

8K BASIC Manual

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1. Text Editor

The Central Data text editor allows a user to create and change source code (ASCII) files for use with an assembler, interpreter, or any other application of this type. The user's file (otherwise called the text or the source code) is read into a RAM buffer where the user can inspect it and make changes to it.

The editor takes full advantage of the system's features. The video display is always used to display the lines of text in the immediate area of last editing which frees the user from the task of trying to remember where he is in the file. The cassette interface is used to store files and also allows editing of files which are larger than the amount of RAM that you have available for the editing buffers. The supervisor program is used by the editor for its many subroutines such as writing a character on the screen, serial input and output, and linefeed-carriage return.

Basic Information

The editor takes up roughly 2K of RAM starting at address H2000. This space includes all of the working RAM locations that the editor needs. The editor requires two buffers to operate: the edit buffer and the insert buffer. The edit buffer is where the source code is held while editing. The insert buffer is where all changes to the edit buffer are made. After an editing operation is finished (i.e. an insert), the insert buffer is merged into the edit buffer to form the new source code.

There are two restrictions concerning the buffers:

1. The edit buffer must be before the insert buffer in RAM, and there can be no space between the two buffers.
2. The buffers must be multiples of 256 bytes long, and their starting and ending addresses must also be multiples of 256 bytes.

Examples of incorrect formatting of the buffers are:

<u>Text Buffer Start</u>	<u>Insert Buffer Start</u>	<u>Reason Why Wrong</u>
H4400	H4000	The edit buffer must start at a lower address than the insert buffer.
H4110	H4610	Buffers must start in multiples of 256 bytes.

If the text buffer were to start at H4000 and the insert buffer at H4400 this would work fine. Note that this means that the edit buffer has 1024 bytes of space (H4000 to H4400). You can't tell how big the insert buffer is since its ending address is not known. You must, therefore, also specify an address (256 byte multiple) for the first byte after the insert buffer. This byte's address will be called the end of RAM location from here on. If this address was H4600 in this case, the length of the insert buffer would be 512 bytes. Thus far, in our example of correct buffer addressing, we have the following:

<u>Text Buffer Start</u>	<u>Insert Buffer Start</u>	<u>End Of RAM</u>
H4000	H4400	H4600

The user defines where the buffers start and end by altering three RAM locations (using the supervisor) before executing the editor. Because of the 256-byte-multiple address restriction, it can be seen that the low byte of each address is H00. For this reason, you need only specify the high byte of the address for the edit buffer, insert buffer, and the end of RAM location. You alter locations H2003 through H2005 to give this information to the editor and then jump to the editor (address H2000). In our example, location H2003 would be changed to H40, while H2004 would be changed to H44, and H2005 would be changed to H46.

The buffers have no size restrictions so they can span from any one address to any other as long as the end address is greater than the start address.

After the three bytes have been set up for the editor (using the alter command) and the editor has been jumped to (by the execute command) using the supervisor, you are able to edit your source code using one of the 12 editor commands which are described later.

Display Format

While you are inspecting the source code of your file, the editor displays a header line and up to 15 lines of text. The header line tells you how many completely empty blocks (256 bytes per block) you have left in the edit buffer and displays the command you have entered. The bottom 15 lines of the display are used for the text. These lines are numbered from 1 to 15 as they progress down the page. Note that a line can be up to 256 characters long and that the line numbers are not actually part of the text. The line numbers are simply displayed on the screen to allow you to reference each individual line easily.

In the edit buffer, the end of a line is indicated by a ASCII carriage return code (HOD). The end of file is sensed to be the first character in the buffer with bit 7 set to one. Note that the ASCII characters are all encoded using bits 0 through 6 so bit 7 is free for this use.

Commands

There are 12 commands which the editor accepts. All commands are typed in through the keyboard, and all except four are executed after the press of the carriage return key. The four commands that do not require a carriage return are position moving commands which are used so frequently that they are allowed to take only one keypress. They are explained in detail in the section called 'Moving Around in the File' as well as in the Command Reference Section. The other 8 commands require a carriage return for their execution. These other commands also allow you to type in up to sixteen additional characters which tell the routines exactly what should be done. The backspace key is active during command entering so that mistakes can be easily corrected. Pressing control-P causes the last command entered to be executed again.

Depending on the command, the additional characters may be alphabetic, numeric, or not used. If a number is required (such as in the Forward command) it can be of any size, although the maximum number sent to the routine will be 255. For example, if the command typed was F3000 (move forward 3000 lines), the user would only be moved ahead 255 lines. More details about the Forward command are presented later. Also, if a command requiring a number is entered with no extra characters (just the command and then a carriage return), a number of one will automatically be used. This feature was added due to frequent changes the user will make to the 1st line of text.

The specific command explanations tell you what you should enter after the command: a number, a word, or nothing.

Moving Around in the File

Since the display can show only 15 lines at a time and the file can be much larger than this, there are commands which allow you to move around in the file (display different areas of the file).

Four of these commands are executed immediately when the command key is pressed. These four commands are: go to end of file (+), go to beginning of file (-), go forward 15 lines (space), and go backward 15 lines (/). The only exception to this immediate action is when another command is entered, erased (by back-spaces) and then one of the four immediate action commands is entered. The four commands then will require a carriage return to execute them.

The other moving commands are: forward x lines (Fx) and backward x lines (Bx). The detailed explanations for all six of the moving commands are given in the command reference section.

Inserting New Lines

To enter new lines of text, use the Insert (I) command. This command should be followed by a number which signifies which line on the screen the text should be inserted after.

After the command, number, and carriage return have been entered, the screen is cleared and you are in INSERT MODE. In this mode you simply type in your new text pressing carriage return at the end of each line. Backspace is active to the beginning of your current line. Note that while in insert mode the characters you type in are being put in the insert buffer, and they are held there until ETX is pressed. Pressing ETX (control-C) when you are done inserting will put the lines just typed into the edit buffer after the line number originally typed with the command.

If you insert too much text (either the insert buffer is full or it can be seen that the text to be inserted will fill the edit buffer), insert mode is automatically ended and the lines are inserted.

Deleting Lines

To delete selected lines, bring the first line to be deleted to the top of the screen. Then use the delete (D) command followed by a line number to delete that number of lines from the text buffer (starting from the top line on the screen).

Changing Lines

If you have a line in the text buffer which is wrong, you can change it (without having to retype the whole thing). To change a line, type "Cx", with x being the line number. The screen is then cleared and the line selected is displayed. At this time several keys are active:

- 1) Copy character (control-U): causes one character from the old line to be copied to the new line. The new line is written just below the old one as the characters are copied.
- 2) Delete old character (control-O): causes one character of the old line to be deleted. In other words one or more characters from the old line can be skipped from being copied.
- 3) Backspace (control-H): just erases one character from the new line.
- 4) Copy to end of line (control-P): causes all of the remaining characters of the old line to be copied to the new line.
- 5) Any printable (non-control) character will be added to the new line.
- 6) Carriage return ends the change of this line. After this key is pressed, the next line in the text buffer is displayed and you are allowed to change it.

If you press ETX (control-C) right after a new line appears, the editor returns to the normal page showing all of the corrected lines.

Storing your Text

The editor allows you to store and retrieve your programs using cassette tape. You can name your text with labels of up to eight characters long and therefore have the system keep track of the various programs on a tape.

To store the edit buffer on cassette tape, turn the tape recorder to record and type "Sxxxx" with xxxx being the name (up to 8 characters). After carriage return is pressed, the editor starts sending the name and the text to the tape recorder. It finishes when the end of file is reached (any byte in the edit buffer with bit 7 set) and will simply prompt for a new command.

To load that file back just as it was before storing it, first move to the beginning of the file (using the "-")

command). Then type "Lxxxx" followed by a carriage return and play the tape recorder. The editor will read everything on the tape and will load the data contained in blocks with the name xxxx. After the end of file byte is read in, the routine terminates.

You should note that the load routine starts loading at the current line position (it starts loading over the top line on the screen). Thus you can merge two files by loading one in as was explained earlier, moving to the end of that file, and loading the second file. Once it is loaded it will appear after the first file in the text buffer.

Also, the full name need not be typed in for the load routine. The routine only checks the tape against the letters typed in with the command, and no others. For instance, if you have a file named STARTREK on tape, you can load it back by typing any of the following as the command:

LSTARTREK	will load only startrek
L	will load any file
LSTAR	will load any file whose name's first four letters are STAR

Note that the last two methods have the possibility of loading the wrong program--the second one loading anything and the third one loading anything which starts with STAR (i.e. STARWAR OR STAR).

Jumping out of the Editor

Type the command "R" to jump to BASIC.

2. Editor Command Reference Section

The following abbreviations are used in this section:

- l--a line number
- n--a number of lines
- x--a file name (up to 8 characters)

Also, note ~~that~~ all commands (except the ones with immediate action) must be terminated with a carriage return.

Command: BACKWARD

Format: Bn

Description: This command causes the editor to start displaying n lines before the top line on the screen.

Example:

If the screen had displayed the 10th-13th lines of a program as shown below:

```
                                BLOCKS LEFT:  04      COMMAND:
1  THIS IS LINE 10
2  THIS IS LINE 11
3  THIS IS LINE 12
4  THIS IS LINE 13
```

And the command "B3" was executed, the first line displayed is number 7 and the display would change to:

```
                                BLOCKS LEFT:  04      COMMAND:
1  THIS IS LINE 7
2  THIS IS LINE 8
3  THIS IS LINE 9
4  THIS IS LINE 10
5  THIS IS LINE 11
6  THIS IS LINE 12
7  THIS IS LINE 13
```

Command: CHANGE

Format: C1

Description: This command allows you to change a line of text. After entering this command, the screen is cleared and the line selected is displayed on the top of the screen. You can then type control-U to copy a character of the old line to the new one, control-O to skip a character of the old line from being copied, control-H (backspace) to delete a character from the new line, control-P to copy all of the remaining characters from the old line to the new line, or any printable (non-control) character to just be added to the new line. After the new line is as you want it, press carriage return. The next line of the text buffer is then displayed and you can change it. Pressing ETX (control-C) at this point returns you to the command entry page with the corrections entered into the text buffer.

Example:

If you have the line NOW IA THE TIME ready to change (you have just entered the "C" command), the following keypresses will correct the mistake:

<u>KEY</u>	<u>New line so far</u>
control-U	N
control-U	NO
control-U	NOW
control-U	NOW (there is a space after NOW)
control-U	NOW I
control-O	NOW I (the A has been omitted)
S	NOW IS
control-P	NOW IS THE TIME

Pressing carriage-return and ETX now will return you to the normal editor display page with the changes in effect.

Command: DELETE

Format: Dn

Description: This command deletes n lines from the text buffer starting with the top line on the screen.

Example:

If the screen had lines 6-10 of the text buffer displayed as is shown below:

	BLOCKS LEFT: 04	COMMAND:
1	LINE 6	
2	LINE 7	
3	LINE 8	
4	LINE 9	
5	LINE 10	

And the command "D2" was executed, text lines 6&7 would be deleted and the screen would look like:

	BLOCKS LEFT: 04	COMMAND:
1	LINE 5	
2	LINE 8	
3	LINE 9	
4	LINE 10	

Command: FORWARD

Format: Fn

Description: This command causes the editor to start displaying n lines after the present line.

Example:

If the screen had the 10th-16th lines of the text buffer displayed as below:

	BLOCKS LEFT: 04	COMMAND:
1	LINE 10	
2	LINE 11	
3	LINE 12	
4	LINE 13	
5	LINE 14	
6	LINE 15	
7	LINE 16	

And the command "F5" was executed, the first text line now displayed is line 15 and the screen will look as below:

	BLOCKS LEFT: 04	COMMAND:
1	LINE 15	
2	LINE 16	

Command: INSERT

Format: I1

Description: This command allows the insertion of new text. The new text is typed in after the command and is ended by a ETX (control-C) key. Then the text is inserted after the line number specified in the command.

Errors: If you try to type in too much text (either too much for the insert buffer to hold or too much to be able to put back into the edit buffer), the insert is automatically ended just as if you had pressed ETX.

Example:

If the screen looked as it does below:

```
                                BLOCKS LEFT:  04          COMMAND:
1  LINE 1
2  LINE 2
3  LINE 3
4  LINE 4
5  LINE 5
```

And the command "I2" was executed, the screen would be erased and you would be allowed to type in new text. If you typed in the following lines (each line followed by a carriage return):

```
NOW IS THE TIME
FOR ALL GOOD MEN
TO COME TO THE AID
```

And pressed ETX, the 3 new lines would be inserted after line 2 of the text buffer, and the screen would change to:

```
                                BLOCKS LEFT:  04          COMMAND:
1  LINE 2
2  NOW IS THE TIME
3  FOR ALL GOOD MEN
4  TO COME TO THE AID
5  LINE 3
6  LINE 4
7  LINE 5
```

Command: LOAD

Format: Lx

Description: Loads a file from cassette tape into the text buffer. The name, x, can be up to 8 characters, and any file which has at least the letters specified in the command will be loaded. A simple "L" command (one with no file name) will load any file. Loading ceases when a byte is read in with the end of file bit set.

The file is loaded starting at the first character position on the screen. Any lines before the ones displayed will not be changed during the load.

Errors: If you run out of text buffer space before a load is complete, ~~you~~ will get an error saying TOO MUCH. If upon loading, a cassette error occurs, you are given a SUMCHECK ERROR message and you must reload.

Command: RUN

Format: R

Description: This command jumps to BASIC.

Command: STORE

Format: Sx

Description: This command stores the text buffer onto cassette tape. A name (x) is also stored on the tape, and that specific name can be referenced during a LOAD command.

Command: GO TO BEGINNING--IMMEDIATE ACTION

Format: -

Description: Starts displaying lines at the first line of the file.

Command: GO TO END--IMMEDIATE ACTION

Format: +

Description: Starts displaying lines beginning at the last line in the file. You should note that after this command is executed, the screen will contain only one line of text (the last line of the text buffer).

Command: FORWARD 15 LINES--IMMEDIATE ACTION

Format: space

Description: This command functions exactly the same way as the command "F15".

Command: BACKWARD 15 LINES--IMMEDIATE ACTION

Format: /

Description: This command functions in exactly the same way as the command "B15".

3. 8K BASIC

The Central Data BASIC Interpreter is used to allow execution of standard BASIC programs on a 2650 System. The user written BASIC program is entered using the editor and must be fully in memory at the time the program is run. To execute your BASIC program, type the letter "R" followed by a carriage return as an editor command. The interpreter takes roughly 6K bytes of RAM starting right after the editor in RAM.

Options

Once the editor has jumped you into BASIC, you have several options. Whenever BASIC is waiting for you to decide what option to choose, it will display:

OPTION:

on the 15th line of the screen. You can always get to this mode by typing escape any time while BASIC is running. If you press escape at the option, you will return to the editor.

The first option is RUN which is selected by typing the letter "R". BASIC will respond by writing "EXECUTING" beside the "R" and by starting the user program's execution. As stated earlier, you can press escape to return to choose another option.

The second option, SINGLE STEP, is entered with an "S". At that point, the line about to be executed (the first line of the program) is displayed on the screen. That line is executed on the next keypress (except of course, for escape) and the next line is then displayed.

The next option is INSPECT VARIABLE. To use this, just type "I" as the option. BASIC will then overwrite "OPTION" with:

INSPECT VARIABLE:

where you can type the name of any variable. The value of the variable is then printed on the bottom line of the

screen. Note that the variable must be used previous to the inspect command or BASIC will give an error.

The fifth and final option is LINE NUMBER BREAKPOINT. If you wish your program's execution to be stopped before a certain line number is executed, you can use this. Type "L" as the option and BASIC will respond asking:

BREAKPOINT AT LINE:

At this point you should type the line number to breakpoint at and hit carriage return. Every time that line is encountered you will be put into step mode. Note that the breakpoint is not cleared unless you change the line number to breakpoint at or press escape instead of a line number (which simply clears the breakpoint).

Memory Arrangement

Basic uses the same workspace as the editor. The text buffer is used to hold the user program during execution and the area allocated to the editor's insert buffer is used to store variables and other BASIC data. The variable table, which holds the variable names and their values, starts at the address pointed to by IBST. It grows toward the end of RAM and an error is given if it tries to go further. Starting at the end of RAM and moving back toward IBST is the stack area for BASIC. It is used by the program and is of a constantly changing length. If the variable table and the stack ever try to occupy the same memory, a stack overflow error occurs which means that you should allocate more space to the insert buffer in the editor.

Variable Information

Variable names in Central Data's BASIC can be from 1-15 characters long and the first character must be a letter. The variables afford six digit precision and have a range of approximately 10^{37} to 10^{-38} .

Below is a list of the error conditions that BASIC will catch:

SYNTAX ERROR is an error in the typing of a line. It could be an improper command, a missing comma, an imbalance in parenthesis or any other such mistake.

TYPE MISMATCH ERROR occurs if you try to add a floating point number to a string or use the wrong type of variable as an argument of a command.

LEN MISMATCH ERROR results if you try to do a calculation

with strings of different lengths.

ARG. ERROR indicates that you did not specify enough arguments for the command.

TOO MANY OPS ERROR is caused by too many operations in one expression; you will have to break the expression into two pieces.

