .84.84.3.23.31  PRT 12 REDUCE MOD 8
D238 017     Z02.83                   0000007- 12 PRT X
D238 018      03.84   .85.87.2.26.28  PRT 13 8I TO AR
D238 019      03.87   .88.90.0.28.21  PRT 14 8I TO 21.0 IS D.
D238 020      03.90 U.93.93.2.28.29   PRT 15 SHIFT TO SOURCE
D238 021      03.93   .95.97.0.06.29  PRT 16 BUILD TABLE ONE PICK UP
D238 022      06.95 W.U1.U3.4.08.26   16 PRT PICK UP TABLE 1
D238 023      03.97   .99.99.0.31.31  PRT 17 PICK UP TABLE ONE

D238 024     Z08.U1                   8V61304- 16 PRT
D238 025     Z09.U1                   WZV1216 16 PRT
D238 026     Z10.U1                   9UVY131 16 PRT
D238 027     Z11.U1                   Y69594V 16 PRT
D238 028     Z12.U1                   UVWW866 16 PRT
D238 029     Z13.U1                   8000081 16 PRT
D238 030     Z14.U1                   VYVW29V 16 PRT
D238 031     Z15.U1                   8Y1VXV6 16 PRT
D238 032     Z16.U1                   X3W22X0 16 PRT
D238 033     Z17.U1                   9XW5VYV 16 PRT
D238 034      03.U3 W.U5.U6.3.23.31   PRT 18 EXP TO PN 10N TO 1D
D238 035     Z02.U5                   ZZZZZ00 18 PRT X
D238 036      03.U6   .U7.01.0.31.24  PRT 19 A TO MQ
D238 037      03.01   .03.04.1.30.28  PRT 20 EXP A TO AR
D238 038      03.04   .05.06.3.26.29  PRT 21 MINUS EXP 1 EQUALS BR
D238 039      03.06   .07.08.0.25.25  PRT 22 CLEAR PN1
D238 040      03.08   .39.49.0.24.31  PRT 23 10N TIMES A EQUALS P
D238 041      03.49   .50.52.2.28.21  PRT 24 BR TO 21.2
D238 042      03.52   .53.54.0.26.21  PRT 25 P TO 21.1
D238 043      03.54   .55.57.0.06.24  PRT 26 LOG 2 TO MQ1
D238 044     Z06.55                   4X00000 26 PRT
D238 045      03.57   .58.60.6.21.25  PRT 27 BR TO 1D1
D238 046      03.60   .15.76.0.24.31  PRT 28 I2 TO PN1
D238 047      03.76   .77.78.2.26.28  PRT 29 I2 TO AR
D238 048      03.78   .80.81.1.21.29  PRT 30 PLUS D.
D238 049      03.81   .82.83.1.06.29  PRT 31 MINUS 90 EQUALS D..
D238 050     Z06.82                   0000050- 31 PRT
D238 051      03.83   .84.85.1.28.21  PRT 32 STORE D.. 21.0
D238 052      03.85   .87.89.2.26.28  PRT 33 I2 TO AR
D238 053      03.89 U.95.95.2.28.29   PRT 34 SHIFT TO SOURCE
D238 054      03.95   .96.97.0.06.29  PRT 35 PLUS DUMMY PICK UP TABLE 2
D238 055      06.96 U.U2.U2.6.08.26   35 PRT PICK UP TABLE 2
D238 056     Z08.U0                   ZZZZZ00 35 PRT
D238 057     Z09.U0                   U000004 35 PRT
D238 058     Z10.U0                   W800007 35 PRT
D238 059     Z11.U0                   ZU00000 35 PRT
D238 060     Z12.U0                   9W4000Y 35 PRT
D238 061     Z13.U0                   W350011 35 PRT
D238 062     Z14.U0                   Z424014 35 PRT
D238 063     Z15.U0                   9896818 35 PRT
D238 064      03.U2   .U4.U4.4.21.31  PRT 36 TO 4.U4 PRT 37
D238 065      04.U4   .U6.U6.3.23.31  PRT 37 B2 TO PN 10N2 TO 1D
D238 066      04.U6   .U7.01.1.26.28  PRT 38 B2
D238 067      04.01   .02.03.3.21.29  PRT 39 MINUS BR EQUALS EXCESS
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D238 068      04.03   .05.06.0.21.24   PRT 40 P TO MQ
D238 069      04.06   .39.46.0.24.31   PRT 41 TIMES 10N2 EQUALS D
D238 070      04.46   .47.48.0.26.25   PRT 42 D TO 1D
D238 071      04.48   .49.51.2.28.27   PRT 43 ANY EXCESS TEST
D238 072      04.51   .54.58.0.04.04   PRT 44 SKIP SHIFT
D238 073      04.52   .05.58.0.26.31   PRT 45 SHIFT EXCESS
D238 074      04.58   .59.60.0.25.26   PRT 46 1D TO PN
D238 075      04.60 U.64.64.6.26.30    PRT 47 TIMES 4
D238 076      04.64   .65.66.2.25.30   PRT 48 PLUS ONE MAKES 5
D238 077      04.66   .67.68.2.26.30   PRT 49 TIMES 2 IS 10
D238 078      04.68   .70.71.0.29.31   PRT 50 10 1D OFLO TEST
D238 079      04.71   .72.74.1.06.28   PRT 51 PLUS ONE TO INCREMENT D..
D238 080     Z06.72                    0000001 51 PRT
D238 081      04.72   .73.74.0.25.26   PRT 52 1D TO PN
D238 082      04.74   .75.76.0.06.30   PRT 53 ROUNDOFF
D238 083     Z06.75                    000053Y 53 PRT
D238 084      04.76   .98.98.0.28.31   PRT 54 READY TEST
D238 085      04.98   .U4.76.0.05.05   PRT 55 WAIT FOR READY
D238 086      04.99   .U1.U2.0.09.31   PRT 56 TYPE L19
D238 087      04.U2   .U7.00.0.24.19   PRT 57 SIGN TO 19.U7
D238 088      04.00 U.04.04.0.23.02    PRT 58 FORMAT TO L2
D238 089      04.04   .06.08.0.29.31   PRT 59 ROUND TO ONE TENTH TEST
D238 090      04.08   .09.10.0.26.25   PRT 60 D TO 1D
D238 091      04.09   .15.40.1.06.26   PRT 61 .1 TO PN TO PRT 73
D238 092     Z06.15                    1000000 61 PRT
D238 093      04.10   .11.12.0.06.24   PRT 62 LOAD COMPR MULTIPLIER
D238 094     Z06.11                    V6XU000 62 PRT
D238 095      04.12   .05.18.0.24.31   PRT 63 START CONVERSION
D238 096      04.18   .20.20.3.23.31   PRT 64 D1 TO PN
D238 097     Z02.19                    0ZZZZZZ- 64 PRT X
D238 098      04.20   .05.26.0.24.31   PRT 65 MULT
D238 099      04.26   .28.28.3.23.31   PRT 66 D2 TO PN
D238 100     Z02.27                    00ZZZZZ- 66 PRT X
D238 101      04.28   .05.34.0.24.31   PRT 67 MULT
D238 102      04.34   .36.36.3.23.31   PRT 68 D3 TO PN
D238 103     Z02.35                    000ZZZZ- 68 PRT X
D238 104      04.36   .05.42.0.24.31   PRT 69 MULT
D238 105      04.42   .44.44.3.23.31   PRT 70 D 4 TO PN
D238 106     Z02.43                    0000ZZZ- 70 PRT X
D238 107      04.44   .05.50.0.24.31   PRT 71 MULT
D238 108      04.50   .52.53.1.21.29   PRT 72 PLUS D..NEG TO PRT 74
D238 109      04.40   .45.50.3.06.29   PRT 73 DECREMENT D..
D238 110     Z06.45                    0000001 73 PRT
D238 111      04.53   .54.55.0.06.29   PRT 75 PLUS 50


D238 112     Z06.54                    0000032 74 PRT
D238 113      04.55   .56.57.1.23.26   PRT 76 SCALE FACTOR TO PN0
D238 114      04.57   .59.59.3.23.31   PRT 77 D... TO 1D0
D238 115     Z02.58                    000002Z- 77 PRT X
D238 116      04.59   .60.61.1.25.29   PRT 78 D... MINUS D.. PLUS 50
D238 117      04.61 W.63.65.3.23.31    PRT 79 BCD TO 1D
D238 118     Z02.63                    ZZZZZ00 79 PRT X
D238 119      04.65   .67.69.0.22.31   PRT 80 PRINT FLOATING TEST TO PFP 01
D238 120      04.69 U.72.73.2.28.29    PRT 81 TIMES 4
D238 121      04.73   .74.75.3.28.28   PRT 82 NEGATE
D238 122      04.75   .76.78.2.28.27   PRT 83 TEST NOT ZERO TO PRT 85
D238 123      04.78   .80.80.0.06.06   PRT 84 WAIT ONE CYCLE
D238 124      04.79   .V2.80.0.26.31   PRT 85 SHIFT TO FIX POINT
D238 125      04.80   .82.84.4.25.21   PRT 86 BCD TO 21.2,3
D238 126      04.84 U.87.87.1.02.25    PRT 87 LOAD 1D ALL ONES
D238 127     Z02.85                    0000001- 87 PRT C
D238 128     Z02.86                    0000001- 87 PRT C
D238 129      04.87   .88.89.2.26.30   PRT 88 SHIFT PN0
D238 130      04.89   .90.91.1.26.28   PRT 89 TOTAL DIGITS TO AR
D238 131      04.91   .92.93.0.06.29   PRT 90 PLUS DUMMY
D238 132      06.92 U.00.U0.1.26.31    90 PRT SHIFT DIGITS
D238 133      04.93   .95.95.0.31.31   PRT 91 SHIFT TO TOTAL DIGITS
D238 134      04.U0   .U2.U5.5.25.20   PRT 92 EXTRACTOR TO L20
D238 135      04.U5   .U6.16.6.30.19   PRT 93 DIGITS TO LINE 19
D238 136      04.16 U.20.21.0.06.20    PRT 94 RESTORE EXTRACTORS
D238 137     Z06.17                    ZZZZZ00- 94 PRT
D238 138     Z06.18                    02001Y0 94 PRT
D238 139     Z06.19                    ZZZZZ00- 94 PRT
D238 140      04.21   .23.23.0.29.31   PRT 95 OVERFLOW OFF
D238 141      04.23   .79.79.1.21.31   PRT 96 TO RESTORE A
D238 142      04.24   .79.79.1.21.31   PRT 97 TO RESTORE A


D239 000                               PFP PRINT FLOATING POINT

D239 001      04.70   .72.25.3.25.29   PFP 01 FLOATING POINT MINUS D...
D239 002      04.25   .27.22.0.00.31   PRT 98 SET READY STOP NUMERIC TYPEOUT
D239 003      04.22   .54.62.3.06.29   PRT 99 D.. NEG
D239 004      04.62   .60.85.1.28.28   PFP 04 D.. ABSOLUTE PLUS SIGN
D239 005      04.85   .U7.02.0.06.19   PFP 05 F TO 19.U7
D239 006     Z06.U7                    96ZX000 05 PFP
D239 007      04.02   .04.05.4.09.31   PFP 06 TYPE F SPACE
D239 008      04.05 U.18.27.2.28.29    PFP 07 12 LEFT IN AR
D239 009      04.27 U.30.30.2.28.24    PFP 08 AR TO MQMQ
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D239 010      04.30  .32.33.1.26.28   PFP 09 SF TO AR
D239 011      04.33  .34.37.4.06.26   PFP 10 FORMAT TO PNPN
D239 012     Z06.34                   2200000 10 PFP
D239 013     Z06.35                   8036000 10 PFP
D239 014      04.37  .38.39.2.28.29   PFP 11 SET CR
D239 015      04.39  .81.81.0.29.31   PFP 12 CR TEST TO PFP 14
D239 016      04.81  .88.96.0.06.30   PFP 13 ADD TAb TO FORMAT
D239 017     Z06.88                   4000000 13 PFP
D239 018      04.82  .84.96.0.28.28   PFP 135 CR IN FORMAT ALREADY
D239 019      04.96  .02.11.5.26.02   PFP 14 FORMAT TO L2
D239 020      04.11  .16.29.1.26.31   PFP 15 SHIFT 2 DIGITS
D239 021      04.29  .31.32.2.24.28   PFP 16 D.. TO AR
D239 022      04.32  .33.35.0.25.29   PFP 17 PLUS BCD
D239 023      04.35 U.41.41.0.06.25   PFP 18 LOAD TWO TENTHS
D239 024     Z06.39                   3333400 18 PFP
D239 025      04.41  .16.63.0.24.31   PFP 19 MULTIPLY BY D..
D239 026      04.63 W.67.86.3.23.31   PFP 20 EXTRACT TWO TENTHS
D239 027     Z02.67                   1Y00000 20PFP X
D239 028      04.86 U.92.94.0.25.29   PFP 21 3 TIMES TO AR
D239 029      04.94  .94.94.0.28.31   PFP 22 READY WAIT
D239 030      04.95  .97.97.0.09.31   PFP 23 TYPE
D239 031      04.97  .U7.16.0.28.19   PFP 24 LOAD FP TO L19 TO PRT 94
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D240 000                              TRA TRANSFER UNCONDITIONAL

D240 001      01.26  .27.28.3.24.26   TRA 01 TRANSFER SAVE A
D240 002      01.28  .30.30.3.23.31   TRA 02 REDUCE MOD 4 TO E
D240 003     Z02.29                   0300000 02 TRA X
D240 004      01.30  .15.46.1.26.31   TRA 03 SHIFT E TO NN
D240 005      01.46 U.49.49.1.28.24   TRA 04 RESTORE A
D240 006      01.49  .50.51.0.06.28   TRA 05 PICK UP DUMMY
D240 007      06.50 U.60.60.2.26.28   05 TRA SWITCH ON E
D240 008      01.51  .53.54.0.06.30   TRA 06 FIX TRA
D240 009     Z06.53                   0437000 06 TRA
D240 010      01.54  .55.56.2.25.29   TRA 07 ADD E TO FORM SWITCH
D240 011      01.56  .58.58.0.31.31   TRA 08 OBEY SWITCH ON E
D240 012      01.60  .72.84.0.01.01   TRA 09 E0 TO TRA 15
D240 013      01.61  .62.77.2.22.22   TRA 10 E1 FIX L 22
D240 014      01.77  .84.85.0.28.22   TRA 11 TO NXT 01
D240 015      01.62 U.72.90.2.22.22   TRA 12 E2 FIX L22 TO NXT 02
D240 016      01.63 U.73.90.2.22.22   TRA 13 E3 FIX L22 TO NXT 02
D240 017      01.81  .83.84.0.06.29   TRA 14 TRA PLUS 4
D240 018     Z06.83                   0400000 14 TRA



D240 019      01.84  .86.87.2.22.22   TRA 15 FIX L22
D240 020      01.87  .88.90.2.22.22   TRA 16 FIX L22 TO NXT 02
                •

D241 000                              TPZ% TNE TRANSFER NOT NEGATIVE

D241 001      01.10  .14.15.0.06.29   TPZ 01 TRANSFER NOT NEGATIVE FIX TO TRA
D241 002     Z06.14                   000ZZZZ 01 TPZ
D241 003      01.15  .17.19.3.24.26   TPZ 02 TRA TO PN A TO AR
D241 004      01.19  .21.23.0.22.31   TPZ 03 TEST A NEGATIVE NO TO TNE 05
D241 005      01.24  .34.85.0.03.03   TPZ 04 YES TO NXT 01
D241 006      01.23 U.28.28.0.23.22   TNE 05 YES TO TRA 02
                •

D242 000                              TZE'TRANSFER NOT ZERO

D242 001      01.11  .13.14.0.06.29   TZE 01 TRANSFER ZERO FIX TO TRA
D242 002     Z06.13                   000YZZZ 01 TZE
D242 003      01.14  .15.16.3.24.26   TZE 02 TRA TO PN A TO AR
D242 004      01.16  .17.20.0.28.21   TZE 03 A TO L 21
D242 005      01.20  .21.22.2.31.27   TZE 04 TEST A NOT ZERO TO TNE 04,05
D242 006      01.22  .32.85.0.02.02   TNE 04 NO TO NXT 01
                •

D243 000                              TXL TRANSFER NOT INDEX LIMIT

D243 001      01.12  .16.18.0.06.29   TXL 01 TRANSFER LIMIT FIX TO TRA
D243 002     Z06.16                   000XZZZ 01 TXL
D243 003      01.18 U.20.21.3.24.26   TXL 02 TRA TO PN A TO AR
D243 004      01.21  .22.23.1.25.27   TXL 03 TEST 1DO NOT ZERO
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D244 000                              TIX INDEXED TRANSFER FOR RESUME OR START

D244 001      01.96  .31.33.0.03.28   TIX 01 INDEXED TRANSFER DUMMY TO AR
D244 002     Z03.31                   02VU136 TIX 01
D244 003      01.33  .37.99.2.25.29   TIX 02 ADD CHWD. EXECUTE
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D245 000                              MRK MARK LOCATION

D245 001      02.34  .37.37.0.21.31   MRK 01 MARK PLACE TO D.37 MRK 02
D245 002      00.37  .38.39.0.06.28   MRK 02 TRA DUMMY TO AR
D245 003      06.38 U.04.26.0.00.22   02 MRK MARK DUMMY
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D245 004      00.39  .41.43.2.26.29   MRK 03 PLUS CHWD
D245 005      00.43 U.46.47.1.28.26   MRK 04 TO PNPN
D245 006      00.47  .52.99.0.06.28   MRK 05 PICK UP MARK COUNTER
D245 007     Z06.52                   0900000 05 MRK
D245 008      00.99  .U0.U3.3.06.29   MRK 06 DECREMENT
D245 009     Z06.U0                   0100000 06 MRK
D245 010      00.U3  .U4.05.0.28.21   MRK 07 HOLD COUNTER
D245 011      00.05  .06.09.0.06.29   MRK 08 PLUS DUMMY
D245 012      06.06 W.14.23.1.26.08   08 MRK STORE MARK
D245 013      00.09  .11.11.0.31.31   MRK 09 STORE MARK IN LINE 08
D245 014      00.23  .24.25.0.21.27   MRK 10 COUNTER NOT ZERO TEST
D245 015      00.25 W.02.36.1.21.31   MRK 11 ZERO MARK TOO DEEP ERROR
D245 016      00.26  .52.83.0.21.06   MRK 12 RESTORE COUNTER TO ADD 05
D245 017      01.36  .12.13.0.00.28   MRK 13 MARK ERROR TYPE 0Y

D246 000                              RET RETURN TO AND REMOVE LATEST MARK

D246 001      00.33  .52.97.1.06.28   RET 01 RETURN TO MARK COUNTER TO AR
D246 002      00.97  .U0.U1.0.06.29   RET 02 INCREMENT COUNTER
D246 003      00.U1  .00.03.0.28.21   RET 03 HOLD COUNTER
D246 004      00.03  .07.09.0.06.29   RET 04 PLUS DUMMY PICK UP MARK
D246 005      06.07 W.13.31.0.08.28   04 RET PICK UP MARK
D246 006      00.31  .52.93.0.21.06   RET 05 RESTORE COUNTER TO INC 38

D247 000                              REA READ PAPER TAPE

D247 001      09.03 W.85.44.1.21.31   REA 01 WAIT FOR READY
D247 002      09.04 U.85.85.0.15.31   REA 02 READ TAPE
D247 003      09.05 W.85.44.1.21.31   REA 03 WAIT FOR READY
D247 004      09.06 U.69.26.0.08.22   REA 04 TRA TO 08.65 REA 05
D247 005     Z08.65                   -6015354 REA 05 I23 CA 1900
D247 006     Z08.66                   -1010140 REA 06 I22 STORE 0900
D247 007     Z08.67                   -8001140 REA 07 INCREMENT I22
D247 008      08.68 U.05.12.0.09.23   REA 08 TXN NOT LIMIT TO REA 08
D247 009      08.69 U.U0.85.0.29.19   REA 09 DONE READING CLEAR LINE 19
D247 010      08.70 U.64.85.0.08.22   REA 10 RETURN TO NXT
D247 011      09.01                   -8201140 REA 08 INCREMENT I23
D247 012      09.02 U.69.12.0.08.23   REA 12 TXN NOT LIMIT TO REA 05 REA 01 NEXT

D248 000                              WRI PUNCH PAPER TAPE

D248 001      08.79 W.85.44.1.21.31   WRI 01 WAIT FOR READY

D248 002     Z08.80                   -5015340 WRI 02 I22 CA 0900
D248 003     Z08.81                   -201014U WRI 03 I23 STORE 1900
D248 004     Z08.82                   -8001140 WRI 04 INCREMENT I22
D248 005      08.83 U.80.12.0.08.23   WRI 05 TXN TO WRI 19 08.76
D248 006     Z08.84                   -8009880 WRI 06 GO TO ML SR 0800 WRT 07
D248 007      08.00 U.04.05.0.29.02   WRI 07 CLEAR FORMAT
D248 008      08.05  .77.10.0.06.28   WRI 08 PICK UP FORMAT FOR WORD 03
D248 009      08.10  .03.25.2.19.02   WRI 09 FORMAT TO 2. 19.3 TO AR
D248 010      08.25  .58.98.2.02.27   WRI 10 TEST 19.03 ZERO PICK UP-FP ZERO
D248 011      08.98  .03.99.2.28.19   WRI 11 IS ZERO MAKE FP ZERO
D248 012      08.99  .92.92.2.21.31   WRI 12 NOT ZERO TO PUNCH SR 2.92 WRI 13
D248 013      02.92  .89.90.0.06.28   WRI 13 LOAD TIMER FOR LEADER PUNCH
D248 014      02.90  .92.91.7.28.28   WRI 14 DECREMENT AR
D248 015      02.91  .92.93.0.28.27   WRI 15 TIMER ZERO TO WRI 16
D248 016      02.93  .85.85.1.21.31   WRI 16 TO NXT 01
D248 017      02.94  .01.90.0.10.31   WRI 17 PUNCH LEADER AND LINE 19
D248 018      08.85 U.64.85.0.08.22   WRI 18 RETURN TO NXT 01
D248 019     Z08.76                   -8201140 WRI 19 INCREMENT I23
D248 020      08.77 U.84.12.0.08.23   WRI 20 TXN TO 08.80 WRI 02
D248 021     Z08.78                   -8009880 WRI 21 LINE FULL PUNCH TO WRI 01

D249 000                              SUB EXECUTE MACHINE LANGUAGE ST

D249 001      02.40  .42.55.3.23.31   SUB 01 SUBROUTINE CHANNEL TO 1D
D249 002      02.55  .56.65.0.06.28   SUB 02 DUMMY TRANSFER TO LINE 05
D249 003      02.65  .67.17.2.25.29   SUB 03 PLUS CH EXECUTE
D249 004      06.56 U.20.00.0.00.05   SUB 04 COPY SUBROUTINE TO LINE 05
D249 005      02.00 U.04.20.2.26.28   SUB 05 STARTING WORD TO AR
D249 006      02.20  .27.17.0.06.29   SUB 06 PLUS DUMMY EXECUTE
D249 007      06.27 W.00.79.2.21.31   SUB 07 MARK STARTING LOCATION
D249 008      02.79  .81.80.5.20.31   SUB 08 RETURN TO STARTING LOCATION IN SR

D250 000                              EXE EXECUTE INTERPRETIVE SUBROUTINE

D250 001      01.59 U.64.91.0.22.08   EXE 01 KEEP LINE 22 IN 08.60-63
D250 002      01.91  .92.U6.3.08.29   EXE 02 CHANGE TO TRANSFER COMMAND
D250 003     Z08.92                   0021001 EXE 02
D250 004      01.U6 U.26.26.0.23.22   EXE 03 L23 TO L22 TO TRA 01

D251 000                              TCR TABS OR CARRIAGE RETURNS

D251 001      02.37 W.43.44.3.23.31   TCR 01 2N TO 1D1
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D251 002      02.44   .U4.U4.3.21.31   TCR 02 TRA TO 3.U4 TCR 03
D251 003      03.U4   .U4.U4.0.28.31   TCR 03 WAIT READY
D251 004      03.U5   .03.07.0.26.02   TCR 04 FORMAT TO L02
D251 005      03.07   .02.10.1.26.31   TCR 05 N TO 1D1
D251 006      03.10   .12.20.0.09.31   TCR 06 TYPE CR OR TAB END
D251 007      03.20   .21.25.3.25.28   TCR 07 MINUS N TO AR
D251 008      03.25 U.28.38.3.29.25    TCR 08 SET 1D FOR MARKER
D251 009      03.38   .30.69.0.26.31   TCR 09 SHIFT MARKER INTO 1D1 FROM TE
D251 010      03.69 U.71.73.0.29.25    TCR 10 CLEAR TE 1D0
D251 011      03.73   .U7.98.1.25.19   TCR 11 COUNTER TO L19 TO ZERO OUT DIV 06 2
                 .

D252 000                               PBL PERIODS OR BELLS

D252 001      02.38 W.U5.35.0.21.31    PBL 01 MARK PERIODS
D252 002      02.39 W.19.35.0.21.31    PBL 02 MARK BELLS
D252 003      00.35 W.43.57.3.23.31    PBL 03 2N TO 1D1
D252 004      00.57   .59.98.2.25.28   PBL 04 2N TO AR
D252 005      00.98   .U0.99.0.20.31   PBL 05 TO BELLS OR PERIODS
D252 006      00.19 U.20.17.0.17.31    PBL 06 DING. TO PBL 10
D252 007      00.U5   .U5.U5.0.28.31   PBL 07 WAIT FOR READY
D252 008      00.U6   .03.13.0.26.02   PBL 08 PERIOD END FORMAT
D252 009      00.13   .15.17.0.09.31   PBL 09 TYPE ONE PERIOD
D252 010      00.17 U.22.15.7.28.28    PBL 10 AR MINUS 2
D252 011      00.15   .10.01.0.28.27   PBL 11 TEST DONE
D252 012      00.01   .79.79.1.21.31   PBL 12 RESTORE AMD TO NEXT
D252 013      00.02   .00.98.0.28.28   PBL 13 WAIT. TO PBL 05
                 .

D253 000                               ERR ERROR ALARM

D253 001      01.13   .15.09.0.00.31   ERR 01 ERROR ALARM SET READY
D253 002      01.09   .11.44.0.08.31   ERR 02 TYPE ERROR ALARM
D253 003     Z03.03                    6X80XU2 ERROR FORMAT 3P2D2PC
D253 004      01.44   .44.44.0.28.31   ERR 03 WAIT FOR READY
D253 005      01.45   .47.46.1.20.31   ERR 04 RETURN TO MARK USUALLY ERR 05
D253 006      01.02   .04.09.0.16.31   ERR 05 HALT GO TO ERR 02
                 .

D254 000                               SNS SNAPSHOT SUBROUTINE

D254 001      02.31   .79.79.1.21.31   SNS 01 SNAPSHOT NO BP TO RESTORE
D254 002      02.32   .38.38.1.21.31-  SNS 02 SNAPSHOT BP STOP HERE
D254 003      01.38   .41.41.1.17.31   SNS 03 PUNCH SWITCH ON TO SNS 05

D254 004      01.41 U.85.85.0.10.10    SNS 04 GO TO NXT 01
D254 005      01.42 U.43.98.0.06.05    SNS 05 COPY LINE 06 TO COMMAND LINE
D254 006      01.98 W.43.67.5.21.31    SNS 06 MARK PRT 00 GO TO SNS 07 6.67
D254 007      06.67 U.74.76.6.26.30    SNS 07 SHIFT PN TO BCD
D254 008      06.76   .80.84.0.06.23   SNS 08 LOAD F.P. TYPER FORMAT
D254 009      06.84   .97.U4.0.06.28   SNS 09 FORMAT TO AR
D254 010     Z06.97                    1ZZ03Y2 SNS 09
D254 011      06.U4   .U4.U4.0.28.31   SNS 10 WAIT FOR READY
D254 012      06.U5   .U7.00.4.26.19   SNS 11 SS NUMBER TO L 19
D254 013      06.00   .03.08.0.28.02   SNS 12 LOAD FORMAT
D254 014      06.08   .10.10.0.09.31   SNS 13 TYPE SS NUMBER
D254 015      06.10   .12.11.1.20.31   SNS 14 RETURN TO TYPE FP THEN NXT
                 .

D255 000                               CLA CLEAR AND ADD

D255 001      01.82 U.85.85.1.28.24    CLA 01 CLEAR AND ADD
                 .

D256 000                               CLS CLEAR AND SUBTRACE

D256 001      01.78 U.81.85.3.28.24    CLS 01 CLEAR AND SUBTRACT
                 .

D257 000                               ABS ABSOLUTE VALUE OF ACCUMULATOR

D257 001      01.39 U.42.85.2.28.24    ABS 01 ABSOLUTE VALUE A
                 .

D258 000                               RES RESTORE ACCUMULATOR FROM HOLD

D258 001      01.79   .80.82.0.20.28   RES 01 RESTORE A TO AR TO CLA 01
D258 002     Z06.U6                    8000072  FLOATING POINT ONE
                 .