LINE NOT FND. ERROR occurs when you do a GOTO, GOSUB, or RESTORE command with an invalid line number.

NEST ERROR results if you incorrectly nest your FOR-NEXT statements.

STK. OVF. ERROR indicates that the stack has grown over the top of the variable table. You must enlarge the insert buffer allocation in the editor to fix the problem.

NO STOP STATEMENT ERROR means you didn't put an stop statement at the end of your program.

VAR. NM. ERROR says that you tried to use a variable in an expression that had not been used before (one that had not been initialized) or that you tried to use a variable with more than 15 characters.

LN # ERROR indicates the line number is more than 4 characters long on this line.

DVD BY ZERO ERROR occurs if you try to divide a number by zero.

OVF. ERROR takes place if a floating point number exceeds its range (from approximately 10^{37} to 10^{-38}) or if a binary number (such as in a EXTOUT command) is too large.

OUT OF DATA ERROR means a read statement has tried to read past the end of the last DATA statement.

When an error is encountered, it writes the error message on the 15th line of the screen and the line which caused the error is displayed below it. On the failing line, a left arrow is displayed just to the right of where the error was detected. Due to the structure of BASIC, this arrow may not point directly at the error, but it usually narrows it down substantially.

4. BASIC Command and Function Reference Section

This section details the commands and functions that Central Data's BASIC allows. It is by no means meant to be an introduction on how to write BASIC programs which is left up to the user.

Two good books for beginners on BASIC are listed below and are available from most computer stores and through the mail from advertisements in various hobbist computer magazines.

BasicBASIC

by James S. Coan
Hayden Book Company
Rochelle Park, N.J.

Advanced BASIC

by James S. Coan
Hayden Book Company
Rochelle, N.J.

The following standards are used to give the format of the commands and functions:

- 1) Any item enclosed in brackets ([]) is optional.
- 2) <expression> can be any mathematical expression to the limits set forth in this BASIC. In a LET statement it can also be a string.
- 3) Line numbers can range from 1 to 9999.
- 4) Variable names can be from 1 to 15 characters with the first character always alphabetic.

ABS(<expression>)

Description: The ABS function returns the absolute value of the expression.

Examples:

ABS (X)

ABS ((3*X)*Y)

" [line number] CALL <expression>

Description: This command causes a branch to subroutine to an assembly language program located at the memory location indicated by the expression. A return instruction in the assembly language program causes a return to the BASIC program where it resumes execution at the next line.

Examples:

100 CALL A
CALL 1024

COS (<expression>)

Description: COS is a function which returns the cosine of the expression.

Examples:

COS (B)

COS (X-Y)

✓ [line number] DATA <expression> [,<expression>...]
Description: DATA statements define string and floating point data which are assigned to variables using a READ statement. The data is read sequentially from the start of the program although the sequence can be altered using a RESTORE statement.

Strings must be enclosed in quote marks.

Examples:

```
25 DATA 13.56,"THIS IS A STRING",16E5  
DATA 10.0
```

[line number] DIM <variable name>(<size> [,<variable>...])

Description: The DIM statement allocates storage for floating point arrays or string variables. Strings may be up to 255 bytes in length. Floating point arrays can have up to 255 elements. All variables are zeroed when created. The size must be a constant, not a variable.

When referencing subscripted variables, the index for the array must be a variable (with no arithmetic operation and cannot be a constant. For example, to create an array 10 numbers long and put the number 20 into the second position, you must:

```
DIM A(10)
LET INDEX=2
LET A(INDEX)=20
STOP
```

Examples:

```
DIM LINE(30),ABC$(10),POINT(5)
100 DIM NAMES$(25)
```

[line number] ERASE

Description: This command causes the screen to be erased and the cursor to be positioned in the upper left hand corner.

EXP (<expression>)

Description: This function returns the value of e raised to the expression.

Examples:

EXP (A)

EXP (3)

✓ [line number] EXTIN <expression> , <variable>

Description: This command causes the computer to evaluate the expression setting the result equal to the number of the input port to be accessed. The data from the specified input port is then set equal to the variable name.

Examples:

```
EXTIN  A,B  
10  EXTIN 10,B
```

✓ [line number] EXTOUT <expression>, <expression>

Description: This command causes the data determined by the second expression to be sent out at the output port number specified by the first expression.

Examples:

EXTOUT 10,12
EXTOUT PORT,DATA

```
[line number] FOR <variable> = <expression> TO <expression>  
[STEP<expression>]
```

Description: All statements between the FOR and its corresponding NEXT are executed until the variable is greater than the TO value. The variable is initialized with the value of the first expression and is incremented by the (positive) STEP value at the end of each loop. If the STEP value is excluded, it is assumed to be 1.

The values for both TO and STEP are evaluated at the beginning of each loop, and any variables used in these expressions may change within the loop.

Examples:

```
FOR INDEX=32*J+LENGTH TO 36-J STEP ABS(30*SIN(Y))  
FOR I=3 TO 5
```

FRC (<expression>)

Description: This function returns the fractional part of a floating point number.

Examples:

FRC(A)

FRC(32.5*A)

V[line number] GOSUB <expression>

Description: The address of the next line is stored on the GOSUB stack and then control is transferred to the line number which is equal to the expression. GOSUB's can be nested to any depth until the stack area is used up.

Examples:

```
32 GOSUB LINE  
GOSUB 15
```

✓ [line number] GOTO <expression>

Description: Control is transferred to the line with the number corresponding to the value of the expression.

Examples:

200 GOTO 50
GOTO A

[line number] IF <expression><relational operator><expression><statement>

Description: The two expressions are evaluated, and their relation (equal, first<second, or first>second) is determined. If the relation is satisfied, the statement following the second expression is executed. Up to two relational operators can be used giving the possibilities: =, >, <, =>, <=, or ><.

Examples:

```
IF A>B GOTO 35
IF A=>B GOTO C
20 IF A<=32.5 IF B<=A LET D=12*SIN(RADIAN)
```


[line number] INPUT ["<string>"]<variable>[,<variable>...]

Description: The string, if present, is printed on the screen at the left edge of the next line. If no string is present, a question mark (?) is printed at the same location. For each variable in the statement, the system waits for the operator to enter an expression or string followed by a carriage return. As each expression is entered it is stored into the corresponding variable. Entered strings should not be enclosed in quote marks.

The prompting string can have quote marks in it by entering two quote marks in the string. In other words the string "TYPE "HELLO"" gets printed as TYPE "HELLO".

Examples:

```
10 INPUT A,B,C
INPUT "TYPE YOUR NAME" NAMES$
```

INT(<expression>)

Description: The INT function returns the non-fractional part of the expression.

Examples:

INT(TOTAL/100)

INT(30*SIN(A))

[line number] LET <variable>=<expression>

Description: The value of the expression is stored into the variable. The type of expression, either floating point or string, must match the type of the variable. Any statement with no command is considered to be a LET statement.

Examples:

```
10 LET A$="HELLO"  
LET A=COS(9)  
A=COS(B)
```

LN(<expression>)

Description: This function returns the natural log of the expression.

Examples:

LN(3)

LN(A)

LOG(<expression>

Description: This function returns the log of the expression.

Examples:

LOG(3.2)

LOG(VALUE)

[line number] NEXT <variable>

The NEXT statement denotes the end of the FOR-NEXT loop using the variable named in the FOR command.

Examples:

```
10 NEXT INDEX  
NEXT I
```

/ [line number] PEEK <expression>, <variable>

Description: This command causes the data at memory location expression to be read into the named variable.

Examples:

PEEK 1024,A
PEEK LOCATION,VARIABLE

✓ [line number] POKE <expression>, <expression>

Description: This command puts the value of the second expression into the memory location pointed to by the first expression.

Examples:

POKE 1024,32

10 POKE DESTINATION,DATA

✓ [line number] PRINT [/]<object>[<delimiter><object>...]

Description: The PRINT statement is used to display data on the screen. If a slash (/) appears as the first character after the command, then the normal linefeed-carriage return to the next line on the screen is not performed at the beginning of the PRINT.

Objects can be one of seven different types as listed below:

#<expression>: This form prints only the integer part of the number.

%<expression>: This moves the cursor to the position on the line equal to the expression.

@<expression>,<expression>: This moves the cursor to the line specified by the first expression and the character position specified by the second expression.

&<expression>: This prints out the hex bytes of a floating point number.

"<string>": This form simply prints the string on the screen.

<expression>: This form prints the value of the expression in floating point form.

<string variable>: This prints the string identified by the variable name on the screen.

If the delimiter is a comma, eight spaces are printed between the two objects. If it is a semicolon (;), then the cursor is tabbed to the next (16 space multiple) tab stop. If the delimiter is a space, then no spaces will be printed between the two objects.

Examples:

```
100 PRINT / "THE DATE IS " DATE$  
PRINT "A=" A, "B" B, "C" C  
PRINT @5,12 "HELLO THERE"
```

✓ [line number] READ <variable>, [<variable>...]

Description: The READ statement takes sequential expressions in a set of DATA statements and assigns them to the listed variables. The normal flow of READ's is from the first DATA statement in the program to the last one.

If you try to read past the last DATA statement, you will get the error OUT OF DATA.

Examples:

```
READ A,B,C
10 READ A$,B,NAME$
```

✓ [line number] * remark
(REM statement)

Description: Using an asterisk (*) as the command functions just like using a REM statement in other BASICS. It causes the line to be totally ignored and is only there for commenting purposes.

Examples:

```
*  
*THIS SECTION IS THE COMPUTATION SUBROUTINE  
*
```

✓ [line number] RESTORE <expression>

Description: This command changes the DATA statement pointer. This pointer tells the READ statement where to get its next data; and, thus, by doing a RESTORE, you change the sequence of DATA statements.

If <expression> is present, the data pointer is moved to begin at the line with that number. If no line number is present, then the data pointer is moved to the beginning of the program.

Examples:

```
RESTORE  
RESTORE 20
```

✓ [line number] RETURN

Description: This command is placed at the end of each BASIC subroutine and causes a return to the calling (GOSUB using) program.

RND(<expression>)

Description: The RND function returns a pseudo-random number in the range of zero to the value of the expression.

Examples:

RND(A)

RND(3)

SGN(<expression>)

Description: This function returns a +1 if the expression is positive or zero and a -1 if the expression is negative.

Examples:

SGN(A)

SGN(10*A)

SIN(<expression>)

Description: This function returns the sine of the expression which must be expressed in radians.

Examples:

SIN(A)
SIN(.4)

— —
—

SQR(<expression>)

Description: This function returns the square root of the expression. If the expression is less than zero, an error results.

Examples:

SQR(1)
SQR(A)

✓ [line number] STOP

Description: This command causes the execution of the BASIC program to be terminated. It functions in the same way as the END statement.

TAN(<expression>)

Description: This function returns the value of the tangent of the expression enclosed in parenthesis. The expression must be in radians.

Examples:

TAN(32*A-D)

TAN(.2)

5. 8K BASIC Program Listing

This section contains the program listings for the editor and BASIC.

LINE	ADDR	B1	B2	B3	LABEL	OPCODE	OPERAND
0002	0000					PRNT	
0003	0000				BTX	FQU	03
0004	0000				BS	FQU	08 BACKSPACE KEY (CTRL-H)
0005	0000				CTRLP	FQU	10 CTRL-P
0006	0000				CTRLO	FQU	0F CTRL-O
0007	0000				CTRLU	FQU	15 CTRL-U
0008	0000				ESC	FQU	1B ESCAPE (SHIFT CTRL-K)
0009	0000				CRCD	FQU	0D CARRIAGE RETURN (CTRL-M)
0010	0000				*		
0011	0000				*		
0012	0000				*	THE FOLLOWING ARE DEFINITIONS FOR THE SUPERVISOR SUBROUTINES	
0013	0000				*		
0014	0000				*		
0015	0000				LFCR	FQU	0024
0016	0000				ERASEL	FQU	003A
0017	0000				WRTCOR	FQU	0064
0018	0000				HXOT	FQU	006A
0019	0000				SUPENT	FQU	0083
0020	0000				SERO	FQU	024F
0021	0000				SERI	FQU	02F9
0022	0000				KBIN	FQU	030F
0023	0000				SWCHR	FQU	0396
0024	0000				*		
0025	0000				*		
0026	0000				*	THE FOLLOWING ARE DEFINITIONS FOR THE FLOPPY PORTS	
0027	0000				*		
0028	0000				*		
0029	0000				FCMR	FQU	0 COMMAND REGISTER
0030	0000				FTR	FQU	1 TRACK REGISTER
0031	0000				FSR	FQU	2 SECTOR REGISTER
0032	0000				FDR	FQU	3 DATA REGISTER
0033	0000				FCMRH	FQU	10 COMMAND REGISTER, WITH HOLD OPTION
0034	0000				FDRH	FQU	13 DATA REGISTER WITH HOLD OPTION
0035	0000				*		
0036	0000				*		
0037	0000				*	BRANCH INSTRUCTION CONDITION DEFINITIONS	
0038	0000				*		
0039	0000				*		
0040	0000				EQ	FQU	0
0041	0000				GT	FQU	1
0042	0000				LT	FQU	2
0043	0000				UN	FQU	3
0044	0000				*		
0045	0000				*		
0046	0000				*	REGISTER DEFINITIONS	
0047	0000				*		
0048	0000				*		
0049	0000				R0	FQU	0
0050	0000				R1	FQU	1
0051	0000				R2	FQU	2
0052	0000				R3	FQU	3
0053	0000				*		
0054	0000				*		
0055	0000				*	PROGRAM STATUS WORD DEFINITIONS	
0056	0000				*		
0057	0000				*		
0058	0000				CRY	FQU	1

	01		CI	EQ	
0060	0000		OVF	EQU	4
0061	0000		WC	EQU	8
0062	0000		RS	EQU	10
0063	0000		*		
0064	0000		*		
0065	0000		*	GENERAL DEFINITIONS	
0066	0000		*		
0067	0000		*		
0068	0000		EBC	EQU	83
0069	2000		START	ORG	2000
0070	2000	1F 20 4F		BCTA.UN	EDITOR
0071	2003	40	BSTART	DATA	40
0072	2004	5C	IBST	DATA	5C
0073	2005	60	ENDRAM	DATA	60
0074	2006	42 4C 4F	LITS	ALIT	BLOCKS LEFT: 42 4C 4F 43 20 4C 45 46 54 3A 20 20 20 20
0075	2014	FF		DATA	FF
0076	2015	43 4F 4D	COMMSG	ALIT	COMMAND: 43 4F 4D 4D 41 4E 44 3A 20 20 20
0077	201F	FF		DATA	FF
0078	2020	20 4F 4B	OKMSG	ALIT	OK 20 4F 4B
0079	2023	FF		DATA	FF
0080	2024	54 4F 4F	TMSG	ALIT	TOO MUCH 54 4F 4F 20 4D 53 43 48
0081	202C	FF		DATA	FF
0082	202D	53 55 4D	SCMSG	ALIT	SUMHECK ERROR 53 55 4D 43 48 45 43 48 20 43 52 52 41 52 2E
0083	203A	FF		DATA	FF
0084	203B	00	COMS	RES	1
0085	203C	00 00 00	NAME	RES	10
0086	204C	00	TMPS	RES	1
0087	204D	00	TEMP	RES	1
0088	204E	04 02	EDITOR	LODI,R0	02
0089	2050	93		LPSL	
0090	2051	76 40		PPSU	40
0091	2053	3F 22 4E		BSTA.UN	BEGIN
0092	2056		*		
0093	2056		*		
0094	2056		*		
0095	2056	3F 21 4E	FBDN	PSTA.UN	DISP
0096	2059		*		
0097	2059		*		
0098	2059		*		
0099	2059	05 0F	COMD	LODI,R1	0F
0100	205B	06 10		LODI,R2	10
0101	205D	3F 21 45		BSTA.UN	SETCUR
0102	2060	FF 24		ZBSR	LFGR
0103	2062	05 F0		LODI,R1	F0
0104	2064	06 10		LODI,R2	10
0105	2066	3F 21 45		BSTA.UN	SETCUR
0106	2069	05 06		LODI,R1	LITS
0107	206B	3F 24 23		BSTA.UN	BLKW
0108	206E	3F 21 F7		BSTA.UN	FINDND
0109	2071	0F 00 04		LODA,R3	IBST
0110	2074	AF 04 61		SUBA,R3	DUMA
0111	2077	A7 01		SUBI,R3	01
0112	2079	3F 21 09		BSTA.UN	BTODCT
0113	207C	06 13		LODI,R2	13
0114	207E	05 20		LODI,R1	20
0115	2080	3F 21 45		BSTA.UN	SETCUR

← BIN → 8000 ... at blocks

LINE	ADLR	E1	E2	P3	LABEL	OPCODE	OPERAND
0116	2083	05	15			LODI, R1	COMMSG
0117	2085	3F	24	23		ESTA, UN	BLKW
0118	2088	70			RL1	REDD, R0	
0119	2089	F4	80			TMI, R0	80
0120	208B	18	7B			BCTR, EQ	RL1
0121	2090	3F	21	20		PSTA, UN	OLC
0122	2090	04	20			LODI, R0	COMS
0123	2092	05	3B			LODI, R1	COMS
0124	2094	06	11			LODI, R2	11
0125	2096	3F	22	59		PSTA, UN	ARROW
0126	2099	9C	02	83		ICFA, EQ	SUPENT
0127	209C	0C	00	3B		LODA, R0	COMS
0128	209F	3F	21	20		PSTA, UN	OLC
0129	20A2	20				EORZ, R0	
0130	20A3	C1				STRZ, R1	
0131	20A4	07	FF			LODI, R3	FF
0132	20A6	0F	20	3C	NI	LODA, R3	NAME, +
0133	20A9	18	70			BCTR, EQ	CK0
0134	20AB	E7	10			COMI, R3	10
0135	20AD	9A	2C			BCFR, LT	EADD
0136	20AF	F4	30			COMI, R0	'0'
0137	20B1	1A	26			BCTR, LT	DS
0138	20B3	E4	39			COMI, R0	'9'
0139	20B5	19	22			BCTR, GT	DS
0140	20B7	01				LODZ, R1	
0141	20B8	06	09			LODI, R2	09
0142	20BA	81			CNE	ADDZ, R1	
0143	20BE	B5	01			TPSL	CRY
0144	20BD	18	0E			BCTR, EQ	D255
0145	20BF	FA	79			BDRR, R2	ONE
0146	20C1	C1				STRZ, R1	
0147	20C2	0F	60	3C		LODA, R3	NAME, I
0148	20C5	A4	30			SUBI, R0	'0'
0149	20C7	81				ADDZ, R1	
0150	20C8	C1				STRZ, R1	
0151	20C9	B5	01			TPSL	CRY
0152	20CB	98	59			BCFR, EQ	NI
0153	20CD	05	FF		D255	LODI, R1	FF
0154	20CF	1B	0A			BCTR, UN	EADD
0155	20D1	E7	02		CK0	COMI, R3	00
0156	20D3	98	06			BCFR, EQ	EADD
0157	20D5	05	01			LODI, R1	01
0158	20E7	1B	02			BCTR, UN	EADD
0159	20E9	05	00		TS	LODI, R1	00
0160	20DE	0F	00	3B	EADD	LODA, R3	COMS
0161	20DE	E7	42			COMI, R3	'B'
0162	20F0	1C	22	0A		BCTA, EQ	BACK
0163	20E3	F7	43			COMI, R3	'C'
0164	20F5	1C	25	E2		BCTA, EQ	CHANGE
0165	20FE	F7	44			COMI, R3	'D'
0166	20FA	1C	24	2E		BCTA, EQ	DELT
0167	20ED	E7	46			COMI, R3	'F'
0168	20FF	1C	22	10		BCTA, EQ	FORWD
0169	20F2	F7	49			COMI, R3	'I'
0170	20F4	1C	22	E0		BCTA, EQ	INST
0171	20F7	E7	4C			COMI, R3	'L'
0172	20F9	1C	24	BB		BCTA, EQ	LOADER

	1	2	F7		C	R3	
	0174	20FE	1C 27 81		BCTA,EQ	BASIC	
	0175	2101	E7 53		COMI,R3	'S'	
	0176	2103	1C 25 41		BCTA,EQ	TAPEO	
	0177	2106	1F 20 59		BCTA,UN	COMD	
	0178	2109		*			
	0179	2109		*			
	0180	2109		*			
	0181	2109	E7 63	BTODCT	COMI,R3	63	
	0182	210B	99 07		BCFR,GT	NO100	
	0183	210D	04 31		LODI,R0	'1'	
	0184	210F	3F 21 E5		BSTA,UN	WRT	
	0185	2112	A7 64		SUBI,R3	64	
	0186	2114	06 00	NO100	LODI,R2	00	
	0187	2116	E7 09	SUB10	COMI,R3	09	
	0188	2118	99 06		BCFR,GT	TENIN	
	0189	211A	A7 0A		SUBI,R3	A	
	0190	211C	86 01		ADDI,R2	1	
	0191	211E	1B 76		BCTR,UN	SUB10	
	0192	2120	02	TENIN	LODZ,R2		
	0193	2121	64 30		IORI,R0	'0'	
	0194	2123	3F 21 E5		BSTA,UN	WRT	
	0195	2126	03		LODZ,R3		
	0196	2127	64 30		IO I,R0	'0'	
	0197	2129	1F 21 E5		BCTA,UN	WRT	
	0198	212C		*			
	0199	212C		*			
	0200	212C		*			
19	0201	212C	E4 2B	OLC	COMI,R0	2B	GO TO END OF FILE
	0202	212E	1C 21 EF		BCTA,EQ	ENDF	
	0203	2131	E4 2E		COMI,R0	2E	GO TO BEGINNING OF FILE
	0204	2133	1C 22 49		BCTA,EQ	BEGN	
	0205	2136	E4 20		COMI,R0		FORWARD 15 LINES
	0206	2139	1C 22 0E		BCTA,EQ	F15	
	0207	213B	E4 2F		COMI,R0	'/'	BACKWARD 15 LINES
	0208	213D	1C 22 08		BCTA,EQ	B15	
	0209	2140	17		RETC,UN		
	0210	2141		*			
	0211	2141		*			
	0212	2141		*			
	0213	2141	17 FF	MCU1	ACON	17FE	
	0214	2143	17 FF	MCUR	ACON	17FF	
	0215	2145		*			
	0216	2145		*			
	0217	2145		*			
	0218	2145	3F 23 F4	SETCUR	BSTA,UN	ERAS2	
	0219	2148	CA F7		STRR,R2	*MCU1	
	0220	214A	C9 F7		STRR,R1	*MCUR	
	0221	214C	17		RETC,UN		
	0222	214D		*			
	0223	214D		*			
	0224	214D		*			
	0225	214D	00	LINE	RES	1	
	0226	214E		*			
	0227	214E		*			
	0228	214E		*			
	0229	214E	3F 24 87	DISP	BSTA,UN	MTDA	MOVE LINE ADDRESS TO DUMMY ADDRESS

LINE	ADDR	B1	B2	B3	LABEL	OPCODE	OPERAND
0230	2151	C1				STRZ,R1	
0231	2152	20				EORZ,R0	
0232	2153	C8	EE			STRR,R0	*MCUR
0233	2155	CC	04	62		STRA,R0	DUM2
0234	2158	C8	73			STRR,R0	LINE
0235	215A	BB	24		LINENO	ZBSR	LFGR
0236	215C	08	E5			LODR,R0	*MCUR
0237	215E	44	0F			ANDI,R0	0F
0238	2160	14				RETC,EQ	
0239	2161	0D	F4	61		LODA,R1	*DUMA,I
0240	2164	1E	21	A8		BCTA,LT	CLREND
0241	2167	08	64			LODR,F0	LINE
0242	2169	84	01			ADDI,R0	1
0243	216B	C8	60			STRR,R0	LINE
0244	216D	C3				STRZ,R3	
0245	216F	F4	09			COMI,R0	09
0246	2170	19	05			BCTR,GT	TWOCH
0247	2172	3F	21	E3		BSTA,UN	WRTEBK
0248	2175	1B	07			BCTR,UN	WR2ND
0249	2177	04	31		TWOCH	LODI,R0	1
0250	2179	3F	21	E5		BSTA,UN	WRT
0251	217C	A7	0A			SUBI,R3	A
0252	217E	67	30		WR2ND	IORI,R3	0
0253	2180	03				LODZ,R3	
0254	2181	3F	21	E5		BSTA,UN	WRT
0255	2184	3F	21	E3		BSTA,UN	WRTBLK
0256	2187	0D	E4	61	NXTC	LODA,R1	*DUMA,I
0257	218A	1A	1C			BCTF,LT	CLREND
0258	218C	C3				STRZ,R3	CLEAR LAST PART OF PAGE IF END OF FILE
0259	218D	19	05			BIRR,R1	NA1
0260	218F	3F	24	9D		BSTA,UN	A1DA
0261	2192	9A	14			BCFR,LT	CLREND
0262	2194	E7	0D		NA1	COMI,R3	CRCD
0263	2196	1C	21	FA		BCTA,EQ	LINENO
0264	2199	03				LODZ,P3	
0265	219A	3F	21	E5		BSTA,UN	WRT
0266	219D	1B	68			BCTR,UN	NXTC
0267	219F				*		
0268	219F				*		
0269	219F				*		
0270	219F	20			ERASE	EORZ,R0	
0271	21A0	CC	81	43		STRA,R0	*MCUR
0272	21A3	3B	03			BSTR,UN	CLREND
0273	21A5	BB	24			ZBSR,UN	LFGR
0274	21A7	17				RETC,UN	
0275	21A8				*		
0276	21A8				*		
0277	21A8				*		
0278	21A8	0C	81	43	CLREND	LODA,R0	*MCUR
0279	21AB	F4	0F			TMI,R0	0F
0280	21AD	14				RETC,EQ	
0281	21AE	BB	24			ZBSR,UN	LFGR
0282	21F0	1F	76			BCTE,UN	CLREND
0283	21B2				*		
0284	21E2				*		
0285	21B2				*		
0286	21F2	00			FTEMP	RES	1

7	0288	21B3		*			
	0289	21F3		*			
	0290	21B3	3F 24 87	FWDX	BSTA,UN	MTDA	
	0291	21B6	C2	FWDX2	STRZ,R2		
	0292	21F7	01		LODZ,R1		
	0293	21B8	14		RETC,EQ		
	0294	21B9	20		EORZ,R0		
	0295	21BA	CC 04 62		STRA,R0	DUM2	
	0296	21BD	0E E4 61	NXTCHR	LODA,R2	*DUMA,I	
	0297	21C0	1A 1D		BCTR,LT	ENDFW	
	0298	21C2	C8 6E		STRR,R0	FTEMP	
	0299	21C4	1A 11		BIRR,R2	CRCK	
	0300	21C6	3F 24 9D		BSTA,UN	A1DA	
	0301	21C9	1A 0C		BCTR,LT	CRCK	
	0302	21CB	3F 24 69		BSTA,UN	S1DA	
	0303	21CE	06 FF		LODI,R2	FF	
	0304	21D0	04 83		LODI,R0	EBC	
	0305	21D2	CE E4 61		STRA,R2	*DUMA,I	
	0306	21D5	1B 08		BCTR,UN	ENDFW	
	0307	21D7	08 59	CRCK	LODR,R0	FTEMP	<i>crk</i>
	0308	21D9	E4 0D		COMI,R0	CRCD	
	0309	21DB	98 60		BCFR,EQ	NXTCHR	
	0310	21DL	F9 5E		BDRR,R1	NXTCHR	
	0311	21DF	CE 04 62	ENDFW	STRA,R2	DUM2	
	0312	21E2	17		RETC,UN		
	0313	21E3		*			
	0314	21E3		*			
	0315	21E3		*			
53	0316	21E3		WRBL	EQ	\$	
	0317	21F3	04 20	WRTELK	LODI,R0		
	0318	21E5		*			
	0319	21E5		*			
	0320	21E5		*			
	0321	21E5	77 10	WRT	PPSL	RS	
	0322	21E7	C3		STRZ,R3		
	0323	21E8	3F 03 96		BSTA,UN	SWCHR	
	0324	21EB	75 10		CPSL	RS	
	0325	21ED	17		RETC,UN		
	0326	21EE		*			
	0327	21EE		*			
	0328	21EE		*			
	0329	21EE	3B 07	ENDF	BSTR,UN	FINDND	
	0330	21F0	3F 24 92		BSTA,UN	MTCA	
	0331	21F3	05 01		LODI,R1	1	
	0332	21F5	1B 13		BCTR,UN	BACK	
	0333	21F7		*			
	0334	21F7		*			
	0335	21F7		*			
	0336	21F7	3F 24 87	FINDND	BSTA,UN	MTDA	
	0337	21FA	05 FF	FINDND2	LODI,R1	FF	
	0338	21FC	3F 21 B6		BSTA,UN	FWDX2	
	0339	21FF	0C 84 61		LODA,R0	*DUMA	
	0340	2202	16		RETC,LT		
	0341	2203	0C 04 62		LODA,P0	DUM2	
	0342	2206	1B 72		BCTR,UN	FINDND2	
	0343	2208		*			

LINE	ADDR	R1	B2	B3	LABEL	OPCODE	OPERAND
0344	2208				*		
0345	2208				*		
0346	2208	05	0F		R15	LODI,R1	F DECIMAL 15
0347	220A				*		
0348	220A				*		
0349	220A				*		
0350	220A	3B	0D		BACK	BSTR,UN	BACKX
0351	220C	1B	05			BCTR,UN	FBD
0352	220E				*		
0353	220E				*		
0354	220E				*		
0355	220E	05	0F		F15	LODI,R1	F DECIMAL 15
0356	2210				*		
0357	2210				*		
0358	2210				*		
0359	2210	3F	21	B3	FORWD	BSTA,UN	FWDX
0360	2213	3F	24	92	FBD	BSTA,UN	MTCA
0361	2216	1F	20	56		BCTA,UN	FBDN
0362	2219				*		
0363	2219				*		
0364	2219				*		
0365	2219	3F	24	87	BACKX	BSTA,UN	MTDA
0366	221C	C2				STRZ,R2	
0367	221D	20				EORZ,R0	
0368	221E	CC	04	62		STRA,R0	DUM2
0369	2221	85	01			ADDI,R1	1
0370	2223	1B	03			BCTR,UN	CHEK
0371	2225	0E	C4	61	SUBL	LODA,R2	*DUMA,-
0372	2228	C3			CHEK	STRZ,R3	
0373	2229	E6	00			COMI,R2	00
0374	222B	98	08			BCFR,EQ	NOSU
0375	222D	3F	24	69		BSTA,UN	SIDA
0376	2230	4C	00	03		COMA,R0	BSTART
0377	2233	1A	14			BCTR,LT	BEGN
0378	2235	E7	0D		NOSU	COMI,R3	CRCO
0379	2237	9E	6C			BCFR,EQ	SUBL
0380	2239	F9	6A			BD R,R1	SUBL
0381	223B	E6	00			COMI,R2	00
0382	223D	3C	24	9D		BSTA,EQ	A1DA
0383	2240	86	01			ADDI,R2	1
0384	2242	3C	24	9D		BSTA,EQ	A1DA
0385	2245	CE	04	62		STRA,R2	DUM2
0386	2248	17				RETC,UN	
0387	2249				*		
0388	2249				*		
0389	2249				*		
0390	2249	3B	03		BEGN	BSTR,UN	BEGIN
0391	224F	1F	20	56		BCTA,UN	FBDN
0392	224F				*		
0393	224F				*		
0394	224F				*		
0395	224F	0C	00	03	BEGIN	LODA,R0	ESTART
0396	2251	CC	04	5F		STRA,R0	CURA
0397	2254	20				EORZ,R0	
0398	2255	CC	04	60		STRA,R0	CUR2
0399	2258	17				RETC,UN	
0400	2259				*		

LINE	DI	DE	DO	DABEL	CODE	OPERAND	
0401	2253						
0402	2259						* input control char (max control = R2) in THPA
0403	2259	CC 04 63	ARROW	STRA,R0	TPMA		input char from KB
0404	225C	CD 04 64		STRA,R1	TPMA+1		
0405	225F	05 FF		LODI,R1	FF		als esc → R0 = FF
0406	2261	3F 25 A8	INLOOP	BSTA,UN	GETKB		
0407	2264	E4 1B		COMI,R0	ESC		test of escape
0408	2266	1C 22 AD		BCTA,EQ	ARROW1		
0409	2269	F4 08		COMI,R0	BS		Back space?
0410	226B	98 10		BCFR,EQ	NOBS		
0411	226D	E5 FF		COMI,R1	FF		key repeat?
0412	226F	18 70		BCTR,EQ	INLOOP		is it input of previous
0413	2271	3F 23 A3		BSTA,UN	BACK1		is it back space
0414	2274	E5 FF		COMI,R1	FF		key repeat?
0415	2276	3C 24 1A		BSTA,EQ	A1TA		THPA+1
0416	2279	8E 01		ADDI,R2	1		
0417	227B	1B 64		BCTR,UN	INLOOP		
0418	227D	E4 10	NOBS	COMI,R0	CTRLP		ctrl? (control char?)
0419	227F	98 05		BCFR,EQ	STRIN		
0420	2281	F5 FF		COMI,R1	FF		
0421	2283	98 5C		BCFR,EQ	INLOOP		
0422	2285	17		RETC,UN			
0423	2286	3F 25 C6	STRIN	BSTA,UN	CKCTRL		
0424	2289	1A 56		BCTR,LT	INLOOP		IF CONTROL CHARACTER SKIP IT
0425	228B	CD A4 63		STRA,R1	*TPMA,+		
0426	228F	F4 0D		COMI,R0	CRCO		
0427	2290	18 11		BCTR,EQ	CLRLAS		
0428	2292	FA 4D		BDRR,R2	INLOOP		als control char 0?
0429	2294	70	CRWAIT	REDD,R0			
0430	2295	F4 08		COMI,R0	BS		test of back space
0431	2297	18 48		BCTR,EQ	INLOOP		→ is it, test of CR
0432	2299	E4 0D		COMI,R0	CRCO		→ als given CR, skip char for CR.
0433	229B	98 77		BCFR,EQ	CRWAIT		
0434	229D	70	CRWT2	REDD,R0			als not CR, not
0435	229E	F4 80		TMI,R0	80		test space not?
0436	22A0	14		RETC,EQ			
0437	22A1	1B 7A		BCTR,UN	CRWT2		
0438	22A3	20	CLRLAS	EORZ,R0			als CR repeated R2 op?
0439	22A4	CD E4 63	CL	STRA,R1	*TPMA.I		real rest of not 00
0440	22A7	85 01		ADDI,R1	1		
0441	22A9	FA 79		BDRR,R2	CL		
0442	22AB	20		EORZ,R0			als of probit into char R0=0
0443	22AC	17		RETC,UN			
0444	22AD	04 FF	ARROW1	LODI,R0	FF		als escape, R0 = FF
0445	22AF	17		RETC,UN			
0446	22B0		*				
0447	22B0		*				
0448	22B0		*				
0449	22B0	3F 21 9F	INST	BSTA,UN	ERASE		
0450	22B3	3F 23 89		BSTA,UN	IBADD		
0451	22B6	3F 21 B3		BSTA,UN	FWDX		
0452	22B9	3F 24 92		BSTA,UN	MTCA		
0453	22BC	3F 21 F7		BSTA,UN	FINDND		
0454	22BF	05 00		LODI,R1	00		
0455	22C1	3F 25 A8	NEXI	BSTA,UN	GETKB		
0456	22C4	F4 08		COMI,R0	BS		
0457	22C6	1C 23 94		BCTA,EQ	BACKN		