D259 000                               EXP EXPONENTIAL SUBROUTINE

D259 001      01.06   .14.14.5.21.31   EXP 01 ENTRY TO EXP SR
D259 002      07.14 U.19.19.1.24.21    EXP 1 PLACES X IN LINE 21
D259 003      07.19   .22.22.0.23.31   EXP 2 CLEAR REGISTERS
D259 004      07.22 U.24.24.0.31.24    EXP 3 COMPLEMENT OF 20.21 INTO MQ
D259 005      07.24   .26.29.0.05.25   EXP 04 LOG 2E TO 1D
D259 006     Z07.26                    2Y2U8YX  04 EXP
D259 007      07.29   .40.77.0.24.31   EXP 5 2Y2U8YX TIMES COMPL OF X
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D259 008    07.77  .79.81.0.30.28   EXP 6 2V2U8YX TIMES COMPL OF X TO AR
D259 009    07.81  .83.84.3.05.29   EXP 7 0000083 TO AR
D259 010   Z07.83                   0000083  07 EXP
D259 011    07.84 U.87.87.0.26.25   EXP 8 2Y2U8YX TIMES COMPL OF X TO ID
D259 012    07.87  .89.89.0.22.31   EXP 9 IS AR NEG %
D259 013    07.89 U.91.92.0.28.27   EXP 10 IS AR ZERO
D259 014    07.92  .94.32.0.28.28   EXP 11 DELAY
D259 015    07.93 U.95.U1.3.28.28   EXP 12 COMPL AR
D259 016    07.U1  .38.32.0.26.31   EXP 13 SHIFT UNDER CONTROL AR
D259 017    07.32  .34.36.6.25.25   EXP 14 /2Y2U8YX TIMES COMPL OF X TO ID/
D259 018    07.36 U.38.41.0.24.21   EXP 15 COMPL. OF 20.21 INTO LINE 21
D259 019    07.90 U.93.97.0.25.24   EXP 16 /ID1 INTO MQ
D259 020    07.97  .30.20.0.26.31   EXP 17 SHIFT
D259 021    07.20  .22.25.0.24.28   EXP 18 /ID/ INTO AR
D259 022    07.25  .02.34.1.26.31   EXP 19 SHIFT ONE BIT
D259 023    07.34  .37.38.0.24.21   EXP 20 /2Y2U8YX TIMES COMP OF X / TO LINE 21
D259 024    07.38 U.40.41.0.28.25   EXP 21 /ID/ TO ID1
D259 025    07.41  .08.50.1.26.31   EXP 22 SHIFT FOUR BITS
D259 026    07.50 U.53.54.2.25.21   EXP 23 /ID/ TO LINE 21
D259 027    07.54 U.56.58.0.25.24   EXP 24 /ID/ TO MQ1
D259 028    07.58 U.49.01.0.24.31   EXP 25 /ID/ TIMES /ID/
D259 029    07.01  .03.05.0.26.21   EXP 26 STORE PRODUCT
D259 030    07.05  .07.09.0.05.30   EXP 27 576UY12 TO PN EVEN
D259 031   Z07.07                   576UY12  27 EXP
D259 032    07.09 U.12.13.4.26.25   EXP 28 576UY12 TO ID
D259 033    07.13  .15.17.0.05.26   EXP 29 9U7Y39U TO PN
D259 034   Z07.15                   9U7Y39V  29 EXP
D259 035    07.17  .53.71.5.25.31   EXP 30 DIVIDE 9U7Y39V BY 576UY12
D259 036    07.71 U.73.73.0.05.28   EXP 31 9Z46064 TO AR
D259 037   Z07.72                   9Z46064  31 EXP
D259 038    07.73 U.75.75.3.24.29   EXP 32 9Z46064 PLUS 9U7Y39V BY 576UY12
D259 039    07.75 U.77.78.3.21.29   EXP 33 MINUS LINE 21.01
D259 040    07.78 U.80.80.0.05.25   EXP 34 8XZ4Y00 TO ID
D259 041   Z07.79                   8XZ4Y00  34 EXP
D259 042    07.80 U.82.82.2.28.26   EXP 35 9Z46064 PLUS 9U7Y39U BY 576UY12 TO PNODD
D259 043    07.82 U.84.85.0.21.24   EXP 36 21.00 TO MQ ODD
D259 044    07.85  .50.28.0.24.31   EXP 37 8XZ4Y00 TIMES 21.00
D259 045    07.28 U.30.30.0.26.25   EXP 38 8XZ4Y00 TIMES 21.00 TO ID ODD
D259 046    07.30  .32.35.6.21.26   EXP 39 21.00 TO PN ODD
D259 047    07.35  .55.91.5.25.31   EXP 40 DIVIDE 21.00 BY 8XZ4Y00 TIMES 21.00
D259 048    07.91 U.93.94.0.24.28   EXP 41 21.00 BY 8XZ4Y00 TIMES 21.00 TO AR
D259 049    07.94 U.96.96.0.05.26   EXP 42 4000000 TO PN ODD
D259 050   Z07.95                   4000000  42 EXP
D259 051    07.96 U.98.U0.1.26.29   EXP 43 4000000 TO AR PLUS

D259 052    07.U0 U.U3.U3.3.21.25   EXP 44 COMPLEMENT 21 AND PUT IN ID
D259 053    07.U3  .U5.00.0.23.31   EXP 45 CLEAR EVEN SIDE
D259 054    07.00  .02.02.0.22.31   EXP 46 TEST IF 4000000 PLUS IS NEG
D259 055    07.02  .07.11.0.25.24   EXP 47 NO... COMPL. 21 TO MQ
D259 056    07.11  .13.98.3.21.28   EXP 48 EXPONENT TO AR
D259 057    07.98 U.U0.62.0.07.29   EXP 49 EXPONENT PLUS 126
D259 058   Z07.99                   000007Y  49 EXP
D259 059    07.62  .64.U4.0.29.31   EXP 50 TURN OFF OFLO INDICATOR
D259 060    07.U4  .52.52.0.21.31   EXP 53 TO NOR 01
D259 061    07.U5  .52.52.0.21.31   EXP 54 TO NOR 01
D259 062    07.03  .53.57.5.25.31   EXP 51 DIVIDE
D259 063    07.57  .60.60.6.24.24   EXP 52 MQ0 TO MQ1
D259 064    07.60 U.62.98.2.21.28   EXP 53 EXPONENT TO AR

 D26 000                            LOG LOGARITHM SUBROUTINE

 D26 001    01.17  .31.31.5.21.31   LOG 01 ENTRY TO LOG SR
 D26 002    07.31 U.36.37.1.24.21   LOG 1 PUTS X IN LINE 21
 D26 003    07.37  .39.40.3.31.28   LOG 2 PUTS COMPLEMENT EXTRACTED INTO AR
 D26 004    07.40  .42.42.0.22.31   LOG 3 IS X NEGATIVE
 D26 005    07.42  .11.U7.0.03.28   LOG 04 NON POSITIVE OPERAND ERROR
 D26 006    07.U7 W.22.33.1.21.31   LOG 05 ERROR TYPE 0X
 D26 007    07.43  .45.47.1.28.25   LOG 6 YES... X COMPL. INTO ID0
 D26 008    07.47  .02.51.1.26.31   LOG 7 SHIFT MQ AND ID ONE BIT
 D26 009    07.51 U.53.53.2.05.21   LOG 8 5U8279U IN LINE 21/ 2TO MINUS 2 TIMES SQ.
 D26 010   Z07.52                   5U8279U  08 LOG
 D26 011    07.53  .55.56.3.25.29   LOG 9 2-1X SUBTRACT FROM X COMPL
 D26 012    07.56 U.58.61.1.28.26   LOG 10 2-1X - X %COMP= ITS COMPL TO 26
 D26 013    07.61 U.63.63.0.28.25   LOG 11 PLUS 28 TO IP
 D26 014    07.63 U.65.66.1.21.29   LOG 12 2 TO MINUS 2 TIMES SQ. RT SUBTRACT FROM
 D26 015    07.66 U.68.69.2.28.25   LOG 13 TAKE CONTENTS AP TO ID. AND IS SQUARED
 D26 016    07.69  .57.21.5.25.31   LOG 14 DIVIDE TWO TO MINUS 1 TIMES MINUS X
 D26 017    07.21 U.23.23.0.24.21   LOG 15 %2-1X -X= TO LINE 21
 D26 018    07.23 U.26.27.6.24.24   LOG 16 %2-1X-X= TO MQ1
 D26 019    07.27  .29.33.0.24.25   LOG 17 %2-1X-X= ABS Y ID1
 D26 020    07.33  .52.86.0.24.31   LOG 18 MULTIPLY Y TIMES X
 D26 021    07.86 U.88.88.0.26.25   LOG 19 XY TO ID ODD
 D26 022    07.88  .U2.04.6.05.24   LOG 20 00ZVW88 TO 8Q0.1
 D26 023   Z07.U2                   00ZVW88  20 LOG
 D26 024    07.04  .06.08.6.05.26   LOG 21 02Y29Y6 TO PN ODD
 D26 025   Z07.06                   02Y29Y6 21 LOG
 D26 026    07.08  .55.64.0.24.31   LOG 22 MULTIPLY 02Y29Y6 BY 00ZVW88
 D26 027    07.64 U.66.67.0.26.24   LOG 23 02Y29Y6 TIMES 00ZVW88 INTO PN ODD
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D26 028      07.67  .70.74.6.21.25   LOG 24 ARGUMENT TO 1D
D26 029      07.74  .55.10.0.24.31   LOG 25 ARGUMENT TIMES 002VW88
D26 030      07.10  .11.12.3.30.28   LOG 26 EXPONENT TO AR
D26 031      07.12  .16.18.0.05.29   LOG 27 0000080 TO AR
D26 032     Z07.16                   0000080  27 LOG
D26 033      07.18 U.39.39.2.28.29   LOG 28 /EXP PLUS 0000080/ TO AR
D26 034      07.39  .41.44.0.26.21   LOG 29 ARG XC TO 21 1
D26 035      07.44  .45.46.3.21.29   LOG 30 -ARG XC TO AR
D26 036      07.46  .48.49.3.05.29   LOG 31 0080000 SUBTRACT FROM AR
D26 037     Z07.48                   0080000  31 LOG
D26 038      07.49  .51.55.1.28.28   LOG 32 RECOMPLEMENT AR IF NECESSARY
D26 039      07.55  .65.68.0.05.24   LOG 33 V172180 TO MQ1 /LOGE2
D26 040     Z07.65                   V172180  33 LOG
D26 041      07.68 U.70.70.0.28.25   LOG 34 AR TO 1D1
D26 042      07.70  .56.45.0.24.31   LOG 35 TIMES LOG 2
D26 043      07.45  .46.59.0.08.28   LOG 36 EXPONENT 120
D26 044     Z08.46                   0000078 LOG 36 SR CONSTANT
D26 045      07.59 U.62.62.0.26.24   LOG 37 LOG TO MQ


D261 000                             COS COSINE SUBROUTINE

D261 001     10.68 W.95.99.5.21.31   COS 01 MARK 95
D261 002     10.99  .U6.01.1.06.24   COS 02 ONE TO MQQ TO SIN 02


D262 000                             SIN SINE SUBROUTINE

D262 001     10.01 U.06.08.1.24.21   SIN 02 CONTENTS OF ACCUMULATOR TO LINE 21 SIN
D262 002     10.08  .11.13.0.23.31   SIN 03 CLEAR 2 WORD REGISTERS
D262 003     10.13  .18.23.0.02.25   SIN 04 U2Z9837 TO ID
D262 004     Z02.18                  U2Z9870 SIN 04 TRIG SR CONSTANT
D262 005     10.23  .25.29.0.31.24   SIN 05 FRACTION MANTISSA TO MQ
D262 006     10.29  .31.39.0.24.27   SIN 06 TEST ARGUMENT EQUAL TO ZERO
D262 007     10.39  .42.71.0.23.31   ART 03 YES... CLEAR 2 WORD REGISTERS
D262 008     10.40  .43.81.3.30.28   SIN 07 EXP FROM AR
D262 009     10.81  .40.86.0.24.31   SIN 08 CIRCLES TO PNQ
D262 010     10.86  .89.91.2.08.29   SIN 09 000007Z TO AR
D262 011     10.91  .93.96.0.22.31   SIN 10 TEST AR FOR NEGATIVE
D262 012     10.96  .98.03.0.28.27   SIN 11 NO... TEST AR EQUAL TO ZERO
D262 013     10.97  .98.67.0.26.25   SIN 12 YES... NUMBER OF RADIANS TO ID
D262 014     10.03  .08.90.0.28.28   SIN 13 YES... DO NOTHING
D262 015     10.04  .06.11.3.28.28   SIN 14 NO... NEGATE AR
D262 016     10.11  .12.17.0.26.24   SIN 15 NUMBER OF RADIANS TO MQ




D262 017     10.17  .32.51.0.26.31   SIN 16 SHIFT UNDER CONTROL OF AR 16 BITS
D262 018     10.51  .54.55.0.28.27   SIN 17 TEST AR EQUAL TO ZERO
D262 019     10.55  .58.90.4.24.26   SIN 18 YES... FRACTION MANTISSA TO PN
D262 020     10.56  .57.56.0.17.31   SIN 19 NO SIGNIFICANCE ERROR HALT
D262 021     10.67  .16.84.0.26.31   SIN 20 SHIFT UNDER CONTROL OF AR 8 BITS ARG LESS
D262 022     10.84  .86.87.0.28.27   SIN 21 TEST AR EQUAL TO ZERO
D262 023     10.87 U.90.90.0.25.26   SIN 22 YES RADIANS TO PN
D262 024     10.88  .47.92.0.05.21   SIN 23 NO    SMALL ARGUMENTS LOAD 21 3
D262 025     Z10.47                  OUY5U7Z SIN 23
D262 026     10.90  .91.93.0.26.28   SIN 24 CIRCLES AT B28 TO AR
D262 027     10.93  .95.98.5.20.31   SIN 25 RETURN TO 95 OR 98
D262 028     10.95  .U6.00.1.06.30   COS 03 800007Z TO PN IF COS
D262 029     10.98  .U5.00.1.21.30   SIN 26 ARGUMENT SIGN TO PN IF SIN OR ART
D262 030     10.00 U.21.27.2.28.29   SIN 27 20 L IN AR
D262 031     10.27  .28.42.2.26.23   SIN 28 CIRCLES 23.0 FRACTION TO AR
D262 032     10.42  .43.25.0.28.29   SIN 29 FRACTION DOUBLED
D262 033     10.25  .27.24.0.29.31   SIN 295 OVERFLOW OFF
D262 034     10.24  .29.31.1.26.23   SIN 30 SIGN TO 23.01
D262 035     10.31  .32.33.1.28.28   SIN 31 CHANGE THE SIGN OF ARGUMENT
D262 036     10.33 U.38.45.0.05.21   SIN 32 SIN CONSTANTS TO LINE 21
D262 037     Z10.34                  0U2WU6Y SIN
D262 038     Z10.35                  008YZ7Z C7 SIN
D262 039     Z10.36                  52UX89Y SIN
D262 040     Z10.37                  W90ZWY4 C1 SIN
D262 041     10.45  .50.53.0.28.23   SIN 33 ARGUMENT TO 23.02
D262 042     10.53  .55.57.0.28.24   SIN 34 ARGUMENT TO MQ
D262 043     10.57  .59.60.2.25.25   SIN 35 INTERCHANGE ID WITH AR
D262 044     10.60  .47.02.0.24.31   SIN 36 MULTIPLY BY 24 BITS
D262 045     10.02  .03.07.0.26.23   SIN 37 ARGUMENT SQUARED TO 23.03
D262 046     10.07  .08.09.0.28.27   SIN 38 TEST AR EQUAL TO 0
D262 047     10.09  .11.14.3.21.29   SIN 39 YES... C7 IN 21.03 TO AR SIN OR COS
D262 048     10.14  .15.16.0.23.25   SIN 40 ARGUMENT SQUARED IN 23.03 TO ID
D262 049     10.16  .17.19.1.28.24   SIN 41 SUMMATION IN AR TO MQ
D262 050     10.19  .40.61.0.24.31   SIN 42 MULTIPLY BY 20 BITS
D262 051     10.61  .63.65.2.26.28   SIN 43 PN TO AR
D262 052     10.65  .66.69.3.21.29   SIN 44 C5 IN 21.02 TO AR
D262 053     10.69  .71.73.1.28.24   SIN 45 SUMMATION IN AR TO MQ
D262 054     10.73  .75.77.0.23.25   SIN 46 ARGUMENT SQUARED IN 23.03 TO ID
D262 055     10.77  .40.12.0.24.31   SIN 47 MULTIPLY BY 20 BITS
D262 056     10.12  .13.15.2.26.28   SIN 48 PN TO AR
D262 057     10.15  .16.18.3.21.29   SIN 49 C3 IN 21.00 TO AR
D262 058     10.18  .19.20.0.23.25   SIN 50 ARGUMENT SQUARE IN 23.03 TO ID
D262 059     10.20  .21.22.1.28.24   SIN 51 SUMMATION IN AR TO MQ
D262 060     10.22  .47.70.0.24.31   SIN 52 MULTIPLY BY 24 BITS
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D262 061      10.70  .71.72.2.26.28   SIN 53 PN TO AR
D262 062      10.72  .73.74.3.21.29   SIN 54 C1 IN 21.01 TO AR
D262 063      10.74  .77.78.1.28.29   SIN 55 COMMPLEMENT AR
D262 064      10.78  .79.80.0.28.25   SIN 56 SUMMATION TO ID
D262 065      10.80  .82.85.6.23.24   SIN 57 ARGUMENT IN 23.02 TO MQ
D262 066      10.85  .48.26.0.24.31   SIN 58 MULTIPLY BY 24 BITS
D262 067      10.26  .27.28.2.26.28   SIN 59 PN TO AR
D262 068      10.29  .29.30.0.23.25   SIN 60 SIGN OF ARGUMENT IN 23.01 TO IP
D262 069      10.30  .32.38.5.20.31   SIN 61 RETURN TO 32 OR 38
D262 070      10.38  .39.41.1.28.24   SIN 62 SUMMATION IN AR TO MQ ARG LESS THAN 1
D262 071      10.41 U.45.46.2.25.25   SIN 63 CLEAR ID AND AR
D262 072      10.46 W.48.49.0.21.31   SIN 64 TRANSFER TO 00.49

D263 000                              ART ARC TANGENT ROUTINE

D263 001      10.64 U.69.39.1.24.21   ART 02 ACCUMULATOR TO LINE 21 IF ART
D263 002      10.71  .73.75.0.31.25   ART 04 FRACTION MANTISSA TO ID
D263 003      10.75  .76.79.0.21.25   ART 05 EVEN HALF OF ACCUMULATOR TO ID
D263 004      10.79  .81.62.0.25.27   ART 06 TEST 1D1 ZERO
D263 005      10.62  .84.89.0.21.28   ART 08 ZERO ARGUMENT OUT
D263 006      10.89  .82.82.1.21.31   ART 09 TO RA 01
D263 007      10.63  .89.44.2.08.28   ART 07 EXPONENT 127
D263 008     Z08.89                   000007Z ART 07 TRIG SR CONSTANT
D263 009      10.44  .45.83.3.30.29   ART 11 MINUS EXP A
D263 010      10.83  .65.66.0.22.31   ART 12 EXP NEGATIVE
D263 011      10.66  .77.06.1.06.26   ART 13 NO... 8000000 TO PN ARG. LARGER THAN 1
D263 012      10.06  .08.21.3.28.28   ART 14 NEGATE AR
D263 013      10.21  .55.82.5.25.31   ART 15 TAKE RECIPROCAL
D263 014      10.82 W.32.76.5.21.31   ART 16 MARK 32 FOR BIG ART
D263 015      10.76 U.80.81.0.24.26   ART 17 QUOTIENT TO PN
D263 016      10.92  .93.94.1.06.25   ART 20 8000000 TO ID
D263 017      10.94  .56.43.0.26.31   ART 21 FINISH SHIFT OF ID & MQ
D263 018      10.43  .44.58.2.25.28   ART 22 NUMBER OF RADIANS TO AR
D263 019      10.58  .32.62.5.20.31   ART 23 NOT BIG ART TO 62
D263 020      10.10 U.51.52.0.05.21   ART 25 NO... ART CONSTANTS TO LINE 21 ART
D263 021     Z10.47                   0UYXU7Z ART
D263 022     Z10.48                   2U47410 ART
D263 023     Z10.49                   7ZZV9VZ ART
D263 024     Z10.50                   170YXW4 ART
D263 025      10.52  .53.54.0.00.24   ART 26 C9 02UUV98 TO MQ
D263 026     Z00.53                   02UUV98 SIN
D263 027     Z00.53                   02UUV98 ART 26 TRIG SR CONSTANT
D263 028      10.54  .55.89.0.23.25   ART 27 ARGUMENT SQUARED IN 23.03 TO ID

D263 029      10.59  .52.05.0.24.31   ART 28 MULTIPLY BY 26 BITS
D263 030      10.05  .07.09.2.26.28   ART 29 PN TO AR

D029 031      10.32  .37.38.3.05.29   ART 30 W9D2WY4 AT B1 TO AR ARG LARGER THAN 1
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D165 000                                    UPDATER LOADER

D165 001      05.00   .01.01.1.19.31        TURN OFF DA-1
D165 002      05.01   .04.17.6.21.31        TRANSFER COMM TO LINE 19
D165 003      05.17 U.18.04.0.19.05         LINE 19 TO LINE 05
D165 004      05.04 U.09.09.0.19.23         FORMAT TO 23
D165 005      05.09   .02.10.4.23.02        FORMAT
D165 006      05.10   .00.11.4.23.02        FORMAT
D165 007      05.11   .02.12.4.19.03        FORMAT
D165 008      05.12 U.17.18.0.19.20         SET UP CONSTANTS
D165 009      05.18   .22.22.5.21.31        TRANSFER COMM TO LINE 05
D165 010      05.22   .23.24.0.20.28        LINE TO AR
D165 011      05.24   .25.26.0.20.29        INCREMENT
D165 012      05.26   .27.28.0.28.20        RESTORE
D165 013      05.28   .30.30.0.31.31        N C FROM AR
D165 014      05.15   .46.23.4.05.25        CHECK SUM TO MQ
D165 015      05.23   .24.27.4.25.22        RESTORE
D165 016      05.27   .28.29.0.22.28        CHECK SUM TO AR
D165 017      05.29   .30.30.3.20.29        INCREMENT
D165 018      05.30   .32.33.0.28.27        FINISHED
D165 019      05.33   .36.20.0.20.28        YES... LINE TO AR
D165 020      05.20   .22.22.0.31.31        N C FROM AR
D165 021      05.48 U.23.22.0.19.00         GO TO START PROGRAM
D165 022      05.34   .37.37.0.23.31        CLEAR 2 WD REG
D165 023      05.37 U.38.38.0.25.19         CLEAR LINE 19
D165 024      05.38   .41.41.0.15.31        READ PAPER TAPE
D165 025      05.41   .45.35.0.22.28        CHECK SUM TO AR
D165 026      05.35   .35.35.0.28.31        READY
D165 027      05.36   .37.31.0.28.27        AR EQUAL TO ZERO
D165 028      05.31   .32.42.0.28.28        YES... ADD AR
D165 029      05.42   .44.21.0.22.28        LINE TO AR
D165 030      05.21   .20.20.0.29.31        OVERFLOW TEST
D165 031      05.32 U.33.40.3.19.29         SUBTRACT LINE 19
D165 032      05.40   .41.42.0.28.27        AR EQUAL TO ZERO
D165 033      05.43   .44.44.0.06.31        REVERSE PAPER TAPE
D165 034      05.44   .44.44.0.28.31        READY
D165 035      05.45   .46.37.0.17.31        RING BELL
D165 036      05.70   .72.73.0.05.28        Z9299VZ TO AR
D165 037      05.73   .38.39.0.28.05        AR TO 05.38
D165 038      05.39   .63.64.0.05.28        COMM TO AR
D165 039      05.64   .43.22.0.28.05        RESTORE
D165 040      05.63   .66.68.0.05.28        0000010 TO AR
D165 041      05.68   .70.71.7.28.28        DECR AR
D165 042      05.71   .72.67.0.28.27        AR EQUAL TO ZERO

D165 043      05.67   .87.88.2.04.31        REV SEARCH
D165 044      05.88   .88.88.0.28.31        READY
D165 045      05.89   .90.92.0.05.28        0000010 TO AR
D165 046      05.92   .94.95.7.28.28        DECR AR
D165 047      05.95   .96.91.0.28.27        AR EQUAL TO ZERO
D165 048      05.91   .93.94.0.05.28        0000002 TO AR
D165 049      05.94   .96.97.2.13.31        READ MAG TAPE
D165 050      05.97   .97.97.0.28.31        READY
D165 051      05.98   .U0.U1.7.28.28        DECR AR
D165 052      05.U1   .U2.U3.0.28.27        AR EQUAL TO ZERO
D165 053      05.U3   .U4.00.0.17.31        YES.. RING BELL
D165 054      05.U4   .00.94.0.00.00        NO... READ MAG TAPE
D165 055     Z05.02                         1000000
D165 056     Z05.03                         -8W00000
D165 057     Z05.05                         00000X0
D165 058     Z05.06                         0000034
D165 059     Z05.07                         800000X
D165 060     Z05.08                         0000110
D165 061     Z05.13                         0200000
D165 062     Z05.14                         ZZZZZZZ
D165 063     Z05.48                         1716260
D165 064     Z05.49                         XXXXXXX
D165 065     Z05.50                         1716262
D165 066     Z05.51                         2222222
D165 067     Z05.52                         1716263
D165 068     Z05.53                         3333333
D165 069     Z05.54                         1780265
D165 070     Z05.55                         5555555
D165 071     Z05.66                         0000010
D165 072     Z05.72                         29299VZ
D165 073     Z05.93                         0000002
D165 074     Z05.90                         0000010
D165 075     Z05.U6                         X37UZZU
D165 076     Z05.U7                         9191960

D166 000                                    UPDATER MAIN CONTROL

D166 001      05.00   .02.02.4.09.31        TYPE ... MODE
D166 002      05.02   .02.02.0.28.31        READY
D166 003      05.03   .04.05.0.29.28        CLEAR AR
D166 004      05.05 U.06.07.0.29.23         CLEAR 23.00
D166 005      05.07   .08.10.0.02.23        0800000 TO 23.00
D166 006      05.10   .12.12.0.12.31        GATE TYPE IN
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D166 007      05.12  .13.14.0.17.31  RING BELL
D166 008      05.14  .17.14.0.23.27  NUMBER TYPED IN
D166 009      05.15  .16.17.2.23.23  YES... CLEAR 23.00 AND NUMBER TO AR
D166 010      05.17  .17.17.0.28.31  READY
D166 011      05.18  .22.23.7.28.28  DECR AR
D166 012      05.23  .24.25.0.28.27  MODE ONE
D166 013      05.26  .28.29.7.28.28  NO... DECR AR
D166 014      05.29  .30.27.0.28.27  MODE TWO
D166 015      05.28 U.29.00.0.05.19  NO... TYPE MODE
D166 016      05.25  .28.45.0.23.27  YES... IS IT CORRECT
D166 017      05.45  .00.28.0.00.00  NO... RESTART
D166 018      05.27  .28.30.0.29.21  YES... CLEAR 21.00
D166 019      05.30  .82.82.0.21.31  GO READ TAPE
D166 020      05.46  .00.31.0.00.00  GO TO TYPE OUT
D166 021      05.31 U.32.33.0.02.19  LINE 02 TO 19
D166 022      05.33  .35.36.4.09.31  TYPE... SET MAG SW EQUAL TO 1
D166 023      05.36  .36.36.0.28.31  READY
D166 024      05.37  .38.39.0.16.31  HALT
D166 025      05.39 W.40.24.2.21.31  GO TO DEC TO BINARY CONV
D166 026      05.40  .60.66.1.04.31  REVERSE SEARCH
D166 027      05.66  .66.66.0.28.31  READY
D166 028      05.67 W.68.96.2.21.31  GO TO DELAY
D166 029      05.68  .68.69.1.02.28  0000035 TO AR
D166 030      05.69  .71.72.1.13.31  READ MAG TAPE
D166 031      05.72  .74.77.7.28.28  DECR AR
D166 032      05.77  .78.79.0.28.31  READY
D166 033      05.79  .80.71.0.28.27  NO... AR EQUAL TO ZERO
D166 034      05.80  .57.58.0.19.21  YES... ID TO 21.01
D166 035      05.58  .61.73.0.21.26  ID TO PN
D166 036      05.73 W.75.76.3.23.31  EXTRACT...000ZZZZ
D166 037      05.76  .77.78.3.02.30  SUBTRACT 0008ZVV
D166 038      05.78  .79.70.0.26.27  PN EQUAL TO ID BLOCK
D166 039      05.71  .73.75.0.00.31  NO... SET READY
D166 040      05.75 W.87.96.2.21.31  GO TO DELAY
D166 041      05.87 W.67.34.2.21.31  GO TO REV SEARCH
D166 042      05.70  .75.81.0.21.28  21.03 TO AR
D166 043      05.74  .94.95.1.04.31  REVERSE SEARCH
D166 044      05.95  .95.95.0.28.31  READY
D166 045      05.96 W.99.96.2.21.31  DELAY
D166 046      05.99  .68.90.0.02.28  0000035 TO AR
D166 047      05.90  .92.U2.1.13.31  READ MAG TAPE
D166 048      05.U2  .U4.93.7.28.28  DECR AR
D166 049      05.93  .94.98.0.28.31  READY
D166 050      05.98  .U0.U1.0.28.27  NO... AR EQUAL TO ZERO

D166 051      05.U1  .U3.01.0.00.31  YES... SET READY
D166 052      05.01  .06.08.1.30.31  WRITE FILE CODE
D166 053      05.08  .10.11.1.13.31  READ MAG TAPE
D166 054      05.11  .13.16.0.00.31  SET READY
D166 055      05.16  .17.20.0.21.28  ID NO TO AR
D166 056      05.20  .21.22.1.02.29  INCREMENT ID
D166 057      05.22  .25.32.0.28.21  ID TO 21.01
D166 058      05.32  .57.59.2.28.03  CLEAR AR AND ID TO 03.57
D166 059      05.59 U.60.61.3.03.29  SUBTRACT LINE 03
D166 060      05.61  .U0.04.0.28.03  CHECK SUM TO 03.U0
D166 061      05.04 U.05.06.0.03.19  LINE 03 TO 19
D166 062      05.06 W.00.34.1.01.31  WRITE ID BLOCK
D166 063      05.34  .34.34.0.28.31  READY
D166 064      05.35 W.38.00.2.21.31  GO TO CONVERSION AND TYPE OUT
D166 065      05.38 W.91.34.2.21.31  GO TO REV SEARCH
D166 066      05.91  .92.94.1.02.28  000002U TO AR
D166 067      05.94  .96.U4.1.13.31  READ MAG TAPE
D166 068      05.U4  .U6.41.7.28.28  DECR AR
D166 069      05.41  .42.43.0.28.31  READY
D166 070      05.43  .45.U3.0.28.27  NO... FINISHED
D166 071      05.U3  .U5.84.0.00.31  SET READY
D166 072      05.84 W.38.96.2.21.31  GO TO DELAY AND START
D166 073      05.44  .46.92.0.00.00  YES... DUMMY
D166 074      05.92  .95.56.0.21.28  EDITOR ID TO AR
D166 075      05.56  .57.60.3.19.29  SUBTRACT ID NO
D166 076      05.60  .64.83.0.28.27  IS IT RIGHT BLOCK
D166 077      05.83 U.84.51.0.24.22  YES... CLEAR LINE 22
D166 078      05.51 U.56.86.0.05.21  LOAD 21
D166 079      05.86  .89.97.0.23.31  CLEAR 2WD REG
D166 080      05.97  .U0.U5.0.21.20  21.00 TO 20.00
D166 081     Z05.52                  813267W
D166 082     Z05.53                  Y900000
D166 083     Z05.54                  0827361   BALANCER
D166 084     Z05.55                  5555555 CHECK SUM
D166 085     Z05.U6                  92VZV36
D166 086     Z05.U7                  YUU4U69
D166 087      05.47  .50.57.0.23.31  CLEAR 2WD REGISTERS
D166 088      05.48  .50.57.0.05.02  SET INDICATOR
D166 089      05.50  .28.64.0.02.22  02.28 TO 22.00
D166 090      05.57  .62.63.0.05.28  05.62 TO AR
D166 091      05.62  .84.86.0.28.31  READY
D166 092      05.63  .74.80.0.28.02  AR TO 02.74
D166 093      05.64 W.74.79.2.21.31  GO TO 02.79
D166 094      05.81  .57.85.3.19.29  SUBTRACT 19.57
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D166 095        05.82   .88.U0.0.05.28   05.88 TO AR
D166 096        05.85   .86.47.0.28.27   AR ZERO %
D166 097        05.88 U.91.09.2.21.31    MARK TRANSFER TO 02.09
D166 098        05.89   .91.91.1.13.31   READ MAG. TAPE
D166 099        05.U0   .38.50.0.28.05   AR TO 05.38
D166 100        05.U5   .00.00.0.21.31   GO TO LINE 00

D167 000                                 MAGNETIC TAPE IDENTIFICATION BLOCK

D167 001        03.00 W.02.61.6.21.31    TRANSFER COMM. TO LINE 19
D167 002        03.61   .63.39.0.29.28   CLEAR AR
D167 003        03.39 U.40.43.1.19.29    LINE 19 TO AR
D167 004        03.43   .45.20.0.28.27   AR EQUAL TO ZERO
D167 005        03.21   .22.16.0.17.31   NO... RING BELL
D167 006        03.16 W.V2.00.0.16.31    RESTART
D167 007        03.20 U.20.36.0.19.20    YES... LINE 19 TO 20
D167 008        03.36 U.95.95.0.29.23    CLEAR 23.00
D167 009        03.95   .97.14.0.20.23   20.01 TO 23.01
D167 010        03.14 W.26.51.0.12.31    GATE TYPE IN
D167 011        03.51   .51.51.0.28.31   READY
D167 012        03.52   .56.79.0.23.28   NUMBER TO AR
D167 013        03.79 U.24.24.0.28.21    RESTORE
D167 014        03.24 U.41.44.0.28.29    AR TO AR 16 WORD TIMES
D167 015        03.44   .48.49.2.28.21   EXCHANGE
D167 016        03.49   .50.55.6.20.24   20.02 TO MQ
D167 017        03.55   .56.59.4.20.25   20.00.01 TO ID
D167 018        03.59   .60.63.1.25.20   RESTORE
D167 019        03.63   .65.66.1.26.28   PN TO AR
D167 020        03.66   .68.74.0.31.29   EXTRACT
D167 021        03.74   .75.76.0.28.25   AR TO ID
D167 022        03.76   .77.30.1.24.27   MQ EQUAL TO ZERO
D167 023        03.30   .37.U1.0.28.22   YES... AR TO 22
D167 024        03.U1   .U2.22.0.23.28   23.02 TO AR
D167 025        03.22   .24.04.0.22.31   AR NEG
D167 026        03.31   .08.59.0.24.31   MULTIPLY
D167 027        03.04   .07.47.0.31.25   EXTRACT
D167 028        03.47   .04.U7.1.26.31   SHIFT
D167 029        03.U7 U.20.22.0.19.05    19 TO 05
D167 030        03.05   .07.16.0.28.28   DUMMY TO A HALT
D167 031        03.02 W.04.25.5.21.31    MARK TRANSFER TO 05.
D167 032        03.25 U.29.U4.2.05.23    0526-29 TO LINE 23
D167 033        03.U4   .U6.U6.0.31.31   N. C. FROM AR
D167 034        03.28 U.01.15.0.23.05    23 TO 05

D167 035        03.15   .69.01.0.31.28   EXTRACT
D167 036        03.01   .67.U6.3.05.29   00U0000 TO AR
D167 037        03.U6   .30.37.0.28.27   AR ZERO
D167 038        03.38   .41.53.0.23.27   NO...23.00 ZERO
D167 039        03.54   .56.16.0.28.28   DUMMY TO HALT
D167 040        03.37   .39.16.0.28.28   DUMMY TO HALT
D167 041        03.53   .55.83.1.25.28   ID TO AR
D167 042        03.83   .87.68.3.05.29   0000400 TO AR
D167 043        03.68   .U6.09.0.28.27   AR EQUAL TO ZERO
D167 044        03.09   .10.11.0.28.28   YES... DUMMY
D167 045        03.11   .12.13.1.05.24   -U2616UZ TO MQ
D167 046        03.13   .26.29.0.05.25   802339W TO ID
D167 047        03.29   .33.34.0.05.20   ZZZ0000 TO 20.01
D167 048        03.34   .36.97.5.21.31   T. C. TO LINE 05
D167 049        03.10   .23.32.1.25.05   NO.. ID TO 05.23
D167 050        03.32   .87.48.1.05.25   0000400 TO ID
D167 051        03.48 W.64.97.5.21.31    T. C. TO LINE 05
D167 052        03.97   .98.99.0.05.28   6V4X09Z TO AR
D167 053        03.99   .U0.U2.1.24.05   MQ TO 05.U0
D167 054        03.U2   .U3.U4.1.25.29   ID TO 19.U3
D167 055        03.98   .U7.77.0.04.31   REVERSE SEARCH
D167 056        03.77   .77.77.0.28.31   READY
D167 057        03.78   .80.79.5.20.31   T. C. TO LINE 05
D167 058        03.85   .87.88.1.26.27   PN EQUAL TO ZERO
D167 059        03.88 W.89.69.0.28.28    DUMMY
D167 060        03.69 W.70.70.0.28.28    DUMMY
D167 061        03.70 W.71.71.0.28.28    DUMMY
D167 062        03.71 W.72.93.5.21.31    TRANSFER TO 05
D167 063        03.64 W.65.90.5.21.31    TRANSFER TO 05
D167 064        03.90   .91.U2.0.05.28   0Z4X0VZ TO AR
D167 065        03.65   .23.11.1.05.25   004000 TO ID
D167 066        03.93 W.94.U2.0.05.28    014X1VZ TO AR
D167 067      Z03.67                     00U0000
D167 068      Z03.87                     0000400
D167 069      Z03.12                     -U2616VZ
D167 070      Z03.26                     802339W
D167 071      Z03.U0                     3303333    ... BALANCER
D167 072      Z03.23                     0040000
D167 073      Z03.91                     0Z4X0VZ
D167 074      Z03.94                     014X1VZ
D167 075      Z03.33                     ZZZ0000
D167 076      Z03.57                     0000000
D167 077      Z03.03                     00V0000
D167 078      Z03.07                     0010000
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D167 079      Z03.17                        00Z0000
D167 080      Z03.18                        UU00000
D167 081      Z03.19                        0003000
D167 082      Z03.41                        0008ZVV
D167 083       03.96 W.73.93.5.21.31        TRANS. TO LINE 05
D167 084       03.73 W.75.00.6.21.31        TRANS. TO LINE 06
D167 085       03.75  .78.81.0.28.27        AR EQUAL TO ZERO
D167 086       03.81  .82.96.0.28.28        DUMMY
D167 087       03.82  .84.84.0.22.31        NO... AR NEG.
D167 088       03.84 W.86.97.5.21.31        NO... TRANS. TO LINE 05
D167 089       03.86  .89.06.1.26.28        PN TO AR
D167 090       03.06  .07.08.3.05.29        0010000 TO AR
D167 091       03.08  .11.82.0.28.26        RESTORE
D167 092       03.92  .93.U3.1.25.28        MQ TO AR
D167 093       03.U3  .U4.62.0.28.22        AR TO 22.00
D167 094       03.62 U.01.87.7.30.24-       EXTRACT
D167 095       03.42  .44.45.0.28.27        AR EQUAL TO ZERO
D167 096       03.45  .U0.U5.1.25.05        YES.. MQ TO 05.U0
D167 097       03.U5  .01.50.0.31.21        EXTRACT
D167 098       03.50  .53.56.1.21.28        21.01 TO AR
D167 099       03.56  .57.60.3.22.29        22.01 TO AR
D167 100       03.60  .61.75.0.28.26        AR TO PN
D167 101       03.46  .47.U0.0.17.31        RING BELL
D167 102       03.89  .07.35.1.05.30        0010000 TO PN
D167 103       03.35 W.85.90.5.21.31        T. C. TO LINE 05
D167 104       03.72  .57.58.0.19.21        ID TO 21.01
D167 105       03.58  .61.40.1.30.28        EXTRACT
D167 106       03.27 U.20.36.0.05.20        05.20 TO LINE 20
D167 107      Z03.40                        2U2UWVX
D167 108      Z03.80                        83360V6