LINE	ADDR	B1	B2	B3	IABEL	OPCODE	OPERAND
0458	22C9	E4	03			COMI,R0	ETX
0459	22CB	18	05			BCTR,EQ	BYFAS
0460	22CD	3F	25	C6		BSTA,UN	CKCTRL
0461	22D0	1A	6F			BCTR,LT	NEXI
0462	22D2	CD	E4	63	BYPAS	STRA,R1	*TMPA,I
0463	22D5	E4	03			COMI,R0	ETX
0464	22D7	18	3D			BCTR,EQ	ENDI
0465	22D9	E4	0D			COMI,R0	CRCD
0466	22DB	3C	00	24		BSTA,EQ	LFCR
0467	22DE	3F	02			BSTR,UN	INSTS
0468	22E0	1B	5F			BCTR,UN	NEXI
0469	22E2				*		
0470	22E2	04	01		INSTS	LODI,R0	1
0471	22E4	06	02			LODI,R2	2
0472	22E6	3F	24	A9		BSTA,UN	ADDANY
0473	22E9	EC	00	04		COMA,R0	IBST
0474	22EC	1A	0A			BCTR,LT	INCR
0475	22EE	3F	24	69		BSTA,UN	SIDA
0476	22F1	04	FE			LODI,R0	FE
0477	22F3	CC	04	62		STRA,R0	DUM2
0478	22F6	1B	19			BCTR,UN	ENDINS
0479	22F8	D9	0D		INCR	BIRR,R1	RETCUN
0480	22FA	04	01			LODI,R0	1
0481	22FC	8C	E4	63		ADDA,R0	TMPA
0482	22FF	EC	00	05		COMA,R0	ENDRAM
0483	2302	9A	04			BCFR,LT	STRTMP
0484	2304	CC	04	63		STRA,R0	TMPA
0485	2307	17			RETCUN	RETC,UN	
0486	2308	04	01		STRTMP	LODI,R0	1
0487	230A	06	02			LODI,R2	2
0488	230C	3F	24	03		BSTA,UN	SUBANY
0489	230F	05	FF			LODI,R1	FF
0490	2311	04	03		ENDINS	LODI,R0	ETX
0491	2313	CD	E4	63		STRA,R1	*TMPA,I
0492	2316				*		
0493	2316				*	DUMA HAS THE ADDRESS OF NEW LAST BYTE OF BUFFER	
0494	2316				*		
0495	2316	0C	04	61	ENDI	LODA,R0	DUMA
0496	2319	CC	04	63		STRA,R0	TMPA
0497	231C	0F	04	62		LODA,R3	DUM2
0498	231F	3F	21	F7		BSTA,UN	FINDND
0499	2322	3F	24	70		BSTA,UN	SDCA
0500	2325	0D	04	62		LODA,R1	DUM2
0501	2328	20				EORZ,R0	
0502	2329	CC	04	62		STRA,R0	DUM2
0503	232C	CC	04	64		STRA,R0	TMP2
0504	232F	0D	E4	61	DOWN	LODA,R1	*DUMA,I
0505	2332	CF	E4	63		STRA,R3	*TMPA,I
0506	2335	04	01			LODI,R0	1
0507	2337	06	06			LODI,R2	6
0508	2339	3F	24	03		BSTA,UN	SUBANY
0509	233C	98	05			BCFR,EQ	NOCK
0510	233E	0C	04	66		LODA,R0	BSA2
0511	2341	18	1E			BCTR,EQ	INSTDN
0512	2343				*		
0513	2343	A5	01		NCKK	SUPI,R1	1
0514	2345	E5	FF			COMI,R1	FF

0515	2341	98	20	08	LODA, EQ	LA
0516	2349	3F	24	69	BSTA, UN	S1DA
0517	234C	EC	00	03	COMA, R0	BSTART
0518	234F	1A	10		BCTR, LT	INSTDN
0519	2351	A7	01		SUBI, R3	01
0520	2353	E7	FF		COMI, R3	FF
0521	2355	08	58		BCFR, EQ	DOWN
0522	2357	0C	04	63	LODA, R0	TMPA
0523	235A	A4	01		SUBI, R0	01
0524	235C	CC	04	63	STRA, R0	TMPA
0525	235F	1B	4E		BCTR, UN	DOWN
0526	2361			*		
0527	2361	3F	23	89	INSTDN	BSTA, UN
0528	2364	3F	24	87	BSTA, UN	MTDA
0529	2367	C1			STRZ, R1	
0530	2368	20			FORZ, R0	
0531	2369	CC	04	62	STRA, R0	DUM2
0532	236C	07	FF		LODI, R3	FF
0533	236E	0F	A4	63	INSERT	LODA, R3
0534	2371	F4	03		COMI, R0	ETX
0535	2373	18	0F		BCTR, EQ	INSTE
0536	2375	CD	E4	61	STRA, R1	*DUMA, I
0537	2378	E7	FF		COMI, R3	FF
0538	237A	3C	24	1A	BSTA, EQ	A1TA
0539	237D	D9	6F		BIRR, R1	INSERT
0540	237F	3F	24	9D	BSTA, UN	A1DA
0541	2382	1A	6A		BCTR, LT	INSERT
0542	2384	0E	01		INSTE	LODI, R1
0543	2386	1F	22	0A	BCTA, UN	BACK
0544	2389			*		
0545	2389	0C	00	04	IBADD	LODA, R0
0546	238C	CC	04	63		STRA, R0
0547	238F	20				FORZ, R0
0548	2390	CC	04	64		STRA, R0
0549	2393	17				RETC, UN
0550	2394			*		
0551	2394	3B	0D		BACKN	BSTR, UN
0552	2396	1E	22	C1		BCTA, LT
0553	2399	04	01			LODI, R0
0554	239B	06	02			LODI, R2
0555	239D	3F	24	03		BSTA, UN
0556	23A0	1F	22	C1		BCTA, UN
0557	23A3			*		
0558	23A3			*		
0559	23A3			*		
0560	23A3	3F	23	D6	BACK1	BSTA, UN
0561	23A6	16				RETC, LT
0562	23A7	0C	04	66		LODA, R0
0563	23AA	A4	10			SUBI, R0
0564	23AC	CC	04	66		STRA, R0
0565	23AF	CC	81	43		STRA, R0
0566	23B2	77	08			PSSL
0567	23B4	0C	04	65		LODA, R0
0568	23B7	A4	00			SUBI, R0
0569	23B9	CC	04	65		STRA, R0
0570	23BC	CC	81	41		STRA, R0
0571	23BF	75	08			CPSL

LINE	ADDR	B1	B2	B3	LABEL	OPCODE	OPFAND
0572	23C1	04	1C			LODI,R0	1C
0573	23C3	CC	84	6F		ST A,R0	*BSA1
0574	23C6	A5	01			SUBI,R1	1
0575	23C8	F5	FF			COMI,R1	FF
0576	23CA	98	08			BCFR,FQ	NOSUB1
0577	23CC	0C	04	63		LODA,R0	TMFA
0578	23CF	A4	01			SUPI,R0	1
0579	23D1	CC	04	63		STRA,R0	TMFA
0580	23D4	20			NCSUB1	EORZ,R0	
0581	23D5	17				RETC,UN	
0582	23D6				*		
0583	23D6				*		
0584	23D6				*		
0585	23D6	0C	81	43	ERAS1	LODA,R0	*MCUR
0586	23D9	CC	04	66		STRA,R0	BSA2
0587	23DC	0C	81	41		LODA,R0	*MCU1
0588	23DF	CC	04	6F		STRA,R0	BSA1
0589	23E2	F4	10			COMI,R0	10
0590	23F4	98	08			BCFR,FQ	EROLD
0591	23E6	0C	04	6C		LODA,R0	BSA2
0592	23E9	44	F0			ANDI,R0	F0
0593	23EB	F4	50			COMI,R0	50
0594	23ED	16				RETC,LT	
0595	23FF	04	20		EROLD	LODI,R0	
0596	23F0	CC	84	65		STRA,R0	*BSA1
0597	23F3	17				RETC,UN	
0598	23F4				*		
0599	23F4	0C	81	43	ERAS2	LODA,R0	*MCUR
0600	23F7	CC	04	66		STRA,R0	BSA2
0601	23FA	0C	81	41		LODA,R0	*MCU1
0602	23FD	CC	04	65		STRA,R0	BSA1
0603	2400	1F	6C			BCTR,UN	EROLD
0604	2402				*		
0605	2402	00			STORE	RES	1
0606	2403	08	7D		SUBANY	STRE,R0	STORE
0607	2405	0E	64	60		LODA,R2	CUR2,I
0608	2408	A8	78			SUBR,R0	STORE
0609	240A	0F	64	60		STRA,R2	CUR2,I
0610	240D	77	08			PSSL	WC
0611	240F	0F	64	5F		LODA,R2	CURA,I
0612	2412	A4	00			SUBI,R0	0
0613	2414	0F	64	5F		STRA,R2	CURA,I
0614	2417	75	08			CPSI	WC
0615	2419	17				RETC,UN	
0616	241A				*		
0617	241A	04	01		A1TA	LODI,R0	1
0618	241C	8C	04	63		ADDA,R0	TMFA
0619	241F	CC	04	63		STRA,R0	TMFA
0620	2422	17				RETC,UN	
0621	2423				*		
0622	2423	0D	60	00	BLKW	LODA,R1	START,I
0623	2426	16				RETC,LT	
0624	2427	3F	21	F5		ESTA,UN	WRT
0625	242A	80	01			ADDI,R1	1
0626	242C	1F	7F			BCTR,UN	BLKW
0627	242E				*		
0628	242F	3F	21	B3	DELT	ESTA,UN	FWDX

0630	2433	05 01	LODI,R1	1	
0631	2435	1F 22 0A	BCTA,UN	BACK	
0632	2438	*			
0633	2438	0F 04 5F SHIF	LODA,R3	CURA	
0634	243B	CF 04 63	STRA,R3	TMPA	
0635	243E	0F 04 60	LODA,R3	CUR2	
0636	2441	0D 04 62	LODA,R1	DUM2	
0637	2444	20	FORZ,R0		
0638	2445	CC 04 64	STRA,R0	TMP2	
0639	2448	CC 04 62	STRA,R0	DUM2	
0640	244F	0D F4 61 UP	LODA,R1	*DUMA,I	
0641	244F	CF F4 63	STRA,R3	*TMPA,I	
0642	2451	16	RETC,LT		
0643	2452	87 01	ADDI,R3	1	
0644	2454	3C 24 1A	BSTA,FQ	A1TA	
0645	2457	D9 72	BIRR,R1	UP	
0646	2459	3F 24 9D	BSTA,UN	A1DA	
0647	245C	1A 6D	BCTR,LT	UP	
0648	245E	17	RETC,UN		
0649	245F	*			
0650	245F	00	CURA	RES	1
0651	2460	00	CUR2	RES	1
0652	2461	00	DUMA	RES	1
0653	2462	00	DUM2	RES	1
0654	2463	00	TMPA	RES	1
0655	2464	00	TMP2	RES	1
0656	2465	00	BSA1	RES	1
0657	2466	00	BSA2	RES	1
0658	2467	00	CHGA	RES	1
0659	2468	00	CHG2	RES	1
0660	2469	*			
0661	2469	08 76	S1DA	LODR,R0	DUMA
0662	246B	A4 01	SUBI,R0	1	
0663	246D	C8 72	STRR,R0	DUMA	
0664	246F	17	RETC,UN		
0665	2470	*			
0666	2470	08 70	SDCA	LODR,R0	DUM2
0667	2472	A8 6C	SUBR,R0	CUR2	
0668	2474	C8 70	STRR,R0	BSA2	
0669	2476	77 08	PFSL	WC	
0670	2478	08 67	LODR,R0	DUMA	
0671	247A	A8 63	SUBR,R0	CURA	
0672	247C	C8 67	STRR,R0	BSA1	
0673	247E	75 08	CFSL	WC	
0674	2480	04 01	LODI,R0	1	
0675	2482	06 06	LODI,R2	6	
0676	2484	1F 24 A9	BCTA,UN	ADDANY	
0677	2487	*			
0678	2487	08 56	MTDA	LODR,R0	CURA
0679	2489	C8 56	STRR,R0	DUMA	MOVE CURRENT ADDRESS TO DUMMY ADDRESS
0680	248B	0C 04 60	LODA,R0	CUR2	
0681	248E	CC 04 62	STRA,R0	DUMA+1	
0682	2491	17	RETC,UN		
0683	2492	*			
0684	2492	08 4D	MTCA	LODR,R0	DUMA
0685	2494	C8 49	STRR,R0	CURA	

LINE	ADDR	B2	B3	LABE	OPCODE	OPERAND
0686	2496	0C	04	62	LODA,R0	DUM2
0687	2499	CC	04	60	STRA,R0	CUR2
0688	249C	17			RETC,UN	
0689	249D			*		
0690	249D	04	01	A1DA	LODI,R0	01
0691	249F	8C	04	61	ADDA,R0	DUMA
0692	24A2	CC	04	61	STRA,R0	DUMA
0693	24A5	EC	00	04	COMA,R0	TEST
0694	24A8	17			RETC,UN	
0695	24A9			*		
0696	24A9	8F	64	60	ADDANY	ADDA,R2
0697	24AC	CF	64	60	STRA,R2	CUR2,I
0698	24AF	77	08		PPSL	WC
0699	24B1	20			EORZ,R0	
0700	24B2	8F	64	5F	ADDA,R2	CURA,I
0701	24B5	CF	64	5F	STRA,R2	CURA,I
0702	24B8	75	08		CPSL	WC
0703	24BA	17			RETC,UN	
0704	24BB			*		
0705	24BB	3F	25	33	LOADER	BSTA,UN
0706	24BE	3F	24	C9	BSTA,UN	AOK
0707	24C1	9C	25	3C	BCFA,EQ	SCERR
0708	24C4	1F	20	56	BCTA,UN	FBDN
0709	24C7			*		
0710	24C7			*		
0711	24C7	17	F9		SUMK	ACON
0712	24C9			*		
0713	24C9			*		
0714	24C9	3F	24	87	LOADA	BSTA,UN
0715	24CC	20			EORZ,R0	MTDA
0716	24CD	08	F8		STRR,R0	MOVE THE START ADDRESS TO DUMA
0717	24CF	3F	02	E9	BSTA,UN	CLEAR R0
0718	24D2	F7	3B		COMI,R3	CLEAR SUMCHECK
0719	24D4	98	76		BCFR,EQ	GET CHARACTER FROM TAPE
0720	24D6	05	FF		LODI,R1	COMPARE FOR START OF BLOCK CHAR
0721	24D8	3F	02	E9	BSTA,UN	IF NOT, WAIT
0722	24DB	0D	20	3C	LODA,R1	SETUP INDEX
0723	24DE	18	03		BCTR,EQ	GET NEXT CHARACTER
0724	24E0	E3			COMZ,R3	LOAD NEXT BYTE OF NAME TYPED IN
0725	24E1	98	69		BCFR,EQ	IF 0. STOP LOCKING
0726	24E3	E5	07		COMI,R1	COMPARE THE CHARACTERS
0727	24E5	98	71		BCFR,EQ	IF NOT EQUAL, GET ANOTHER BLOCK
0728	24E7	3F	02	E9	BSTA,UN	COMPARE FOR END OF NAME
0729	24FA	0C	84	C7	LODA,R0	IF NOT, DO NEXT CHARACTER
0730	24FD	16			RETC,LT	GET SUMCHECK CHAR IN
0731	24FE	15			RETC,GT	LOAD THE SUMCHECK
0732	24FF	0D	04	62	LODA,R1	IF NOT ZFRO, RETURN
0733	24F2	CC	04	62	STRA,R0	DUM2
0734	24F5	CC	00	4C	STRA,R0	DUM2
0735	24F8	3F	02	E9	BSTA,UN	ASCII
0736	24FB	03			LODZ,R3	LOAD IT INTO R0
0737	24FC	CD	F4	61	STRA,R1	*DUMA,I
0738	24FF	1A	2B		BCTR,LT	ENDING
0739	2501	D9	12		BIRR,R1	LL1
0740	2503	3F	24	9D	BSTA,UN	A1DA
0741	2506	1A	0D		BCTR,LT	LL1
0742	2508	3F	24	69	BSTA,UN	S1DA