D168 000                                    REVERSE SEARCH ROUTINE

D168 001       02.34  .54.55.1.04.31        REVERSE SEARCH
D168 002       02.55  .55.55.0.28.31        READY
D168 003       02.56  .59.60.0.00.00        DUMMY
D168 004       02.60  .61.66.0.02.28        0000009 TO AR
D168 005       02.66  .86.87.1.04.31        REVERSE SEARCH
D168 006       02.87  .89.19.0.28.31        READY
D168 007       02.20  .40.66.0.00.00        YES... RETURN TO REVERSE SEARCH
D168 008       02.19  .22.22.7.28.28        DECREMENT AR
D168 009       02.22  .23.86.0.28.27        AR EQUAL TO ZERO
D168 010       02.86  .88.95.0.00.00        YES... DUMMY

D168 011       02.95  .95.95.0.28.31        READY

D169 000                                    DELAY ROUTINE

D169 001       02.96  .98.U0.0.02.28        000000U TO AR
D169 002       02.U0  .U4.94.7.28.28        DECR AR
D169 003       02.94  .98.99.0.28.27        AR EQUAL TO ZERO
D169 004       02.99  .U1.U0.5.20.31        RETURN TO MARK

D170 000                                    FORWARD SEARCH ROUTINE

D170 001       02.79  .80.81.0.02.28        00000ZZ TO AR
D170 002       02.81  .U1.U2.1.05.31        SEARCH FORWARD
D170 003       02.U2  .U6.74.7.28.28        DECR AR
D170 004       02.74  .77.78.0.28.31        READY
D170 005       02.78  .U0.U1.0.28.27        AR EQUAL TO ZERO
D170 006       02.U1  .U3.U2.5.20.31        YES... RETURN TO MARK

D171 000                                    DECIMAL TO BINARY CONVERSION

D171 001       02.24  .27.27.0.23.31        CLEAR 2 WORD REGISTERS
D171 002       02.27  .28.31.0.23.24        NUMBER TYPED IN TO MQ
D171 003       02.31  .32.33.0.26.31        SHIFT SIXTEEN BITS
D171 004       02.33  .34.35.6.24.26        MQ TO PN
D171 005       02.35 W.37.38.3.23.31        EXTRACT... Z000000
D171 006       02.38  .39.41.0.02.24        V400000 TO MQ
D171 007       02.41  .06.47.0.24.31        MULTIPLY
D171 008       02.47 W.49.51.3.23.31        EXTRACT...ZZ00000
D171 009       02.51  .06.76.0.24.31        MULTIPLY
D171 010       02.76  .77.72.1.02.30        0008ZVV TO PN
D171 011       02.72  .79.79.0.26.21        PN TO 21.03

D172 000                                    BINARY TO DECIMAL CONVERSION

D172 001       02.00  .03.04.0.23.31        CLEAR 2 WD REGISTERS
D172 002       02.04  .05.06.0.02.25        3Y80000 TO ID
D172 003       02.06  .09.13.0.21.26        NUMBER TYPED TO AN
D172 004       02.13  .57.58.1.25.31        DIVIDE
D172 005       02.58  .60.62.6.24.25        MQ TO ID
D172 006       02.62  .63.65.0.02.24        V680000 TO MQ
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D172 007      02.65  .06.71.0.24.31   MULTIPLY
D172 008      02.71 W.73.83.3.23.31   EXTRACT...0ZZZZZZ
D172 009      02.83  .06.89.0.24.31   MULTIPLY
D172 010      02.89 W.91.93.3.23.31   EXTRACT...00ZZZZZ
D172 011      02.93  .06.97.0.24.31   MULTIPLY
D172 012      02.97  .U5.02.0.26.28   CONVERTED NO TO AR
D172 013      02.02  .03.07.0.02.03   FORMAT TO LINE 03
D172 014      02.07  .09.10.0.08.31   TYPE AR
D172 015      02.10  .10.10.0.28.31   READY
D172 016      02.11  .13.12.5.20.31   RETURN TO MARK
                *

D173 000                              GENERAL UPDATER CONSTANTS

D173 001      Z02.03                  0010000
D173 002      Z02.05                  3Y80000
D173 003      Z02.08                  0800000
D173 004      Z02.01                  810235W
D173 005      Z02.21                  0010000
D173 006      Z02.37                  Z000000
D173 007      Z02.39                  W400000
D173 008      Z02.42                  2222222   ...  CHECK SUM
D173 009      Z02.43                  9692458   ...  BALANCER
D173 010      Z02.49                  ZZ00000
D173 011      Z02.61                  0000009
D173 012      Z02.63                  W680000
D173 013      Z02.68                  0000035
D173 014      Z02.73                  0ZZZZZZ
D173 015      Z02.75                  ZZZ0000
D173 016      Z02.77                  0008ZVV
D173 017      Z02.80                  00000U0
D173 018      Z02.91                  00ZZZZZ
D173 019      Z02.92                  000002U
D173 020      Z02.98                  000000U
D173 021      Z02.U3                  U000000
D173 022      Z02.U4                  6XY5Y0Z
D173 023      Z02.U5                  =5ZZ6WUX
D173 024      Z02.U6                  7ZV4923
D173 025      Z02.U7                  YUV295V
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D174 000                              SUB CONTROL ROUTINE

D174 001      00.00  .02.03.1.13.31   READ MAGNETIC TAPE

D174 002      00.03  .03.03.0.28.31   READY
D174 003      00.04  .01.10.0.19.28   19.01 TO AR
D174 004      00.10  .11.12.3.00.29   .00000ZZ FROM AR
D174 005      00.12  .13.14.0.28.27   AR EQUAL TO LAST BLOCK
D174 006      00.15  .1.17.1.00.29    NO... 0000022 TO AR
D174 007      00.17  .18.19 .00.29    SUBTRACT 4ZZZW00
D174 008      00.19  .20.21.0.28.27   AR EQUAL TO LAST BLOCK
D174 009      00.22  .24.25.0.22.28   NO... NUMBER OF BLOCKS TO AR
D174 010      00.25  .26.27.0.00.29   INCREMENT AR
D174 011      00.27  .28.29.0.28.22   RESTORE
D174 012      00.29  .30.41.1.22.28   CHECK SUM TO AR
D174 013      00.41 U.42.08.1.19.29   ADD LINE 19
D174 014      00.08  .10.24.1.28.22   RESTORE
D174 015      00.24 U.25.31.0.19.01   LINE 19 TO N PLUS ONE
D174 016      00.31  .26.28.0.00.28   INCREMENT
D174 017      00.28  .24.96.0.00.29   25.31.0.19.01 TO AR
D174 018      00.96  .24.00.0.28.00   RESTORE
D174 019      00.21  .86.30.0.00.28   YES... 00.56.0.00.00
D174 020      00.30  .31.22.0.28.00   RESTORE
D174 021      00.14  .16.32.1.21.28   01.50.1.19.28
D174 022      00.32  .33.34.3.21.29   SUBTRACT Y900000
D174 023      00.34  .36.37.0.22.31   AR NEG
D174 024      00.38  .39.40.1.00.29   YES... YV00000
D174 025      00.40  .44.45.0.28.21   RESTORE
D174 026      00.45  .47.50.0.31.31   NEXT COMM FROM AR
D174 027      00.50  .51.52.3.00.29   SUBTRACT 4ZZZW00
D174 028      00.52  .53.54.0.28.27   AR EQUAL TO ZERO
D174 029      00.54  .00.21.0.00.00   YES... RETURN
D174 030      00.55  .00.14.0.00.00   NO... RETURN
D174 031      00.37  .40.22.0.20.21   NO... 20.00 TO 21.00
D174 032      00.56  .57.58.0.00.28   0000060 TO AR
D174 033      00.58  .78.79.1.05.31   SEARCH FORWARD
D174 034      00.79  .82.83.7.28.28   DECR AR
D174 035      00.83  .84.85.0.28.31   READY
D174 036      00.85  .86.78.0.28.27   AR EQUAL TO ZERO
D174 037      00.78  .98.99.1.04.31   REVERSE SEARCH
D174 038      00.99  .99.99.0.28.31   READY
D174 039      00.U0 W.01.73.0.21.31   GO TO DELAY
D174 040      00.86  .00.56.0.00.00   RETURN
D174 041      00.01  .04.07.0.22.21   NUMBER OF BLOCKS TO 21.00
D174 042      00.07  .09.05.1.13.31   READ MAG TAPE
D174 043      00.05  .05.05.0.28.31   READY
D174 044      00.06  .08.09.0.22.28   NUMBER BLOCKS TO AR
D174 045      00.09 W.13.42.0.21.31   GO TO FILE CODE SR
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D174 046      00.13 U.14.20.0.01.19   LINE XX TO 19
D174 047      00.20 W.00.35.1.01.31   WRITE 19 ON MAG TAPE
D174 048      00.35  .35.35.0.28.31   READY
D174 049      00.36  .40.53.7.28.28   DECR AR
D174 050      00.53  .54.62.0.28.27   AR EQUAL TO ZERO
D174 051      00.63  .64.65.0.28.22   NO... RESTORE
D174 052      00.65  .66.02.0.00.28   0000020 TO AR
D174 053      00.02  .13.U1.0.00.29   14.20.0.01.19
D174 054      00.U1  .13.06.0.28.00   RESTORE
D174 055      00.62 W.43.42.0.21.31   GO TO FILE CODE SR
D174 056      00.43 W.44.73.0.21.31   GO TO DELAY
D174 057      00.44  .48.49.0.21.28   NUMBER BLOCKS TO AR
D174 058      00.49  .69.70.1.04.31   REVERSE SEARCH
D174 059      00.70  .70.70.0.28.31   READY
D174 060      00.71  .74.75.7.28.28   DECR AR
D174 061      00.75  .76.48.0.28.27   AR EQUAL TO ZERO
D174 062      00.48 W.59.73.0.21.31   GO TO DELAY
D174 063      00.59  .62.64.1.22.28   CHECK SUM TO AR
D174 064      00.64  .68.69.0.21.26   NUMBER BLOCKS TO PN
D174 065      00.69  .94.94.1.13.31   READ MAG TAPE
D174 066      00.95 U.96.74.3.19.29   SUBTRACT FROM AR
D174 067      00.74  .76.77.3.00.30   SUBTRACT FROM PN
D174 068      00.77  .78.80.0.26.27   PN EQUAL TO ZERO
D174 069      00.94  .94.94.0.28.31   READY
D174 070      00.81  .00.69.0.00.00   NO... RETURN
D174 071      00.80  .81.87.0.28.27   AR EQUAL TO ZERO
D174 072      00.88 U.89.90.0.00.19   NO...
D174 073      00.90  .95.97.4.09.31   ALPHA TYPE RECORDING ERROR
D174 074      00.97  .97.97.0.28.31   READY
D174 075      00.98  .99.U2.0.17.31   RING BELL
D174 076      00.U2  .U3.U2.0.16.31   HALT
D174 077      00.87  .16.33.0.00.28   X2492VZ TO AR
D174 078      00.33  .48.44.0.28.00   ALTER 00.48
D174 079      00.82  .46.46.0.15.31   READ PAPER TAPE
D174 080      00.46  .46.46.0.28.31   READY
D174 081      00.47  .00.00.6.21.31   TR COMM TO 19.00
D174 082      00.73  .91.93.0.00.28   0000010 TO AR
D174 083      00.93  .96.89.7.28.28   DECR AR
D174 084      00.89  .90.92.0.28.27   AR EQUAL TO ZERO
D174 085      00.92  .94.93.0.20.31   YES.. RETURN TO MARK
D174 086      00.42  .41.60.1.13.31   READ MAG TAPE
D174 087      00.60  .59.67.0.00.31   SET READY
D174 088      00.67  .66.68.0.00.00   DUMMY
D174 089      00.68  .67.84.1.30.31   FILE CODE
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D174 090       00.84  .86.85.0.20.31   RETURN TO MARK
D174 091      Z00.11                   000002Z
D174 092       00.16 W.82.73.0.21.31   GO TO DELAY
D174 093      Z00.26                   0000001
D174 094      Z00.18                   422ZW00
D174 095      Z00.23                   XXXXXXX  CHECK SUM .
D174 096      Z00.39                   YV00000
D174 097      Z00.51                   422ZW00
D174 098      Z00.57                   0000060
D174 099      Z00.66                   0000020
D174 100      Z00.76                   0000001
D174 101      Z00.91                   0000015
D174 102      Z00.U3                   6U90000
D174 103      Z00.U4                   WUX4X4X
D174 104      Z00.U5                   66965ZZ
D174 105      Z00.U6                   74X5329
D174 106      Z00.U7                   YUU9959
D174 107      Z00.61                   U34242W
D174 108                               ID NUMBER TYPE OUT
D174 109       02.09  .12.16.0.22.28   22 00 TO AR
D174 110       02.12  .16.79.1.26.22   PN TO 22 00
D174 111       02.16  .36.29.1.04.31   TYPE LINE 19
D174 112      Z02.28                   0000002
D174 113       02.29  .29.29.0.28.31   READY
D174 114       02.30  .32.36.7.28.28   DECR. AR
D174 115       02.36  .40.45.0.28.27   AR EQUAL TO ZERO
D174 116       02.45  .50.52.0.02.27   INDIC. SET
D174 117       02.46  .00.16.0.02.02   DELAY
D174 118       02.52  .55.96.0.01.01   DELAY
D174 119       02.53  .64.67.0.02.28   02.64 TO AR
D174 120       02.64 W.91.34.2.21.31   GO TO 02 34
D174 121       02.67  .38.96.0.28.05   AR TO 05 38
D174 122       02.84  .00.78.0.01.01   DELAY
D174 123       02.85  .88.90.1.22.26   22 00 TO PN
D174 124      Z02.88                   0000001
D174 125       02.90  .88.12.1.02.30   ADD 02 88
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D187                                        READ CONTROL ROUTINE LN 0-11-12-4-3

D187  00      00.00 U.01.01.0.11.19   SET NUM. INPUT ROUTINE
D187  01      00.01 U.02.04.0.12.05   SET NUMBER UPDATE ROUTINE
D187  02      00.04  .06.06.6.21.31   GO TO NUM. INPUT ROUTINE
D187  03      11.06 U.11.11.0.29.23   CLEAR LN 23
D187  04      11.11  .16.13.0.09.28   PICK UP CARR. RETURN
D187  05      11.13  .15.80.4.08.31   ALPHA TYPE AR
D187  06      11.80  .80.80.0.28.31   W. F. R.
D187  07      11.81  .82.79.0.17.31   RING BELL
D187  08      11.79  .85.83.0.12.31   GATE NUMERIC TYPE-IN
D187  09      11.83  .84.35.0.17.31   RING BELL
D187  10      11.35  .35.35.0.28.31   W. F. R.
D187  11      11.36  .38.39.0.29.11   CLEAR ADDER REG. NO SLASHES
D187  12     Z11.38                    0000000 ADDER REGISTER
D187  13      11.39  .40.41.0.23.27   ANY ENTRY %
D187  14      11.41  .52.78.0.09.28   PICK UP DUMMY
D187  15      11.78  .92.77.0.28.12   SET PATCH
D187  16      11.77  .92.U2.0.28.05   SET PATCH
D187  17      11.U2  .U3.U6.0.09.28
D187  18      11.U6  .76.82.0.28.09   SET IN NENUCO
D187  19      11.31  .35.35.0.28.31   W. F. R. / SLASH
D187  20      11.32  .38.77.1.07.11   SET ADDER
D187  21      11.73  .76.98.0.23.31   CLEAR 2-WD REGS.
D187  22      11.94  .U7.06.0.07.11   SET INSERT SW.
D187  23      11.02  .00.20.1.19.28   NO. INTO AR
D187  24      11.16  .23.07.1.28.24   STORE IN MQ
D187  25      11.03  .02.44.1.26.31   SHIFT / PLACE
D187  26      11.40 U.46.04.0.24.26   MQ INTO PN
D187  27      11.00 U.05.10.0.11.19   RESET LN. 11
D187  28      11.27  .37.54.0.00.31   SET READY 2 SLASHES
D187  29      11.46 U.55.06.0.11.19   RESTORE LN. 11
D187  30      11.42  .U7.01.0.29.11   YES SET CHANGE SWITCH
D187  31     Z11.U7                    0000000 SWITCH
D187  32      11.01  .04.10.6.23.26   NUMBER INTO PN
D187  33      11.10  .15.17.0.11.24   55 INTO MQ
D187  34     Z11.15                    V400000
D187  35      11.17 W.33.59.3.23.31   -ZZZZZ00
D187  36      11.59  .06.43.0.24.31   MULT
D187  37      11.43 W.47.61.3.23.31   ZZZZZZ0
D187  38      11.61  .06.68.0.24.31   MULT
D187  39      11.68  .69.70.1.26.28   PICK UP NO.
D187  40      11.70 U.85.34.0.28.29   SHIFT 14 PLACES
D187  41      11.34  .38.71.1.11.29   ADD ADDER REG.

D187  42      11.71  .76.82.0.28.09   STORE IN NO. STORAGE
D187  43      11.82  .85.86.0.11.27   CONSTANT MODE %
D187  44     Z11.85                    0000000 CONST. MODE IND.
D187  45      11.86  .84.84.5.21.31   NO EXIT
D187  46      12.84  .11.12.0.07.28   OLD LOC INTO AR
D187  47      12.12  .15.16.0.07.29   ADD DUMMY
D187  48      12.16  .18.18.0.31.31
D187  49      12.96 W.99.22.3.23.31   07ZW000
D187  50      12.22  .76.83.0.09.28   PICK UP SEARCH NO.
D187  51      12.83  .85.86.3.25.29   SUBTRACT OLD NO. IN ID
D187  52      12.86  .88.88.0.22.31   SEARCH NO. LESS THAN OLD NO. %
D187  53      12.89  .U3.U3.3.21.31   YES ERROR
D187  54      12.88  .89.92.2.25.27   NO SEARCH NO. EQUAL OLD NO.
D187  55      12.92 U.U3.U3.1.21.31
D187  56      01.U3  .63.89.1.25.11   SET PRESENT ENTRY NO.
D187  57      01.89 U.90.62.0.29.19   CLEAR LN. 19
D187  58      01.62  .06.06.5.21.31   GO BACK
D187  59      12.06  .07.15.0.07.28   TAB TAB INTO AR
D187  60      12.15  .20.13.4.08.31   ALPHA TYPE AR
D187  61      12.13  .13.13.0.28.31   W. F. R.
D187  62      12.14  .20.31.4.12.31   GATE ALPHA TYPE-IN
D187  63      12.31 U.34.34.0.07.23   OVFL BITS TO 23
D187  64      12.34  .35.32.0.17.31   RING BELL
D187  65      12.32  .36.37.0.23.28   PICK UP 2300 ERROR SENSE
D187  66      12.37  .39.41.0.22.31   NEG %
D187  67      12.41  .43.32.0.28.31   NO READY %
D187  68      12.42  .44.45.2.28.26   YES
D187  69      12.45 W.26.27.3.23.31   ZZZZZ80
D187  70      12.27  .30.35.3.09.30   DECRE BY 40
D187  71      12.35  .36.38.0.26.27   ZERO %      *
D187  72      12.38  .40.92.0.00.31   YES SET READY
D187  73      12.39  .40.46.0.25.27   NO ID CLEAR %
D187  74      12.47  .49.32.0.28.31   NO READY %
D187  75      12.46  .54.56.5.09.30   YES
D187  76      12.56  .00.09.0.19.28   PICK UP 1900
D187  77      12.09  .10.17.0.26.27   PN EQUAL ZERO %
D187  78      12.17  .18.19.0.28.26   YES STORE IN PNO
D187  79      12.19 W.32.36.3.23.31   ZZZZZZ8
D187  80      12.36  .38.48.3.09.30   MINUS 4
D187  81      12.48  .50.24.0.26.27   ZERO %
D187  82      12.24  .26.92.0.00.31   YES SET READY
D187  83      12.18  .20.25.0.22.31   NO NEG %
D187  84      12.25  .27.32.0.28.31   NO READY %
D187  85      12.26  .28.45.0.28.26   YES PUT INTO PN
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D187  86      12.93 W.U1.U2.3.23.31   NO Z800000
D187  87      12.U2  .U3.U4.0.25.27   STMT %
D187  88      12.U4 W.U6.01.3.23.31   YES STMT
D187  89      12.01  .03.05.0.29.25   CLEAR ID
D187  90      12.05  .34.40.1.26.31   SHIFT 17 PLACES
D187  91      12.40  .42.98.1.25.28   PICK UP NO. OF WORDS
D187  92      12.U5  .U7.60.3.25.25   NO PICK UP CODE
D187  93      12.60  .61.62.3.07.29   MINUS 3
D187  94      12.62  .63.66.0.28.27   SUBSCRIPTS %
D187  95      12.66  .70.75.0.07.27   YES IND. SET %
D187  96      12.75  .92.98.0.09.28   NO NOT SET
D187  97      12.76  .92.99.1.09.24   YES SET
D187  98      12.99  .69.69.4.21.31
D187  99      12.67  .61.63.3.07.29   NO MINUS 3
D187 100      12.63  .64.68.0.28.27   FORMATS %
D187 101      12.68  .72.98.0.07.28   YES
D187 102      12.69  .43.77.3.07.29   NO MINUS 1
D187 103      12.77  .92.97.2.09.27   CONSTANTS %
D187 104      12.97  .28.78.1.26.31   YES SHIFT 14 PLACES
D187 105      12.78  .79.U0.0.25.28   PICK UP
D187 106      12.U0 W.U5.03.3.23.31   00003ZW
D187 107      12.03  .04.08.1.26.31   SHIFT 2 PLACES
D187 108      12.08  .10.50.1.28.25   STORE OLD NO.
D187 109      12.50  .51.00.0.25.29   ADD TO OLD NO.
D187 110      12.00 U.15.79.0.28.29   SHIFT BACK 14 PLACES
D187 111      12.79  .76.85.3.09.29   MINUS NEW NO.
D187 112      12.85  .87.94.0.22.31   CONST ENTRY %
D187 113      12.94  .96.U1.0.25.28   YES PICK UP PRESENT NO.
D187 114      12.U1 U.08.10.0.28.29   SHIFT 14 PLACES
D187 115      12.10  .86.51.0.07.29   ADD 1
D187 116      12.51  .63.65.3.25.11   PICK UP NO.
D187 117      12.65  .85.70.0.28.11   SET CONST. MODE IND.
D187 118      12.70  .96.58.0.28.11   STORE IN NO. CONST. LEFT
D187 119      12.58  .92.59.0.09.28   PICK UP 2
D187 120      12.59  .22.98.0.02.03   PATCH LN. 3
D187 121      02.22  .30.30.1.21.31
D187 122      12.95  .U3.U6.1.25.28   NO PICK UP NO.
D187 123      12.U6  .09.11.1.09.29   ADD 3
D187 124      12.11  .13.23.0.28.26   NO. PLUS 1 INTO PN
D187 125      12.23 W.29.30.3.23.31   0000001
D187 126      12.30  .31.98.1.26.28   NO. PLUS 3 ROUNDED INTO AR
D187 127      12.98  .U0.U3.0.28.24   NO NO. INTO MQ
D187 128      12.U3  .U5.U5.4.21.31
D187 129      04.U5  .11.19.0.07.28   OLD LOC INTO AR

D187 130      04.19  .21.68.0.07.29
D187 131      04.45  .48.51.5.26.26
D187 132      04.51  .53.U4.1.26.28
D187 133      04.U4  .U5.09.1.28.28
D187 134      04.09  .51.55.1.07.29
D187 135      04.55  .56.02.1.28.28
D187 136      04.02  .05.28.1.28.26
D187 137      04.28  .30.53.5.26.26
D187 138      04.53  .54.63.0.07.28   PICK UP NEW LOC
D187 139      04.63  .65.04.3.09.29   MINUS 2
D187 140      04.04  .06.10.0.22.31   NEG %
D187 141      04.10  .54.31.0.28.07   NO NUMBER INTO NEW NUMBER
D187 142      04.31  .54.56.0.07.28   PICK UP NEW NUMBER
D187 143      04.56  .59.68.0.07.29
D187 144      04.11 W.24.04.3.21.31   YES PUNCH STOLN S.R.
D187 145      01.24  .05.05.4.21.31   DUMMY
D187 146      04.05  .22.10.0.07.28
D187 147      04.69  .11.52.0.07.28   PICK UP OLD NUMBER
D187 148      04.52  .85.03.3.09.29   MINUS 2
D187 149      04.03  .05.29.0.22.31   NEG. %
D187 150      04.29  .11.66.0.28.07   NO NUMBER INTO OLD LOC
D187 151      04.66  .78.78.3.21.31
D187 152      03.78  .92.U2.3.09.28   MINUS 2
D187 153      03.U2  .U4.10.1.24.29   PLUS NUMBER
D187 154      03.10  .11.22.0.28.27   AR EQUAL ZERO
D187 155      03.22  .84.84.5.21.31   YES
D187 156      03.23  .24.51.0.28.24   NO RESTORE NUMBER
D187 157      03.51  .56.01.0.07.28   DUMMY INTO AR
D187 158      03.01  .11.24.0.07.29   ADD OLD LOC
D187 159      03.24  .68.68.4.21.31
D187 160      04.30 W.10.41.4.21.31   READ TAPE S.R.
D187 161      00.10  .69.U0.0.09.28
D187 162      00.U0 U.U1.02.0.19.16
D187 163      00.02  .11.20.0.28.07   RESET OLD LOC.
D187 164      00.20  .78.78.3.21.31
D187 165      12.33 U.34.43.0.19.18   YES READY TYPE IN INTO STORAGE
D187 166      12.43  .51.02.1.07.28   PICK UP INCRE
D187 167      12.02 U.02.20.0.18.27   DELETE %
D187 168      12.21  .76.52.1.09.29   ADD NENUCO
D187 169      12.52  .76.80.0.28.09   RESTORE NENUCO
D187 170      12.80  .76.04.0.28.07   ALSO INTO 0776
D187 171      12.04  .06.15.3.21.31
D187 172      12.20  .86.87.3.07.29   DECRE
D187 173      12.87  .51.53.1.28.07   RESTORE INCRE
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D187 174      12.53  .70.81.0.09.28  ADD DUMMY
D187 175      12.81  .11.16.0.07.29  ADD OLD LOC.
D187 176      12.49 W.99.U7.3.23.31  07ZW000
D187 177      12.U7  .21.84.1.25.28  OLD ENTRY NO. INTO AR
D187 178      12.64  .76.90.3.09.29  MINUS NEW NO.
D187 179      12.90  .92.28.0.28.27  EQUAL %
D187 180      12.29  .00.00.0.21.31  NO
D187 181      12.28  .51.54.0.11.03  YES PATCH 351
D187 182      11.51  .69.69.4.21.31
D187 183      12.54  .U3.07.0.11.05  PATCH 5U3
D187 184      11.U3  .69.69.4.21.31
D187 185      12.07  .22.57.0.11.03  PATCH 322
D187 186      11.22  .71.71.5.21.31
D187 187      12.57  .79.93.0.07.05  PATCH 579
D187 188      12.71  .22.44.0.01.03  RESTORE 322
D187 189      01.22  .84.84.5.21.31  DUMMY USED AT 1271
D187 190      12.44  .51.53.0.01.03  RESTORE 351
D187 191      01.51  .56.01.0.07.28  DUMMY USED AT 1244

D188 000                             TYPE FINDER ROUTINE LN 0-1

D188 001      00.05  .10.18.4.29.09  CLEAR TLOFFCW
D188 002      00.18 U.21.24.0.29.26  CLEAR PN
D188 003      00.24  .39.70.0.29.09  CLEAR FICHCO
D188 004      00.70  .72.93.0.07.22  SET SHIFT BITS
D188 005      00.93 W.06.08.3.21.31  8-BIT EXTRACTOR S.R.
D188 006      00.06  .08.15.0.28.26  CHAR INTO PNO
D188 007      00.15  .31.33.3.09.29  MINUS TAB
D188 008      00.33  .34.36.0.28.27  TAB %
D188 009      00.36  .10.11.1.09.28  YES
D188 010      00.37  .39.40.1.07.29  NO
D188 011      00.40  .41.42.0.28.27  COLON %
D188 012      00.42  .U5.35.0.03.09  YES SET LABEL IND.
D188 013      00.35  .39.84.0.29.09  CLEAR FICHCO
D188 014      00.84  .10.38.4.29.09  CLEAR TLOFFCW
D188 015      00.38  .40.93.4.29.26  CLEAR PNPN
D188 016      00.43  .44.50.3.09.29  NO
D188 017      00.50  .51.52.0.28.27  SPACE %
D188 018      00.52  .10.31.4.09.27  YES TLOFFCW EMPTY %
D188 019      00.31  .72.08.0.09.28  YES
D188 020      00.08  .39.93.0.28.09  SET FICHCO EQUAL 1
D188 021      00.32  .10.11.1.09.28  NO
D188 022      00.53  .72.73.1.09.29  NO

D188 023      00.73  .74.75.0.28.27  OPEN PARENTHESIS %
D188 024      00.75 U.76.77.0.15.05  YES
D188 025      00.77  .00.00.5.21.31  GO TO OPEN PARA S.R.
D188 026      00.76  .80.81.1.07.29  NO
D188 027      00.81  .39.44.2.09.27  EQUAL SIGN % PICH UP FICHCO
D188 028      00.44  .97.U6.1.07.26  YES
D188 029      00.U6  .39.U5.0.29.09  CLEAR FICHCO
D188 030      00.U5  .06.06.4.21.31  GO TO STMT STORER S.R.
D188 031      00.45  .48.34.1.09.29  NO ADD 1 TO FICHCO
D188 032      00.34  .39.41.0.28.09  RESTORE FICHCO
D188 033      00.41  .57.80.3.09.29
D188 034      00.80  .82.93.0.22.31  FICHCO FULL % IF YES SEE 93
D188 035      00.94  .10.17.5.09.24  NO PUT TLOFFCW INTO MQ
D188 036      00.17  .19.51.3.23.31  -ZZZZZWO
D188 037      00.51  .12.U4.1.26.31  SHIFT 6 PLACES
D188 038      00.U4  .U6.07.5.24.30  ADD TLOFFCW
D188 039      00.07  .10.93.5.26.09  RESTORE TLOFFCW
D188 040      00.11  .12.16.3.07.29
D188 041      00.16  .17.22.0.28.27  DO STMT %
D188 042      00.22  .37.U3.1.07.26  YES
D188 043      00.U3  .06.06.4.21.31  GO TO STMT STORER
D188 044      00.23  .25.26.3.07.29  NO
D188 045      00.26  .27.28.0.28.27  GO STMT %
D188 046      00.28  .39.55.0.09.28
D188 047      00.55  .72.88.1.09.29  INCRE FICHCO
D188 04R      00.88  .39.93.0.28.09
D188 049      00.29  .30.39.3.07.29  NO
D188 050      00.39  .40.48.0.28.27  IF STMT %
D188 051      00.48  .34.U3.6.09.26  YES
D188 052      00.49  .50.54.3.07.29  NO
D188 053      00.54  .55.56.0.28.27  FOR STMT %
D188 054      00.56  .81.U3.1.07.26  YES
D188 055      00.57  .63.64.3.07.29  NO
D188 056      00.64  .65.66.0.28.27  CARR %
D188 057      00.66  .67.93.0.00.00  YES
D188 058      00.67  .68.74.3.07.29  NO
D188 059      00.74  .75.78.0.28.27  DATA %
D188 060      00.78  .56.58.0.29.09  YES
D188 061      00.58  .60.60.1.21.31
D188 062      00.79  .82.83.3.07.29  NO
D188 063      00.83  .84.85.0.28.27  GO TO %
D188 064      00.85  .30.U3.6.09.26  YES
D188 065      00.86  .89.91.3.07.29  NO
D188 066      00.91  .92.96.0.28.27  READ %
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D188 067      00.96   .98.93.0.00.00   YES
D188 068      00.97   .98.99.3.07.29   NO
D188 069      00.99   .U0.U1.0.28.27   STOP %
D188 070      00.U1   .13.U3.1.07.26   YES
D188 071      00.U2   .U5.09.3.07.29   NO
D188 072      00.09   .10.12.0.28.27   TABS %
D188 073      00.12   .13.93.0.00.00   YES
D188 074      00.13   .27.30.3.07.29   NO
D188 075      00.30   .31.59.0.28.27   BEGIN %
D188 076      00.59   .17.U3.1.07.26   YES
D188 077      00.60   .64.65.3.07.29   NO
D188 078      00.65   .66.68.0.28.27   BELLS %
D188 079      00.68   .69.93.0.00.00   YES
D188 080      00.69   .73.82.3.07.29   NO
D188 081      00.82   .83.89.0.28.27   SUBSCRIPTS %
D188 082      00.89 U.90.63.0.06.05    YES
D188 083      00.63   .70.25.0.08.07   SET SUBSCRIPT IND.
D188 084      00.25   .31.31.5.21.31   GO TO SUBSCRIPTS S.R.
D188 085      00.90   .93.95.3.07.29   NO
D188 086      00.95   .97.97.1.21.31   CONTINUE AT 0197
D188 087      01.97   .98.99.0.28.27   CONSTANTS %
D188 088      01.99   .56.60.0.12.09   YES
D188 089      01.60 U.61.61.0.14.05
D188 090      01.61   .10.13.4.29.09
D188 091      01.13   .39.U1.0.29.09
D188 092      01.U1   .U5.U5.5.21.31   GO TO LINE 5 ROUTINE
D188 093      01.U0   .U1.U2.3.07.29   NO
D188 094      01.U2   .U3.00.0.28.27   FORMAT %
D188 095      01.00   .21.21.0.21.31   YES
D188 096      00.21 U.22.62.0.13.05
D188 097      00.62   .64.61.0.29.31   TURN OFF OVRFLOW
D188 098      00.61   .00.00.5.21.31   FORMAT S.R.
D188 099      01.01   .03.05.3.07.29   NO
D188 100      01.05   .06.08.0.28.27   WRITE %
D188 101      01.08   .09.47.0.00.00   YES
D188 102      01.09   .28.29.3.07.29   NO
D188 103      01.29   .30.31.0.28.27   FUNCTION %
D188 104      01.31 U.32.70.0.10.05    YES
D188 105      01.70   .93.U1.0.13.05   SET CSP SWITCH
D188 106      01.32   .36.38.3.07.29   NO
D188 107      01.38   .39.40.0.28.27   PERIODS %
D188 108      01.40   .41.47.0.00.00   YES
D188 109      01.41   .44.45.3.07.29   NO
D188 110      01.45   .46.47.0.28.27   PRINT %

D188 111      01.47   .93.93.0.21.31   YES
D188 112      01.48   .65.66.3.07.29   NO
D188 113      01.66   .67.68.0.28.27   PROCEDURE %
D188 114      01.68 U.69.U1.0.10.05    YES
D188 115      01.69   .83.84.3.07.29   NO
D188 116      01.84   .85.90.0.28.27   RETURN %
D188 117      01.90   .93.04.1.11.26   YES
D188 118      01.91   .94.95.1.07.29   NO
D188 119      01.95   .96.U4.0.28.27   END %
D188 120      01.U4   .69.04.1.11.26   YES
D188 121      01.04   .06.06.4.21.31
D188 122      01.U5   .97.19.1.07.26   NO ASSIGNMENT STMT.
D188 123      01.19   .39.04.0.29.09

D189 000                               CHANGE CONSTANTS ROUTINE LN. 1-11-0

D189 001      01.30   .22.23.0.01.03   RESTORE PATCH
D189 002      01.23 U.24.25.0.11.05
D189 003      01.25   .54.63.1.07.28   PICK UP NEW LOC.
D189 004      01.63   .85.93.3.09.29   MINUS 2
D189 005      01.93   .54.59.1.28.07   RESTORE
D189 006      01.59   .76.98.0.09.28   PICK UP NEW ENTRY NUMBER.
D189 007      01.98   .62.62.5.21.31
D189 008      11.87 U.88.58.0.11.05    YES LN 11 INTO LN 05
D189 009      11.58   .62.62.5.21.31   GO TO 1162
D189 010      11.62   .63.64.3.11.29   MINUS PRESENT ENTRY NO.
D189 011      11.64   .U6.98.2.07.27   THIS ENTRY %
D189 012     Z11.63                    0000000 PRESENT CONST. ENTRY NO.
D189 013     Z11.96                    0000000 NO OF CONSTANTS LEFT.
D189 014      11.98 U.99.06.0.08.05    YES BRING IN CONST. ROUTINE
D189 015      11.99   .11.12.0.07.29   ADD OLD LOC.
D189 016      11.47   .96.09.0.28.11   RESTORE
D189 017      11.09   .63.U4.2.11.27   EMPTY %
D189 018      11.U4   .85.04.0.29.11   YES CLEAR CONSTANT MODE IND.
D189 019      11.04   .54.57.6.07.26   NO. INTO PN
D189 020      11.57   .63.67.1.08.30   MINUS 0200000
D189 021      11.67 W.71.30.3.23.31    0100000
D189 022      11.30   .31.37.1.26.28   PICK UP NO.
D189 023      11.37   .54.05.0.28.07   STORE IN NEW NO.
D189 024      11.05   .11.49.1.07.26
D189 025      11.49 W.71.72.3.23.31
D189 026      11.72 W.11.60.1.26.07
D189 027      11.60 U.61.84.0.12.05    RESTORE LN. 05
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D189 028      11.53   .60.U4.0.09.05
D189 029      11.U5   .86.29.1.07.29   NO
D189 030      11.29   .63.65.0.28.11   SET INTO ENTRY NO. THIS CONSTANT
D189 031      11.65   .76.62.0.09.28   PICK UP MENUCO
D189 032      11.24 W.U0.04.3.21.31    YES  PUNCH STOLN S.R.
D189 033      11.U0   .22.23.0.07.28
D189 034      11.12   .14.14.0.31.31
D189 035      11.07 U.10.14.1.28.26    NO. INTO PN
D189 036      11.14   .31.33.0.07.28   ADD DUMMY
D189 037      11.33   .54.12.0.07.29   ADD NEW LOC
D189 038      11.50   .54.18.0.07.28   PICK UP NEW STORAGE
D189 039      11.18   .20.44.0.22.31   EMPTY %
D189 040      11.45 W.U0.04.3.21.31    YES PUNCH STOLN
D189 041      11.44   .18.23.3.09.29   NO
D189 042      11.23   .54.66.0.28.07   STORE IN NEW STORAGE
D189 043      11.66   .11.21.0.07.28   PICK UP OLD STORAGE
D189 044      11.21   .23.25.0.22.31   FINISHED %
D189 045      11.26 W.14.41.4.21.31    YES
D189 046      00.14 U.15.27.0.19.16    INPUT LINE TO STORAGE
D189 047      00.27   .56.56.5.21.31
D189 048      11.25   .18.19.3.09.29   NO MINUS 1
D189 049      11.19   .11.56.0.28.07   RESTORE IN OLD STORAGE
D189 050      11.56   .96.97.0.11.28 * PICK UP NO. CONSTANTS LEFT
D189 051      11.97   .U3.47.3.07.29   DECRE.
D189 052      11.28 U.30.30.3.23.31
D189 053     Z11.48                    00000YX

D190 000                               FIRST WORD FINDER S.R. LN3

D190 001      03.15   .85.29.0.09.28
D190 002      03.29   .30.31.0.28.22   SET FRWDFDCO EQUAL TO 02
D190 003      03.31   .34.39.0.22.28
D190 004      03.39   .43.44.1.09.29   INCREMENT FRWDFDCO BY 04
D190 005      03.44   .46.57.0.28.22   RESTORE
D190 006      03.57   .58.59.0.09.29   DUMMY STORE COMMAND TO AR
D190 007      03.59   .61.61.0.31.31   NEXT COMMAND FROM AR
D190 008      03.40   .43.45.3.09.28   YES... DECREMENT FRWDFDCO BY 04
D190 009      03.41   .42.60.0.22.28   NO...
D190 010      03.60   .63.38.3.09.29   DECREMENT FRWDFDCO BY 6V
D190 011      03.38   .39.45.0.28.27   FRWDFDCO EQUAL ZERO
D190 012      03.45   .46.61.1.22.29   YES... FRWDFDCO TO AR
D190 013      03.46   .48.31.0.00.00   NO... DUMMY
D190 014      03.61   .62.91.0.28.22   RESTORE FRWDFDCO



D191 000                               8-BIT EXTRACTOR S.R. LNS 3-4

D191 001      03.08   .11.12.0.23.31   CLEAR 2 WORD REGISTERS
D191 002      03.12   .14.17.0.09.28   DUMMY PICK-UP COMMAND TO ARC
D191 003      03.17   .18.59.1.22.29   NEXT WORD COUNTER TO AR
D191 004      03.47   .48.49.1.28.24   AR TO MQ0
D191 005      03.49   .51.62.0.22.28   BITOBESHCO TO ARC
D191 006      03.62   .67.68.3.07.29   SUBTRACT 12 FROM BITOBESHCO
D191 007      03.68   .70.71.0.22.31   TEST AR NEGATIVE
D191 008      03.71   .58.42.1.26.31   NO... SHIFT 29 BITS
D191 009      03.72   .75.89.3.22.28   YES... BITOBESHCO TO -ARC
D191 010      03.42   .53.54.1.09.29   INCREMENT BITOBESHCO BY 2
D191 011      03.54   .55.56.0.28.22   RESTORE BITOBESHCO
D191 012      03.56   .58.64.0.22.28   NEXT WORD COUNTER TO ARC
D191 013      03.64   .18.19.3.09.29   DECREMENT BY 01
D191 014      03.19   .22.36.0.28.22   RESTORE NEXT WORD COUNTER
D191 015      03.36   .38.12.0.22.31   TEST AR NEGATIVE
D191 016      03.13   .14.95.0.29.28   YES... CLEAR AR
D191 017      03.95   .97.98.0.28.27   IS AR EQUAL 0
D191 018      03.99 W.45.79.3.23.31    NO...SPECIAL EXTRACT LAST 6 BITS
D191 019      03.79   .17.U1.1.07.30   CHANGE CHARACTER TO LOWER CASE
D191 020      03.U1   .U3.09.1.26.28   PICK-UP CHARACTER IN AR
D191 021      03.09   .76.76.4.20.31   TRANSFER
D191 022      04.76   .41.64.3.10.30   SUBTRACT CONSTANT FOR C&R
D191 023      04.64   .67.91.0.26.27   C&R
D191 024      04.91   .08.08.3.20.31   YES...RETURN
D191 025      04.92   .95.85.0.29.26   NO...CLEAR PN1
D191 026      04.85   .87.84.0.29.31   TURN OFF OVERFLOW
D191 027      03.89   .80.69.0.26.31   SHIFT UNDER CONTROL OF AR
D191 028      03.69   .71.30.0.24.26   MQ1 TO PN1
D191 029      03.30 W.33.50.3.23.31    SPECIAL EXTRACT LAST 8 BITS
D191 030      03.50   .51.53.0.22.28   BITOBESHCO TO ARC
D191 031      03.53   .68.81.1.09.29   INCREMENT BY 8
D191 032      03.81   .83.95.2.26.22   RESTORE BITOBESHCO & PN1 TO AR

D192 000                               NEXT STOLOC S.R. LN 3

D192 001      03.93   .54.48.0.07.28
D192 002      03.48   .85.88.3.09.29   DECREMENT STOLOC BY 2
D192 003      03.88   .54.97.0.28.07
D192 004      03.97   .99.91.0.22.31   TEST AR NEGATIVE
D192 005      03.91   .00.19.0.20.31   RETURN TO MARK
D192 006      03.92   .04.04.3.20.31   YES... PUNCH STOLN S.R.
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D193 000                                    INSERT OR CHANGE% ROUTINE LN 1-12-0

D193 001      01.10  .U7.11.0.11.27         INSERT %
D193 002      01.11 U.12.18.0.12.05         NO MUST BE CHANGE
D193 003      01.18  .73.73.5.21.31
D193 004      12.73  .76.82.0.09.28         PICK UP MENUCO
D193 005      12.82  .51.61.3.07.29         SUB. INCRE
D193 006      12.61  .76.53.0.28.09         RESTORE MENUCO
D193 007      01.12  .03.03.0.21.31         YES GO FOR NEXT ENTRY
D193 008      00.03  .51.71.1.07.28
D193 009      00.71  .86.98.1.07.29
D193 010      00.98  .51.00.1.28.07


D194 000                                    PUNCH STOLN S.R. LN 3

D194 001      03.04  .15.U7.0.09.28
D194 002      03.U7 U.24.36.0.09.02         SET FORMAT
D194 003      03.16  .17.18.3.09.29         DECREMENT AR
D194 004      03.18  .20.20.0.22.31         TEST AR NEGATIVE
D194 005      03.20 W.01.16.0.10.31         NO...PUNCH PAPER TAPE
D194 006      03.21  .23.U0.0.00.31         YES...SET READY
D194 007      03.U0  .00.27.4.17.27         TEST 17.00-01 EQUAL 0
D194 008      03.27  .01.28.0.15.17         YES...0000ZZ TO 17.01
D194 009      03.28  .24.25.0.29.28         NO...CLEAR AR
D194 010      03.25 U.26.26.1.17.29         CHECK SUM LINE 17
D194 011      03.26 U.28.43.1.28.28         COMPLIMENT AR
D194 012      03.43  .45.84.3.28.28         CLEAR & SUBTRACT
D194 013      03.84  .U6.11.1.28.17         CHECK SUM BALANCER TO 17.U6
D194 014      03.11  .62.05.0.09.28
D194 015      03.05  .06.14.1.09.29
D194 016      03.14  .62.52.0.28.09
D194 017      03.52  .U7.55.0.28.17
D194 018      03.55 U.56.63.0.17.19         OUTPUT TO LINE 19
D194 019      03.63 U.64.32.0.29.17         CLEAR OUTPUT LINE
D194 020      03.32  .34.74.0.10.31         PUNCH LINE 19
D194 021      03.74  .74.74.0.28.31         TEST READY
D194 022      03.75  .76.70.0.01.01
D194 023      03.70  .69.73.0.09.28         PICK UP 6800000
D194 024      03.73  .54.91.0.28.07         SET IN NEW STORAGE


D195 000                                    READ PAPER TAPE LN 4

D195 001      04.41  .43.33.0.15.31         READ TAPE




D195 002      04.33  .33.33.0.28.31         W. F. R.
D195 003      04.34  .U7.01.1.19.28         CHECK SUM INTO AR
D195 004      04.01 U.02.20.3.19.29         SUM LN 19 FROM AR
D195 005      04.20  .22.36.2.07.27         CHECK SUM CORRECT %
D195 006      04.36 U.37.44.0.19.16         YES LN 19 INTO LN 16
D195 007      04.44 U.00.19.0.20.31         RETURN
D195 008      04.37  .38.40.0.17.31         NO RING BELL
D195 009      04.40  .42.41.0.16.31         HALT


D196 000                                    MAG. TAPE READ ROUTINE LN 1

D196 001      01.43  .19.49.0.02.27         MODE % READ ROUTINE
D196 002      01.49  .50.53.0.01.01         A
D196 003      01.50  .27.81.0.02.28         B PICK UP COUNT
D196 004      01.81  .82.54.7.28.28         DECRE
D196 005      01.54  .74.74.1.04.31         REVERSE SEARCH
D196 006      01.74  .76.78.7.28.28         DECRE
D196 007      01.78  .78.78.0.28.31         W. F. R.
D196 008      01.79  .56.53.0.28.27         FINISHED % IF NO SEE 54 ABOVE
D196 009      01.53  .27.02.0.02.28         YES PICK UP COUNT
D196 010      01.02  .00.44.7.28.28         DECRE
D196 011      01.44  .27.75.0.28.02         RESTORE
D196 012      01.75  .69.58.0.09.28         PICK UP 6800000
D196 013      01.58  .11.03.0.28.07         STORE IN OLD LOC
D196 014      01.03  .02.U6.0.01.01         DELAY
D196 015      01.U6  .U5.88.0.01.01         DELAY
D196 016      01.88 W.87.86.1.13.31         READ
D196 017      01.86  .86.86.0.28.31         W. F. R.
D196 018      01.87  .U7.55.1.19.28         PICK UP CHECK SUM
D196 019      01.55 U.56.56.3.19.29         SUM LN. 19 FROM AR
D196 020      01.56  .57.64.0.28.27         CHECK SUMMED %
D196 021      01.64  .19.80.0.29.02         YES SET A
D196 022      01.80  .00.19.0.20.31         RETURN
D196 023      01.65  .85.72.1.04.31         NO REVERSE SEARCH
D196 024      01.72  .72.72.0.28.31         W. F. R.
D196 025      01.73  .93.77.0.09.28         PICK UP COUNTER
D196 026      01.77 U.80.57.7.28.28         DECRE.
D196 027      01.57  .58.76.0.28.27         FINISHED
D196 028      01.76  .77.03.0.01.01         YES.


D197 000                                    MAG. TAPE WRITE ROUTINE LN 2

D197 001      02.17  .19.20.0.02.27         MODE % READ ROUTINE
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D197 002      Z02.19                    0000000 MODE IND.
D197 003       02.20  .27.37.0.02.28    A PICK UP COUNT
D197 004       02.21  .22.36.0.29.28    B CLEAR A R
D197 005      Z02.27                    0000000 COUNT
D197 006       02.37  .57.31.1.05.31    FORWARD SEARCH
D197 007       02.31 U.34.34.7.28.28    DECREMENT
D197 008       02.34  .34.34.0.28.31    W. F. R.
D197 009       02.35 W.36.36.0.28.27    FINISHED %
D197 010       02.36  .00.00.4.17.27    BOTTOM EMPTY %
D197 011       02.00  .01.01.0.15.17    YES - FILL WITH GARB
D197 012       02.01 U.02.40.0.17.19    NO - LN 17 TO OUTPUT
D197 013       02.40 U.41.39.1.19.29    SUM LN 19
D197 014       02.39 W.39.46.1.28.28    BALANCE LINE
D197 015       02.46 W.46.42.3.28.28    BALANCE LINE
D197 016       02.42  .U6.30.1.28.19    BALANCE LINE
D197 017       02.30  .62.50.0.09.28    MTA COUNTER INTO A R
D197 018       02.50  .U7.63.0.28.19    SET CHECK SUM
D197 019       02.63  .06.05.1.09.29    INCRE
D197 020       02.05  .62.66.2.07.09    RESTORE AND PICK UP 6800000
D197 021       02.66  .54.52.0.28.07    STORE IN NEW LOC.
D197 022       02.52  .78.82.0.07.27    END SW. SET %
D197 023       02.82 W.00.90.1.01.31    NO WRITE ON MTA
D197 024       02.83  .85.98.0.07.21    YES SET S MODE SW.
D197 025       02.98  .62.87.0.09.21    SET MTA COUNTER
D197 026       02.87 W.00.96.1.01.31    WRITE BLOCK ON MTA
D197 027       02.96  .96.96.0.28.31    W. F. R.
D197 028       02.97  .85.85.3.21.31    GO TO END ROUTINE
D197 029       02.90  .90.90.0.28.31    W. F. R.
D197 030       02.91 W.00.04.1.01.31    WRITE FILE CODE
D197 031       02.04  .06.70.0.00.31
D197 032       02.70 W.62.62.0.01.01
D197 033       02.62  .67.94.1.30.31
D197 034       02.94  .94.94.0.28.31    W. F. R.
D197 035       02.95  .27.79.0.02.28    PICK UP COUNT
D197 036       02.79  .U3.U4.1.07.29    INCRE
D197 037       02.U4  .27.43.0.28.02    RESTORE
D197 038       02.43  .19.64.0.12.02    SET B
D197 039       02.64  .00.19.0.20.31    EXIT


D198 000                                EXTRACTORS AND CONSTANTS LNS 2-7-9

D198 001      Z02.06                    -ZZZZZW0
D198 002      Z02.07                    -ZZZZZZZ
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D198 003      Z02.18                    -ZZZZZW0
D198 004      Z02.23                    UW9Z426
D198 005      Z02.24                    4V4V000
D198 006      Z02.26                    ZZZZZ80
D198 007      Z02.28                    0000008
D198 008      Z02.29                    0000001
D198 009      Z02.32                    ZZZZZZ8
D198 010      Z02.33                    -ZZZZZ00
D198 011      Z02.38                    -ZW003ZZ
D198 012      Z02.45                    -ZZZZZW0
D198 013      Z02.47                    ZZZZZZ0
D198 014      Z02.54                    -0000004
D198 015      Z02.55                    003W000
D198 016      Z02.57                    -ZZZZZ00
D198 017      Z02.58                    Y1Y01Y0
D198 018      Z02.59                    -Z0Z00Z0
D198 019      Z02.60                    7ZZY000
D198 020      Z02.61                    3ZZZ000
D198 021      Z02.71                    0100000
D198 022      Z02.74                    -ZZZZZW0
D198 023      Z02.75                    00ZZ000
D198 024      Z02.84                    -ZZZZZZ0
D198 025      Z02.99                    07ZW000
D198 026      Z02.U1                    Z800000
D198 027      Z02.U2                    ZY01Y00
D198 028      Z02.U3                    7Z00Z00
D198 029      Z02.U5                    00003ZW
D198 030      Z02.U6                    0ZY0000
D198 031      Z07.00                    0000000 TLOFFCW2
D198 032      Z07.01                    0000000 TLOFFCW3
D198 033      Z07.02                    0000000 SCA
D198 034      Z07.03                    00V03W4
D198 035      Z07.04                    000000U
D198 036       07.05  .02.68.1.26.17
D198 037      Z07.06                    0000002 SUSSBITCHCO
D198 038      Z07.07                    YXYX000
D198 039       07.08  .00.11.5.26.17
D198 040      Z07.09                    0000000 TO11
D198 041      Z07.10                    0000000 TO 12
D198 042      Z07.11                    0000000 OLD LOC
D198 043      Z07.12                    0000526
D198 044      Z07.13                    0000060
D198 045      Z07.14                    0000000 STORAGE
D198 046       07.15  .00.96.4.16.26    USED AT 0013
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D198 047     07.16  .00.49.5.26.17
D198 048    Z07.17                  00000W0
D198 049    Z07.18                  0000000 SWITCH S1ST
D198 050    Z07.19                  0000010
D198 051    Z07.20                  -8000000
D198 052     07.21  .00.45.5.16.26
D198 053    Z07.22                  6800000
D198 054    Z07.23                  0000070
D198 055    Z07.24                  0000000SWITCH SSS
D198 056    Z07.25                  00000W0
D198 057    Z07.26                  0000000 SWITCH S2ND
D198 058    Z07.27                  18861V3
D198 059    Z07.28                  02WV81Y
D198 060    Z07.29                  3200000
D198 061    Z07.30                  0000070
D198 062     07.31  .01.50.1.26.17
D198 063    Z07.32                  0000000
D198 064    Z07.33                  0000400
D198 065    Z07.34                  0000020
D198 066    Z07.35                  0015954
D198 067    Z07.36                  0844173
D198 068    Z07.37                  0000010
D198 069    Z07.38                  0004000
D198 070    Z07.39                  0000010
D198 071     07.40  .56.63.0.10.09
D198 072    Z07.41                  0000002
D198 073    Z07.42                  0000000 BCD IND.
D198 074    Z07.43                  0800000
D198 075    Z07.44                  04Z030X
D198 076    Z07.45                  0040268
D198 077    Z07.46                  34X5200
D198 078    Z07.47                  -YU95U9U
D198 079    Z07.48                  0844173
D198 080    Z07.49                  -0000002
D198 081    Z07.50                  0016353
D198 082    Z07.51                  0000000 INCREMENTER
D198 083    Z07.52                  0800000
D198 084    Z07.53                  0000010
D198 085    Z07.54                  0000000 NEW STORAGE
D198 086    Z07.55                  0000640
D198 087     07.56  .00.53.5.16.26
D198 088    Z07.57                  0000400
D198 089    Z07.58                  0800000
D198 090     07.59  .00.69.5.26.17
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D198 091    Z07.60                  0000040
D198 092    Z07.61                  1800000
D198 093     07.62                  6800000
D198 094    Z07.63                  04VW0W0
D198 095    Z07.64                  000W26X
D198 096    Z07.65                  000WV62
D198 097    Z07.66                  04Z030X
D198 098    Z07.67                  000001Z
D198 099    Z07.68                  0040268
D198 100    Z07.69                  0000000 COMMA IND.
D198 101    Z07.70                  0000000 SUBSCRIPT IND
D198 102    Z07.71                  0000014
D198 103    Z07.72                  0000006
D198 104    Z07.73                  07UZ3U1
D198 105    Z07.74                  3800000
D198 106    Z07.75                  0000050
D198 107    Z07.76                  0000000 S.R. MENUCO
D198 108    Z07.77                  0000000 OPEN PAR. IND.
D198 109    Z07.78                  0000000 END SWITCH FOR MTA
D198 110     07.79  .80.95.0.01.01
D198 111    Z07.80                  0000031
D198 112    Z07.81                  0000030
D198 113    Z07.82                  00X5015
D198 114    Z07.83                  1V0X854
D198 115    Z07.84                  1892440
D198 116    Z07.85                  00000X0
D198 117    Z07.86                  0004000
D198 118    Z07.87                  0000000 LIBRARY IND.
D198 119    Z07.88                  -Z800000 LEVCO
D198 120    Z07.89                  046Y76Y
D198 121    Z07.90                  5005X74
D198 122    Z07.91                  0004000
D198 123    Z07.92                  027W05Y
D198 124    Z07.93                  0W93020
D198 125    Z07.94                  955Y3X5
D198 126    Z07.95                  ZZZZZ00 SUSSHBITS
D198 127    Z07.96                  0002000
D198 128    Z07.97                  00000V0
D198 129    Z07.98                  025Y553
D198 130    Z07.99                  000002X
D198 131    Z07.U0                  00000XX
D198 132    Z07.U1                  3003W5Y
D198 133     07.U2  .00.74.5.26.17
D198 134    Z07.U3                  0000001
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D198 135      Z07.U4                        701W6W4
D198 136      Z07.U5                        001XV0V
D198 137       07.U5   .01.07.0.16.28
D198 138      Z07.U7                        0Z0Z0Z0 INSERT SWITCH
D198 139      Z09.00                        0400000
D198 140      Z09.01                        0000000
D198 141      Z09.02                        0000000
D198 142      Z09.03                        8000000
D198 143      Z09.04                        0000000 ERROR SWITCH
D198 144      Z09.05                        0800000
D198 145      Z09.06                        0000001
D198 146      Z09.07                        000000V
D198 147      Z09.08                        0000000 NOBLRDCO
D198 148      Z09.09                        0000003
D198 149      Z09.10                        0000000 TLOFFCW0
D198 150      Z09.11                        0000000 TLOFFCW1
D198 151      Z09.12                        000000W
D198 152      Z09.13                        0000000
D198 153       09.14   .00.47.1.18.28
D198 154      Z09.15                        0000096
D198 155      Z09.16                        YU00000
D198 156      Z09.17                        0000001
D198 157      Z09.18                        0100000
D198 158       09.19   .00.99.5.18.26
D198 159      Z09.20                        0100000
D198 160      Z09.21                        95W98UZ
D198 161      Z09.22                        0000002
D198 162      Z09.23                        00000ZV
D198 163      Z09.24                        00000XW
D198 164      Z09.25                        0000000 INITIAL OVFL. IND.
D198 165      Z09.26                        0W00000
D198 166      Z09.27                        0000000 SWITCH SZ
D198 167      Z09.28                        0000001
D198 168      Z09.29                        0000000 IND. D
D198 169      Z09.30                        0000040
D198 170      Z09.31                        00000YX
D198 171      Z09.32                        1000000
D198 172      Z09.33                        6U00000
D198 173      Z09.34                        0000020
D198 174      Z09.35                        0000000 IDKN REGISTER
D198 175      Z09.36                        0000024
D198 176      Z09.37                        0000U0
D198 177      Z09.38                        0000004
D198 178      Z09.39                        0000000 FICHCO

D198 179       09.40   .00.01.5.18.26
D198 180      Z09.41                        0003W00
D198 181      Z09.42                        000000Z
D198 182      Z09.43                        0400000
D198 183      Z09.44                        0000020
D198 184      Z09.45                        ZZZZZZZ
D198 185      Z09.46                        0000011
D198 186      Z09.47                        0600000
D198 187      Z09.48                        0000001
D198 188       09.49   .00.09.4.08.26
D198 189      Z09.50                        0000000 STO. LOC.
D198 190      Z09.51                        0000004
D198 191       09.52   .53.72.0.09.28
D198 192      Z09.53                        0000002
D198 193      Z09.54                        0000038
D198 194      Z09.55                        0000000
D198 195      Z09.56                        0000000 CONSTANT IND.
D198 196      Z09.57                        0000006
D198 197       09.58   .00.40.0.18.27
D198 198      Z09.59                        0100000
D198 199       09.60   .00.00.0.21.31
D198 200      Z09.61                        00000ZW
D198 201      Z09.62                        0000001 MTA COUNTER
D198 202      Z09.63                        6V00000
D198 203      Z09.64                        00000XW
D198 204       09.65   .00.81.5.26.17
D198 205       09.66   .00.82.5.25.17
D198 206       09.67   .00.71.5.24.17
D198 207      Z09.68                        0000008
D198 208      Z09.69                        6800000
D198 209       09.70   .00.49.4.16.26
D198 210      Z09.71                        00000W0
D198 211      Z09.72                        0000001
D198 212      Z09.73                        0000010
D198 213      Z09.74                        4000000
D198 214       09.75   .06.09.4.08.26
D198 215      Z09.76                        0000000 NENUCO
D198 216      Z09.77                        0000000 PERIOD IND.
D198 217      Z09.78                        000001Z
D198 218      Z09.79                        0000400
D198 219      Z09.80                        00000U0
D198 220      Z09.81                        0000013
D198 221      Z09.82                        0000003
D198 222      Z09.83                        0000000 IND.
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D198 223      09.84   .00.10.5.25.17
D198 224     Z09.85                    0200000
D198 225     Z09.86                    000000Z
D198 226     Z09.87                    00003ZW
D198 227     Z09.88                    0ZY0000
D198 228     Z09.89                    ZW00000
D198 229      09.90   .00.03.5.26.17
D198 230     Z09.91                    0003W00
D198 231     Z09.92                    0000002
D198 232     Z09.93                    000000U
D198 233     Z09.94                    6U00000 STOLOCO
D198 234     Z09.95                    3000000
D198 235      09.96   .50.03.5.08.25
D198 236     Z09.97                    0000040
D198 237      09.98   .00.99.5.26.17
D198 238     Z09.99                    0000000 SUPERELOCO
D198 239      09.U0   .00.90.4.18.30
D198 240     Z09.U1                    8000000
D198 241      09.U2   .42.42.1.21.31
D198 242     Z09.U3                    07ZW000
D198 243      09.U4   .70.70.3.20.31
D198 244     Z09.U5                    0000000 LABEL IND.
D198 245     Z09.U6                    0000000   STORAGE
D198 246     Z09.U7                    0200000

D199 000                               TITLE-INPUT / OUTPUT S.R. LN 10

D199 001       10.59   .71.U5.0.07.22  0000014 TO BITOBESCHO
D199 002       10.30   .32.U5.0.09.05  SET IND. FOR EXIT POINT
D199 003       10.U5   .U6.06.0.07.05  SET TITLE IND.
D199 004       10.06   .10.24.4.29.09  CLEAR TLOFFCW0,1
D199 005       10.24   .39.55.0.29.09  CLEAR FICHCO
D199 006       10.55   .58.00.0.23.31  CLEAR 2 WORD REGISTERS
D199 007       10.00 W.U7.08.3.21.31   8-BIT EXTRACTOR S.R.
D199 008       10.U7   .23.24.0.28.27  TEST AR 0
D199 009       10.04   .10.13.0.09.27  YES... TEST TLOFFCW0,1 EQUAL 0
D199 010       10.05   .06.34.0.28.26  NO... 8-BIT CHARACTER TO PN
D199 011       10.34   .48.81.3.11.29
D199 012       10.81 U.83.84.2.26.27   TAB & 8-BIT CHARACTER TO ARC
D199 013       10.84 U.86.00.0.00.00   YES... DUMMY
D199 014       10.85   .99.08.0.00.00  NO... DUMMY
D199 015       10.08   .99.U0.3.07.29
D199 016       10.U0   .U1.00.0.28.27  SPACE