3	05	FF	R1	S. NE. INDEX	
0744	250D	04 83	LODI,R0	ERC	PREPARE TO STORE DUMMY END OF FILE CODE
0745	250F	CD E4 61	STRA,R1	*DUMA,I	STORE IT
0746	2512	1F 25 C1	BCTA,UN	TME	TELL THE OPERATOR THAT HE TRIED TO LOAD TOO MUCH
0747	2515	0E 00 4C LL1	LODA,R2	TMPS	LOAD TMPS
0748	2518	86 01	ADDI,R2	1	ADD 1
0749	251A	CE 00 4C	STRA,R2	TMPS	STORE IT
0750	251D	98 59	BCFR,EQ	ASCII	GO DO NEXT BLOCK
0751	251F	*			
0752	251F	3F 02 E9 ENDTF	BSTA,UN	SERI	GET SUMCHECK CHARACTER
0753	2522	CD 04 62	STRA,R1	DUM2	RESTORE THE LOW BYTE OF THE POINTER
0754	2525	0F 84 C7	LODA,R3	*SUMK	LOAD THE SUMCHECK CHARACTER
0755	2528	1C 24 CC	BC A,EQ	WAIT	IF EQUAL, NO ERRORS--BRANCH
0756	252B	17	RETC,UN		RETURN OTHERWISE
0757	252C	*			
0758	252C	3F 02 E9 ENDINC	BSTA,UN	SERI	GET SUMCHECK CHARACTER
0759	252F	0C 84 C7	LODA,R0	*SUMK	LOAD THE SUMCHECK CHARACTER
0760	2532	17	RETC,UN		
0761	2533	*			
0762	2533	05 20 AOK	LODI,R1	OKMSG	GET THE ADDR OF FIRST BYTE OF MESSAGE 'OK'
0763	2535	3F 24 23	BSTA,UN	BLKW	WRITE THE LITERAL
0764	2538	3F 23 D6	BSTA,UN	ERAS1	ERASE THE CURSOR
0765	253B	17	RETC,UN		
0766	253C	*			
0767	253C	07 2D SCERR	LODI,R3	SCMSG	SETUP FOR ERROR ROUTINE
0768	253E	1F 25 94	BCTA,UN	ERRORE	WRITE ERROR MESSAGE
0769	2541	*			
0770	2541	3F 25 33 TAPEO	BSTA,UN	AOK	WRITE THE MESSAGE 'OK' ON THE SCREEN
0771	2544	0C 00 03	LODA,R0	BSTART	LOAD THE FIRST ADDR OF TXTBUF
0772	2547	CC 04 61	STRA,R0	DUMA	STORE INTO DUMA
0773	254A	20 TAPEOT	FORZ,R0		CLEAR R0
0774	254B	CC 84 C7	STRA,R0	*SUMK	CLEAR SUMCHECK
0775	254E	CC 04 62	STRA,R0	DUM2	CLEAR LOW BYTE OF POINTER
0776	2551	07 3B	LODI,R3	;	BEGINNING OF TAPE BLOCK IS SEMICOLON
0777	2553	3F 02 4F	BSTA,UN	SERO	SEND IT OUT
0778	2556	0E FF	LODI,R1	FF	SETUP THE INDEX REGISTER
0779	2558	0D 20 3C NAMO	LODA,R1	NAME, +	GET THE NEXT CHARACTER OF THE FILE NAME
0780	255B	C3	STRZ,R3		STORE INTO R3
0781	255C	3F 02 4F	BSTA,UN	SERO	SEND IT OUT
0782	255F	EF 07	COMI,R1	07	SEE IF END OF NAME
0783	2561	98 75	BCFR,EQ	NAMO	IF NOT, DO NEXT CHARACTER
0784	2563	0F 84 C7	LODA,R3	*SUMK	LOAD THE SUMCHECK SO FAR
0785	2566	3F 02 4F	BSTA,UN	SERO	SEND IT OUT
0786	2569	0E 00	LODI,R1	0	CLEAR R1
0787	256B	CD 84 C7	STRA,R1	*SUMK	STORE INTO SUMCHECK--START AGAIN
0788	256E	0D E4 61 BYTEO	LODA,R1	*DUMA,I	GET NEXT BYTE OF TEXT
0789	2571	C3	STRZ,R3		STORE INTO R3
0790	2572	1A 14	BCTR,LT	ENIO	IF END, FINISH UP
0791	2574	3F 02 4F	BSTA,UN	SERO	SERIAL OUT IT
0792	2577	D9 75	BIRR,R1	BYTEO	INCR R1, CHECK FOR OVERFLOW
0793	2579	0F 84 C7	LODA,R3	*SUMK	LOAD THE SUMCHECK CHARACTER
0794	257C	3F 02 4F	BSTA,UN	SERO	SEND IT OUT
0795	257F	3F 24 9D	BSTA,UN	AIDA	INCREMENT THE ADDRESS BY 256
0796	2582	9E 20 5C	BCFA,LT	FRDN	IF STILL IN TEXT BUFFER, GO ON
0797	2585	1F 25 4A	BCTA,UN	TAPEOT	OTHERWISE QUIT
0798	2588	*			
0799	2588	3F 02 4F ENDO	BSTA,UN	SERO	SEND OUT THE CHARACTER (END OF BLOCK)

LINE	ADDR	R1	R2	R3	LABEL	OPCODE	OPERAND
0800	258E	0F	84	C7	ENDT	LODA,R3	*SUMK LOAD SUMCHECK BYTE
0801	258E	3F	02	4F		BSTA,UN	SERO SEND IT OUT
0802	2591	1F	20	56		BCTA,UN	FBDN GET A NEW COMMAND
0803	2594				*		
0804	2594	06	13		ERRORE	LODI,R2	13
0805	2596	05	C0			LODI,R1	C0
0806	2598	3F	21	45		BSTA,UN	SETCUR
0807	259B	03				LODZ,R3	
0808	259C	C1				STRZ,R1	
0809	259D	3F	24	23		BSTA,UN	BLKW
0810	25A0	3F	23	F4		BSTA,UN	ERAS2
0811	25A3	3F	01			BSTR,UN	PAUSE
0812	25A5	1F	20	56		BCTA,UN	FBDN
0813	25A8				*		
0814	25A8	3F	25	E2	GETKB	BSTA,UN	PAUSE
0815	25AB	3F	21	E5		BSTA,UN	WRT
0816	25AE	08	01			LODR,R0	PAUSES
0817	25B0	17				RETC,UN	
0818	25B1				*		
0819	25B1	00			PAUSES	RES	1
0820	25B2				*		
0821	25B2	70			PAUSE	REDD,R0	
0822	25B3	F4	80			TMI,R0	80
0823	25B5	18	7B			BCTR,EQ	PAUSE
0824	25B7	C8	78			STRR,R0	PAUSES
0825	25B9	70			PL	REDD,R0	
0826	25BA	F4	80			TMI,R0	80
0827	25BC	98	7B			BCFR,EQ	PL
0828	25BE	08	71		PAUSE	LODR,R0	PAUSES
0829	25C0	17				RETC,UN	
0830	25C1	07	24		TME	LODI,R3	TMMSG
0831	25C3	1F	30	77		BCTA,UN	ERROR
0832	25C6				*		
0833	25C6	F4	0E		CKCTRL	COMI,R0	CRCD
0834	25C8	98	05			BCFR,EQ	CKLP12
0835	25CA	75	80			CPSL	80
0836	25CC	77	40			PPSL	40
0837	25CE	17				RETC,UN	
0838	25CF	24	FF		CKLP12	EORI,R0	FF
0839	25D1	77	10			PPSL	RS
0840	25D3	C1				STRZ,R1	
0841	25D4	24	FF			EORI,R0	FF
0842	25D6	F5	F0			TMI,R1	E0
0843	25D8	98	05			BCFR,EQ	NOCTCK
0844	25DA	77	80			PPSL	80
0845	25DC	75	50			CPSL	50
0846	25DF	17				RETC,UN	
0847	25DF	75	D0		NOCTCK	CPSL	D0
0848	25F1	17				RETC,UN	
0849	25F2				*		
0850	25F2	01			CHANGE	LODZ,R1	
0851	25F3	10	20	59		BCTA,EQ	COMD
0852	25F6	3F	23	89		BSTA,UN	IBADD
0853	25F9	A5	01			SUBI,R1	1
0854	25EB	3F	21	E3		BSTA,UN	FWDX
0855	25FE	3F	24	92		BSTA,UN	MTCA
0856	25F1	3F	21	9F		BSTA,UN	ERASE

LINE	ADDR	B1	B2	B3	LABEL	OPCODE	OPERAND
0857	2514	3F	21	F7		BSTA,UN	NDND
0858	25F7	0C	04	5F		LODA,R0	CURA
0859	25FA	CC	04	67		STRA,R0	CHGA
0860	25FD	0C	04	60		LODA,R0	CUR2
0861	2600	CC	04	68		STRA,R0	CHG2
0862	2603	05	00			LODI,R1	00
0863	2605	3F	00	24	DISPL	BSTA,UN	LFCR
0864	2608	0C	81	43		LODA,R0	*MCUR
0865	260F	F4	0F			TMI,R0	F
0866	260D	3C	21	9F		BSTA,EQ	ERASE
0867	2610	0E	04	67		LODA,R2	CHGA
0868	2613	CF	04	65		STRA,R2	PSA1
0869	2616	0F	04	68		LODA,R3	CHG2
0870	2619	0C	84	67	DISPLP	LODA,R0	*CHGA
0871	261C	1E	27	19		BCTA,LT	ENDCHG
0872	261F	F4	0D			COMI,R0	CRCD
0873	2621	18	12			BCTR,EQ	ELFND
0874	2623	3F	21	E5		BSTA,UN	WRT
0875	2626	04	01			LODI,R0	1
0876	2628	06	08			LODI,R2	8
0877	262A	3F	24	A9		BSTA,UN	ADDANY
0878	262D	EC	00	04		COMA,R0	IBST
0879	2630	1A	67			BCTR,LT	DISPLP
0880	2632	1F	27	19		BCTA,UN	ENDCHG
0881	2635	CF	04	68	ELFND	STRA,R3	CHG2
0882	2638	0C	04	65		LODA,R0	BSA1
0883	263B	CC	04	67		STRA,R0	CHGA
0884	263E	3F	00	24		BSTA,UN	LFCR
0885	2641	3F	25	A8	CHGL	BSTA,UN	GETKB
0886	2644	E4	08			COMI,R0	BS
0887	2646	98	05			BCFR,EQ	NOCHBS
0888	2648	3F	27	21		BSTA,UN	CHBACK
0889	264B	1B	74			BCTR,UN	CHGL
0890	264D	E4	15		NOCHBS	COMI,R0	CTRLU
0891	264F	98	0A			BCFR,EQ	NOCOPY
0892	2651	3F	26	CA		BSTA,UN	LOADD
0893	2654	18	6F			BCTR,EQ	CHGL
0894	2656	3F	26	E1		BSTA,UN	STRTMS
0895	2659	1B	66			BCTR,UN	CHGL
0896	265B	E4	10		NOCOPY	COMI,R0	CTRLP COPY TO END OF LINE
0897	265D	98	0A			BCFR,EQ	NOCEOL
0898	265F	3F	26	CA	COPYLP	BSTA,UN	LOADD
0899	2662	18	5D			BCTR,EQ	CHGL
0900	2664	3F	26	E1		BSTA,UN	STRTMS
0901	2667	1B	76			BCTR,UN	COPYLP
0902	2669	F4	0F		NOCEOL	COMI,R0	CTRL0
0903	266B	98	06			BCFR,EQ	NODISC
0904	266D	3F	26	CA		BSTA,UN	LOADD
0905	2670	1F	26	41		BCTA,UN	CHGL
0906	2673	C3			NCDISC	STRZ,R3	
0907	2674	F4	03			COMI,R0	ETX
0908	2676	18	06			BCTR,EQ	BYPASS
0909	2678	3F	25	C6		BSTA,UN	CKCTRL
0910	267B	1F	26	41		BCTA,LT	CHGL
0911	267E	3F	26	E5	BYPASS	BSTA,UN	STRT2
0912	2681	03				LODZ,R3	
0913	2682	F4	0D			COMI,R0	CRCD

LINE	ADDR	F1	F2	F3	LABEL	OPCODE	OPERAND
0914	2684	18	0F			BCTR,EQ	ENDCHL
0915	2686	E4	03			COMI,R0	ETX
0916	2688	9C	26	41		BCFA,EQ	CHGL
0917	268E	04	01			LODI,R0	1
0918	268D	06	02			LODI,R2	2
0919	268F	3F	24	03		BSTA,UN	SUBANY GET RID OF ETX BEING IN PICTURE
0920	2692	1F	26	A0		BCTA,UN	ENDCH
0921	2695	3F	26	CA	ENDCHL	BSTA,UN	LOADD
0922	2698	98	7B			BCFR,EQ	ENDCHL
0923	269A	3F	28	D0		BSTA,UN	AISC
0924	269L	1F	26	05		BCTA,UN	DISPL
0925	26A0				*		
0926	26A0	0C	04	61	ENDCH	LODA,R0	DUMA
0927	26A3	CC	04	65		STRA,R0	BSA1
0928	26A6	0C	04	62		LODA,R0	DUM2
0929	26A9	CC	04	66		STRA,R0	BSA2
0930	26AC	0C	04	67		LODA,R0	CHGA
0931	26AF	CC	04	61		STRA,R0	DUMA
0932	26B2	0C	04	68		LODA,R0	CHG2
0933	26B5	CC	04	62		STRA,R0	DUM2
0934	26B8	3F	24	38		BSTA,UN	SHIF
0935	26BE	0C	04	65		LODA,R0	BSA1
0936	26BE	CC	04	61		ST A,R0	DUMA
0937	26C1	0C	04	66		LODA,R0	BSA2
0938	26C4	CC	04	62		STRA,R0	DUM2
0939	26C7	1F	23	16		BCTA,UN	ENDI
0940	26CA				*		
0941	26CA	0F	84	67	LOADD	LODA,R3	*CHGA
0942	26CD	F7	0D			COMI,R3	CRCD
0943	26CF	14				RETC,EQ	
0944	26D0	04	01		AISC	LODI,R0	1
0945	26D2	06	02			LODI,R2	2
0946	26D4	3F	24	03		BSTA,UN	SUBANY
0947	26D7	04	01			LODI,R0	1
0948	26D9	06	08			LODI,R2	8
0949	26DE	3F	24	A9		BSTA,UN	ADDANY
0950	26E0	04	80			LODI,R0	80
0951	26E0	17				RETC,UN	
0952	26F1				*		
0953	26E1	03			STRTMS	LODZ,R3	
0954	26E2	3F	21	E5		BSTA,UN	WRT
0955	26E5	03			STRT2	LODZ,R3	
0956	26E6	CD	E4	63		STRA,R1	*TMPA,I
0957	26F9	04	01			LODI,R0	1
0958	26F0	06	02			LODI,R2	2
0959	26ED	3F	24	A9		BSTA,UN	ADDANY
0960	26F0	EC	00	04		COMA,R0	IBST
0961	26F3	1A	0E			ECTR,LT	A1R1
0962	26F5	3F	24	69		BSTA,UN	S1DA
0963	26F8	04	FE			LODI,R0	FE
0964	26FA	CC	04	62		STRA,R0	DUM2
0965	26FD	1F	27	19		BCTA,UN	ENDCHG
0966	2700	D9	0D		A1R1	PIRR,R1	RETCN
0967	2702	04	01			LODI,R0	1
0968	2704	8C	04	63		ADDA,R0	TMPA
0969	2707	EC	00	0E		COMA,R0	ENDRAM
0970	270A	9A	04			BCFR,LT	ABRUPT