D199 017       10.01   .06.07.1.09.29  NO...
D199 018       10.07   .08.09.0.28.27  OPEN PARENTHESIS
D199 019       10.09   .77.78.0.05.07  YES... SET OPEN PAR. IND.
D199 020       10.10   .17.18.1.09.29  NO...
D199 021       10.18   .19.20.0.28.27  COMMA
D199 022       10.20   .30.78.0.00.00  YES... DUMMY
D199 023       10.21   .81.40.1.07.29  NO...
D199 024       10.40   .41.42.0.28.27  EQUAL
D199 025       10.42   .88.78.0.09.11  YES... SET EQUAL IND.
D199 026       10.43   .46.54.3.09.29  NO...
D199 027       10.54   .39.56.2.09.27  CLOSING PAR. & FICHCO TO ARC
D199 028       10.56   .89.26.0.09.11  YES... SET CLOSING PAR. IND.
D199 029       10.57   .48.51.1.09.29  NO... INCREMENT FICHCO
D199 030       10.51   .39.44.0.28.09  RESTORE FICHCO
D199 031       10.44   .57.58.3.09.29  0000006 TO -AR
D199 032       10.58   .60.94.0.22.31  TEST FOR FIVE CHARACTERS PICKED UP
D199 033       10.94   .95.00.0.00.00  NO... DUMMY
D199 034       10.95   .10.31.4.09.24  YES... TLOFFCW0,1 TO MQ0,1
D199 035       10.31   .12.68.1.26.31  SHIFT MQ 6 BITS
D199 036       10.68 W.74.75.3.23.31   SPECIAL EXTRACT
D199 037       10.75   .76.U2.5.24.30  MQ0,1 TO PN0,1
D199 038       10.U2   .10.00.4.26.09  PN0,1 TO TLOFFCW0,1
D199 039       10.13   .77.87.0.29.07  YES... CLEAR OPEN PAR. IND.
D199 040       10.14   .92.12.0.01.11  NO... SET EXIT SWITCH
D199 041       10.87 U.93.72.0.29.11   CLEAR 11.88 THRU 11.92 IND.
D199 042       10.72   .04.02.0.09.27  TEST ERROR SWITCH SET
D199 043       10.02   .10.10.1.21.31
D199 044       10.03   .04.15.0.29.09  YES... CLEAR ERROR SWITCH
D199 045       10.15 U.16.92.0.12.05   ERROR
D199 046       10.12   .90.96.0.11.27  TEST I/O IND. SET
D199 047       10.96   .89.60.0.11.27  NO... TEST CLOSING PAR. IND. SET
D199 048       10.97   .04.35.0.07.09  YES... SET ERROR SWITCH
D199 049       10.35   .88.48.0.07.28  LEVCO TO ARC
D199 050       10.48   .52.71.3.07.29  DECREMENT LEVCO BY 1
D199 051       10.71   .88.13.0.28.07  RESTORE LEVCO
D199 052       10.60   .91.52.0.11.27  NO... TEST OUTPUT IND. SET
D199 053       10.61   .92.60.0.00.11  YES... SET EXIT SWITCH
D199 054       10.52   .88.64.0.11.27  NO... TEST EQUAL IND. SET
D199 055       10.53   .32.88.0.09.28  YES... 1000000 TO ARC
D199 056       10.64   .90.56.0.11.27  NO... TEST I/O IND. SET
D199 057       10.65   .91.64.0.07.11  YES...SET OUTPUT IND.
D199 058       10.66   .77.98.0.07.27  NO... TEST OPEN PAR. IND. SET
D199 059       10.67   .00.39.0.00.00  YES... DUMMY
D199 060       10.39   .58.88.0.07.28  0800000 TO ARC
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D199 061      10.98   .U6.16.0.05.27   NO... TEST ONE WORD TITLE IND. SET
D199 062      10.99   .90.98.0.09.11   YES... SET I/O IND.
D199 063      10.16   .20.00.0.00.00   NO... DUMMY
D199 064      10.17   .88.U3.0.07.28   YES... LEVCO TO ARC
D199 065      10.U3   .52.86.1.07.29   INCREMENT LEVCO
D199 066      10.86   .88.11.0.28.07   RESTORE LEVCO
D199 067      10.11   .U1.U4.1.09.29   BUILD OUTPUT
D199 068      10.U4   .U6.88.0.29.05   CLEAR ONE WORD TITLE IND.
D199 069      10.88   .11.74.0.09.29   BUILD OUTPUT
D199 070      10.74   .76.77.1.07.29   BUILD OUTPUT
D199 071      10.77   .93.27.0.05.27   TEST CSP SWITCH SET
D199 072      10.27   .11.33.0.28.09   NO... AR TO TLOFFLW1
D199 073      10.28   .19.22.1.07.29   YES... PUT IN FUNCTION IND. BIT
D199 074      10.22   .11.73.0.28.09   STORE OUTPUT IN TLOFFCW1
D199 075      10.73   .93.33.0.29.05   CLEAR CSP SWITCH
D199 076      10.33   .10.76.4.09.26   TLOFFCW0.1 TO PN0.1
D199 077      10.76 W.U1.93.3.21.31    NEXT STORE LOC. S.R.
D199 078      10.U1   .16.25.0.07.29   DUMMY STORE COMMAND TO AR
D199 079      10.25   .26.49.0.31.31   NEXT COMMAND FROM AR
D199 080      10.49   .76.45.0.07.28   NENUCO TO ARC
D199 081      10.45   .57.47.1.07.29   INCREMENT NENUCO
D199 082      10.47   .76.70.0.28.07   RESTORE NENUCO
D199 083      10.70   .10.38.4.29.09   CLEAR TLOFFCW0.1
D199 084      10.38   .39.69.0.29.09   CLEAR FICHCO
D199 085      10.69   .92.62.0.11.27   TEST EXIT SWITCH SET
D199 086      10.62   .67.00.0.00.00   NO... DUMMY
D199 087      10.63   .70.13.0.00.00   YES... DUMMY
D199 088      10.26   .90.78.0.29.11   CLEAR I/O IND.
D199 089      10.78   .10.36.4.09.27   TEST TLOFFCW0.1 EQUAL 0
D199 090      10.36   .50.00.0.00.00   YES... DUMMY
D199 091      10.37   .51.96.0.00.00   NO... DUMMY
D199 092     Z10.32                    0000000 IND. FOR EXIT POINT
D199 093     Z10.U6                    0000000 ONE WORD TITLE IND.
D199 094     Z10.93                    0000000 CSP SWITCH
D199 095     Z10.19                    0000002
D199 096     Z10.29                    02WV81Y
D199 097     Z10.79                    ZZZZZ00
D199 098     Z10.23                    0000007
D199 099     Z10.46                    0000017
D199 100     Z10.41                    00000YU

D200 000                               FORMAT S.R. LNS 2-4-13

D200 001      13.00   .10.38.4.29.09   CLEAR TLOFFCW0.1

D200 002      13.38   .39.40.0.29.09   CLEAR FICHCO
D200 003      13.40   .44.46.0.29.21   CLEAR OPEN PARENTHESIS IND.
D200 004      13.46 W.U0.08.3.21.31    8-BIT EXTRACTOR S.R.
D200 005      13.U0   .44.50.0.28.26   8-BIT CHARACTER TO PN
D200 006      13.50   .55.57.3.12.29
D200 007      13.57   .58.60.0.28.27   TAB
D200 008      13.60   .61.U1.0.28.27   YES... TEST AR 0
D200 009      13.61   .77.77.2.21.31   NO... TRANSFER FOR PART OR ROUTINE
D200 010      02.77   .78.86.0.26.28   PN0 TO ARC
D200 011      02.86   .88.92.0.21.27   TEST FOR OPEN PARENTHESIS EQUAL 0
D200 012      02.92   .37.37.5.21.31   YES... RETURN
D200 013      02.93   .59.59.5.21.31   NO... RETURN
D200 014      13.37   .54.55.0.28.27   TEST AR 0
D200 015      13.55   .10.10.1.21.31
D200 016      13.56   .61.62.3.09.29   NO...
D200 017      13.62   .63.64.0.28.27   OPEN PARENTHESIS
D200 018      13.64 U.68.69.0.29.21    YES... CLEAR 21.01-02-03
D200 019      13.65   .72.72.1.09.29   NO...
D200 020      13.72   .74.53.0.28.27   COMMA
D200 021      13.53   .55.46.0.00.00   YES... DUMMY
D200 022      13.54   .92.07.3.09.29   NO...
D200 023      13.07   .39.46.2.09.27   SPACE & FICHCO TO ARC
D200 024      13.47   .06.15.1.09.29   NO... INCREMENT FICHCO
D200 025      13.15   .39.48.0.28.09   RESTORE FICHCO
D200 026      13.48   .57.63.3.09.29   TEST FOR FIVE CHARACTERS PICK-UP
D200 027      13.63   .64.66.0.22.31   TEST AR NEGATIVE
D200 028      13.66   .67.46.0.00.00   NO... DUMMY
D200 029      13.67   .10.13.5.09.24   YES... TLOFFCW0.1 TO MQ0.1
D200 030      13.13   .12.26.1.26.31   SHIFT MQ 6 BITS
D200 031      13.26 W.74.03.3.23.31    SPECIAL EXTRACT
D200 032      13.03   .04.09.5.24.30   MQ0.1 TO PN0.1
D200 033      13.09   .10.46.4.26.09   PN0.1 TO TLOFFCW0.1
D200 034      13.69   .72.75.0.07.21   SET OPEN PAR. IND.
D200 035      13.75   .77.78.0.29.09   CLEAR PERIOD IND.
D200 036      13.78   .80.04.4.29.22   CLEAR 22.00-01
D200 037      13.04   .12.14.4.09.20   OVERFLOW BITS TO FORMAT T-LOC. #1
D200 038      13.14   .25.41.0.29.09   CLEAR INITIAL OVFL. IND.
D200 039      13.41   .42.46.4.29.20   CLEAR FORMAT T-LOC. #2
D200 040      13.59   .64.70.3.09.29
D200 041      13.70   .71.73.0.28.27   CLOSING PARENTHESIS
D200 042      13.73   .76.U4.5.20.26   YES... FORMAT T-LOC. #1 TO PN
D200 043      13.74   .78.79.3.09.29   NO...
D200 044      13.79   .80.07.0.28.27   COMMA
D200 045      13.08   .53.10.3.09.29   NO...
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D200 046      13.10  .11.16.0.28.27   SPACE
D200 047      13.16  .17.46.0.00.00   YES... DUMMY
D200 048      13.17 W.74.76.3.23.31   NO... SPECIAL EXTRACT
D200 049      13.76  .78.80.0.26.28   PN0 TO ARC
D200 050      13.80  .81.82.3.09.29
D200 051      13.82  .83.86.0.28.27   C/R
D200 052      13.86  .87.88.0.05.21   YES... SET CARR IND.
D200 053      13.88  .92.94.0.09.28   0000002 TO ARC
D200 054      13.87  .06.11.3.09.29   NO...
D200 055      13.11  .12.18.0.28.27   DIGIT
D200 056      13.18  .22.24.4.21.27   YES... TEST TAB OR CARR IND SET
D200 057      13.19  .81.83.3.09.29   NO...
D200 058      13.83  .84.05.0.28.27   PERIOD
D200 059      13.05  .77.81.0.05.09   YES... SET PERIOD IND
D200 060      13.06  .07.12.3.09.29   NO...
D200 061      13.12  .13.20.0.28.27   SIGN
D200 062      13.20  .21.46.0.00.00   YES... DUMMY
D200 063      13.21  .28.30.3.09.29   NO...
D200 064      13.30  .31.32.0.28.27   TAB
D200 065      13.32  .34.52.0.09.21   YES... SET TAB IND.
D200 066      13.33  .36.39.1.09.29   NO... 0000024 TO AR
D200 067      13.39  .41.92.0.22.31   TEST AR NEGATIVE
D200 068      13.92 U.93.92.0.12.05   NO... ERROR
D200 069      13.93  .97.22.0.21.27   YES... TEST INDIV. DIG. COUNTER EQUAL 0
D200 070      13.22  .24.36.1.26.28   YES... PN0 TO ARC
D200 071      13.23  .28.31.0.09.28   NO... 0000001 TO ARC
D200 072      13.36  .37.46.0.28.21   AR TO INDIV. DIG. COUNTER
D200 073      13.31  .33.89.3.21.29   INDIV. DIG. COUNTER TO AR
D200 074      13.89  .90.91.0.28.27   TEST AR0
D200 075      13.91  .93.49.0.09.28   YES... 0000000 TO ARC
D200 076      13.49  .50.68.1.26.29   PN0 TO AR
D200 077      13.68  .69.77.0.28.21   AR TO INDIV. DIG. COUNTER
D200 078      13.77  .86.95.3.09.29   TEST FOR MAXIMUM NO. OF DIG. USED
D200 079      13.95  .97.45.0.22.31   TEST AR NEGATIVE
D200 080      13.45 U.46.92.0.12.05   NO... ERROR
D200 081      13.81  .82.94.0.09.28   PERIOD BITS TO ARC
D200 082      13.52  .57.94.0.09.28   TAB BITS TO ARC
D200 083      13.94  .97.98.0.21.27   TEST INDIV. DIG. COUNTER EQUAL 0
D200 084      13.98  .17.99.0.09.21   YES... 0000001 TO INDIV. DIG. COUNTER
D200 085      13.99  .U0.U3.4.20.26   NO... FORMAT T-LOC. #1 TO PN0,1
D200 086      13.U3 U.02.02.5.26.30   SHIFT PN 3 BITS
D200 087      13.02  .04.27.1.28.30   AR TO PN0
D200 088      13.27  .28.34.4.26.20   PN0,1 TO FORMAT T-LOC. #1
D200 089      13.34  .36.96.0.29.31   TEST FOR OVFL.

D200 090      13.96  .U6.01.0.28.09   NO... STORE CONTENTS
D200 091      13.97  .25.44.0.09.27   YES... TEST INITIAL OVFL. IND. SET
D200 092      13.44  .25.43.0.05.09   NO... SET INITIAL OVFL. IND.
D200 093      13.43  .46.71.5.26.20   PN0,1 TO FORMAT T-LOC. #2
D200 094      13.71  .72.96.4.09.20   OVERFLOW BITS & END BITS TO FORMAT T-LOC. #1
D200 095      13.01  .05.42.0.21.28   INDIV. DIG. COUNTER TO ARC
D200 096      13.42  .06.35.3.09.29   0000001 TO -AR
D200 097      13.35  .37.60.1.28.21   AR TO INDIV. DIGIT COUNTER
D200 098      13.U1  .U2.46.0.00.00   YES... DUMMY
D200 099      13.U2  .U6.99.0.09.28   NO... PICK-UP STORAGE
D200 100      13.24  .25.28.0.21.27   NO... TEST INDIV. DIG. COUNTER EQUAL 0
D200 101      13.25 U.26.92.0.12.05   YES... ERROR
D200 102      13.28  .48.51.0.09.28   YES... 0000001 TO ARC
D200 103      13.29  .33.51.0.21.28   NO... INDIV. DIG. COUNTER TO ARC
D200 104      13.51  .53.58.1.22.29   TOTAL DIG. COUNTER TO AR
D200 105      13.58  .77.84.0.09.27   TEST PERIOD IND. SET
D200 106      13.84  .88.90.4.28.22   NO... AR TO #DIG. BEFORE & TOT. DIG. COUNTER
D200 107      13.85  .89.90.0.28.22   YES... AR TO TOT. DIG. COUNTER
D200 108      13.90  .91.94.0.29.28   CLEAR AR
D200 109      13.U4  .79.79.4.20.31   TRANSFER TO COMPLETE S.R.
D200 110      04.79 U.86.87.5.26.30   SHIFT PN 3 BITS
D200 111      04.87  .06.07.1.09.30   0000001 TO PN0
D200 112      04.07  .10.12.4.20.27   TEST FORMAT T-LOC. #2 EQUAL 0
D200 113      04.12  .14.15.0.29.31   YES... TEST FOR OVERFLOW
D200 114      04.13  .15.17.0.29.31   NO... TURN OFF OVERFLOW
D200 115      04.15 U.22.12.5.26.30   NO... SHIFT PN 3 BITS
D200 116      04.16  .18.24.4.26.20   YES... PN0,1 TO FORMAT T-LOC. #2
D200 117      04.17  .20.21.2.26.28   NO... PN0 TO ARC
D200 118      04.18  .20.21.2.26.28   YES... PN0 TO ARC
D200 119      04.21  .22.23.1.28.29   SHIFT AR 1 BIT
D200 120      04.23  .25.21.0.29.31   TEST FOR OVERFLOW
D200 121      04.22  .23.24.2.28.29   YES... AR TO AR
D200 122      04.24 W.30.32.5.20.25   FORMAT T-LOC. #2 TO ID0,1
D200 123      04.32 U.34.26.0.22.31   TEST AR NEGATIVE
D200 124      04.26  .06.08.5.25.25   NO... COMPLIMENT ID0,1
D200 125      04.27  .06.08.4.25.25   YES... ID0,1 TO ID0,1
D200 126      04.08 U.10.35.5.28.24   AR TO MQ
D200 127      04.35  .37.38.0.22.28   TOTAL DIGIT COUNTER TO ARC
D200 128      04.38 U.61.62.1.28.29   SHIFT AR 22 BITS
D200 129      04.62  .64.67.1.22.29   22,00 TO AR
D200 130      04.67  .71.72.0.21.27   TEST CARR IND. SET
D200 131      04.72  .74.75.0.28.24   NO... BUILD OUTPUT
D200 132      04.73  .U1.72.1.09.29   YES... PUT IN C/R IND. BIT
D200 133      04.75  .10.74.4.09.26   BUILD OUTPUT
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D200 134      04.74  .76.77.1.07.28   BUILD OUTPUT
D200 135      04.77  .79.80.1.28.30   STORE OUTPUT
D200 136      04.80  .95.96.1.09.30   BUILD OUTPUT
D200 137      04.96 W.86.93.3.21.31   NEXT STORE LOC. S.R.
D200 138      04.86  .65.68.0.09.29   DUMMY STORE COMMAND TO AR
D200 139      04.81 W.93.93.3.21.31   NEXT STORE LOC. S.R.
D200 140      04.93  .66.68.0.09.29   DUMMY STORE COMMAND TO AR
D200 141      04.82 W.83.93.3.21.31   NEXT STORE LOC. S.R.
D200 142      04.83  .67.68.0.09.29   DUMMY STORE COMMAND TO AR
D200 143      04.71  .76.78.0.07.28   NENUCO TO ARC
D200 144      04.78  .79.48.1.09.29   INCREMENT NENUCO
D200 145      04.48  .76.U0.0.28.07   RESTORE NENUCO
D200 146      04.U0  .00.00.5.20.31   RETURN TO LINE 5
D200 147     Z13.U5                   9V6Z080  CONSTANT FOR LOAD NO. 2
D200 148     Z13.U6                   3292V4V  CONSTANT FOR LOAD NO. 2
D200 149     Z13.U7                   YUU3U69  CONSTANT FOR LOAD NO. 2

D201 000                              SUBSCRIPTS S.R. LNS. 2-3-6

D201 001      06.00 W.U4.08.3.21.31   8-BIT EXTRACTOR S.R.
D201 002      06.U4  .03.04.0.28.27   TEST AR 0
D201 003      06.04  .06.55.0.29.31   YES... TEST FOR OVERFLOW
D201 004      06.05  .06.11.0.28.26   NO... 8-BIT CHARACTER TO PN0
D201 005      06.11  .31.26.3.09.29
D201 006      06.26  .30.40.0.28.27   TAB
D201 007      06.40  .00.04.0.00.00   YES... DUMMY
D201 008      06.41  .73.U0.3.09.29   NO...
D201 009      06.U0  .U2.00.0.28.27   SPACE
D201 010      06.01  .53.54.1.09.29   NO...
D201 011      06.54  .56.57.0.28.27   COMMA
D201 012      06.57  .10.23.4.09.27   YES... TEST TLOFFCW0,1 EQUAL 0
D201 013      06.58  .72.73.3.09.29   NO...
D201 014      06.73  .74.75.0.28.27   OPEN PARENTHESIS
D201 015      06.75  .77.00.0.00.07   YES... SET OPEN PAR. IND.
D201 016      06.76  .34.35.1.09.29   NO...
D201 017      06.35  .39.37.2.09.27   CLOSING PAR. & FICHCO TO ARC
D201 018      06.37  .77.78.0.07.27   YES... TEST OPEN PAR. IND. SET
D201 019      06.38  .48.87.1.09.29   NO... INCREMENT FICHCO
D201 020      06.87  .39.43.0.28.09   RESTORE FICHCO
D201 021      06.43  .57.62.3.09.29   TEST FOR FIRST FIVE CHARACTERS
D201 022      06.62  .64.71.0.22.31   TEST AR NEGATIVE
D201 023      06.71  .90.00.0.00.00   NO... DUMMY
D201 024      06.72  .10.33.4.09.24   YES... TLOFFCW0,1 TO MQ0,1

D201 025      06.33  .12.47.1.26.31   SHIFT MQ LEFT 6 BITS
D201 026      06.47 W.74.89.3.23.31   SPECIAL EXTRACT
D201 027      06.89  .90.94.5.24.30   BUILD UP-TO-DATE FIVE CHAR. WORD
D201 028      06.94  .10.00.4.26.09   STORE IN TLOFFCW0,1
D201 029      06.55  .10.67.4.09.27   NO... TEST TLOFFCW0,1 EQUAL 0
D201 030      06.56  .90.04.0.00.00   YES... DUMMY
D201 031      06.67  .10.10.1.21.31
D201 032      06.68  .70.57.0.00.00   NO... DUMMY
D201 033      06.23  .30.00.0.00.00   YES... DUMMY
D201 034      06.24  .58.61.0.29.24   NO... CLEAR MQ0
D201 035      06.61  .77.91.0.07.27   TEST OPEN PAR. IND. SET
D201 036      06.91  .95.46.0.07.24   NO... SUSSHBITS TO MQ1
D201 037      06.92  .09.09.2.20.31   YES... TRANSFER TO PART OF ROUTINE
D201 038      02.09  .83.15.0.09.27   TEST IND. SET
D201 039      02.15  .10.25.4.09.26   NO... TLOFFCW0,1 TO PN0,1
D201 040      02.16  .50.50.5.20.31   YES... TRANSFER TO TRANSFER TO ERROR S.R.
D201 041      02.25  .00.13.4.26.07   PN0,1 TO TLOFFCW2,3
D201 042      02.13  .06.06.5.20.31   RETURN
D201 043      06.06  .83.31.0.07.09   SET IND.
D201 044      06.31  .10.36.4.29.09   CLEAR TLOFFCW0,1
D201 045      06.36  .39.00.0.29.09   CLEAR FICHCO
D201 046      06.46  .49.51.0.24.27   TEST MQ1 EQUAL 0
D201 047      06.51  .60.78.0.00.00   YES... DUMMY
D201 048      06.52  .06.29.0.07.28   NO... SUSBITCHCO TO ARC
D201 049      06.29  .54.84.0.27.31   NORMALIZE
D201 050      06.84  .95.98.0.24.07   RESTORE SUSSHBITS
D201 051      06.98  .06.45.0.28.07   RESTORE SUSSBITCHCO
D201 052      06.45 U.50.03.1.28.29   SHIFT AR 4 BITS
D201 053      06.03  .11.27.0.09.29   BUILD OUTPUT
D201 054      06.27  .76.85.1.07.29   BUILD OUTPUT
D201 055      06.85  .61.U3.1.07.29   BUILD OUTPUT
D201 056      06.U3  .11.15.0.28.09   STORE OUTPUT IN TLOFFCW1
D201 057      06.15  .20.25.0.07.28
D201 058      06.25  .27.69.1.24.29   DECREMENT SUSSHBITS BY 8
D201 059      06.69  .95.U7.0.28.07   RESTORE SUSSHBITS
D201 060      06.U7  .30.33.4.09.26   TLOFFCW0,1 TO PN0,1
D201 061      06.13 W.U1.93.3.21.31   NEXT STORE LOC. S.R.
D201 062      06.U1  .U2.30.0.07.29   DUMMY STORE COMMAND TO AR
D201 063      06.30  .32.74.0.31.31   NEXT COMMAND FROM AR
D201 064      06.74  .76.93.1.07.28   NENUCO TO ARC
D201 065      06.93  .57.59.1.07.29   INCREMENT NENUCO BY 400
D201 066      06.59  .76.02.0.28.07   RESTORE NENUCO
D201 067      06.02  .24.31.0.07.27   TEST SWITCH SSS SET
D201 068      06.32  .14.77.0.07.28   YES... STORAGE TO ARC
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D201 069      06.77   .11.65.0.09.29   BUILD OUTPUT
D201 070      06.65   .76.82.1.07.29   BUILD OUTPUT
D201 071      06.82   .61.95.1.07.29   BUILD OUTPUT
D201 072      06.95   .11.22.0.28.09   STORE OUTPUT IN TLOFFCW1
D201 073      06.22   .24.U7.0.29.07   CLEAR SWITCH SSS
D201 074      06.78 U.79.92.0.12.05    NO... ERROR
D201 075      06.79   .83.39.0.29.09   YES... CLEAR IND.
D201 076      06.39   .77.80.0.29.07   CLEAR OPEN PAR. IND.
D201 077      06.80   .83.88.0.23.31   CLEAR 2 WORD REGISTERS
D201 078      06.88   .95.96.0.07.28   SUSSHBITS TO ARC
D201 079      06.96   .98.99.0.28.24   AR TO MQ0
D201 080      06.99   .06.14.6.07.26   SUSSBITCHCO TO PN1
D201 081      06.14 W.29.81.3.23.31    SPECIAL EXTRACT
D201 082      06.81   .83.U5.0.25.27   TEST FOR SUSSBITCHCO EVEN
D201 083      06.U5   .41.42.3.07.28   YES..CLEAR / SUBTRACT 2  EVEN # OF IXR
D201 084      06.U6   .09.07.3.09.28   NO...CLEAR / SUBTRACT 3  ODD # OF IXR
D201 085      06.07   .04.21.1.26.31   SHIFT 4 BITS
D201 086      06.21   .23.42.1.29.24   CLEAR MQ1
D201 087      06.42   .72.08.0.24.27   TEST MQ0 EQUAL 0
D201 088      06.08   .60.78.0.00.00   YES... DUMMY
D201 089      06.09   .04.16.1.26.31   NO... SHIFT MQ LEFT 2 BITS
D201 090      06.16 U.18.18.0.24.27    TEST MQ1 EQUAL 0
D201 091      06.18   .41.21.3.07.29   YES...SUBTRACT  2
D201 092      06.19   .20.49.1.29.25   NO... CLEAR ID0
D201 093      06.49   .49.63.1.07.25   -0000002 TO ID1
D201 094      06.63   .14.17.1.28.07   AR TO STORAGE
D201 095      06.17   .54.83.0.26.31   SHIFT UNDER CONTROL OF AR
D201 096      06.83   .95.U2.0.07.28   SUSSHBITS TO ARC
D201 097      06.U2   .U4.20.1.25.29   ID0 TO AR
D201 098      06.20   .95.44.2.28.07   ABSOLUTE AR TO SUSSHBITS
D201 099      06.44   .06.86.0.07.28   SUSBITCHCO TO ARC
D201 100      06.86   .48.12.3.09.29   INCREMENT SUSBITCHCO BY 1
D201 101      06.12   .14.28.2.07.29   ABSOLUTE STORAGE TO AR
D201 102      06.28 U.33.34.0.28.29    SHIFT AR 4-BITS
D201 103      06.34   .14.48.0.28.07   AR TO STORAGE
D201 104      06.48   .53.66.3.07.29   DECREMENT BY 10
D201 105      06.66   .01.60.0.07.29   BUILD OUTPUT
D201 106      06.60   .76.90.1.07.29   BUILD OUTPUT
D201 107      06.90   .61.97.1.07.29   BUILD OUTPUT
D201 108      06.97   .01.10.0.28.07   STORE OUTPUT IN TLOFFCW3
D201 109      06.10   .24.64.0.09.07   SET SWITCH SSS
D201 110      06.64   .00.13.4.07.26   TLOFFLW2,3 TO PN0,1
D201 111      06.50   .83.70.0.29.09   CLEAR IND.
D201 112      06.70   .77.78.0.29.07   CLEAR OPEN PAR. IND.


D201 113     Z06.53                    0900000 USED AT 11.50

D202 000                               STATEMENT STORER S.R. LNS 2-4

D202 001      04.06 W.51.15.3.21.31    1ST WORD FINDER S.R.
D202 002      02.51   .74.81.0.29.25   CLEAR ID0
D202 003      02.81   .39.41.1.09.25   FICHCO TO ID1
D202 004      02.41   .10.65.1.26.31   SHIFT ID 5 BITS
D202 005      02.65   .66.76.0.25.26   ID0 TO PN0
D202 006      02.76   .78.80.0.22.28   FRWDFDCO TO AR
D202 007      02.80 U.83.85.5.29.25    CLEAR ID0,1
D202 008      02.85   .70.70.4.20.31   RETURN
D202 009      04.58   .85.57.1.09.29   ADD 2
D202 010      04.70   .00.57.4.18.27   TEST 1800-01 EQU 0
D202 011      04.57   .60.61.1.28.25   YES... AR TO ID0
D202 012      04.61   .06.89.1.26.31   SHIFT ID RIGHT 3 BITS
D202 013      04.89   .90.46.0.22.28   FRWDFDCO TO ARC
D202 014      04.46   .U0.68.0.09.29   DUMMY PICK-UP COMMAND TO AR
D202 015      04.68   .70.70.0.31.31   NEXT COMMAND FROM AR
D202 016      04.90   .96.43.1.25.30   ID0 TO PN0
D202 017      04.43   .76.47.0.09.28   NENUCO TO ARC
D202 018      04.47   .93.97.1.28.30   AR TO PN1
D202 019      04.97   .U5.U6.0.09.27   TEST LABEL IND. SET
D202 020      04.U6   .56.U3.5.26.26   NO... COMPLIMENT PN
D202 021      04.U7   .77.79.3.26.28   YES... CLEAR & SUBTRACT PN1
D202 022      04.59   .61.95.1.28.26   RESTORE PN1
D202 023      04.95   .U5.U6.0.29.09   CLEAR LABEL IND.
D202 024      04.U3 W.88.93.3.21.31    NEXT STORAGE LOCATION S.R.
D202 025      04.88   .54.65.0.07.28
D202 026      04.65   .29.68.0.15.29
D202 027      04.54   .58.60.0.22.28   FRWDFDCO TO ARC
D202 028      04.60   .85.98.3.09.29   DECREMENT BY 02
D202 029      04.98   .U0.U1.0.22.31   TEST AR NEGATIVE
D202 030      04.U1   .U2.14.0.28.22   NO... RESTORE FRWDFDCO
D202 031      04.U2   .10.10.1.21.31
D202 032      04.14   .19.68.0.09.29   DUMMY PICK-UP COMMAND TO AR
D202 033      04.99   .U0.U2.5.26.27   PN EMPTY %

D203 000                               OPEN PARENTHESIS S.R. LNS. 2-15

D203 001      15.00 U.06.06.0.29.20    CLEAR LINE 20
D203 002      15.06   .10.11.0.09.28   TLOFFCW0 TO ARC
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D203 003      15.11  .14.15.3.05.29
D203 004      15.15 W.16.16.0.28.27   IF
D203 005      15.16  .34.78.6.07.26   YES... STORE TYPE CODE
D203 006      15.17  .27.19.0.05.26   NO... STORE CARR TYPE CODE
D203 007      15.19 U.21.21.3.05.29
D203 008      15.21 U.23.23.0.28.27   CARR
D203 009      15.23  .11.12.0.26.09   YES... PN1 TO TLOFFCW1
D203 010      15.24  .67.68.3.05.29   NO...
D203 011      15.68  .69.70.0.28.27   READ
D203 012      15.70  .75.07.0.07.28   YES... PICK UP TYPE CODE
D203 013      15.71  .92.74.3.07.29   NO...
D203 014      15.74  .75.76.0.28.27   TABS
D203 015      15.76  .19.23.3.07.30   YES... STORE TYPE CODE
D203 016      15.77  .84.79.3.07.29   NO...
D203 017      15.79  .80.81.0.28.27   BELLS
D203 018      15.81  .34.86.0.07.28   YES... PICK UP TYPE CODE
D203 019      15.82  .83.84.3.05.29   NO...
D203 020      15.84  .85.08.0.28.27   WRITE
D203 021      15.08  .23.10.0.07.28   YES... PICK UP TYPE CODE
D203 022      15.09  .42.44.3.05.29   NO...
D203 023      15.44  .57.58.0.28.27   PERIODS
D203 024      15.58  .19.23.0.07.30   YES... STORE TYPE CODE
D203 025      15.59  .66.62.3.07.29   NO...
D203 026      15.62  .63.64.0.28.27   PRINT
D203 027      15.64  .75.78.0.05.26   YES... STORE TYPE CODE
D203 028      15.65 U.66.92.0.12.05
D203 029      15.12  .39.47.0.09.28   FICHCO TO ARC
D203 030      15.47  .48.49.0.09.29   INCREMENT FICHCO
D203 031      15.49  .39.41.0.28.09   RESTORE FICHCO
D203 032      15.41 W.U3.08.3.21.31   8-BIT EXTRACTOR S.R.
D203 033      15.U3  .93.94.0.28.26   STORE 8-BIT CHARACTER
D203 034      15.94  .99.U0.3.07.29
D203 035      15.U0  .U1.12.0.28.27   SPACE
D203 036      15.13  .43.22.0.05.29   NO...
D203 037      15.22  .24.25.0.28.27   CLOSING PARENTHESIS
D203 038      15.25  .28.40.6.20.26   YES... DIG. STORE TO PN1
D203 039      15.26 W.45.80.3.23.31   NO... SPECIAL EXTRACT
D203 040      15.80  .83.85.1.26.28   STORE 6-BIT CHARACTER
D203 041      15.85  .86.87.3.09.29   TEST FOR DIGIT
D203 042      15.87 U.89.89.0.22.31   TEST AR NEGATIVE
D203 043      15.89 U.90.92.0.12.05
D203 044      15.90  .90.91.0.20.27   YES... TEST DI #1 SET
D203 045      15.91  .94.39.0.07.20   NO... SET DI #1
D203 046      15.92  .93.95.0.20.27   YES... TEST DI #2 SET
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D203 047      15.95  .96.97.0.20.28   NO... DIG. STORE TO ARC
D203 048      15.96 U.97.92.0.12.05
D203 049      15.97  .U3.U4.3.07.29   TEST FOR A 1 DIGIT
D203 050      15.U4  .U5.U6.0.28.27   TEST AR 0
D203 051      15.U6  .01.02.0.09.20   YES... SET DI #2
D203 052      15.U7 U.20.V2.0.12.05
D203 053      15.02  .03.04.1.26.28   PN1 TO ARC
D203 054      15.04  .05.32.0.05.29   000000U TO AR
D203 055      15.32  .33.28.0.28.26   AR TO PN1
D203 056      15.28  .30.39.3.05.29   TEST FOR LARGEST POSSIBLE NO.
D203 057      15.39 U.45.45.0.22.31   TEST AR NEGATIVE
D203 058      15.45 U.46.92.0.12.05
D203 059      15.46  .47.48.0.26.28   YES... PN1 TO ARC
D203 060      15.48  .52.12.0.28.20   AR TO DIG. STORE
D203 061      15.07  .11.99.0.28.09   AR TO TLOFFCW1
D203 062      15.99  .U0.U1.0.05.28   COMMAND FOR SPACE TEST TO ARC
D203 063      15.U1  .U2.69.0.05.29   INCREMENT AR
D203 064      15.69  .U0.12.0.28.05   RESTORE COMMAND
D203 065      15.37  .00.12.0.00.00   YES... DUMMY
D203 066      15.38 W.45.61.3.23.31   NO... SPECIAL EXTRACT
D203 067      15.50  .52.53.3.05.29   NO...
D203 068      15.51  .18.31.3.05.29   YES...
D203 069      15.31  .32.33.0.28.27   CLOSING PARENTHESIS
D203 070      15.33  .35.40.0.29.26   YES... CLEAR PN1
D203 071      15.34  .35.36.0.29.20   NO... CLEAR SWITCH S1
D203 072      15.53  .54.55.0.28.27   MAG. TAPE
D203 073      15.55  .72.73.0.09.28   YES... MAG. TAPE IND. BIT TO AR
D203 074      15.56  .09.60.3.09.29   NO...
D203 075      15.60  .34.35.0.28.27   PAPER TAPE
D203 076      15.35  .39.12.0.07.20   YES... SET SWITCH S1
D203 077      15.36 U.37.92.0.12.05
D203 078      15.73  .11.54.0.09.29   TLOFFCW1 TO AR
D203 079      15.54  .11.35.0.28.09   AR TO TLOFFCW1
D203 080      15.10  .11.99.0.28.09   AR TO TLOFFCW1
D203 081      15.U5  .U7.U7.2.20.31   TRANSFER TO STATEMENT STORE S.R.
D203 082      02.U7  .59.87.0.09.28
D203 083      02.67  .72.U0.0.09.29   INCREMENT FICHCO
D203 084      02.U0  .39.10.0.28.09   RESTORE
D203 085      02.10  .06.06.4.20.31   STATEMENT STORE S.R.
D203 086      15.40 U.44.57.0.29.20   CLEAR SWITCH S1, DI #1, & DI #2
D203 087      15.57  .11.U5.0.09.30   TLOFFCW1 TO PN1
D203 088     Z15.43                   0000021
D203 089      15.29  .00.54.5.26.17   DUMMY COMMAND
D203 090      15.U2 U.00.25.0.00.00   DUMMY CONSTANT
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D203 091      15.86   .91.23.0.28.30   AR TO PN1
D203 092     Z15.20                    04X1413
D203 093     Z15.18                    000001W
D203 094     Z15.05                    000000U
D203 095     Z15.67                    05839YV
D203 096     Z15.52                    0000024
D203 097      15.72   .47.50.0.20.27   TEST SWITCH S1 SET
D203 098      15.78   .06.06.4.20.31   STATEMENT STORE S.R.
D203 099     Z15.83                    44Z63Y3
D203 100     Z15.42                    0V0Z991
D203 101      15.61   .63.72.0.26.28   PN1 TO ARC
D203 102     Z15.75                    0000080
D203 103     Z15.30                    0000010
D203 104     Z15.27                    0000110
D203 105     Z15.14                    0000656
D203 106     Z15.01                    00000ZZ
D203 107     Z15.63                    1V0X854


D204 000                               CONSTANT AND DATA S.R. LNS. 1-2-4-12-14

D204 001      14.U5   .U7.U4.0.29.31   TEST FOR EVERFLOW
D204 002      14.U4  W.96.08.3.21.31   NO... 8-BIT EXTRACTOR S.R.
D204 003      14.96   .93.94.0.28.27   TEST AR 0
D204 004      14.94   .10.10.1.21.31
D204 005      14.95   .96.98.0.28.26   NO... STORE 8-BIT CHARACTER
D204 006      14.98   .12.12.2.20.31   TRANSFER FOR PART OF ROUTINE
D204 007      02.12   .48.73.3.11.29
D204 008      02.73  U.53.68.2.26.27   TAB   & PN0 TO ARC
D204 009      02.68   .53.53.2.21.31   YES... RETURN
D204 010      02.69   .64.64.5.21.31   NO... RETURN
D204 011      02.53   .10.10.1.21.31   EXIT
D204 012      14.64   .99.U0.3.07.29
D204 013      14.U0   .U1.00.0.28.27   SPACE
D204 014      14.00   .U0.U5.0.00.00   YES... DUMMY
D204 015      14.01   .02.04.0.07.27   NO... TEST SCA SET
D204 016      14.04   .06.07.1.09.29   NO...
D204 017      14.05   .53.57.1.09.29   YES...
D204 018      14.07   .10.37.2.26.27   OPEN PARENTHESIS & PICK-UP 8-BIT CHARACTER
D204 019      14.37   .02.13.0.12.07   YES... SET SCA SWITCH
D204 020      14.38   .72.72.2.20.31   NO... TRANSFER FOR PART OF ROUTINE
D204 021      02.72   .23.78.3.09.29
D204 022      02.78   .39.48.2.09.27   COMMA   & FICHCO TO ARC
D204 023      02.48   .U5.U5.5.20.31   YES...RETURN
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D204 024      02.49   .72.14.0.09.29   NO...INCREMENT FICHCO
D204 025      02.14   .36.36.5.20.31   RETURN
D204 026      14.36   .39.56.0.28.09   RESTORE FICHCO RETURN FROM L.02
D204 027      14.56   .57.58.3.09.29   TEST FOR 5 CHARACTERS PICKED-UP
D204 028      14.58   .60.60.0.22.31   TEST AR NEGATIVE
D204 029      14.60   .61.U5.0.00.00   NO... DUMMY
D204 030      14.61   .10.23.5.09.24   YES... TLOFFCW0,1 TO MQ0,1
D204 031      14.23   .12.39.1.26.31   SHIFT MQ 6 BITS
D204 032      14.39  W.74.75.3.23.31   SPECIAL EXTRACT
D204 033      14.75   .76.93.5.24.30   MQ0,1 TO PN0,1
D204 034      14.93   .10.U5.5.26.09   PN0,1 TO TLOFFCW0,1
D204 035      14.57   .58.62.0.28.27   COMMA
D204 036      14.62   .69.70.0.07.27   YES... TEST COMMA IND. SET
D204 037      14.63   .67.68.1.07.29   NO...
D204 038      14.70   .69.U5.0.09.07   NO... SET COMMA IND.
D204 039      14.71   .02.03.0.29.07   YES... CLEAR SCA
D204 040      14.68   .10.73.2.07.27   CLOSING PARENTH. & PICK UP T012
D204 041      14.73   .10.11.0.28.27   YES... TEST AR EQUAL 0
D204 042      14.74  W.06.69.3.23.31   NO... SPECIAL EXTRACT
D204 043      14.69   .84.85.0.26.28   PICK UP 6-BIT CHARACTER
D204 044      14.85   .86.87.3.09.29   TEST FOR A DIGIT
D204 045      14.87   .89.90.0.22.31   TEST AR NEGATIVE
D204 046      14.90   .00.71.0.00.00   NO... DUMMY
D204 047      14.91   .69.76.0.07.27   YES... TEST COMMA IND. SET
D204 048      14.76   .09.78.0.07.28   NO... PICK UP T011
D204 049      14.77   .10.78.0.07.28   YES... PICK UP T012
D204 050      14.78  U.83.84.1.28.29   SHIFT AR 4 BITS
D204 051      14.84   .86.06.1.26.29   PN0 TO AR
D204 052      14.06   .69.80.0.07.27   TEST COMMA IND. SET
D204 053      14.80   .09.U5.0.28.07   NO... STORE IN T011
D204 054      14.81   .10.U5.0.28.07   YES... STORE IN T012
D204 055      14.11   .09.14.0.07.27   YES... TEST T011 EQUAL 0
D204 056      14.12   .18.19.0.09.07   NO... SET SWITCH S1ST
D204 057      14.13   .69.U5.0.29.07   CLEAR COMMA IND.
D204 058      14.19  U.36.40.1.28.29   SHIFT AR 16 BITS
D204 059      14.40   .42.43.0.29.31   TEST FOR OVFL.
D204 060      14.43   .46.47.0.23.31   NO... CLEAR 2 WORD REGISTERS
D204 061      14.44   .50.71.0.00.00   YES... DUMMY
D204 062      14.47   .49.50.0.28.24   AR TO MQ1
D204 063      14.50   .55.65.1.07.25   0000640 TO ID1
D204 064      14.65   .08.89.0.24.31   MULTIPLY 8 WORD TIMES
D204 065      14.89   .37.97.1.09.25   0000UU0 TO ID1
D204 066      14.97   .08.08.0.24.31   MULTIPLY 8 WORD TIMES
D204 067      14.08   .19.25.1.07.25   0000010 TO ID1
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D204 068      14.25   .08.42.0.24.31   MULTIPLY 8 WORD TIMES
D204 069      14.42   .18.20.0.07.27   TEST S1ST SET
D204 070      14.20   .26.29.0.07.27   NO... TEST 52ND SET
D204 071      14.21   .26.27.0.09.07   YES   SET S2ND
D204 072      14.27   .11.16.0.26.28   PN1 TO ARC
D204 073      14.16   .10.24.0.28.07   STORE IN T012
D204 074      14.24   .18.15.0.29.07   CLEAR S1ST
D204 075      14.14   .50.71.0.00.00   YES... DUMMY
D204 076      14.15   .09.19.0.07.28   NO... PICK UP T011
D204 077      14.29   .31.33.0.26.28   NO... PN1 TO ARC
D204 078      14.30   .31.32.0.26.28   YES... PN1 TO ARC
D204 079      14.32   .35.41.0.23.31   CLEAR 2 WORD REGISTERS
D204 080      14.41   .45.51.0.28.25   AR TO ID1
D204 081      14.51   .02.48.1.26.31   SHIFT ID 1 BIT
D204 082      14.48   .10.53.6.07.24   PICK UP T012
D204 083      14.53   .56.02.0.24.31   MULTIPLY 56 WORD TIMES
D204 084      14.02   .04.09.0.26.28-  PN0 TO ARC
D204 085      14.09   .26.31.0.29.07   CLEAR S2ND
D204 086      14.31   .10.33.0.29.07   CLEAR T012
D204 087      14.33   .09.10.0.28.07   STORE IN T011
D204 088      14.10 U.13.34.1.28.29    SHIFT AR 2 BITS
D204 089      14.34   .11.18.0.09.29   TLOFFCW1 TO AR
D204 090      14.18   .56.66.0.09.27   TEST CONSTANT IND. SET
D204 091      14.66   .74.79.1.09.29   NO... BUILD OUTPUT
D204 092      14.67   .74.79.1.07.29   YES... BUILD OUTPUT
D204 093      14.79   .76.82.1.07.29   BUILD OUTPUT
D204 094      14.82   .11.83.0.28.09   STORE IN TLOFFCW1
D204 095      14.83   .10.17.5.09.26   TLOFFCW0,1 TO PN0,1
D204 096      14.17 W.U1.93.3.21.31    NEXT STORE LOC. S.R.
D204 097      14.U1   .16.26.0.07.29   DUMMY STORE COMMAND TO AR
D204 098      14.26   .28.49.0.31.31   NEXT COMMAND FROM AR
D204 099      14.49   .39.52.0.29.09   CLEAR FICHCO
D204 100      14.52   .10.54.5.29.09   CLEAR TLOFFCW0,1
D204 101      14.54   .69.59.0.29.07   CLEAR COMMA IND.
D204 102      14.59   .02.22.0.29.07   CLEAR SCA
D204 103      14.22   .56.U2.0.09.27   TEST CONSTANT IND. SET
D204 104      14.U2   .09.92.0.29.07   NO... CLEAR T011
D204 105      14.U3   .U5.35.0.29.28   CLEAR AR
D204 106      14.35   .94.94.1.21.31   TRANSFER FOR PART OF ROUTINE
D204 107      01.94   .09.14.2.07.07
D204 108      01.14   .96.67.0.28.11   SET NO. CONSTANTS
D204 109      01.67   .85.46.0.28.11   SET CONST IND.
D204 110      01.46   .54.85.0.07.28
D204 111      01.85   .U7.96.3.09.29
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D204 112      01.96   .54.10.0.28.07   SET PRESENT ENTRY NO.
D204 113      14.86   .91.99.3.07.29   DECREMENT NENUCO
D204 114      14.99   .76.88.0.28.07   RESTORE SRNENUCO
D204 115      14.88 W.U6.72.0.21.31    NEXT NUMBER S.R.
D204 116      14.55   .57.72.0.12.31   GATE NUMERIC TYPE-IN
D204 117      14.72 U.73.20.0.08.05    BRING IN NO. CONVERSION ROUTINE
D204 118      14.28   .42.45.0.07.27   TEST BCD IND. SET
D204 119      14.45   .51.U6.0.28.20   NO... STORE IN 20.03
D204 120      14.46   .50.U7.0.28.20   YES... STORE IN 20.02
D204 121      14.U6   .72.72.1.20.31   TRANSFER
D204 122      14.U7   .85.85.1.20.31   TRANSFER
D204 123      14.03 U.04.92.0.12.05    ERROR
D204 124      14.92   .11.11.2.20.31   TRANSFER
D204 125      02.11   .76.88.0.07.28   PICK UP NENUCO
D204 126      02.88   .U1.08.0.11.29   INCREMENT NENUCO
D204 127     Z11.U1                    0000400  USED AT 02 88
D204 128      02.08   .76.89.0.28.07   RESTORE
D204 129      02.89   .U5.U5.5.20.31   RETURN

D205 000                               BCD TO BINARY CONVERSION S.R. LN 08

D205 001      08.06   .07.08.0.07.28   TAB TAB INTO AR
D205 002      08.08   .10.12.4.08.31   ALPHA TYPE AR
D205 003      08.12   .12.12.0.28.31   W. F. R.
D205 004      08.13   .14.57.0.17.31   RING BELL
D205 005      08.57   .59.20.0.12.31   GATE NUMERIC TYPE IN
D205 006      08.20   .24.27.7.29.23   CLEAR LINE 23 & PUT IN MARKER BIT
D205 007      08.27   .30.31.0.23.31   CLEAR 2 WORD REGISTERS
D205 008      08.31   .33.38.0.02.20   EXTRACTOR TO 20.01
D205 009      08.38 U.39.42.0.08.19    LINE 08 TO LINE 19
D205 010      08.42   .44.44.6.21.31   TRANSFER
D205 011      08.44   .44.44.0.28.31   TEST READY INTEGER 0 SLASHS
D205 012      08.45   .46.47.0.29.28   CLEAR AR
D205 013      08.47   .48.70.4.23.24   INPUT TO MQ0,1
D205 014      08.70   .73.73.5.21.31   RETURN
D205 015      08.73   .V4.72.0.27.31   NORMALIZE
D205 016      08.72 U.75.79.0.28.25    BITS NORMALIZED TO ID
D205 017      08.79   .04.91.1.26.31   SHIFT ID RIGHT 2 BITS
D205 018      08.91   .93.97.0.25.21   ID1 TO 21.01
D205 019      08.97   .U0.U3.4.23.24   INPUT TO MQ0,1
D205 020      08.U3   .V2.85.1.27.31   NORMALIZE
D205 021      08.85   .02.86.1.26.31   SHIFT 1 BIT
D205 022      08.86   .88.22.4.24.26   MQ0,1 TO PN0,1
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D205 023        08.22 U.25.25.0.02.24   LOAD MULTIPLIER
D205 024        08.25 W.58.71.7.23.31   SPECIAL EXTRACT Y1Y01Y0, -Z0Z00Z0
D205 025        08.71  .06.80.0.24.31   MULTIPLY BY 10*2**-4
D205 026        08.80 W.U2.U5.7.23.31   SPECIAL EXTRACT
D205 027        08.U5  .12.49.0.24.31   MULTIPLY BY 10**2*2**-8
D205 028        08.49 W.60.77.7.23.31   SPECIAL EXTRACT
D205 029        08.77  .18.96.0.24.31   MULTIPLY BY 10**4*2**-16
D205 030        08.96  .97.15.0.26.25   PN1 TO 1D1
D205 031        08.15  .16.81.1.29.25   CLEAR 1D0
D205 032        08.81  .42.16.0.24.31   MULTIPLY BY 10**5*2**-20
D205 033        08.16  .17.21.0.08.28   72 EQUAL 0000048 TO ARC
D205 034        08.21  .22.33.4.26.24   INTEGER *2**-56 TO MQ0.1
D205 035        08.33  .V2.74.0.27.31   NORMALIZE
D205 036        08.74  .76.78.4.24.25   NR TO 1D0.1
D205 037        08.78  .81.82.2.21.21   21.01 TO AR & AR TO 21.01
D205 038        08.82  .84.U1.0.22.31   TEST AR EQUAL N EQUAL NEGATIVE
D205 039        08.U1  .U2.18.0.28.27   NO... TEST AR 0
D205 040        08.U2  .17.26.0.09.29   YES... N EQUAL N PLUS 1
D205 041        08.26  .54.76.0.02.21   -0000004 TO 21.02
D205 042        08.76  .89.93.0.08.24   10*2**-4 TO MQ1
D205 043        08.18  .21.23.0.21.28   YES... 21.01 EXPONENT TO ARC
D205 044        08.19  .23.30.3.10.29   NO... 0000007 TO -AR
D205 045        08.30  .46.84.0.10.21   E EQUAL 23*2**-28 TO 21.02
D205 046        08.84  .87.93.0.08.24   X6VZ94Y 10**-7*2**23 TO MQ1
D205 047        08.93  .97.99.2.21.21   AR TO 21.01 & 21.01 TO ARC
D205 048        08.99  .56.U4.0.24.31   MULTIPLY * SCALE FACTOR
D205 049        08.U4  .18.21.1.21.29   E TO AR
D205 050        08.23  .25.28.2.31.27   TEST 31.01 EQUAL 0
D205 051        08.28  .29.90.0.24.21   YES... MQ1 TO 21.01
D205 052        08.29  .31.34.0.22.31   NO... TEST AR NEGATIVE
D205 053        08.34  .35.U6.0.29.28   NO... CLEAR AR
D205 054        08.35  .79.U6.0.10.28   YES... BIG NR TO ARC
D205 055        08.90  .U1.U6.0.27.28   27.01 TO ARC
D205 056        08.U6 U.01.69.1.28.26   NUMBER INTO PN
D205 057        08.69  .54.07.0.07.28   NENUCO INTO AR
D205 058        08.07  .18.50.3.09.29   MINUS 1
D205 059        08.50  .54.00.0.28.07   RESTORE
D205 060        08.00  .05.55.0.07.29   ADD DUMMY
D205 061        08.55  .57.57.0.31.31
D205 062        08.68  .54.01.0.07.28   PICK UP NENUCO
D205 063        08.01  .03.51.0.22.31   NEG %
D205 064        08.51  .96.10.0.11.28   NO PICK UP NO OF CONSTANTS
D205 065        08.52 W.28.04.3.21.31   YES
D205 066        01.28  .51.51.5.21.31   DUMMY GO TO CONSTANT ROUTINE

D205 067        08.10  .17.62.3.09.29   MINUS 1
D205 068        08.62  .96.11.0.28.11   STORE IN NO. CONST. REG.
D205 069        08.11  .63.64.2.11.27   FINISHED
D205 070        08.64  .U7.53.0.11.27   YES CHANGE
D205 071        08.53  .11.56.0.07.28   YES PICK UP OLD LOC.
D205 072        08.56  .59.09.3.09.29   DECRE
D205 073        08.09  .11.54.0.28.07   RESTORE
D205 074        08.54 U.55.53.0.11.05   EXIT
D205 075        08.65  .U7.60.0.11.27   NO CHANGE
D205 076        08.60  .38.59.1.07.29   YES
D205 077        08.59  .63.66.0.28.11   SET NO.
D205 078        08.66  .71.71.1.21.31
D205 079        01.71  .11.15.0.07.28   PICK UP OLD LOC
D205 080        01.15  .18.06.3.09.29   MINUS 1
D205 081        01.06  .11.16.0.28.07   RESTORE
D205 082        01.16  .18.20.0.22.31   NEG %
D205 083        01.20  .00.00.0.21.31   NO EXIT
D205 084        01.21  .23.26.0.15.31   YES READ TAPE
D205 085        01.26  .26.26.0.28.31   W. F. R.
D205 086        01.27  .U7.07.1.19.28   PICK UP CHECK SUM
D205 087        01.07 U.08.17.3.19.29   SUM LN. 19 MINUS FROM A R
D205 088        01.17  .22.33.2.07.27   ZERO %
D205 089        01.33 U.34.35.0.19.16   YES
D205 090        01.34  .36.36.0.06.31   NO REVERSE TAPE.
D205 091        01.35  .11.20.0.28.07   U4 INTO OLD LOC.
D205 092        01.36  .36.36.0.28.31   W. F. READY
D205 093        01.37  .39.21.0.00.00   DUMMY GO TO READ
D205 094        08.61  .00.00.0.21.31   NO GET NEXT ENTRY
D205 095        08.40  .44.44.0.28.31   TEST READY FIXED POINT 1 SLASH
D205 096        08.41  .48.96.3.09.28   0000001 TO -ARC
D205 097        08.92  .00.74.4.19.24   19.00-01 TO MQ0.1
D205 098        08.36  .44.44.0.28.31   TEST READY FLOATING POINT 2 SLASHS
D205 099        08.37  .48.48.5.21.31   TRANSFER
D205 100        08.48  .52.75.4.23.24   NR TO MQ0.1
D205 101        08.75  .90.95.1.27.31   NORMALIZE
D205 102        08.95  .02.U0.1.26.31   SHIFT OFF MARKER BIT
D205 103        08.U0  .37.39.1.09.25   0000U0 TO 1D1
D205 104        08.39  .08.U7.0.24.31   TENS IN EXPONENT
D205 105        08.U7  .57.63.1.07.25   0000010 TO 1D1
D205 106        08.43  .08.94.0.24.31   EXPONENT IN PN
D205 107        08.94  .95.98.3.26.28   PN1 TO -ARC
D205 108        08.98  .60.83.0.07.29   0000040 TO AR
D205 109        08.83  .85.86.0.28.21   AR TO 21.01
D205 110        08.32 U.46.58.0.00.31   SET READY
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D205 111      08.46   .06.06.5.21.31   TRY AGAIN
D205 112      08.14   .U3.U3.3.21.31   ERROR S.R.
D205 113     Z08.17                    0000048
D205 114     Z08.87                    X6VZ94Y
D205 115     Z08.89                    U000000
D205 116     Z08.24                    1111111 TYPE-IN IND.
D205 117     Z08.63                    0200000

D206 000                               END OFF ROUTINE LN 12-3

D206 001      12.72   .92.74.0.01.05   PATCH 592
D206 002      01.92   .94.94.3.21.31   DUMMY
D206 003      12.74   .23.23.3.21.31   GO BACK TO PUTTING OLD INFO INTO NEW
D206 004      03.94   .U2.03.0.09.28
D206 005      03.03   .30.02.0.28.04   PATCH 4 30
D206 006      03.02   .22.34.2.09.03   PATCH
D206 007      03.34   .23.23.3.21.31

D207 000                               PAPER TAPE EXIT LN 1-2-3

D207 001      01.42   .51.52.0.09.28
D207 002      01.52   .78.83.0.28.07   SET END SWITCH
D207 003      01.83 W.44.04.3.21.31
D207 004      02.44   .58.58.3.21.31
D207 005      03.58   .62.82.0.09.21   SET MTA COUNTER
D207 006      03.82   .85.90.0.29.21   SET S MODE SW
D207 007      03.90   .91.96.0.09.28   PICK UP COUNTER
D207 008      03.96   .97.35.3.09.29   DECRE
D207 009      03.35   .37.83.0.00.31   SET READY
D207 010      03.83   .87.85.0.28.27   EQUAL ZERO %
D207 011      03.86 U.05.96.0.10.31    NO
D207 012      03.85 U.00.87.0.13.19    YES CONST INTO LN 19
D207 013      03.87   .92.06.4.09.31   ALPHA TYPE LN 19
D207 014      03.06   .06.06.0.28.31   W. F. R.
D207 015      03.07   .09.07.0.16.31   HALT

D208 000                               MARK FINDERS LN 0-1-2-3-4

D208 001      00.19   .21.39.1.20.31   LINE 00 MARK FINDER
D208 002      01.39   .41.56.2.20.31   LINE 01 MARK FINDER
D208 003      02.56   .58.80.3.20.31   RETURN USED IN SERIES

D208 004      03.80   .82.94.4.20.31   RETURN USED BY SERIES OF RETURNS
D208 005      04.94   .96.U7.5.20.31   RETURN USED BY SERIES OF RETURNS

D209 000                               MAG MASTERS PATCH LN 0

D209 001      00.92   .91.87.0.01.01   DELAY
D209 002      00.87   .86.72.0.01.01   DELAY
D209 003      00.72   .74.46.2.13.31   READ LOADER 3
D209 004      00.46   .46.46.0.28.31   W F R
D209 005      00.47   .00.00.6.21.31   GO TO MAG. REV. SEARCH ROUTINE

D210 000                               LOADER TWO LN. 00

D210 001     Z00.U7                    U4Y6Z4Y
D210 002     Z00.U6                    VY7ZV4K-
D210 003     Z00.U5                    8Z53Z69
D210 004     Z00.U4                    Z36XZ69
D210 005     Z00.U3                    1ZXU6Z4-
D210 006     Z00.U2                    Y7WZY9Y
D210 007     Z00.U1                    ZU80000
D210 008      00.00   .04.32.0.21.28   PICK UP IND
D210 009      00.05   .05.05.0.28.31   W. F. R.
D210 010      00.06   .08.08.0.16.31   HALT
D210 011      00.08   .10.48.0.15.31   READ TAPE
D210 012      00.48   .48.48.0.28.31   W. F. R.
D210 013      00.49   .U7.01.1.19.28   CHECK SUM
D210 014      00.01 U.02.02.3.19.29    SUM LN. 19 FROM AR
D210 015      00.02   .03.12.0.28.27   O. K. %
D210 016      00.12 U.13.14.0.19.16    YES LN. 19 INTO LN. 16
D210 017      00.13   .14.09.0.17.31   NO RING BELL
D210 018      00.09   .10.08.0.16.31   HALT
D210 019      00.14   .U4.10.4.16.17   TITLE ONTO NEW TAPE
D210 020      00.10   .11.52.0.00.07   SET OLD LOC.
D210 021     Z00.11                    6600000
D210 022      00.52   .54.U0.0.00.07   SET NEW STORAGE
D210 023     Z00.54                    6600000
D210 024      00.U0   .11.15.0.07.28   PICK UP OLD LOC
D210 025      00.15   .16.17.0.00.29   ADD DUMMY
D210 026      00.16   .00.57.5.16.26   DUMMY
D210 027      00.17   .19.19.0.31.31
D210 028      00.57   .18.99.0.00.28
D210 029      00.99 W.U1.07.3.23.31    EXTRACT CODE
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D210 030      00.07  .09.19.3.25.29
D210 031     Z00.18                  2800000
D210 032      00.19  .20.22.2.00.27  IS THIS LIBRARY %
D210 033      00.20 U.02.25.0.16.23  DUMMY
D210 034      00.22  .11.17.0.07.29  YES ADD OLD LOC.
D210 035      00.23  .54.55.0.07.28  NO NEW STORAGE
D210 036      00.25  .26.53.0.00.28
D210 037      00.26 U.02.03.0.23.17
D210 038      00.53  .54.17.0.07.29
D210 039      00.03  .11.27.0.07.28  OLD LOC
D210 040      00.27  .30.98.3.00.29  MINUS 4
D210 041     Z00.30                  0400000
D210 042      00.98  .11.29.0.28.07  RESTORE OLD LOC
D210 043      00.29  .30.51.3.00.28  MINUS 4
D210 044      00.51  .54.50.0.07.29  ADD NEW STORAGE
D210 045      00.50  .54.00.0.28.07  RESTORE NEW STORAGE
D210 046      00.55  .85.86.0.09.29  ADD 2
D210 047      00.86  .U6.31.4.29.17
D210 048      00.31  .54.56.0.28.07  RESTORE NEW STORAGE
D210 049      00.56  .00.97.4.00.17
D210 050      00.97 U.98.00.0.18.00  BEGIN
D210 051      00.32  .33.34.0.28.27  PAPER IND %
D210 052      00.34  .39.05.4.09.31  YES ALPHA TYPE LN. 19
D210 053      00.35  .37.41.1.13.31  READ MTA 1
D210 054      00.41  .27.43.0.28.02  STORE NO. OF SEARCHES
D210 055      00.43  .43.43.0.28.31  NO W. F. R.
D210 056      00.44  .45.12.0.01.01
D210 057      00.24  .33.83.0.00.28
D210 058      00.33 W.96.92.0.21.31
D210 059      00.83  .97.04.0.28.02  PATCH 297
D210 060      00.04  .85.00.0.00.03  PATCH 385
D210 061      00.85 W.91.96.2.21.31  PATCH
D210 062      00.36  .37.42.0.28.27  EMPTY
D210 063      00.42  .19.43.0.12.02  YES PATCH 219

D211 000                             R/C MAG SEARCH ROUTINE LN 00

D211 001      00.00 U.01.01.0.19.00
D211 002      00.01  .03.03.0.21.31
D211 003      00.03  .04.05.0.00.28
D211 004     Z00.04                  0000005
D211 005      00.05  .25.25.2.04.31
D211 006      00.25  .25.25.0.28.31

D211 007      00.26  .28.30.7.28.28
D211 008      00.30  .31.32.0.28.27
D211 009      00.32  .34.36.0.00.28
D211 010      00.33  .35.05.0.01.01
D211 011     Z00.34                  0000010
D211 012      00.36  .38.38.7.28.28
D211 013      00.38  .39.35.0.28.27
D211 014      00.35  .37.39.2.13.31
D211 015      00.39  .39.39.0.28.31
D211 016      00.40  .00.00.6.21.31
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D151 000                                HOUSEKEEPER LOADER

D151 001      00.00   .01.01.1.19.31    TURN OFF DA-1
D151 002      00.01   .04.17.6.21.31    TRANSFER COMMAND TO LINE 19
D151 003      00.17 U.18.04.0.19.00     LINE 19 TO LINE 00
D151 004      00.04 U.09.09.0.19.23     LINE 02 FORMAT TO LINE 23
D151 005      00.09   .02.10.4.23.02    LINE 23 TO LINE 02
D151 006      00.10   .00.11.4.23.02    LINE 23 TO LINE 02
D151 007      00.11   .02.12.4.19.03    LINE 03 FORMAT
D151 008      00.12 U.17.18.0.19.20     SET SHORT LINE 20
D151 009      00.18   .22.22.0.21.31    TRANSFER COMMAND TO LINE 00
D151 010      00.22   .23.24.0.20.28    -UY17019 TO AR
D151 011      00.24   .25.26.0.20.29    0200000 TO AR
D151 012      00.26   .27.28.0.28.20    RESTORE
D151 013      00.28   .30.30.0.31.31    NEXT COMMAND FROM AR
D151 014      00.29   .24.27.4.25.22    ID TO 22.00
D151 015      00.27   .28.29.0.22.28    22.00 TO AR
D151 016      00.29   .30.30.3.20.29    ZZZZZZZ TO AR
D151 017      00.30   .32.33.0.28.27    IS AR ZERO %
D151 018      00.34   .37.37.0.23.31    NO.. CLEAR TWO WORD REGISTERS
D151 019      00.37 U.38.38.0.25.19     ID TO LINE 19
D151 020      00.38   .41.41.0.15.31    READ PAPER TAPE
D151 021      00.41   .45.35.0.22.28    CHECK SUM TO AR
D151 022      00.35   .35.35.0.28.31    READY %
D151 023      00.36   .37.31.0.28.27    DO THEY CHECK %
D151 024      00.31   .32.42.0.28.28    YES... DUMMY
D151 025      00.42   .44.21.0.22.28    ID TO AR
D151 026      00.21   .20.20.0.29.31    TEST OVERFLOW
D151 027      00.20   .22.22.0.31.31    NEXT COMMAND FROM AR
D151 028      00.15   .46.23.4.00.25    6U0X922 TO 25.
D151 029      00.33   .36.20.0.20.28    20.00 TO AR
D151 030      00.32 U.33.40.3.19.29     LINE 19 FROM AR
D151 031      00.40   .41.42.0.28.27    CHECK SUM CORRECT %
D151 032      00.43   .44.44.0.06.31    NO.. REVERSE PAPER TAPE
D151 033      00.44   .44.44.0.28.31    READY
D151 034      00.45   .46.37.0.17.31    RING BELL
D151 035      00.25   .29.20.0.22.28    22.01 TO AR
D151 036     Z00.48                     171626V
D151 037     Z00.49                     0V0V0V0
D151 038     Z00.50                     171626U
D151 039     Z00.51                     1010100
D151 040     Z00.52                     1716266
D151 041     Z00.53                     00493VV
D151 042     Z00.54                     1716264

D151 043     Z00.55                     0404040
D151 044     Z00.56                     1716263
D151 045     Z00.57                     0303030
D151 046     Z00.58                     1716262
D151 047     Z00.59                     0202020
D151 048     Z00.60                     1716261
D151 049     Z00.61                     0101010
D151 050     Z00.62                     1716260
D151 051     Z00.02                     1000000
D151 052     Z00.03                     -8W00000
D151 053     Z00.05                     00000X0
D151 054     Z00.06                     0000034
D151 055     Z00.07                     800000X
D151 056     Z00.08                     0000110
D151 057     Z00.13                     0200000
D151 058     Z00.14                     ZZZZZZZ
D151 059     Z00.46                     6U0X922
D151 060     Z00.63                     0090090
D151 061     Z00.U7                     9151960    CHECK SUM