1	CC	33	RETEN, R0	1	
0972	270F	17	RETEN	RETEN, UN	
0973	2710	04 01	ABRUPT	LODI, R0	1
0974	2712	06 02		LODI, R2	2
0975	2714	3F 24 03		BSTA, UN	SUBANY
0976	2717	05 FF		LODI, R1	FF
0977	2719	04 03	ENDCHG	LODI, R0	ETX
0978	271B	CD E4 63		STRA, R1	*TMPA, I
0979	271E	1F 26 A0		BCTA, UN	ENDCH
0980	2721		*		
0981	2721	3F 23 A3	CHBACK	BSTA, UN	BACK1
0982	2724	16		RETEN, LT	
0983	2725	04 01		LODI, R0	1
0984	2727	06 02		LODI, R2	2
0985	2729	3F 24 03		BSTA, UN	SUBANY
0986	272C	17		RETEN, UN	
0987	272D		ON	EQU	0
0988	272D		*	PRNT	ON
0989	272D		*		
0990	272D		*	FLOATING POINT ROUTINE EQUATES	
0991	272D		*		
0992	272D		*		
0993	272D		LEN	EQU	4
0994	272D		LEN2	EQU	LEN+LEN 2 X THE LENGTH
0995	272D		LEN4	EQU	LEN2+LEN2 4 X THE LENGTH
0996	272D		LEN8	EQU	LEN4+LEN4 8 X THE LENGTH
0997	272D		MLEN	EQU	LEN8-7 USED IN THE MULTIPLY ROUTINE
0998	272D		DLEN	EQU	LEN8-1 USED IN THE DIVIDE ROUTINE
0999	272D		*		
1000	272D		*		
1001	272D		*	MAKE THE INPT POINTER EQUAL TO THE CURA POINTER IN THE EDITOR	
1002	272D		*		
1003	272D		*		
1004	272D		INPT	EQU	CURA
1005	272D		*		
1006	272D		*		
1007	272D		*	DIRCUR SETS UP THE CURSOR ADDRESS TO LINE 14 POS 4	
1008	272D		*		
1009	272D		*		
1010	272D		DIRCUR	EQU	10
1011	272D		DIRCUA	EQU	4E
1012	272D		*		
1013	272D		*		
1014	272D		*	GENERAL DEFINITIONS	
1015	272D		*		
1016	272D		*		
1017	272D		SDFLT	EQU	A
1018	272D		CR	EQU	0D
1019	272D	00 00 00	INTSTG	RES	4
1020	2731	00 00 00	PRCSTG	RES	4
1021	2735	00	DATA		00
1022	2736	00 00 00	NAMPUF	RES	F
1023	2745	00 00	ADR	RES	2
1024	2747	00	FLAG	RES	1
1025	2748	00 00 00	OPA	RES	LEN
1026	274C	00	SIGN	RES	1
1027	274D	00 00 00	OPB	RES	LEN2

CC 04 63 STRA, R0 TMPA

LINE	ADDR	B1	B2	B3	LABEL	OPCODE	OPERAND
1028	2755	00	00	00	CPSTK	RES	10
1029	2765	00	00	00	LIN	RES	4
1030	2769	00	00	00	LINNUM	RES	4
1031	278D	00	00	00	INBUF	RES	14
1032	2781				*		
1033	2781				*		
1034	2781				*		
1035	2781	00	00	04	BASIC	LODA,R0	YBST GET START OF BASIC'S RAM
1036	2784	CC	15	24		STRA,R0	TABEND INITILIZE END OF VARIABLE TABLE
1037	2787	00	00	05		LODA,R0	ENDRAM GET THE END OF RAM LOCATION
1038	278A	CC	12	CF		STRA,R0	SP INITIALIZE GOSUB STACK POINTER
1039	278D	00	00	03		LODA,R0	BSTART START OF WHERE TO LOOK FOR DATA STATEMENTS
1040	2790	CC	00	5F		STRA,R0	DATPNT
1041	2793	20				BORZ,R0	CLEAR R0
1042	2794	CC	08	48		STRA,R0	PLINE NO LINE BREAKPOINT YET
1043	2797	CC	13	02		STRA,R0	PEATA NO DATA READY YET
1044	279A	CC	15	25		STRA,R0	TABEND+1 *----
1045	279D	CC	00	60		STRA,R0	DATPNT+1 * ZERO LOW BYTES OF POINTERS
1046	27A0	CC	12	D0		STRA,R0	SP+1 *----
1047	27A3	CC	1E	64		STRA,R0	RNDSTR
1048	27A6	CC	95	24		STRA,R0	*TABEND
1049	27A9	3F	21	9F		BSTA,UN	ERASE ERASE THE SCREEN
1050	27AC				*		
1051	27AC	07	01		OPTION	LODI,R3	1 OPTION
1052	27AE	3F	30	9B		BS A,UN	DIRWRT WRITE IT ON DIRECTIVE LINE
1053	27B1	3F	25	A8	OPT1	BSTA,UN	GETKB GET KEY. WRITE ON SCREEN
1054	27B4	E4	1B			COMI,R0	ESC
1055	27B6	1C	20	4E		BCTA,EQ	EDITOR ESCAPE, DONE WITH BASIC
1056	27B9	E4	52			COMI,R0	'R'
1057	27BB	18	14			BCTR,EQ	NORMOP R IS FOR NORMAL EXECUTION
1058	27BD	E4	53			COMI,R0	'S'
1059	27BF	1C	28	04		BCTA,EQ	STEPR S IS STEP MODE
1060	27C2	E4	4C			COMI,R0	'L'
1061	27C4	1C	28	29		BCTA,EQ	BLINE L IS TO SET BREAKPOINT LINE
1062	27C7	E4	49			COMI,R0	'I'
1063	27C9	1C	28	60		BCTA,EQ	INSVS I IS TO INSPECT VARIABLES
1064	27CC	3F	30	B6		BSTA,UN	RECCUR <i>return cursor</i>
1065	27CF	1B	5B			BCTR,UN	OPTION NO MATCH, TRY AGAIN
1066	27D1				*		
1067	27D1	07	06		NORMOP	LODI,R3	6
1068	27D3	3F	30	C7		BSTA,UN	WRTM 'EXECUTING'
1069	27D6	3F	22	4E		BSTA,UN	BEGIN <i>- 2nd "in put" or 16bit char</i>
1070	27D9	3F	30	B6		BSTA,UN	RECCUR
1071	27DC	00	08	48	NORM1	LODA,R0	PLINE <i>00 = line breakpoint</i>
1072	27DF	18	11			BCTR,EQ	NORM6 NO LINE BREAKPOINT
1073	27E1	3F	33	EE		BSTA,UN	GETLIN GET LINE NUMBER 'ASCII'
1074	27E4	05	04			LODI,R1	4 DO 4 BYTE COMPARE
1075	27E6	0D	47	65	NORM5	LODA,R1	LIN.- GET CHARACTER FROM STORED WORD
1076	27E9	ED	67	69		COMA,R1	LINNUM,I CHECK FOR MATCH
1077	27EC	98	04			BCFR,EQ	NORM6 NO MATCH, EXECUTE INSTRUCTION
1078	27EE	59	76			BRNR,R1	NORM5 CHECK FOR DONE
1079	27F0	1B	18			BCTR,UN	STEP DONE, SWITCH TO STEP MODE
1080	27F2	70			NORM6	REED,R0	READ KEYBOARD PORT
1081	27F3	E4	1B			COMI,R0	ESC TEST FOR ESCAPE KEY PRESSED
1082	27F5	98	06			BCFR,EQ	NORM7
1083	27F7	3F	25	B9		BSTA,UN	PL <i>clear breakpoint?</i>
1084	27FA	1F	27	AC		BCTA,UN	OPTION

LINE	ADDR	BT	BE	BS	DATA	CODE	COMMENT
1085	27FD	04	2F		LODI,R0		
1086	27FF	05	DC		LODI,R1	NORM1	set return addr. over key
1087	2801	1F	28	98	BCTA,UN	EXEC	EXECUTE INSTRUCTION
1088	2804				*		
1089	2804	3F	30	B6	STEPR	BSTA,UN	RECCUR
1090	2807	3F	22	4E		BSTA,UN	BEGIN
1091	280A	07	09		STEP	LODI,R3	9 'STEP MODE'
1092	280C	3F	30	9B		BSTA,UN	DIRWRT
1093	280F	3F	28	8B		BSTA,UN	SHINPT
1094	2812	06	FF		LODI,R2	FF	
1095	2814	3F	28	65		BSTA,UN	SHLIN
1096	2817	3F	30	B6		BSTA,UN	RECCUR
1097	281A	3F	2E	B2		BSTA,UN	PAUSE
1098	281D	E4	1B		COMI,R0	ESC	CHECK FOR ESCAPE
1099	281F	1C	27	AC	BCTA,EQ	OPTION	ESCAPE, RETURN TO OPTION
1100	2822	04	28		LODI,R0	STEP	
1101	2824	05	0A		LODI,R1	STEP	SETUP RETURN ADDRESS FOR EXEC
1102	2826	1F	28	98	BCTA,UN	EXEC	NOT ESCAPE, EXECUTE THIS INSTRUCTION
1103	2829				*		
1104	2829	07	0A		BLINE	LODI,R3	0A
1105	282B	3F	30	A5		BSTA,UN	DIRWNL
1106	282E	04	27		LODI,R0	LIN	'BREAKPOINT AT LINE NUMBER'
1107	2830	05	65		LODI,R1	LIN	
1108	2832	06	04		LODI,R2	4	GET BUFFER TO STORE AT
1109	2834	3F	22	59	BSTA,UN	ARROW	GET 4 CHARACTERS MAXIMUM
1110	2837	1E	05		BCTR,EQ	BLINE1	GET STRING FROM KEYBOARD
1111	2839	20			FORZ,R0		NO ESCAPE PRESSED
1112	283A	C8	0C		STRR,R0	PLINE	
1113	283C	1B	04		BCTR,UN	RECOPT	
1114	283F	04	FF		LODI,R0	FF	
1115	2840	C8	06		STRR,R0	PLINE	
1116	2842	3F	30	B6	RECOPT	BSTA,UN	RECCUR
1117	2845	1F	27	AC		BCTA,UN	OPTION
1118	2848				*		
1119	2848				*		
1120	2848				*		
1121	2848	00			PLINE	RES	1
1122	2849				*		
1123	2849				*		
1124	2849				*		
1125	2849	07	0D		INSVAR	LODI,R3	0D 'INSPECT VARIABLE'
1126	284B	3F	30	9B		BSTA,UN	DIRWRT
1127	284E	3F	28	FC		BSTA,UN	AROWCR
1128	2851	04	28		LODI,R0	INSVRT	
1129	2853	CC	0E	96		STRA,R0	RTNADR
1130	2856	04	5D		LODI,R0	INSVRT	
1131	2858	C8	3D		STRR,R0	RTNADR+1	
1132	285A	1F	2E	7D		BCTA,UN	PRINT
1133	285D	3F	29	2F	INSVRT	BSTA,UN	RECBT
1134	2860	3F	30	B6	INSVS	BSTA,UN	RECCUR
1135	2863	1B	64		BCTR,UN	INSVAR	
1136	2865				*		
1137	2865				*		
1138	2865				*		
1139	2865	05	50		SHLIN	LODI,R1	50
1140	2867	5A	05		SHLIN1	PRNR,R2	SHLIN3
1141	2869	04	5F		LODI,R0		

LINE	ADDR	P1	P2	P3	LABEL	OPCODE	OPERAND
1142	286B	3F	21	E5		BSTA,UN	WRT
1143	286E	A6	01		SHLIN3	SUBI,R2	1
1144	2870	08	97			LODR,R0	*SHPNT GET INPUT CHARACTER
1145	2872	E4	0D			COMI,R0	CR
1146	2874	14				RETC,EQ	
1147	2875	3F	21	E5		BSTA,UN	WRT PRINT CHARACTER
1148	2878	08	10			LODR,R0	SHPNT+1
1149	287A	84	01			ADDI,R0	1
1150	287C	C8	0C			STRR,R0	SHPNT+1
1151	287E	9E	06			BCFR,EQ	SHLIN2
1152	2880	08	07			LODR,R0	SHPNT
1153	2882	84	01			ADDI,R0	1
1154	2884	C8	03			STRR,R0	SHPNT
1155	2886	FE	5F		SHLIN2	BDDR,R1	SHLIN1
1156	2888	17				RETC,UN	
1157	2889				*		
1158	2889				*		
1159	2889				*		
1160	2889	00	00		SHPNT	RES	2
1161	288B				*		
1162	288B				*		
1163	288B				*		
1164	288E	0C	04	5F	SHINPT	LODA,R0	INPT
1165	288E	C8	79			STRR,R0	SHPNT SAVE INPUT POINTER FOR POSSIBLE ERROR
1166	2890	0C	04	60		LODA,R0	INPT+1
1167	2893	C8	75			STRR,R0	SHPNT+1
1168	2895	17				RETC,UN	
1169	2896				*		
1170	2896				*		
1171	2896				*		
1172	2896	00	00		RTNADR	RES	2
1173	2898				*		
1174	2898				*		
1175	2898				*		
1176	2898	C8	7C		EXEC	STRR,R0	RTNADR
1177	289A	C9	7B			STRR,R1	RTNADR+1
1178	289C	0C	84	5F		LODA,R0	*INPT
1179	289F	E4	2A			COMI,R0	*
1180	28A1	1C	33	CC		BCTA,EQ	SKPLIN
1181	28A4	3E	65			BSTR,UN	SHINPT.
1182	28A6	3F	33	EE		BSTA,UN	GETLIN
1183	28A9	04	29			LODI,R0	COMTBL
1184	28AB	05	3A			LODI,R1	COMTBL
1185	28AC	3F	08			BSTR,UN	TABUP
1186	28AF	9C	2D	47		BCFA,EQ	LET DO IMPLIED LET IF NO COMMAND
1187	28B2	1F	A8	FA		BCTA,UN	*DST
1188	28B5				*		
1189	28B5	00	00		TABSTG	RES	2
1190	28B7				*		
1191	28B7	C8	7C		TABUP	STRR,R0	TABSTG
1192	28B9	C9	7B			STRR,R1	TABSTG+1
1193	28BB	3F	31	DB	TABLOK	BSTA,UN	SKPDEC SKIP SPACES - set up pointer if re-echo, re-word
1194	28BE	3F	31	F3		BSTA,UN	SINPT INPUT POINTER NOW SET AT INPUT WORD - set up pointer in STEMT
1195	28C1	05	FF			LODI,R1	FF R1 IS INDEX FOR COMMAND TABLE
1196	28C3	3F	33	D5	GETC2	BSTA,UN	GETCHR GET NEXT CHARACTER
1197	28C6	0D	A8	B5		LODA,R1	*TABSTG,+ GET CHARACTER FROM COMMAND TABLE
1198	28C9	E4	2E			COMI,R2	CHECK FOR END OF WORD

S	18	1E	EQ	L	E	MAT
1200	28CD E3		COMZ,R3			CHECK FOR INPUT TABLE MATCH
1201	28CE 18 73		BCTR,EQ	GETC2		<i>BCTR, E8 GETC3 and word, two more</i>
1202	28D0 0D A8 B5	GETC3	LODA,R1	*TABSTG,+	<i>open match:</i>	
1203	28D3 F4 2E		CCMI,R0			
1204	28D5 98 79		BCTR,EQ	GETC3		SKIP TO END OF WORD
1205	28D7 85 03		ADDI,R1	3		
1206	28D9 0D E8 B5		LODA,R1	*TABSTG,I		GET POSSIBLE END OF TABLE
1207	28DC 1A 07		BCTR,LT	GETC4		END CF TABLE. DO IMPLIED LET
1208	28DE A5 01		SUBI,R1	1		RESET COMMAND POINTER
1209	28E0 3F 32 00		BSTA,UN	RINPT		RESET INPUT POINTER <i>from STEM?</i>
1210	28E3 1E 5E		BCTR,UN	GETC2		
1211	28E5 3F 32 00	GETC4	BSTA,UN	RINPT		
1212	28E8 04 01		LODI,R0	1		SET CC TO GT <i>also implied let</i>
1213	28EA 17		RETC,UN			
1214	28EB 0D A8 B5	GETC5	LODA,R1	*TABSTG,+		GET HI BYTE OF ROUTINE ADDRESS
1215	28EE C8 0A		STRR,R0	DST		
1216	28F0 0D A8 B5		LODA,R1	*TABSTG,+		GET LOW BYTE OF ROUTINE ADDRESS
1217	28F3 C8 06		STRR,R0	DST+1		
1218	28F5 3F 31 DE		BSTA,UN	DECPT		
1219	28F8 20		EORZ,R0			CLEAR CONDITION CODE BITS
1220	28F9 17		RETC,UN			
1221	28FA	*				
1222	28FA	*				
1223	28FA	*				
1224	28FA 00 00	DST	RES	2		
1225	28FC	*				
1226	28FC	*				
1227	28FC	*				
1228	28FC 04 27	AROWCR	LODI,R0	INBUF		
1229	28FE 05 6D		LODI,R1	INBUF		
1230	2900 06 13		LODI,R2	13		GET 19 CHARACTERS MAXIMUM
1231	2902 3F 22 59		BSTA,UN	ARROW		
1232	2905 9C 27 AC		BCFA,EQ	OPTION		GO TO OPTION IF ESCAPE PRESSED
1233	2908 0F 14		LODI,R1	14		START ECL SEARCH AT LAST CHARACTERS
1234	290A 0D 47 6D	ACR3	LODA,R1	INBUF,-		GET CHARACTER FROM INPUT
1235	290D 58 04		BRNR,R0	ACR2		SEARCH FOR NON-ZERO ENTRY
1236	290F 59 79		BRNR,R1	ACR3		CHECK FOR END OF BUFFER
1237	2911 A5 01		SUBI,R1	1		
1238	2913 04 0D	ACR2	LODI,R0	CR		
1239	2915 CD 27 6D		STRA,R1	INBUF,+		STORE EOL AFTER VARIABLE
1240	2918 0C 04 5F		LODA,R0	INPT		SAVE INPUT POINTER
1241	291B C8 10		STRR,R0	BTEMP		
1242	291D 0C 04 62		LODA,R0	INPT+1		
1243	2920 C8 0C		STRR,R0	BTEMP+1		
1244	2922 04 27		LODI,R0	INBUF		GET NEW INPUT
1245	2924 CC 04 5F		STRA,R0	INPT		
1246	2927 04 6D		LODI,R0	INBUF		
1247	2929 CC 04 60		STRA,R0	INPT+1		
1248	292C 17		RETC,UN			
1249	292D	*				
1250	292D	*				
1251	292D	*				
1252	292D 00 00	BTEMP	RES	2		
1253	292F	*				
1254	292F	*				
1255	292F	*				