D152 000                                MAIN CONTROL

D152 001      00.00   .03.03.0.21.31    TRANS. COMM. TO LINE 00
D152 002      00.03   .06.79.0.23.31    CLEAR 2 WD REGISTERS
D152 003      00.79 U.84.U1.0.29.23     CLEAR LINE 23
D152 004      00.U1 U.00.01.0.04.19     04.U2 THRU U7 TO LINE 19
D152 005      00.01   .06.09.4.09.31    ALPHA TYPE ANY CORRECTIONS
D152 006      00.09   .09.09.0.28.31    READY
D152 007      00.10   .11.11.0.17.31    RING BELL
D152 008      00.11   .13.13.0.12.31    GATE NUMERIC TYPE IN
D152 009      00.13   .13.13.0.28.31    READY
D152 010      00.14   .16.17.0.23.27    23.00 EQUAL TO ZERO
D152 011      00.17 U.18.75.0.29.07     YES... CLEAR LINE 07
D152 012      00.75   .03.04.2.05.31    SEARCH MAG. TAPE FORWARD
D152 013      00.04   .23.24.0.02.28    02 23 TO AR
D152 014      00.24   .24.28.7.28.28    DECR. AR.
D152 015      00.28   .29.30.0.28.27    AR EQUAL TO ZERO
D152 016      00.31   .32.24.0.28.31    NO... READY
D152 017      00.25   .00.75.0.00.00    YES... GO TO SEARCH MAG. TAPE
D152 018      00.30   .34.33.0.00.31    YES... SET READY
D152 019      00.33   .53.54.2.04.31    REVERSE SEARCH
D152 020      00.54   .54.54.0.28.31    READY
D152 021      00.22   .42.23.2.05.31    SEARCH MAG. TAPE FORWARD
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D152 022      00.23  .25.57.0.00.31   SET READY
D152 023      00.55  .56.22.0.02.28   0000010 TO AR
D152 024      00.57  .58.60.7.28.28   DECREMENT AR
D152 025      00.60  .61.56.0.28.27   AR EQUAL TO ZERO
D152 026      00.56  .53.58.0.23.31   YES... CLEAR 2 WORD REGISTERS
D152 027      00.58  .60.61.2.13.31   READ MAG. TAPE
D152 028      00.66  .67.68.0.28.27   AR EQUAL TO ZERO
D152 029      00.61  .62.63.0.02.28   0000066 TO AR
D152 030      00.63  .64.66.7.28.28   DECR. AR
D152 031      00.68  .00.48.0.00.00   GO TO SET READY
D152 032      00.69  .70.63.0.28.31   NO.. READY
D152 033      00.64  .57.65.0.19.26   YES.. ID NUMBER TO PN
D152 034      00.65 W.67.72.3.23.31   EXTRACT.. ZZZ0000...
D152 035      00.72  .73.77.3.02.30   SUBTRACT 0008ZVV
D152 036      00.77  .79.80.0.26.27   IS IT AN ID NUMBER
D152 037      00.80  .81.82.0.25.28   YES... DDD TO AR
D152 038      00.82  .79.51.0.02.29   0018ZVV TO AR
D152 039      00.51  .57.88.0.28.06   AR TO 06.57
D152 040      00.88  .94.81.0.00.02   SET INDICATOR
D152 041      00.81  .20.67.0.02.28   0000066 TO AR
D152 042      00.67  .68.78.2.13.31   READ MAG TAPE
D152 043      00.78  .83.84.0.28.31   READY
D152 044      00.85  .95.81.0.00.02   YES... RETURN TO READ MAG. TAPE
D152 045      00.84  .86.92.7.28.28   NO... DECR. AR
D152 046      00.92  .94.48.0.28.27   AR EQUAL TO ZERO
D152 047      00.49  .53.78.0.00.00   NO... GO TO TEST READY
D152 048      00.48  .96.93.0.00.31   SET READY
D152 049      00.93  .94.97.0.02.27   INDICATOR SET
D152 050      00.97  .00.83.0.00.00   DUMMY
D152 051      00.98  .95.U4.0.02.27   INDICATOR SET
D152 052      00.U5  .00.83.0.00.00   GO TO 00 83
D152 053      00.83  .86.71.2.30.31   WRITE A FILE CODE
D152 054      00.71 U.72.74.0.06.19   LINE 06 TO LINE 19
D152 055      00.74 U.75.76.3.19.29   SUBTRACT LINE 19
D152 056      00.76  .U0.12.1.28.19   LINE 19 SUM TO AR
D152 057      00.12 W.00.45.2.01.31   WRITE 19 ON MAG TAPE
D152 058      00.45  .45.45.0.28.31   READY
D152 059      00.46  .57.70.0.06.02   ID NUMBER TO STORAGE
D152 060      00.70 U.71.19.0.10.19   LINE 10 TO LINE 19
D152 061      00.19  .25.26.4.09.31   ALPHA TYPE MOUNT MAGAZINE X
D152 062      00.26  .26.26.0.28.31   READY
D152 063      00.27  .U3.02.0.10.28   5ZXW100 TO AR
D152 064      00.02  .03.05.1.04.29   0000100 TO AR
D152 065      00.05  .U3.29.0.28.10   RESTORE
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D152 066      00.29  .31.50.0.16.31   HALT
D152 067      00.50 U.51.89.0.29.19   CLEAR LINE 19
D152 068      00.89 W.96.01.3.21.31   MARK 96 GO TO LINE 03
D152 069      00.U4  .06.07.0.00.28   00 06 TO AR
D152 070      00.07  .64.32.0.28.00   INCREMENT AR
D152 071      00.32  .31.15.0.01.01   DUMMY
D152 072      00.15  .34.33.0.01.01   RESTORE
D152 073      00.18  .22.22.4.21.31   NO... TRANSFER TO CHECK PAPER OR MAG
D152 074      00.38 U.39.16.0.11.19   LINE 11 TO LINE 19
D152 075      00.16  .21.34.4.09.31   ALPHA TYPE MOUNT CORRECTION TAPE
D152 076      00.34  .34.34.0.28.31   READY
D152 077      00.35  .37.36.0.16.31   HALT
D152 078      00.36 U.37.41.0.29.19   READ PAPER TAPE
D152 079      00.52  .52.52.0.28.31   READY
D152 080      00.53 U.54.91.0.29.28   CLEAR AR
D152 081      00.91 U.92.U3.1.19.29   SUM LINE 19
D152 082      00.U3  .U5.94.0.28.27   AR EQUAL TO ZERO
D152 083      00.95  .00.38.0.00.00   NO... RETURN TO TYPE OUT
D152 084      00.94 U.95.75.0.19.07   LINE 19 TO LINE 07
D152 085      00.96  .98.90.0.00.31   NO... SET READY
D152 086      00.90 W.47.23.4.21.31   MARK TRANSFER TO SEE IF FINISHED
D152 087      00.47  .57.59.0.06.28   ID NUMBER TO AR
D152 088      00.59  .03.44.0.01.29   INCREMENT ID NUMBER
D152 089      00.44  .57.73.0.28.06   RESTORE
D152 090      00.73  .25.62.0.28.10   AR TO 10 25
D152 091      00.62  .38.38.4.21.31   TRANSFER TO LINE 04.38
D152 092      00.U0  .37.20.0.01.28   COUNTER TO AR
D152 093      00.20  .25.40.0.02.29   0100000 TO AR
D152 094      00.40  .37.39.0.28.01   RESTORE
D152 095      00.39  .86.42.0.02.27   IND. SET
D152 096      00.42  .86.87.0.00.02   NO... SET INDICATOR
D152 097      00.87  .87.87.4.21.31   TRANSFER TO TABLE LOOK UP
D152 098      00.43  .00.00.4.21.31   YES.. TRANSFER TO TABLE LOOK UP
D152 099      00.41 U.42.08.0.29.07   CLEAR LINE 07
D152 000      00.08  .10.52.0.15.31   READ PAPER TAPE
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D153 000                              CONSTANTS AND ROUTINE FOR ALPHA TYPE OUTS

D153 001      03.00 U.01.04.0.03.19   LINE 03 TO LINE 19
D153 002      03.04  .07.08.4.09.31   ALPHA TYPE FILE
D153 003      03.08  .08.08.0.28.31   NUMBER
D153 004      03.09  .11.12.0.08.31   TYPE OUT
D153 005      03.12  .12.12.0.28.31   EDITOR ID NUMBER
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D153 006      03.13   .45.70.0.01.02   SET INDICATOR
D153 007      03.70   .00.00.1.21.31   GO TO REWIND
D153 008     Z11.U1                    4000000   TYPE
D153 009     Z11.U2                    -67234Z2   OUT
D153 010     Z11.U3                    -9U6U5ZX   FOR
D153 011     Z11.U4                    -WUW9X9W   MOUNT
D153 012     Z11.U5                    4Y9UU6U   CORRECTION
D153 013     Z11.U6                    94V67ZV   TAPE
D153 014     Z11.U7                    YUU4U6V
D153 015     Z11.03                    4400000
D153 016     Z11.99                    0V0V0V0   CHECK SUM
D153 017     Z11.U6                    -859Y445   BALANCER
D153 018     Z03.U4                    Z42YZY8   FILE
D153 019     Z03.U5                    X3934V5   NU
D153 020     Z03.U6                    -7UVZV4V   M
D153 021     Z03.U7                    YU96X9Y   BER
D153 022     Z10.U3                    5ZXW100
D153 023     Z10.U4                    -XWWWX2W
D153 024     Z10.U5                    92465Y4
D153 025     Z10.U6                    94V67ZV
D153 026     Z10.U7                    YUU4U6V

D154 000                               MAGNETIC TAPE IDENTIFICATION BLOCK

D154 001      06.00 W.02.61.6.21.31   TRANSFER COMM. TO LINE 19
D154 002      06.61  .63.39.0.29.28   CLEAR AR
D154 003      06.39 U.40.43.1.19.29   LINE 19 TO AR
D154 004      06.43  .45.20.0.28.27   AR EQUAL TO ZERO
D154 005      06.21  .22.16.0.17.31   NO... RING BELL
D154 006      06.16 W.V2.00.0.16.31   RESTART
D154 007      06.20 U.20.36.0.19.20   YES... LINE 19 TO 20
D154 008      06.36 U.95.95.0.29.23   CLEAR 23.00
D154 009      06.95  .97.14.0.20.23   20.01 TO 23.01
D154 010      06.51  .51.51.0.28.31   READY
D154 011      06.52  .56.79.0.23.28   NUMBER TO AR
D154 012      06.79 U.24.24.0.28.21   RESTORE
D154 013      06.24 U.41.44.0.28.29   AR TO AR 16 WORD TIMES
D154 014      06.44  .48.49.2.28.21   EXCHANGE
D154 015      06.49  .50.55.6.20.24   20.02 TO MQ
D154 016      06.55  .56.59.4.20.25   20.00.01 TO ID
D154 017      06.59  .60.63.1.25.20   RESTORE
D154 018      06.63  .65.66.1.26.28   PN TO AR
D154 019      06.66  .68.74.0.31.29   EXTRACT

D154 020      06.74  .75.76.0.28.25   AR TO ID
D154 021      06.76  .77.30.1.24.27   MQ EQUAL TO ZERO
D154 022      06.30  .37.U1.0.28.22   YES... AR TO 22
D154 023      06.U1  .U2.22.0.23.28   23.02 TO AR
D154 024      06.22  .24.04.0.22.31   AR NEG
D154 025      06.31  .08.59.0.24.31   MULTIPLY
D154 026      06.04  .07.47.0.31.25   EXTRACT
D154 027      06.47  .04.U7.1.26.31   SHIFT
D154 028      06.U7 U.20.22.0.19.05   19 TO 05
D154 029      06.05  .07.16.0.28.28   DUMMY TO A HALT
D154 030      06.02 W.04.25.5.21.31   MARK TRANSFER TO 05.
D154 031      06.U4  .U6.U6.0.31.31   N.C. FROM AR
D154 032      06.28 U.01.15.0.23.05   23 TO 05
D154 033      06.15  .69.01.0.31.28   EXTRACT
D154 034      06.01  .67.U6.3.05.29   00U0000 TO AR
D154 035      06.U6  .30.37.0.28.27   AR ZERO
D154 036      06.38  .41.53.0.23.27   NO.. 23.00 ZERO
D154 037      06.54  .56.16.0.28.28   DUMMY TO HALT
D154 038      06.37  .39.16.0.28.28   DUMMY TO HALT
D154 039      06.53  .55.83.1.25.28   ID TO AR
D154 040      06.83  .87.68.3.05.29   0000400 TO AR
D154 041      06.68  .U6.09.0.28.27   AR EQUAL TO ZERO
D154 042      06.09  .10.11.0.28.28   YES... DUMMY
D154 043      06.11  .12.13.1.05.24   -U2616VZ TO MQ
D154 044      06.13  .26.29.0.05.25   802339W TO ID
D154 045      06.29  .33.34.0.05.20   ZZZ0000 TO 20.01
D154 046      06.34  .36.97.5.21.31   T.C. TO LINE 05
D154 047      06.10  .23.32.1.25.05   NO.. ID TO 05.23
D154 048      06.32  .87.48.1.05.25   0000400 TO ID
D154 049      06.48 W.64.97.5.21.31   T.C. TO LINE 05
D154 050      06.97  .98.99.0.05.28   6V4X09Z TO AR
D154 051      06.99  .U0.U2.1.24.05   MQ TO 05.U0
D154 052      06.U2  .U3.U4.1.25.29   ID TO 19.U3
D154 053      06.98  .U7.77.0.04.31   REVERSE SEARCH
D154 054      06.77  .77.77.0.28.31   READY
D154 055      06.78  .80.79.5.20.31   T.C. TO LINE 05
D154 056      06.85  .87.88.1.26.27   PN EQUAL TO ZERO
D154 057      06.88 W.89.69.0.28.28   DUMMY
D154 058      06.69 W.70.70.0.28.28   DUMMY
D154 059      06.70 W.71.71.0.28.28   DUMMY
D154 060      06.71 W.72.93.5.21.31   TRANSFER TO 05
D154 061      06.64 W.65.90.5.21.31   TRANSFER TO 05
D154 062      06.90  .91.U2.0.05.28   0Z4X0VZ TO AR
D154 063      06.65  .23.11.1.05.25   004000 TO ID
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D154 064     Z06.67                    00U0000
D154 065     Z06.87                    0000800
D154 066     Z06.12                    -U2616VZ
D154 067     Z06.26                    802339W
D154 068     Z06.U0                    0000000 ... BALANCER
D154 069     Z06.23                    0040000
D154 070     Z06.91                    0Z4X0VZ
D154 071     Z06.94                    014X1VZ
D154 072     Z06.33                    ZZZ0000
D154 073     Z06.57                    00182VV
D154 074     Z06.03                    00V0000
D154 075     Z06.07                    0010000
D154 076     Z06.17                    00Z0000
D154 077     Z06.18                    UU00000
D154 078     Z06.19                    0003000
D154 079     Z06.41                    00082VV
D154 080      06.96 W.73.93.5.21.31    TRANS. TO LINE 05
D154 081      06.73 W.75.00.6.21.31    TRANS. TO LINE 06
D154 082      06.75  .78.81.0.28.27    AR EQUAL TO ZERO
D154 083      06.81  .82.96.0.28.28    DUMMY
D154 084      06.82  .84.84.0.22.31    NO... AR NEG.
D154 085      06.84 W.86.97.5.21.31    NO... TRANS. TO LINE 05
D154 086      06.86  .89.06.1.26.28    PN TO AR
D154 087      06.06  .07.08.3.05.29    0010000 TO AR
D154 088      06.08  .11.82.0.28.26    RESTORE
D154 089      06.92  .93.U3.1.25.28    MQ TO AR
D154 090      06.U3  .U4.62.0.28.22    AR TO 22.00
D154 091      06.62 U.01.87.7.30.24-   EXTRACT
D154 092      06.42  .44.45.0.28.27    AR EQUAL TO ZERO
D154 093      06.45  .U0.U5.1.25.05    YES.. MQ TO 05.U0
D154 094      06.U5  .01.50.0.31.21    EXTRACT
D154 095      06.50  .53.56.1.21.28    21.01 TO AR
D154 096      06.56  .57.60.3.22.29    22.01 TO AR
D154 097      06.60  .61.75.0.28.26    AR TO PN
D154 098      06.46  .47.U0.0.17.31    RING BELL
D154 099      06.89  .07.35.1.05.30    0010000 TO PN
D154 100      06.35 W.85.90.5.21.31    T.C. TO LINE 05
D154 101      06.72  .57.58.0.19.21    ID TO 21.01
D154 102      06.58  .61.40.1.30.28    EXTRACT
D154 103      06.27 U.20.36.0.05.20    05.20 TO LINE 20
D154 104     Z06.40                    2U2UWVX
D154 105     Z06.80                    83360V6
D154 106     Z06.14                    9U3319Z
D154 107     Z06.93                    XY660VW

D154 108      06.25 U.29.U4.2.05.23    BRING 05.23

D155 000                               WRITE FILE CODE ROUTINE

D155 001      04.23  .25.31.2.13.31    READ MAG. TAPE
D155 002      04.31  .32.35.0.02.28    0000005 TO AR
D155 003      04.35  .36.39.7.28.28    DECREMENT AR
D155 004      04.39  .40.34.0.28.27    IS AR ZERO %
D155 005      04.34  .36.41.0.00.31    YES.. SET READY
D155 006      04.41  .42.55.0.02.27    IS INDICATOR SET %
D155 007      04.57  .42.23.0.01.02    SET INDICATOR
D155 008      04.55  .56.57.2.30.31    NO... WRITE A FILE CODE
D155 009      04.56  .42.51.0.29.02    YES... CLEAR INDICATOR
D155 010      04.51  .53.52.0.20.31    RETURN TO MARK

D156 000                               TABLE LOOK UP ROUTINE

D156 001      04.87 U.92.95.0.02.20    SET SHORT LINE 20
D156 002      04.95 U.U0.00.0.02.22    SET SHORT LINE 22
D156 003      04.00  .03.04.0.20.28    XX.07. 1. 10.26 TO AR
D156 004      04.04  .06.06.0.31.31    NEXT COMMAND FROM AR
D156 005      04.07 W.09.09.3.23.31    EXTRACT FROM PN..........00ZZZZZ
D156 006      04.09  .12.15.0.25.24    00WW000 TO MQ
D156 007      04.15  .16.43.0.26.31    SHIFT 8 PLACES
D156 008      04.43  .44.61.6.24.21    WW00000 TO 21.01
D156 009      04.61  .64.65.1.26.21    BB00000 TO 21.00
D156 010      04.65  .37.68.0.01.28    BB00000 TO AR
D156 011      04.68  .68.70.3.21.29    SUBTRACT 21.00
D156 012      04.70  .71.49.0.28.27    DOES THIS BLOCK NEED MODIFICATION
D156 013      04.49  .74.78.0.20.28    YES.. 72.54.1.10.28 TO AR
D156 014      04.78  .02.97.0.04.29    ADD 0200000 TO AR
D156 015      04.97  .98.04.0.28.20    RESTORE
D156 016      04.54 U.57.58.1.25.24    10.XX TO PN
D156 017      04.58  .60.63.0.20.28    XX.64.1.26.19 TO AR
D156 018      04.63  .65.04.0.21.29    ADD WW00000 TO AR
D156 019      04.64  .67.69.0.20.28    XX.07.1.10.26
D156 020      04.69  .71.72.3.02.29    SUBTRACT Y400000 FROM AR
D156 021      04.72  .74.76.0.22.31    ARE WE FINISHED
D156 022      04.76  .75.80.0.02.28    NO... XX.07.0.11.26
D156 023      04.80  .83.04.0.28.20    RESTORE
D156 024      04.77  .78.80.0.02.29    YES... Y600000 TO AR
D156 025      04.50  .79.04.0.22.28    NO... XX.60.0.07.26 TO AR
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D156 026      04.60 W.08.92.3.23.31   EXTRACT ... 00ZZZZZ
D156 027      04.92  .94.01.0.25.24   00WW000 TO MQ
D156 028      04.01  .16.24.0.26.31   SHIFT 8 BITS
D156 029      04.24  .28.53.6.24.21   WW00000 TO 21.01
D156 030      04.53  .56.66.1.26.21   BB00000 TO 21.00
D156 031      04.66  .37.48.0.01.28   BB00000 TO AR
D156 032      04.48  .80.81.3.21.29   SUBTRACT BB00000
D156 033      04.81  .83.84.0.28.27-  ANY CORRECTIONS
D156 034      04.84  .89.98.0.22.28   YES... 7Z.46.0.07.28 TO AR
D156 035      04.98  .02.05.0.04.29   ADD 0000002 TO AR
D156 036      04.05  .09.04.0.28.22   RESTORE
D156 037      04.46 U.49.82.1.28.26   07.XX TO PN
D156 038      04.82  .84.86.0.22.28   XX.83.1.26.19 TO AR
D156 039      04.86  .89.04.0.21.29   ADD WW00000
D156 040      04.83  .87.00.0.22.28   XX.60.0.07.29 TO AR
D156 041      04.00  .02.06.0.04.29   ADD 0200000
D156 042      04.06  .07.04.0.28.22   RESTORE
D156 043      04.85  .10.40.1.02.28   NO.. CHECK SUM TO AR
D156 044      04.40 U.41.42.1.19.29   ADD LINE 19
D156 045      04.42  .10.13.1.28.02   RESTORE
D156 046      04.13  .16.20.0.02.28   NUMBER OF BLOCKS TO AR
D156 047      04.20  .66.11.0.02.29   INCREMENT
D156 048      04.11  .16.17.0.28.02   RESTORE
D156 049      04.17 W.00.18.2.01.31   WRITE LINE ON MAG. TAPE
D156 050      04.18  .18.18.0.28.31   READY
D156 051      04.19  .00.47.0.00.00   DUMMY
D156 052      04.47  .16.59.1.02.28   NUMBER BLOCKS TO AR
D156 053      04.59  .55.93.3.02.29   SUBTRACT 0000041
D156 054      04.93  .23.44.0.28.27-  SUBROUTINE LINE %
D156 055      04.44  .45.67.0.00.00   YES... DUMMY
D156 056      04.67 W.21.23.4.21.31   MARK TRANSFER TO 04.23
D156 057      04.45  .89.89.0.21.31   NO... RETURN TO READ PAPER TAPE
D156 058      04.38  .73.52.0.00.28   , XX.67.0.28.10 TO AR
D156 059      04.52  .71.37.1.01.29   ADD 1600000
D156 060      04.37  .73.89.0.28.00   RESTORE
D156 061      04.89  .52.52.1.21.31   GO TO REWIND ROUTINE
D156 062      04.22  .24.25.0.23.28   23.00 TO AR
D156 063      04.25  .26.32.3.04.29   SUBTRACT 00000YU
D156 064      04.32  .28.29.0.28.27   IS IT PAPER TAPE %
D156 065      04.30  .38.38.0.21.31   NO.. CORR TO MAG. TAPE
D156 066      04.29  .39.16.0.02.28   YES... 19.18.0.10.31 TO AR
D156 067      04.16  .17.62.0.28.04   PUNCH TAPE COMM TO 04.17
D156 068      04.62  .63.74.0.02.27   IS IND. SET
D156 069      04.75  .50.50.0.21.31   YES... GO TO TYPE OUT
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D156 070      04.74  .94.71.0.03.00   NO...
D156 071      04.71  .95.96.0.03.04   U.U0.50.0.02.22 TO 04.95
D156 072      04.96  .43.79.0.03.00   50.50.4.21.31 TO 00.43
D156 073      04.79  .90.91.0.03.00   52.52.1.21.31 TO 00.90
D156 074      04.91  .80.88.0.03.01   22.22.3.21.31 TO 01.80
D156 075      04.88  .19.30.0.02.04   63.21.0.01.02 TO 04.19
D156 076     Z04.02                   0200000
D156 077     Z04.03                   0000100
D156 078     Z04.26                   00000YU
D156 079     Z04.90                   0000080
D156 080     Z04.94                   Y001358
D156 081     Z04.99                   0404040   CHECK SUM
D156 082     Z04.U1                   WU9V490   BALANCER
D156 083     Z04.U3                   5V2ZX9V  ANY
D156 084     Z04.U4                   X9WWX35   COR
D156 085     Z04.U5                   -UBU6564   RECT
D156 086     Z04.U6                   1ZV274X   IONS
D156 087     Z04.U7                   -YU91U5V

D157 000                              MODIFICATIONS TO PLACE ALGO ON MAG. TAPE

D157 001     Z10.00                   0102000
D157 002     Z10.01                   04049VZ
D157 003     Z10.02                   0107000
D157 004     Z10.03                   09099VZ
D157 005     Z10.04                   010W000
D157 006     Z10.05                   0Y0Y9VZ
D157 007     Z10.06                   0111000
D157 008     Z10.07                   13139VZ
D157 009     Z10.08                   0237000
D157 010     Z10.09                   -W0833WX
D157 011     Z10.10                   0226000
D157 012     Z10.11                   28299VZ
D157 013     Z10.12                   022V000
D157 014     Z10.13                   2V2W89Z
D157 015     Z10.14                   022X000
D157 016     Z10.15                   5V5U23Z
D157 017     Z10.16                   025U000
D157 018     Z10.17                   XW5Y000
D157 019     Z10.18                   0500000
D157 020     Z10.19                   -0405UVZ
D157 021     Z10.20                   094V000
D157 022     Z10.21                   4X4Y9VZ
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D157 023     Z10.22                    0942000
D157 024     Z10.23                    -0000UVZ
D157 025     Z10.24                    1539000
D157 026     Z10.25                    0000000
D157 027     Z10.26                    1526000
D157 028     Z10.27                    28299VZ
D157 029     Z10.28                    152V000
D157 030     Z10.29                    462W89Z
D157 031     Z10.30                    152X000
D157 032     Z10.31                    225729Z
D157 033     Z10.32                    1547000
D157 034     Z10.33                    59136Y2
D157 035     Z10.34                    1552000
D157 036     Z10.35                    1794264
D157 037     Z10.36                    2003000
D157 038     Z10.37                    05369VZ
D157 039     Z10.38                    2726000
D157 040     Z10.39                    29299VZ
D157 041     Z10.40                    272V000
D157 042     Z10.41                    2X05892
D157 043     Z10.42                    272Z000
D157 044     Z10.43                    -8U157X7
D157 045     Z10.44                    2749000
D157 046     Z10.45                    -YY1Y21Y
D157 047     Z10.46                    2739000
D157 048     Z10.47                    0000000
D157 049     Z10.48                    333X000
D157 050     Z10.49                    525Z9VZ
D157 051     Z10.50                    3332000
D157 052     Z10.51                    525Z39Z
D157 053     Z10.52                    3340000
D157 054     Z10.53                    -0000YVZ
D157 055     Z10.54                    3347000
D157 056     Z10.55                    9Z2YU00
D157 057     Z10.56                    3418000
D157 058     Z10.57                    19199VZ
D157 059     Z10.58                    341Y000
D157 060     Z10.59                    232389Z
D157 061     Z10.60                    3425000
D157 062     Z10.61                    262U8VZ
D157 063     Z10.62                    3450000
D157 064     Z10.63                    515189Z
D157 065     Z10.64                    3445000
D157 066     Z10.65                    47479VZ

D157 067     Z10.66                    3427000
D157 068     Z10.67                    -6V2WVVY
D157 069     Z10.68                    3439000
D157 070     Z10.69                    0000000
D157 071     Z10.70                    3463000
D157 072     Z10.71                    VV32V88
D157 073     Z10.72                    3406000
D157 074     Z10.73                    6886355
D157 075     Z10.74                    370X000
D157 076     Z10.75                    0Z0Z9VZ
D157 077     Z10.76                    3715000
D157 078     Z10.77                    9W1Y295
D157 079     Z10.78                    374X000
D157 080     Z10.79                    525X89Z
D157 081     Z10.80                    3761000
D157 082     Z10.81                    62269VZ
D157 083     Z10.82                    3900000
D157 084     Z10.83                    01019VZ
D157 085     Z10.84                    3917000
D157 086     Z10.85                    180Y9VZ
D157 087     Z10.86                    393X000
D157 088     Z10.87                    511W89Z
D157 089     Z10.88                    4212000
D157 090     Z10.89                    -16466VZ
D157 091     Z10.90                    4231000
D157 092     Z10.91                    XXXY59X
D157 093     Z10.92                    4352000
D157 094     Z10.93                    2Y2Y9VZ
D157 095     Z10.94                    4711000
D157 096     Z10.95                    1213260
D157 097     Z10.96                    476V000
D157 098     Z10.97                    -000Z000
D157 099     Z10.99                    4980025
D157 100     Z10.U0                    1010100

D158 000                               MAGAZINE NUMBER CHECK

D158 001     03.22  .25.26.0.23.31     CLEAR 2 WD REGISTERS
D158 002     03.26  .U6.27.1.07.24     MAGAZINES TO UPDATE
D158 003     03.27  .10.28.0.26.31     SHIFT 5 BITS
D158 004     03.28  .U6.29.1.24.07     RESTORE
D158 005     03.29  .31.31.1.24.28     BRING MAGAZINE NUMBER TO AR
D158 006     03.31 U.40.40.1.28.29     ADD IT TO ITSELF
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D158 007      03.40   .U3.41.1.10.29   ADD 10 U3
D158 008      03.41   .U3.42.1.28.10   RESTORE
D158 009      03.42   .44.45.3.03.29   SUBTRACT 5ZXW100
D158 010      03.45   .46.47.0.28.27   IS IT MAGAZINE 1
D158 011      03.48   .52.53.3.02.29   NO.. SUBTRACT 0001000
D158 012      03.53   .54.55.0.28.27   IS IT MAGAZINE 2
D158 013      03.56   .52.54.3.02.29   NO.. SUBTRACT 0001000
D158 014      03.54   .55.57.0.28.27   IS IT MAGAZINE 3
D158 015      03.58   .52.59.3.02.29   NO... SUBTRACT 0001000
D158 016      03.59 W.60.63.0.28.27    IS IT MAGAZINE 4
D158 017      03.64   .52.60.3.02.29   NO... SUBTRACT 0001000
D158 018      03.60   .61.74.0.28.27   IS IT MAGAZINE 5
D158 019      03.75   .52.82.3.02.29   NO... SUBTRACT 0001000
D158 020      03.82   .83.84.0.28.27   IS IT MAGAZINE 6
D158 021      03.85   .00.67.0.00.00   NO... DUMMY
D158 022      03.47   .21.49.0.03.04   YES... IT IS 1
D158 023      03.49   .50.68.0.03.28   0000100 TO AR
D158 024      03.68 U.69.79.0.29.19    CLEAR LINE 19
D158 025      03.79   .05.06.0.10.31   PUNCH TRAILER
D158 026      03.06   .08.10.7.28.28   DECR. AR
D158 027      03.10   .14.78.0.28.27   FINISHED
D158 028      03.78   .80.81.0.00.31   YES... SET READY
D158 029      03.81   .70.70.0.21.31   GO TO TYPE OUT
D158 030      03.55   .37.47.0.02.01   YES.. IT IS 2 1400000 TO 01.37
D158 031      03.57   .37.47.0.03.01   YES.. IT IS 3 2600000 TO. 01.37
D158 032      03.63   .37.47.0.00.01   YES.. IT IS 4 3300000 TO. 01.37
D158 033      03.74   .68.69.0.02.28   YES IT IS 5 4100000 TO AR
D158 034      03.69   .37.47.0.28.01   AR TO 01.37
D158 035      03.84   .86.87.0.03.28   5800000 TO AR
D158 036      03.87   .37.47.0.28.01   5800000 TO 01.37
D158 037      03.67   .21.24.0.02.04   961W05W
D158 038      03.24   .62.65.0.03.04   3Y3Y21Z TO 04.62
D158 039      03.65   .21.21.4.21.31   RETURN TO LINE 04
D158 040      03.25   .08.33.0.26.31   SHIFT 4 BITS
D158 041      03.33   .U7.34.0.25.07   ID TO 07.U7
D158 042      03.34   .36.36.0.25.27   ID ZERO
D158 043      03.36   .45.46.0.01.02   YES... SET INDICATOR
D158 044      03.46 W.47.48.0.03.28    218490 TO AR

D159 000                               READ PAPER TAPE ROUTINES

D159 001      03.01   .07.18.0.03.28   0000050 TO AR
D159 002      03.18   .20.30.0.03.22   1313131 TO 23.00

D159 003      03.30   .32.35.0.15.31   READ PAPER TAPE
D159 004      03.35   .36.71.1.23.26   23.00 TO PN
D159 005      03.71   .20.72.3.03.30   SUBTRACT 1313131
D159 006      03.72   .76.91.0.26.27   PN EQUAL TO ZERO
D159 007      03.92   .92.92.0.28.31   NO.. READY
D159 008      03.93   .U0.U0.0.21.31   RETURN TO MARK
D159 009      03.91   .94.96.7.28.28   YES... DECR AR
D159 010      03.96   .97.U2.0.28.27   FINISHED %
D159 011      03.U2   .U4.U3.0.20.31   YES... RETURN
D159 012      03.U3   .00.35.0.00.00   DUMMY
D159 013      03.05   .11.15.1.03.01   16.22.0.02.28 TO 01.11
D159 014      03.15   .16.17.0.03.28   0059000 TO AR
D159 015      03.17   .37.39.0.28.04   0059000 TO 04.37
D159 016      03.39   .52.52.1.21.31   RETURN TO MARK
D159 017      02.05   .06.07.0.02.28   0000050 TO AR
D159 018     Z02.06                    0000050
D159 019      02.07   .12.14.0.02.23   1313131 TO AR
D159 020     Z02.12                    1313131
D159 021      02.14   .16.17.0.15.31   READ PAPER TAPE
D159 022      02.17   .20.24.1.23.26   23.00 TO PN
D159 023      02.18   .20.27.0.26.27   PN EQUAL TO ZERO
D159 024      02.24   .12.18.3.02.30   1313131 TO PN
D159 025      02.27   .30.33.7.28.28   DECREMENT AR
D159 026      02.28   .28.28.0.28.31   READY
D159 027      02.29   .98.98.1.21.31   GO TO 01.98
D159 028      02.33   .34.80.0.28.27   AR EQUAL TO ZERO
D159 029      02.81   .00.17.0.01.01   RETURN
D159 030      02.80   .82.81.1.20.31   RETURN TO MARK

D160 000                               WRITE ALGO SUBROUTINES ON MAGNETIC TAPE

D160 001      01.98   .10.U6.1.02.28   YES... CHECK SUM TO AR
D160 002      01.U6 U.U7.08.1.19.29    LINE 19 TO AR
D160 003      01.08   .10.13.1.28.02   RESTORE
D160 004      01.13   .16.50.1.02.28   NUMBER OF BLOCKS TO AR
D160 005      01.50   .66.68.1.02.29   INCREMENT
D160 006      01.68   .16.42.1.28.02   RESTORE
D160 007      01.42 W.00.69.2.01.31    WRITE ON MAG TAPE
D160 008      01.69   .69.69.0.28.31   READY
D160 009      01.70   .74.79.0.00.00   DUMMY
D160 010      01.79 W.94.05.2.21.31    MARK 94 GO TO LINE 02
D160 011      01.94   .96.88.0.00.31   SET READY
D160 012      01.88   .96.U0.0.01.28   Z000123 TO AR
```