LINE	ADDR	B1	B2	B3	LABEL	OPCODE	OPERAND		
1256	292F	08	7C		RECBT	LODR,R0	BTEMP		
1257	2931	00	04	5F		STRA,R0	INPT	RECOVER SAVED INPUT POINTER	
1258	2934	08	79			LODR,R0	BTEMP+1		
1259	2936	00	04	60		STRA,R0	INPT+1		
1260	2939	17				RETC.UN			
1261	293A				*				
1262	293A				*				
1263	293A				*				
1264	293A	4C	45	54	COMTBL	ALIT	'LET.'		
1265	293E	2D	47			ACON	LET		L 1
1266	2940	50	52	49		ALIT	'PRINT.'		
1267	2946	2E	7D			ACON	PRINT		P 3
1268	2948	49	46	2E		ALIT	'IF.'		
1269	294F	2E	3A			ACON	IF		I 2
1270	294D	47	4F	54		ALIT	'GOTO.'		
1271	2952	2B	49			ACON	GOTO		G 2
1272	2954	47	4F	53		ALIT	'GOSUB.'		
1273	295A	2P	3E			ACON	GOSUB		G 1
1274	295C	52	45	54		ALIT	'RETURN.'		
1275	2963	2F	E3			ACON	RETURN		R 3
1276	2965	46	4F	52		ALIT	'FOR.'		
1277	2969	2C	87			ACON	FOR		F 1
1278	296B	4E	45	58		ALIT	'NEXT.'		
1279	2970	2D	AD			ACON	NEXT		N 1
1280	2972	49	4E	50		ALIT	'INPUT.'		
1281	2978	2F	CC			ACON	INPUT		I
1282	297A	44	41	54		ALIT	'DATA.'		
1283	297F	33	CC			ACON	SKPLIN		D 2
1284	2981	4F	52	41		ALIT	'ERASE.'		
1285	2987	29	F9			ACON	ERASEB		E 3
1286	2989	52	45	41		ALIT	'READ.'		
1287	298F	2C	DE			ACON	READ		R
1288	2990	50	45	45		ALIT	'PEEK.'		
1289	2995	2A	58			ACON	PEEK		P
1290	2997	50	4F	4B		ALIT	'POKE.'		
1291	299C	2A	01			ACON	POKE		P
1292	299E	45	58	54		ALIT	'EXTIN.'		
1293	29A4	2A	90			ACON	EXTIN		E
1294	29A6	45	58	54		ALIT	'EXTOUT.'		
1295	29AD	2A	7F			ACON	EXTOUT		E
1296	29AF	44	49	4D		ALIT	'DIM.'		
1297	29B3	2A	CA			ACON	DIM		D
1298	29B5	52	45	53		ALIT	'RESTORE.'		
1299	29BD	2C	61			ACON	RFSTOR		R
1300	29BF	43	41	4C		ALIT	'CALL.'		
1301	29C4	29	FF			ACON	USER		C 1
1302	29C6	53	54	4F		ALIT	'STOP.'		
1303	29CB	2A	99			ACON	STOP		S 1
1304	29CD	FF				DATA	FF		
1305	29CE				*				
1306	29CE				*				
1307	29CE				*				
1308	29CE	44	41	54	COMTB2	ALIT	'DATA.'		
1309	29D3	0F	00			ACON	0		
1310	29D5	54	4F	2E		ALIT	'TO.'		
1311	29D8	00	01			ACON	1		
1312	29DA	53	54	45		ALIT	'STFP.'		

3	02								
1314	29E1	53 54 4F		ALIT		STOP.			
1315	29E6	00 03		ACON		3			
1316	29E8	FF		DATA		FF			
1317	29E9		*						
1318	29E9		*						
1319	29E9		*						
1320	29E9		*	FRASE	CR				
1321	29E9		*						
1322	29E9		*						
1323	29E9		*						
1324	29E9	3F 21 9F	ERASEB	BSTA,UN	ERASE				
1325	29EC	1F 33 C0		BCTA,UN	NXTLIN				
1326	29EF		*						
1327	29EF		*						
1328	29EF		*						
1329	29EF		*	CALL	<EXPR> CR				
1330	29EF		*						
1331	29EF		*						
1332	29EF		*						
1333	29EF	3F 2A 0F	USER	BSTA,UN	EVALNS	GET DESTINATION			
1334	29F2	3B 08		BSTR,UN	STRCT				
1335	29F4	3F A9 FA		BSTA,UN	*CTEMP	DO THE ASSEMBLY LANGUAGE SUBROUTINE			
1336	29F7	1F 33 C0		BCTA,UN	NXTLIN				
1337	29FA		*						
1338	29FA		*						
1339	29FA		*						
1340	29FA	00 00	CTEMP	RES	2				
1341	29FC		*						
1342	29FC		*						
1343	29FC		*						
1344	29FC	C8 7C	STRCT	STRR,R0	CTEMP				
1345	29FE	C9 7B		STRR,R1	CTEMP+1				
1346	2A00	17		RETC.UN					
1347	2A01		*						
1348	2A01		*						
1349	2A01		*						
1350	2A01		*	POKE	<EXPR> , <EXPR> CR				
1351	2A01		*						
1352	2A01		*						
1353	2A01		*						
1354	2A01	3B 0C	POKE	BSTR,UN	EVALNS	GET DESTINATION LOCATION			
1355	2A03	3B 77		BSTR,UN	STRCT				
1356	2A05	3F 33 E7		BSTA,UN	SKPCOM				
1357	2A08	3B 05		BSTR,UN	EVALNS	GET DATA			
1358	2A0A	C9 EE		STRR,R1	*CTEMP	STORE VALUE			
1359	2A0C	1F 33 C0		BCTA,UN	NXTLIN				
1360	2A0F		*						
1361	2A0F		*						
1362	2A0F		*						
1363	2A0F	3F 35 4B	EVALNS	BSTA,UN	EVAL				
1364	2A12	3B 3B	ENS	BSTR,UN	NOSTR				
1365	2A14	3F 3C F5	ENS1	BSTA,UN	POPC1				
1366	2A17		*						
1367	2A17		*						
1368	2A17		*						
1369	2A17	0C 13 8F	DTBNL	LODA,R0	CBUF1+1				

LINE	ADDR	B1	B2	R3	LABEL	OPCODE	OPERAND
1370	2A1A	18	2D			BCTR,EQ	DTOB3 BRANCH IF NUMBER IS ZERO
1371	2A1C	0F	13	8D		LODA,R3	CBUF1
1372	2A1F	99	28			BCFR,GT	DTOB3
1373	2A21	E7	10			COMI,R3	10
1374	2A23	1D	30	6E		BCTA,GT	ERR15
1375	2A26	04	10			LODI,R0	10
1376	2A28	A3				SUBZ,R3	
1377	2A29	C3				STRZ,R3	
1378	2A2A	0E	13	90		LODA,R2	CBUF1+3
1379	2A2D	0D	13	8F		LODA,R1	CBUF1+2
1380	2A30	0C	13	8E		LODA,R0	CBUF1+1
1381	2A33	77	08			PPSL	WC
1382	2A35	D2				RRL,R2	
1383	2A36	D1				RRL,R1	
1384	2A37	D0				RRL,R0	
1385	2A38	E7	00		DTOB2	COMI,R3	0
1386	2A3A	98	03			BCFR,EQ	DTOB1
1387	2A3C	75	08			CPSL	WC
1388	2A3E	17				RETC,UN	
1389	2A3F	77	01		DTOB1	PPSL	CRY CLEAR BORROW
1390	2A41	A7	01			SUBI,R3	1
1391	2A43	75	01			CPSL	CRY
1392	2A45	50				RRR,R0	
1393	2A46	51				RRR,R1	
1394	2A47	1B	6F			BCTR,UN	DTOB2
1395	2A49	20			DTOB3	FORZ,R0	
1396	2A4A	C1				STRZ,R1	
1397	2A4B	17				RETC,UN	
1398	2A4C			*			
1399	2A4C			*			
1400	2A4C			*			
1401	2A4C	3F	35	4B	ENOSTR	BSTA,UN	EVAL
1402	2A4F	14			NOSTR	RETC,EQ	FLOATING POINT
1403	2A50	1F	30	56		BCTA,LT	ERR2 TYPE MISMATCH
1404	2A53	07	0C		ERR4	LODI,R3	0C
1405	2A55	1F	30	77		BCTA,UN	ERROR
1406	2A58			*			
1407	2A58			*			
1408	2A58			*			
1409	2A58			*		PEEK <EXPR> , <EXPR> CR	
1410	2A58			*			
1411	2A58			*			
1412	2A58			*			
1413	2A58	3F	2A	0F	PEEK	BSTA,UN	EVALNS GET SOURCE LOCATION
1414	2A5B	3F	29	FC		BSTA,UN	STRCT
1415	2A5E	0D	89	FA		LODA,R1	*CTEMP
1416	2A61	20			PEEK1	FORZ,R0	
1417	2A62	3F	2A	A1		BSTA,UN	BTODNL CONVERT IT TO DECIMAL
1418	2A65	3F	33	F7		BSTA,UN	SKPCOM
1419	2A68	3F	34	67		BSTA,UN	GCVAR GET DESTINATION VARIABLE
1420	2A6B	3E	62			BSTR,UN	NOSTR
1421	2A6D	3F	34	0D		BSTA,UN	STROP2
1422	2A70	04	33			LODI,R0	CBUF1
1423	2A72	05	8D			LODI,R1	CBUF1 GET SOURCE
1424	2A74	3F	34	14		BSTA,UN	STROP1
1425	2A77	07	04			LODI,R3	LEN DO 4 BYTE TRANSFER
1426	2A79	3F	33	47		BSTA,UN	MOVEB1 TRANSFER SOURCE TO DESTINATION

27	C 1	C0	A,UN	1
1428	2A7F	1F33 C0	BCTA,UN	NXTLIN
1429	2A7F			
1430	2A7F			
1431	2A7F		EXTOUT	<EXPR> , <EXPR> CR
1432	2A7F			
1433	2A7F			
1434	2A7F			
1435	2A7F	3F 2A 0F	EXTOUT	BSTA,UN EVALNS GET PORT ADDRESS
1436	2A82	CD 0A 8C	STRA,R1	WRTEP+1 STORE IT IN THE PORT ADDRESS
1437	2A85	3F 33 E7	BSTA,UN	SKPCOM
1438	2A88	3F 2A 0F	BSTA,UN	EVALNS GET DATA
1439	2A8B	DE 00	WRTEP	WRTE,R1 00 WRITE THE DATA IN THE CORRECT PCRT
1440	2A8D	1F 33 C0	BCTA,UN	NXTLIN
1441	2A90			
1442	2A90			
1443	2A90			
1444	2A90		EXTIN	<EXPR> , <EXPR> CR
1445	2A90			
1446	2A90			
1447	2A90			
1448	2A90	3F 2A 0F	EXTIN	BSTA,UN EVALNS GET PORT ADDRESS
1449	2A93	C9 01	STRR,R1	\$+3 PUT IN PORT REFERENCE
1450	2A95	55 00	REDE,R1	0 READ THE SELECTED PORT
1451	2A97	1B 48	BCTR,UN	PEEK1
1452	2A99			
1453	2A99			
1454	2A99			
1455	2A99		STOP	CR
1456	2A99			
1457	2A99			
1458	2A99			
1459	2A99	07 0E	STOP	LODI,R3 0E 'STOPPED'
1460	2A9B	3F 30 C7	BSTA,UN	WPTM
1461	2A9E	1F 27 AC	BCTA,UN	OPTION
1462	2AA1			
1463	2AA1			
1464	2AA1			
1465	2AA1	77 08	BTODNL	PPSL WC
1466	2AA3	75 01	CPSL	CRY
1467	2AA5	50	RRR,R0	
1468	2AA6	51	RRR,R1	
1469	2AA7	06 00	LODI,R2	0
1470	2AA9	52	RRR,R2	
1471	2AAA	07 10	LODI,R3	10
1472	2AAC	CF 07 4D	STRA,R3	OPB
1473	2AAF	CC 07 4E	STRA,R0	OPB+1
1474	2AB2	CF 07 4F	STRA,R1	OPB+2
1475	2AB5	CE 07 50	STRA,R2	OPB+3
1476	2ABB	3F 39 94	BSTA,UN	NORM
1477	2ABB	04 02	LODI,R0	2
1478	2ABD	03	LPSL	
1479	2ABE	07 04	LODI,R3	4
1480	2AC0	0F 47 4D	BTOD2	LODA,R3 OPR,-
1481	2AC3	CF 73 8D	STRA,R3	CPUF1,1
1482	2AC6	5B 78	BRNR,R3	BTOD2
1483	2AC8	17	RETC,UN	

LINE	ADDR	F1	B2	B3	LABEL	OPCODE	OPERAND
1484	2AC9				*		
1485	2AC9				*		
1486	2AC9				*		
1487	2AC9	00			DIMSTG	RES	1
1488	2ACA				*		
1489	2ACA				*		
1490	2ACA				*		
1491	2ACA				*	DIM <VAR> (<EXPR>) [, <VAR>...] CR	
1492	2ACA				*		
1493	2ACA				*		
1494	2ACA				*		
1495	2ACA	3F	33	53	DIM	BSTA, UN	GETNAM <i>in NAMBASE</i>
1496	2ACD	CF	14	A5		STRA, R2	OPLTH <i>length, mean- store status</i>
1497	2AE0	13				SPSL	
1498	2AD1	C8	76			STRR, R0	DIMSTG
1499	2AD3	3F	33	E0		BSTA, UN	SKPSP
1500	2AD6	F7	28			COMI, R3	
1501	2AD8	9C	33	C7		BCFA, EQ	ERR1 <i>subroutine</i>
1502	2ADB	3F	3A	AA		BSTA, UN	GET3C <i>3rd char (length) into R2</i>
1503	2ADF	02				LODZ, R2	
1504	2ADF	C1				STRZ, R1	
1505	2AE0	08	67			LODR, R0	DIMSTG <i>count status</i>
1506	2AF2	93				LPSL	
1507	2AF3	1D	30	66		BCTA, GT	ERR11 <i>CC = GT, decm never next found</i>
1508	2AE6	1A	3E			BCTR, LT	DIMST <i>CC = LT last string</i>
1509	2AEB	20				FORZ, R0	
1510	2AE9	C9	5E			STRR, R1	DIMSTG <i>length string</i>
1511	2AFB	77	08			PPSL	WC <i>CRD + 41 in R0, R1 (FRNK/ = 4 byte) 64 bits + 2 digits EXP</i>
1512	2AED	I1				RRL, R1	
1513	2AEF	D0				RRL, R0	
1514	2AEF	D1				RRL, R1	
1515	2AF0	D0				RRL, R0	
1516	2AF1	45	FC			ANDI, R1	FC
1517	2AF3	75	08			CPSL	WC
1518	2AFE	C3				STRZ, R3	
1519	2AF6	0F	14	A5		LODA, R2	OPLTH <i>copy MSB in R3 length to mean set 5th</i>
1520	2AF9	66	40			IORI, R2	40
1521	2AFB	04	02			LODI, R0	2
1522	2AFD	3F	34	D0		BSTA, UN	GCSUB <i>store 4th+5th, then next 00, name, value in table</i>
1523	2B00	0E	0A	C9		LODA, R2	DIMSTG <i>copy 3d</i>
1524	2B03	86	01			ADDI, R2	1 <i>cancel F.P. variables in shg. + 1 x 00 also needs table</i>
1525	2B05	05	04		DIM3	LODI, R1	4 <i>4 bytes per entry, last 00</i>
1526	2B07	20			DIM2	FORZ, R0	
1527	2B08	3F	2B	2E		BSTA, UN	PUSOP2 <i>don't cc in table (value should not be marked)</i>
1528	2B0B	F9	7A			BDRR, R1	DIM2
1529	2B0E	FA	76			BDRR, R2	DIM3
1530	2B0F	3F	33	E0	DIMDEL	BSTA, UN	SKPSP <i>BSTA, UN SKPSP</i>
1531	2B12	F7	29			COMI, R3	
1532	2B14	9C	33	C7		BCFA, EQ	ERR1 <i>COMI, R3 BCTR, R2 BCTR, R2</i>
1533	2B17	3F	33	E0		BSTA, UN	SKPSP <i>BSTA, UN SKPSP</i>
1534	2B1A	F7	2C			COMI, R3	
1535	2B1C	1C	2A	CA		BCTA, EQ	DIM <i>BSTA, UN SKPSP</i>
1536	2B1F	3F	31	DE	DECNXT	BSTA, UN	DECPT <i>BSTA, UN GET3C</i>
1537	2B22	1F	33	C0		BCTA, UN	NXTLIN
1538	2B25	20			DIMST	FORZ, R0	
1539	2B26	0E	14	A5		LODA, R2	OPLTH
1540	2B29	3F	34	A7		BSTA, UN	GCSTRA