```
D160 013      01.U0 U.U1.27.1.28.19   AR TO LINE 19
D160 014      01.27  .70.98.0.02.01   74.76.0.00.00
D160 015      01.85  .57.93.0.06.28   ID NUMBER TO AR
D160 016      01.93  .03.24.0.01.29   INCREMENT
D160 017      01.24  .57.83.0.28.06   RESTORE
D160 018      01.83  .84.89.0.29.28   CLEAR AR
D160 019      01.89  .U0.U4.0.29.06   CLEAR 06.U0
D160 020      01.U4 U.U5.99.3.06.29   LINE 19 TO AR
D160 021      01.99 W.U0.U2.1.28.06   AR TO 19.U0
D160 022      01.U2 U.U3.U5.0.06.19   LINE 06 TO LINE 19
D160 023      01.U5 W.00.10.2.01.31   WRITE 19 ON MAG. TAPE
D160 024      01.10  .10.10.0.28.31   READY
D160 025      01.11  .14.14.3.21.31   T.C. TO LINE 03
D160 026      01.U1 W.U2.94.0.28.27   AR EQUAL TO ZERO
D160 027      01.76 W.U6.23.4.21.31   MARK TRANS. TO F.C. S.R

D161 000                              REWIND PAPER TAPE ROUTINE

D161 001      01.00  .04.05.0.01.24   XXXXXX TO MQ
D161 002      01.05  .12.14.0.01.28   2000000 TO AR
D161 003      01.14  .16.17.0.01.23   XXXXXX TO 23.00
D161 004      01.17  .19.20.0.22.31   AR NEG.
D161 005      01.21  .23.26.0.15.31   YES... READ PAPER TAPE
D161 006      01.26 W.26.31.0.00.31   SET READY
D161 007      01.31  .33.36.0.06.31   REVERSE PAPER TAPE
D161 008      01.36  .40.41.0.23.28   23.00 EQUAL TO ZERO
D161 009      01.41  .16.46.3.01.29   XXXXXX TO AR
D161 010      01.46  .47.51.0.28.27   AR EQUAL TO ZERO
D161 011      01.52  .54.05.0.29.24   NO... CLEAR MQ
D161 012      01.51  .52.00.1.24.27   YES... MQ EQUAL TO ZERO
D161 013      01.01  .03.06.0.00.31   NO... SET READY
D161 014      01.06  .45.80.0.02.27   IND. SET
D161 015      01.80  .70.70.0.21.31   NO.. TRANSFER TO LINE 00
D161 016      01.81  .82.U3.0.17.31   RING BELL
D161 017      01.U3  .U3.U3.0.16.31   HALT
D161 018      01.20  .22.23.0.00.31   NO.. SET READY
D161 019      01.23  .25.25.0.06.31   REVERSE PAPER TAPE
D161 020      01.25  .32.17.3.01.29   0100000 TO AR

D163 021      01.09  .00.00.3.21.31   TRANSFER TO LINE 03

D162 000                              MAGNETIC TAPE CHECKING ROUTINE

D162 001      01.22  .58.72.0.02.29   0000004 TO AR
D162 002      01.72  .16.15.0.28.02   RESTORE
D162 003      01.15  .26.29.0.02.28   0000007 TO AR
D162 004      01.29  .49.54.2.04.31   REVERSE SEARCH
D162 005      01.54  .54.54.0.28.31   READY
D162 006      01.55  .56.58.7.28.28   DECR AR
D162 007      01.58  .60.28.0.28.27   AR EQUALS 0
D162 008      01.28  .48.86.0.02.27   NO. IND. SET
D162 009      01.87  .45.02.0.06.02   SET INDICATOR
D162 010      01.86  .26.73.0.02.28   NO. 0000007 TO AR
D162 011     Z01.73                   5X4U8VZ    BALANCER
D162 012      01.74  .76.75.0.00.31   SET READY
D162 013      01.75  .76.84.7.28.28   DECR. AR
D162 014      01.84  .86.90.0.28.27   AR EQUALS 0
D162 015      01.91  .00.75.0.00.00   NO... DECR. AR
D162 016      01.90  .16.18.0.02.26   YES... BLOCKS TO PN
D162 017      01.18  .10.19.1.02.28   CHECK SUM TO AR
D162 018      01.19  .21.34.2.13.31   READ MAG. TAPE
D162 019      01.34  .34.34.0.28.31   READY
D162 020      01.35  .66.38.3.02.30   DECR. PN
D162 021      01.38  .42.44.0.26.27   PN EQUALS 0
D162 022      01.45 U.46.19.3.19.29   NO.. SUBTRACT 19 FROM AR
D162 023      01.44 U.45.40.3.19.29   YES.. SUBTRACT LINE 19
D162 024      01.40  .46.47.0.28.27-  AR EQUALS 0
D162 025      01.47  .48.22.0.06.02   YES... SET IND.
D162 026      01.48  .54.57.0.02.26   0000002 TO AR
D162 027      01.57  .58.61.7.28.28   DECR. AR
D162 028      01.61  .62.65.0.28.27   AR EQUALS 0
D162 029      01.66  .54.15.0.28.02   RESTORE
D162 030      01.65 U.66.67.0.02.19   LINE 02 TO 19
D162 031      01.67  .72.77.4.09.31   ALPHA TYPE RECORDING ERROR
D162 032      01.77  .77.77.0.28.31   READY
D162 033      01.78  .45.52.0.06.02   SET INDICATOR

D163 000                              BINARY TO DECIMAL CONVERSION

D163 001      01.02  .05.30.0.23.31   CLEAR 2 WD REGISTERS
D163 002      01.30  .35.56.0.02.25   3Y80000 TO ID
D163 003      01.56  .57.59.0.02.26   ID NUMBER TO PN
D163 004      01.59  .57.60.1.25.31   DIVIDE
D163 005      01.60  .62.63.6.24.25   MQ TO ID
```

```
D163 006      01.63   .31.33.0.02.24   V680000 TO MQ
D163 007      01.33   .06.39.0.24.31   MULTIPLY FOR THREE WORD TIMES
D163 008      01.39 W.41.43.3.23.31    EXTRACT ...0ZZZZZZ...
D163 009      01.43   .06.49.0.24.31   MULTIPLY
D163 010      01.49 W.51.53.3.23.31    EXTRACT ...00ZZZZZ...
D163 011      01.53   .06.62.0.24.31   MULTIPLY
D163 012      01.62   .63.64.0.26.28   CONVERTED NUMBER TO AR
D163 013      01.64   .03.09.0.01.03   AR FORMAT TO LINE 03

D164 000                               GENERAL HOUSEKEEPER CONSTANTS

D164 001     Z02.15                    0000091
D164 002     Z02.23                    000007Z
D164 003     Z02.56                    0000010
D164 004     Z02.57                    0000000   STORAGE FOR ID NUMBER
D164 005     Z02.62                    0000066
D164 006     Z02.67                    ZZZ0000
D164 007     Z02.79                    0018ZVV
D164 008     Z02.20                    0000050
D164 009     Z02.25                    0100000
D164 010     Z02.86                    0000000
D164 011     Z02.45                    0000000
D164 012     Z02.16                    0000000
D164 013     Z02.10                    0000000
D164 014     Z02.58                    0000003
D164 015     Z02.26                    0000007
D164 016     Z02.48                    0000000
D164 017     Z02.66                    0000001
D164 018     Z02.54                    0000002
D164 019     Z02.35                    3Y80000
D164 020     Z02.31                    V680000
D164 021     Z02.U3                    6U90000
D164 022     Z02.U4                    WUX4X4X
D164 023     Z02.U5                    66965ZZ
D164 024     Z02.U6                    T4X5329
D164 025     Z02.U7                    YUU9959
D164 026     Z02.41                    02ZZZZZ
D164 027     Z02.51                    00ZZZZZ
D164 028     Z02.92                    0000005
D164 029     Z02.42                    0000000
D164 030      02.88   .00.64.1.26.19   PN TO 19 XX
D164 031      02.89   .U5.54.0.10.28   10 U5 TO AR
D164 032     Z02.90                    TZ3615W

D164 033      02.91   .00.07.0.10.26   10 XX TO PN
D164 034      02.96   .00.83.1.26.19   PN TO 19 XX
D164 035     Z02.97                    7ZZY0ZW
D164 036      02.98   .00.83.1.26.19   PN TO 19.XX
D164 037      02.99   .00.60.0.07.26   07 XX TO PN
D164 038     Z02.08                    00ZZZZZ
D164 039     Z02.71                    Y400000
D164 040     Z02.78                    Y600000
D164 041     Z02.55                    0000041
D164 042      02.39   .19.18.0.10.31   PUNCH TAPE
D164 043      02.19   .63.21.0.01.02   SFT IND.
D164 044     Z02.00                    0400000
D164 045     Z02.01                    0000000
D164 046     Z02.02                    0000000
D164 047     Z02.03                    8000000
D164 048     Z02.63                    0000000
D164 049      02.75   .00.07.0.11.26   11.00 TO PN
D164 050      02.21 W.22.28.0.02.28    00000ZZ TO AR
D164 051     Z02.22                    00000ZZ
D164 052     Z02.37                    1400000
D164 053     Z02.68                    4100000
D164 054     Z02.U2                    0202020   CHECK SUM
D164 055     Z02.U1                    -W1Y7238   BALANCER
D164 056     Z02.70                    WU4W000
D164 057     Z02.52                    0000100
D164 058     Z02.U0                    -0000099
D164 059     Z02.87                    VZ7100X
D164 060      00.06   .57.46.0.19.06   19 57 TO 06 57
D164 061      00.21   .79.79.1.21.31   GO TO 01.79
D164 062     Z00.37                    3300000
D164 063      00.86   .22.22.3.21.31   GO TO 03.22
D164 064     Z00.99                    0090090   CHECK SUM
D164 065      00.U6   .85.85.1.21.31   GO TO 0185
D164 066     Z00.U7                    -57W1U44   BALANCER
D164 067     Z03.02                    720011Z
D164 068     Z03.03                    -8N00000
D164 069     Z03.07                    0000050
D164 070     Z03.11                    901605W
D164 071      03.14   .89.05.0.03.04   53536VZ TO 04.89
D164 072     Z03.16                    0059000
D164 073     Z03.20                    1313131
D164 074      03.21   .23.28.0.03.28   0000053 TO AR
D164 075     Z03.23                    0000053
D164 076     Z03.37                    2600000
```

```
D164 077      03.38  .21.40.0.03.04   03.21 TO 04.21
D164 078     Z03.43                   -32322VZ
D164 079     Z03.44                   52XW100
D164 080     Z03.50                   0000100
D164 081     Z03.51                   8030000
D164 082      03.52  .62.65.0.03.04   U52Z381 TO 04.62
D164 083      03.61  .37.47.0.28.01   AR TO 01.37
D164 084      03.62  .62.62.0.16.31   HALT
D164 085      03.66  .68.69.0.02.28   02.68 TO AR
D164 086     Z03.73                   -0000100   BALANCER
D164 087      03.80  .22.22.3.21.31   GO TO 03.22
D164 088     Z03.86                   5800000
D164 089      03.89  .83.83.1.21.31   GO TO 01.83
D164 090      03.90  .52.52.1.21.31   GO TO 01.52
D164 091      03.94 U.95.86.0.19.07   LINE 19 TO LINE 07
D164 092     Z03.99                   0303030   CHECK SUM
D164 093      03.U0  .U3.36.0.28.10   AR TO 10 U3
D164 094     Z03.U1                   -UY2127W
D164 095     Z01.03                   0010000
D164 096     Z01.04                   XXXXXXX
D164 097     Z01.12                   2000000
D164 098     Z01.16                   XXXXXXX
D164 099     Z01.32                   0100000
D164 100     Z01.37                   0000000   COUNTER
D164 101     Z01.71                   1600000
D164 102     Z01.97                   0W43104
D164 103     Z01.96                   Z000123
D164 104     Z01.U7                   0101010   CHECK SUM
D164 105      03.95 U.U0.50.0.02.22   02.96 THRU U0 TO LINE 22
D164 106     Z04.21                   971W05W
D164 107     Z02.73                   0008ZVV

D150 000                              PAPER TAPE LEADER MODE

D150 001      04.28  .05.33.0.10.31   PUNCH TAPE
D150 002      04.33  .34.36.7.28.28   DECREMENT AR
D150 003      04.36  .40.27.0.28.27   AR ZERO
D150 004      04.27  .29.62.0.00.31   YES... SET READY
```

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TECHNICAL APPLICATIONS MEMORANDUM NO. 72

27 March 1961

TITLE: Programming notes for the ALGO system

PURPOSE: The information contained in this memorandum answers several questions which have been asked and which may arise concerning use of the ALGO system. Other points of interest are included.

EQUIPMENT AFFECTED: G-15D and optionally MTA-2

EFFECTIVE DATE: 27 March 1961

1. (Q) What form is required for declaring processes which use no inputs but use one or more outputs?

   (A) This question can best be answered by use of an example. Consider a procedure called ALPHA which uses no inputs and only one output called BETA. A dummy input must be used in the declaration of ALPHA.

   ```
   15. PROCEdure  ALPHA  (JUNK = BETA)
   ```

   In this example, JUNK need not be mentioned again until the process call at which time another dummy must be used.

   ```
   33. ALPHA (GARB = z)
   ```

   The above example is also true for a FUNCTion.

2. (Q) What use should be made of the NEG operator in the ALGO system?

   (A) Minus signs (-) must not be used immediately following opening parenthesis. The operator NEG must be used instead.

   Example: The following expression is to be computed.

   $x = \frac{y^2}{-3z}$ This should be written as

   ```
   17.  x = y↑2 / (NEG 3 * z)
   ```

   and not as

   ```
   17.  x = y ↑2 / (- 3*z)
   ```

3. (Q) What rules govern the use of process calls as part of an algebraic statement?

   (A) To insure reliable operation of the ALGO system, process calls included as part of an algebraic statement should be the first elements on the right of the equal sign. More than one process call should not be included in an algebraic statement. If two process calls were desired in a single algebraic statement, make one of the process calls as a preceding statement and use the output variable in the following algebraic statement.

   Example: Process IOTA and GAMMA are to be used in a statement.

   IOTA and GAMMA have been declared.

   ```
   5.  IOTA (A, B = C)
   6.  BEGIN
   7.  C = A * KEYBD - B↑2
   8.  RETURN
   9.  END
   10. GAMMA (E, F = G)
   11. BEGIN
   12. G = E/2 + F↑2
   13. RETURN
   14. END
   ```

The statement below including both procedures must not be written
x = IOTA (w, v = u) - M↑2 + GAMMA (P, Q = T)
Instead, the call could be
25. GAMMA (P, Q = T)
26. x = IOTA (w, v = u) - M↑2 + T

4. (Q) Could the title of a program be typed out during object program run?

(A) No. The actual title of a program is not retained following the operation of Package No. 2 of the compiling process due to the complexity of the ALGO system. Therefore the title could not be typed out during the object program run.

5. (Q) What means of detection and correction should be employed concerning scratch tape reading errors in Package No. 2 and Package No. 3?

(A) a) Paper Tape Scratch Pad

When Package No. 2 detects an error when reading the output of Package No. 1, it halts and rings a bell. The operator should rewind the scratch tape one block and cycle the compute switch. If the program continually detects an error, the operator should start over with Package No. 1.

When Package No. 3 detects an error when reading the output of Package No. 2, it types R and halts. Reread the tape as above, or repeat the operation of Package No. 2.

b) Magnetic tape scratch pad

If Package No. 2 detects a read error, it halts and rings a bell. Cycle the compute switch and the block will be reread. If the read error continues, start over.

If Package No. 3 detects a read error, it types R and halts. When this happens, the operator must use the updater to rewrite the Editor output blocks (see updater instructions) and go thru Package No. 2 again.

6. (Q) Is there a method of labeling keyboard inputs to an object program?

(A) SPACE limitations prohibit the automatic labeling (via typewriter) of keyboard inputs to the object program. However, the programmer can easily write his own labels using ALGO language.

Example:

15. PRINT (FORMA) = 1 ⑥
16. X = KEYBD ⑤
17. PRINT (FORMA) = 2 ⑥
18. Y = KEYBD ⑤
ETC.

KEYBD entries must be made in the same order in which they are written.

7. (Q) When typing in an algebraic statement which is too long for one line on the typewriter, can the operator hit the carriage return key or must he return the carriage manually?

(A) If, during type-in in Package No. 1, the type-in goes beyond one line and the operator returns the carriage and completes his type-in on the second line, the carriage return code generated will be ignored unless it is in the middle of an identifier or operator. The hyphen (-) key cannot be used to separate words at the end of lines.

8. (Q) What rules govern the typing out of a carriage return or tab following the typing of a floating point number during the object program run?

(A) If a number is too large for the format under which it is to be typed, the number will be typed in floating point. If there is a carriage return in the format which was too small, the type-out will be followed by a carriage return. If not, the floating point type-out will be followed by a tab. If (FL) is specified as the format, the type-out will be followed by a tab.

9. (Q) Could a dictionary check be made at the end of Package No. 1?

(A) Package No. 1 separates and encodes all declarations, converts constants, forms formats and identifies statement types. It does not investigate identifiers or operands within the statement and therefore cannot make a dictionary check. This check is one of the functions of Package No. 2.

10. (Q) By what means (other then updating) can we change constants in the object program?

(A) In order to change a constant when the object program is being run, the operator must know the location of the constant. If the constant is one of an array, the operator can determine its location in the following manner. During the second phase of compiling (Package No. 2), the computer typed the entry number of the constant array declaration and also the location assigned to the first constant of the array. All constants in the array follow sequentially.

If the constant to be changed is not an element of a constant array, i.e. the constant is a numeric value contained in an algebraic statement, its location is determined by use of the following comments:

a) assignment starts in location 7.
b) 4-words are assigned for every format.
c) 1-word is assigned for every constant.
d) count the number of assignments preceding the constant to be changed.

e) this number plus 7 is the location of the constant to be changed.

Caution: Constants of 0, 1, or 2 and constants modifying subscripts cannot be changed and should not be counted in determining constant locations as they are not assigned locations.

Example: The following program is written.

```
1.  TITLE  EXAMPLE  (S)
2.  FORMAT  FORM1 (S3DP2DT), FORM2 (S2DP)  (S)
3.  CONSTANT  CON1 (3)  (S)
4.
4.  1.67  (S)
5.  55.1234  (S)
6.  42  (S)
7.  BEGIN  (S)
8.  X = KEYBD  *1.37  (S)
9.  Y = KEYBD/  .36  (S)
10. PRINT (FORM1) = ((X * CON1 [ 0 ]) + Y) * 8  (S)
11. !
```

The programmer wishes to change the constant 8 in statement 10. To find its location he must count the number of previous assignments and add 7.

```
2 FORMATS       = 8
CONSTANT ARRAY  = 3
LN. 8 constant  = 1
LN. 9 constant  = 1
   Total          13 + 7 = 20
```

Once the location of the constant is determined the following method is employed for changing it during the run of the object program.

a) Put program in the manual mode ((S) c f).
b) Type minus (-) followed by constant location and tab (S). (At this point the present contents of the location will be typed out in floating point notation. This is a good check to see if this is the location the operator desires).
c) Put punch switch "on".
d) Type in new constant followed by tab (S)
e) Turn off punch switch.
f) Type minus (-) followed by location of constant and tab (S) (optional for checking)
g) The changed constant will be typed out to the operator in floating point form.
h) Return to program.

11. (Q) Could the F in floating point type-out be deleted?

(A) Yes. Two G-15 words must be changed in Line 04 of the Op-Package (No. 4) for the deletion of F from the floating point typeout.

	Decimal	Hex
04:85	w.u3.82.0.06.19	y7520x3
04:62	w.64.05.1.28.28	w0579w

These changes can be made via PPR or the tape corrector routine (ASP 72). Line 4 is the 11th block with check sum = 5xv7u3x. The corrections will not effect the check sum.

12. (Q) What method should be employed to process several ALGO programs with first the Editor (Package No. 1), then the Rator/Cator (Package No. 2) and finally with Packages 3 and 4?

(A) a) The ALGO system must be on paper tape with paper tape output.

b) Load the Editor and enter the first program. When the first program has been edited, the Editor will type out "LOAD No. 2". The programmer may now type (2) c f, and the Editor will permit the type-in of the next program.

This method may be continued until all the programs have been processed by the Editor.

c) Load the Rator/Cator with compute switch on breakpoint. When "MOUNT No. 1 OUTPUT" is typed out, the programmer will mount one of the Editor output tapes. This program will then be processed. When completed, the Rator/Cator may now be reloaded on breakpoint. When so instructed, the programmer will mount the next Editor output.

This method may be continued until all the edited programs have been processed by the Rator/Cator.

d) Load the Lyzer/Lator (Package No. 3) with compute switch on breakpoint.

When so instructed, the programmer will mount one of the program outputs from the Rator/Cator. Further processing will continue in the normal manner as described in the ALGO Operating Instruction Manual. Following the completion of each program (i.e. processed by the Lyzer/Lator and the Op-Package, Package No. 4), the Lyzer/Lator may be loaded on breakpoint. The programmer will then mount the next Rator/Cator output.

13. (Q) How does the programmer write machine language subroutines using inputs and/or outputs in the ALGO system?

(A) Subroutines which will use inputs and outputs (i.e. alphanumeric subroutine, Decimal Tape conversion subroutine, magnetic tape subroutine) must know two things:

a) Starting location of the storage for the input or output.
b) Length of the block of data coming in or going out.

A method of denoting to the subroutine what these values are can best be shown by an example.

In the following example, the programmer wishes to enter data (numeric or alphanumeric) into the computer; perhaps convert it into binary floating point form and store it in data arrays.

Call the subroutine INPUT with check sum 0200000 and starting loc. at 00. The LIBRARY declaration would be:

2. LIBRARY INPUT (0200000)

Now some data storage must also be declared. Two blocks of information are required. Call one block of 76 words A and the other block of 130 words B.

3. DATA A(76), B(130)

The statement to call the subroutine for use on the 1st block would be

15. A [0] = INPUT (76)

The statement to call the subroutine for use on the 2nd block would be

16. B [0] = INPUT (130)

The statements written in this manner result in the length of the block in the ALGO accumulator MQ_0 or MQ_1. Store this information and by using the following sequence of commands, the location of the 1st word of the table is found.

All subroutines operate out of line 05.

```
:80  u.82.82.0.22.28   Pick up N.C.
:82  u.84.84.2.28.29   Set ovfl if store
:84  u.86.86.0.29.31   is it store command?
:86  w.89.90.0.22.18   No. Go get next command
:90  w.94.03.0.05.29
:94  -7w0u804
:03  u.05.05.0.31.31
:87  w.89.91.0.22.26   Yes Put in PN 1
:91  w.u5.07.3.23.31   CH to PN, Rest To ID
:07  w.09.28.2.26.28   CH to AR
:28  u.34.29.2.28.29   Shift to source
:29  w.31.33.2.25.29   Add WD + Junk
:33  u.35.E.3.05.29    - Junk   E = Exit to Program
:34  7z036y4
```

At this point the accumulator contains: w.wd.00.0.CH.00 of the 1st word. With this information and the stored length of the block, the programmer may write his machine language program and exit keeping in mind all of the conditions for writing machine language subroutines as outlined in the ALGO Operating Instructions.

14. (Q) Can decimal data from paper tape be used with ALGO?

(A) Yes. Three methods of using decimal tape input to an ALGO object program are described below.

a) The object program accepts data from tape in binary floating point form. If the data is in decimal, the programmer may write a machine language subroutine for converting it as outlined in 13 above.

b) Another method would be to use Intercom 500 with the flex input subroutine to convert the decimal tape to a binary tape and use the binary tape as input to the ALGO object program.

c) Another method is described in Answer No. 15.

15. (Q) Can data be prepared in decimal floating point notation on punched tape off line on a flexowriter and read into memory by the ALGO read statement?

(A) Yes. A special use of the Decimal to Binary Conversion Routine is in conjunction with flexowriter prepared data. Data may be prepared in decimal floating point notation on punched tape off line on a flexowriter and read into memory by the ALGO read statement. These data are then converted to binary floating point by the conversion routine.

Data is punched in four-word groups (i.e., CR word tab word tab word tab word tab /) in floating point decimal notation, (i.e., EEDDDDDS where EE is the decimal exponent, DDDDD is the decimal mantissa, and S is the sign). If the number of data words is not a multiple of four, a filler word (i.e., 0000000 tab) is punched a sufficient number of times in the first four-word group in order to make the number of data words a multiple of four. If the number of data words is a multiple of four, no filler word is required. When the last four-word group of data is punched, a stop code is punched in place of a "/".

Example No. 1

Given three data words, prepare flexowriter tape. Data tape is punched as follows:

C/R
0000000 tab EEDDDDD tab EEDDDDD tab EEDDDDD tab stop 2

Example No. 2

Given eight data words prepare flexowriter tape. Data tape is punched as follows:

C/R
EEDDDDD tab EEDDDDD tab EEDDDDD tab EEDDDDD tab / C/R
EEDDDDD tab EEDDDDD tab EEDDDDD tab EEDDDDD tab stop 2

Attached is an example ALGO source program, data input and output which demonstrates the special use of the Decimal to Binary Conversion Routine.

16. (Q) It has been stated in the Programming manual that entry numbers start with 001 and continue consecutively to 511. Please clarify.

(A) The compiler assigns the entry number as the programmer enters the ALGO language program. Entry numbers start with 001 and continue consecutively. The number of entry numbers that the compiler assigns for a program will depend upon the complexity of the statements. The ALGO compiler has provisions for handling up to 511 entry numbers, however, this does not mean that the compiler will process 511 statements.

ALGO SOURCE PROGRAM

```
 1.  TITLE DEMONSTRATION OF FLEX LIBRARY ROUTINE $
 2.  LIBRARY FLEX (0202000) $
 3.  FORMAT TAG (s5Dp5Dc) $
 4.  SUBSCRIPT I, J $
 5.  DATA ALPHA(35) $
 6.  BEGIN $
 7.  START: CARR(3) $
 8.  READ(P) ALPHA $
 9.  I=0 $
10.  J=34 $
11.  LOOP: HOLD=ALPHA [J] $
12.  ALPHA [J] =FLEX(ALPHA [I]) $
13.  ALPHA [I] =FLEX(HOLD) $
14.  I=I+1 $
15.  J=J-1 $
16.  IF J>I $
17.  GO TO LOOP $
18.  IF J=I $
19.  ALPHA [I]=FLEX(ALPHA [I]) $
20.  LAST: BELLS(5) $
21.  FOR I=0(1)34 $
22.  PRINT(TAG)=ALPHA [I] $
23.  END $
24.
```

```
   5      865
START      2
LOOP       3
HOLD     864
LAST       4


  12
 864

 2   .0120013
 3   .0220024
 4   .0470048
```

DATA INPUT

0000000	5514161	5515361	5516637	/
5518010	5519480	5521046	5522709	/
5524466	5526316	5528258	5530293	/
5532421	5534630	5536909	5539359	/
5541679	5544169	5546739	5549400	/
5552152	5554995	5557929	5560951	/
5564059	5567253	5570532	5573897	/
5577350	5580893	5584526	5588250	/
5592064	5595990	5310005	5010424	/

OUTPUT

12 ⑧

14161.00000
15361.00000
16637.00000
18010.00000
19480.00000
21046.00000
22709.00000
24466.00000
26316.00000
28258.00000
30293.00000
32421.00000
34630.00000
36909.00000
39359.00000
41679.00000
44169.00000
46739.00000
49400.00000
52152.00000
54995.00000
57929.00000
60951.00000
64059.00000
67253.00000
70532.00000
73897.00000
77350.00000
80893.00000
84526.00000
88250.00000
92064.00000
95990.00000
100.05000
.10424

ACTION BY: All personnel concerned

PREPARED BY: E. J. Records

APPROVED BY: T. Yamashita

THE BENDIX COMPUTER DIVISION OF THE BENDIX CORPORATION
5630 Arbor Vitae Street, Los Angeles 45, California

TECHNICAL APPLICATIONS MEMORANDUM NO. 89

October 16, 1961

TITLE: Decimal to Binary Conversion Library Routine (ALGO)

PURPOSE: To describe a method of converting decimal (binary-coded-decimal) data in ALGO memory to binary. The natural extension of this is to provide ALGO the facility for utilizing decimal-punched tape.

EQUIPMENT AFFECTED: G-15D, ALGO

EFFECTIVE DATE: October 1961

INSTRUCTION:

This program is a library routine for ALGO which permits the conversion of binary-coded-decimal numbers to binary.

USE: The routine should be declared as a library entry at the second line of the ALGO program, i.e.

2. LIBRARY FLEX (0302000)

The routine is executed by giving a statement as below where DEC is a location containing a decimal number, and BIN is the location into which the converted number is to be stored.

k. BIN = FLEX (DEC)

NOTES:

1. The conversion routine is written in 11 words, and utilizes the keyboard input subroutine contained within ALGO package #4. The conversion routine assumes that the decimal number is in the ALGO accumulator (MQ even and odd). It finds the binary exponent, stores it in 21.01, then calls the keyboard input subroutine from line 08 to line 05, entering at word 64. The mantissa will be converted, and the floating point binary number formed and stored in the ALGO memory.

2. The routine is written to be executed from line 05, as are all ALGO library subroutines. The locations of the balancer and the check sum (0300000) are optional. The entry point is word 02; the check sum (0300000) indicates the routines position as the third library routine block on package #4. It should be spliced into the package following the Alphanumeric subroutine.

NOTES: (Continued)

3. Since this routine occupies such a small part of a line, it is reasonable that an other library routines are developed they be incorporated into the same block.

4. A special use of the Decimal to Binary Conversion Routine is in conjunction with the handling of Flexowriter-prepared data. Such data may be punched on tape in decimal floating point notation and read into memory by the ALGO Read statement. The data are converted to binary floating point by the conversion routine.

   a. The data is punched in floating decimal notation (SEMMMMM, where S is the sign which is punched when minus, EE the decimal exponent and MMMMM the decimal mantissa). It is punched in four-word groups (word tab word tab word tab word CR /). The number of words in the first group is the remainder of the total number modulo 4 (i.e. the remainder when the total number is divided by four). All other groups must have four data words.

   b. The data tape is read into memory by a Read statement. It must then be converted to binary. If the tape has been punched in normal order, with the first element of the array punched first, the words are in memory in reverse order. An additional array must be available for working storage to reverse the order of the elements while doing the conversions. The following series of statements can accomplish this:

```
k       for i = 0(1)L begin
k+1     j = L-i
k+2     Alpha [j] = Flex (Temp [i]) end where
        Alpha and Temp are declared data arrays
        of L+1 words, and i and j are declared
        subscripts.
```

5. An example of the application of this extension to the Decimal to Binary Conversion Routine is given in the sample problem which follows.

Sample Problem

This ALGO program reads a block of Flexowriter-punched tape, converts to binary, storing the data in the proper order, then types out the array in a column.

The data tape, which contains 11 numbers was punched on the Flexowriter as follows:

```
 -5150000     -5140000     -5130000
/-5120000     -5110000      5000000     5110000
/ 5120000      5130000      5140000     5150000
S
```

The compilation and execution of the sample problem is shown on the next sheet.

REFERENCES: Algo Programming and Operation Manuals

PREPARED BY: R. J. Margolin

APPROVED BY: T. Yamashita

SAMPLE PROBLEM

```
P
 MODE ?2 ©
  1.  TITLE FLEXTEST ©
  2.  LIBRARY FLEX(0302000) ©
  3.  SUBSCRIPT I,J ©
  4.  DATA DEC(11), BIN(11) ©
  5.  BEGIN ©
  6.  START: CARR(2) ©
  7.  READ(P) DEC ©
  8.  FOR I=0(1)10 BEGIN ©
  9.  J=10-I ©
 10.  BIN[J]=FLEX(DEC[I]) END ©
 11.  FOR I=0(1)10 BEGIN ©
 12.  PRINT(FL)=BIN[I] ©
 13.  CARR(1) END ©
 14.  CARR(2) ©
 15.  STOP ©
 16.  GO TO START ©
 17.  END ©
 18.
LOAD NO.2PMOUNT NO.1 OUTPUT

    4    889
    4    878
START    2


    8
  878
LOAD NO.3
PTYPE KEY NUMBERS
REWIND NO.3
8  878  ©MOUNT NO.2 OUTPUT
 2   .0080009
LOAD NO.4
P.1 ©

F -51..50000
F -51..40000
F -51..30000
F -51..20000
F -51..10000
F    ..00000
F  51..10000
F  51..20000
F  51..30000
F  51..40000
F  51..50000
```

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Page 1 of 1

G-15 PROGRAM PROBLEM: Decimal to Binary Conversion for ALGO

Prepared by A. L. Wilkinson

Date:

Line 05

0	1	2	3
4	5	6	7
8	9	10	11
12	13	14	15
16	17	18	19
20	21	22	23
24	25	26	27
28	29	30	31
32	33	34	35
36	37	38	39
40	41	42	43
44	45	46	47
48	49	50	51
52	53	54	55
56	57	58	59
60	61	62	63
64	65	66	67
68	69	70	71
72	73	74	75
76	77	78	79
80	81	82	83
84	85	86	87
88	89	90	91
92	93	94	95
96	97	98	99
U0	U1	U2	U3
U4	U5	U6	

L	P	T or L_k	N	C	S	D	BP	NOTES
02		03	04	1	24	28		$MQ_1 \xrightarrow{+} AR$
04		07	07	0	23	31		Clear
07		09	10	0	28	24		$AR \longrightarrow MQ_1$
10		57	59	1	06	25		$06.57 \xrightarrow{+} ID_1$
59		08	70	0	24	31		Mult.
70		85	87	1	06	25		$06.85 \xrightarrow{+} ID_1$
87		08	97	0	24	31		Mult.
97		99	00	3	26	28		$PN_1 \xrightarrow{-} AR$
00		01	03	0	06	29		$06.01 \longrightarrow AR+$
03		05	06	0	28	21		$AR \longrightarrow 21.01$
06	u	07	64	0	08	05		Line 08 → Line 05
(99)								Balancer
(u4)								+0300000 Check Sum

FORM BCD 108-5.0