LINE	ADDR	B1	B2	B3	LABEL	CODE	OPERAND
1541	2B2C	1B	01		BCTR,UN		DEB
1542	2B2E			*			
1543	2B2E	1B	61	*	BCTR,UN		DIMDEL
1544	2B2E			*			
1545	2B2E	CC	92	34	PUSOP2	STRA,R0	*OP2
1546	2B31	1F	32	36	BCTA,UN		INCOP2
1547	2B34			*			
1548	2B34			*			
1549	2B34			*			
1550	2B34	3F	32	D1	GPUSH	BSTA,UN	DECSP
1551	2B37	CF	92	CF		STRA,R3	*SP
1552	2B3A	17				RETC,UN	
1553	2B3B			*			
1554	2B3B			*			
1555	2B3B			*			
1556	2B3B			*	GOSUB	<EXPR>	CR
1557	2B3B			*			
1558	2B3B			*			
1559	2B3B			*			
1560	2B3E	0F	04	60	GOSUB	LODA,R3	INPT+1
1561	2B3E	3B	74		BSTR,UN		GPUSH
1562	2B40	0F	04	5F		LODA,R3	INPT
1563	2B43	3B	6F		BSTR,UN		GPUSH
1564	2B45	07	00		LODI,R3		0
1565	2B47	3B	6B		BSTR,UN		GPUSH
1566	2B49			*			
1567	2B49			*			
1568	2B49			*	LOCATION NOW SAVED. NOW DO TRANSFER OF CONTROL (GOTO)		
1569	2B49			*			
1570	2B49			*			
1571	2B49			*			
1572	2B49			*			
1573	2B49			*	GOTO	<EXPR>	CR
1574	2B49			*			
1575	2B49			*			
1576	2B49	3F	08		GOTO	BSTR,UN	FNDLIN
1577	2B4B	1C	A8	96		BCTA,EQ	*RTNADR
1578	2B4E	07	0F		ERR6	LODI,R3	0F
1579	2B50	1F	30	77		BCTA,UN	ERROR
1580	2B53			*			
1581	2B53			*			
1582	2B53			*			
1583	2B53	3F	35	4B	FNDLIN	BSTA,UN	EVAL
1584	2B56	15				RETC,GT	
1585	2B57	3F	2A	12		BSTA,UN	FNS
1586	2B5A	3F	29	FC		BSTA,UN	STRUCT
1587	2B5D	3F	32	0B		BSTA,UN	CSINPT
1588	2B60	3F	22	4E		BSTA,UN	BEGIN
1589	2B63	3F	31	F3	GOTO2	BSTA,UN	SINPT
1590	2B66	3F	33	EF		BSTA,UN	GETLIN
1591	2B69	05	FF			LODI,R1	FF
1592	2B6B	20				EORZ,R0	
1593	2B6C	C2				STRZ,R2	
1594	2B6D	C3				STRZ,R3	
1595	2B6E	0D	27	69	GOTO3	LODA,R1	LINNUM,+
1596	2B71	1C	2B	94		BCTA,EQ	GOTO5
1597	2B74	46	0F			ANDI,R2	0F

LINE	ADDR	B1	B2	B3	LABEL	OPCODE	OPERAND
1598	2B76	75	01			CPSL	CRY
1599	2B78	77	08			FPSL	WC
1600	2B7A	D3				RRL,R3	
1601	2B7B	D2				RRL,R2	
1602	2B7C	CA	25			STRR,R2	TEMPR2
1603	2B7E	CE	24			STRR,R3	TEMPR3
1604	2B80	E3				RRL,R3	
1605	2B81	D2				RRL,R2	
1606	2B82	D3				RRL,R3	
1607	2B83	D2				RRL,R2	
1608	2B84	8B	1F			ADDR,R3	TEMPR3
1609	2B86	8A	1B			ADDR,R2	TEMPR2
1610	2B88	44	0F			ANDI,R0	F
1611	2B8A	83				ADDZ,R3	
1612	2B8E	C3				STRZ,R3	
1613	2B8C	86	00			ADDI,R2	0
1614	2B8E	75	08			CPSL	WC
1615	2B90	FE	03			COMI,R1	3
1616	2B92	98	5A			BCFR,EQ	GOTO3
1617	2B94	EE	09	FA	GOTO5	COMA,R2	CTEMP
1618	2B97	98	0C			BCFR,EQ	GOTO4
1619	2B99	FF	09	FB		COMA,R3	CTEMP+1
1620	2B9C	98	07			BCFR,EQ	GOTO4
1621	2B9E	3F	32	00		BSTA,UN	RINPT
1622	2BA1	20				FORZ,R0	
1623	2BA2	17				RETC,UN	
1624	2BA3			*			
1625	2BA3			*			
1626	2BA3			*			
1627	2BA3	00			TEMPR2 RES		1
1628	2BA4	00			TEMPR3 RES		1
1629	2BA5			*			
1630	2BA5			*			
1631	2BA5			*			
1632	2BA5	3F	33	D5	GOTO4	BSTA,UN	GETCHR
1633	2BA8	E7	0D			COMI,R3	CR
1634	2BAA	98	79			BCFR,EQ	GOTO4
1635	2BAC	0C	84	5F		LODA,R0	*INPT
1636	2BAF	16				RETC,LT	
1637	2BB0	1F	2B	63		BCTA,UN	GOTO2
1638	2BB3			*			
1639	2BB3			*			
1640	2BB3			*			
1641	2BB3			*	RETURN	CR	
1642	2BB3			*			
1643	2BB3			*			
1644	2BB3			*			
1645	2BB3	3B	11		RETURN	BSTR,UN	GPOP
1646	2BB5	03				LODZ,R3	
1647	2BB6	9C	30	5E		BCFA,EQ	ERR7 NEST ERROR
1648	2BB9	3B	0B			BSTR,UN	GPOP
1649	2BBF	CF	04	5F		STRA,R3	INPT
1650	2BBF	3E	06			BSTR,UN	GPOP
1651	2BC0	CF	04	60		STRA,R3	INPT+1
1652	2BC3	1F	33	CC		BCTA,UN	SKPLIN SKIP REMAINDER OF GOSUB LINE
1653	2BC6			*			
1654	2BC6			*			

LINE	ADDR	B1	B2	B3	LABEL	OPCODE	OPERAND
1655	2BC6				*		
1656	2BC6	0F	92	CF	GPOP	LODA,R3	*SP
1657	2BC9	1F	32	9D		BCTA,UN	INCSP
1658	2BCC				*		
1659	2BCC				*		
1660	2BCC				*		
1661	2BCC				*	INPUT	((<STRING>)) <VAR> (,<VAR ...>) CR
1662	2BCC				*		
1663	2BCC				*		
1664	2BCC				*		
1665	2BCC	3F	00	24	INPUT	BSTA,UN	LFGR
1666	2BCF	3F	33	E0		BSTA,UN	SKPSP SKIP THE SPACES
1667	2BD2	E7	0D			COMI,R3	CR
1668	2BD4	98	05			BCFR,EQ	INPUT0
1669	2BD6	3F	31	DE		BSTA,UN	DECPT
1670	2BD9	1B	1F			BCTR,UN	INPUT3
1671	2BDB	E7	27		INPUT0	COMI,R3	
1672	2BDD	1C	2B	EA		BCTA,EQ	INPUT1
1673	2BE0	04	3F			LODI,R0	'??'
1674	2BE2	3F	21	E5		BSTA,UN	WRT
1675	2BE5	3F	31	DE		BSTA,UN	DECPT
1676	2BE8	1B	03			BCTR,UN	INPUT2
1677	2BEA	3F	30	33	INPUT1	BSTA,UN	PRINTO
1678	2BED	04	20		INPUT2	LODI,R0	
1679	2BEF	3F	21	E5		BSTA,UN	WRT
1680	2BF2	3F	34	67		BSTA,UN	GCVAR.
1681	2BF5	18	0D			BCTR,EQ	INFPT
1682	2BF7	1F	2C	25		BCTA,LT	INSTR
1683	2BFA	3F	25	B2	INPUT3	BSTA,UN	PAUSE
1684	2BFD	E7	0E			COMI,R3	CR
1685	2BFF	98	79			BCFR,EQ	INPUT3
1686	2C01	1F	33	C0		BCTA,UN	NXTLIN
1687	2C04	3F	29	FC	INFPT	BSTA,UN	STRCT
1688	2C07	3F	28	FC		BSTA,UN	AROWCR
1689	2C0A	3F	35	4B		BSTA,UN	EVAL
1690	2C0D	18	0E			BCTR,EQ	INFPT1
1691	2C0F	3F	29	2F		BSTA,UN	RECPT
1692	2C12	3F	33	E0	INDEL	BSTA,UN	SKPSP
1693	2C15	E7	2C			COMI,R3	SEE IF COMMA (DELIMITER)
1694	2C17	1C	2B	ED		BCTA,EQ	INPUT2
1695	2C1A	1F	2B	1F		BCTA,UN	DECNXT
1696	2C1D	3F	29	2F	INFPT1	BSTA,UN	RECBT
1697	2C20	3F	2C	D2		BSTA,UN	POPCT
1698	2C23	1B	6E			BCTR,UN	INDEL
1699	2C25	3F	34	0D	INSTR	BSTA,UN	STOP2
1700	2C28	04	27			LODI,R0	INBUF
1701	2C2A	0E	6D			LODI,R1	INBUF
1702	2C2C	06	13			LODI,R2	13
1703	2C2E	3F	22	59		BSTA,UN	ARROW
1704	2C31	9C	27	AC		BCFA,EQ	OPTION
1705	2C34	05	14			LODI,R1	14
1706	2C36	0D	47	6D	INSTR1	LODA,R1	INBUF
1707	2C39	58	04			BRNR,R0	INSTR2
1708	2C3B	59	79			PRNR,R1	INSTR1
1709	2C3E	05	09			LODI,R1	SDFLT-1
1710	2C3F	85	01		INSTR2	ADDI,R1	1
1711	2C41	0C	14	9F		LODA,R0	CREATD

big number?

no use print "?"

different input pointer

no ja print string - let our quote, pointer of char in quote

input string

WAIT FOR CR IF NO VARIABLE → INPUT (CR) is true (would expect error to)

3F 3F EE BSTA,UN STOP2

store R2 in CPLTH in line 1705

→ max 99 keycodes input
→ input register from keyboard
→ escape?

LINE	ADDR	B1	B2	B3	LABEL	OPCODE	OPFRAND
1712	2C44	18	0C			PCTR, EQ	INSTR3
1713	2C46	3F	34	A7		BSTA, UN	GCSTRA
1714	2C49	0F	14	A6		LODA, R3	GCSSTG
1715	2C4C	CF	14	A5		STRA, R3	OPLTH
1716	2C4F	3F	34	0D		BSTA, UN	STROP2
1717	2C52	04	27		INSTR3	LODI, R0	INBUF
1718	2C54	05	6D			LODI, R1	INBUF
1719	2C56	3F	34	14		BSTA, UN	STROP1
1720	2C59	3F	33	43		BSTA, UN	MOVEB
1721	2C5C	1F	2C	12		BCTA, UN	INDEL
1722	2C5F				*		
1723	2C5F				*		
1724	2C5F				*		
1725	2C5F	00	00		DATPNT RES		2
1726	2C61				*		
1727	2C61				*		
1728	2C61				*		
1729	2C61				*	RFSTORE	EXPR CR
1730	2C61				*		
1731	2C61				*		
1732	2C61				*		
1733	2C61	3F	2F	53	RESTOR	BSTA, UN	FNDLIN
1734	2C64	19	17			BCTR, GT	RESTR1
1735	2C66	1F	2B	4E		BCTA, LT	ERR6
1736	2C69	0D	04	5F		LODA, R1	INPT
1737	2C6C	C9	71			STRR, R1	DATPNT
1738	2C6F	0D	04	60		LODA, R1	INPT-1
1739	2C71	C9	6D			STRR, R1	DATPNT+1
1740	2C73	3F	32	18		BSTA, UN	CRINPT
1741	2C76	20			RESTR2	EORZ, R0	
1742	2C77	CC	13	02		STRA, R0	PDATA
1743	2C7A	1F	33	C0		BCTA, UN	NXTLIN
1744	2C7D	20			RESTR1	EORZ, R0	
1745	2C7E	C8	60			STRF, R0	DATPNT+1
1746	2C80	0C	00	03		LODA, R0	BSTART
1747	2C83	C8	5A			STRR, R0	DATPNT
1748	2C85	1B	6F			BCTR, UN	RESTR2
1749	2C87				*		
1750	2C87				*		
1751	2C87				*		
1752	2C87				*	FOR <VAR> = <EXPR> TO <EXPR> [STEP <EXPR>]	
1753	2C87				*		
1754	2C87				*		
1755	2C87				*		
1756	2C87	3F	34	67	FCR	BSTA, UN	GCVAR
1757	2C8A	3F	2A	4F		BSTA, UN	NOSTR
1758	2C8D	3F	29	FC		BSTA, UN	STRCT
1759	2C90	C2				STRZ, R2	
1760	2C91	01				LODZ, R1	
1761	2C92	C3				STRZ, R3	
1762	2C93	3F	2B	34		BSTA, UN	GPUSH
1763	2C96	02				LOFZ, R2	
1764	2C97	C3				STRZ, R3	
1765	2C98	3F	2B	34		BSTA, UN	GPUSH
1766	2C9B	3F	33	E0		BSTA, UN	SKPSF
1767	2C9F	E7	3D			CCMI, R3	
1768	2CA0	9C	33	C7		RCFA, R0	FBR1

1770	2CA6	3F 2C D2	BSTA, UN	POPCT	
1771	2CA9	04 29	LODI, R0	COMTB2	3F 2A 4C
1772	2CAB	05 CE	LODI, R1	COMTB2	
1773	2CAD	3F 28 B7	BSTA, UN	TABUP	
1774	2CB0	0C 33 C7	BCFA, EQ	ERR1	
1775	2CB3	0C 08 FB	LODA, R0	DST+1	
1776	2CB6	F4 01	COMI, R0	1	
1777	2CB8	9C 33 C7	BCFA, EQ	ERR1	
1778	2CBB	3F 31 DB	BSTA, UN	SKPDEC	
1779	2CBE	0F 04 60	LODA, R3	INPT+1	
1780	2CC1	3F 2B 34	BSTA, UN	GPUSH	
1781	2CC4	0F 04 5F	LODA, R3	INPT	
1782	2CC7	3F 2B 34	BSTA, UN	GPUSH	
1783	2CCA	07 FF	LODI, R3	FF	
1784	2CCC	3F 2B 34	BSTA, UN	GPUSH	
1785	2CCF	1F 33 CC	BCTA, UN	SKPLIN	
1786	2CD2		*		
1787	2CD2		*		
1788	2CD2		*		
1789	2CD2	0C 09 FA	POPCT LODA, R0	CTEMP	
1790	2CD5	0D 09 FB	LODA, R1	CTEMP+1	
1791	2CD8	1F 32 45	BCTA, UN	POP	
1792	2CDE		*		
1793	2CDB		*		
1794	2CDB		*		
1795	2CDB		*	READ <VAR> (,<VAR>...) CR	
1796	2CDB		*		
1797	2CDB		*		
1798	2CDB		*		
1799	2CDB	3F 34 67	READ BSTA, UN	GCVAR	GET DESTINATION
1800	2CE1	1A 1B	BCTR, LT	RDSTR	
1801	2CE0	1L 2A 53	BCTA, GT	FRR4	NO DESTINATION
1802	2CE3	3F 29 FC	BSTA, UN	STRCT	
1803	2CE6	3F 32 E3	BSTA, UN	GETDAT	GET NEXT DATA
1804	2CE9	3F 2A 4F	BSTA, UN	NOSTR	
1805	2CEC	3B 64	BSTR, UN	POPCT	DESTINATION <-- DATA
1806	2CE1	3F 33 E0	RDDEL BSTA, UN	SKPSP	
1807	2CF1	E7 2C	COMI, R3	,	CHECK FOR COMMA
1808	2CF3	18 66	BCTR, EQ	READ	IF SO, GET MORE DATA
1809	2CF5	3F 31 DE	BSTA, UN	DECPT	NO. BACK UP AND RETURN
1810	2CF8	1F 33 C0	BCTA, UN	NXTLIN	
1811	2CFB		*		
1812	2CFB	3F 34 0D	RDSTR BSTA, UN	STROP2	
1813	2CFE	0C 14 9F	LODA, R0	CREATD	
1814	2D01	9E 03	BCFR, EQ	RDSTR2	
1815	2D03	CE 14 A5	STRA, R2	OPLTH	SAVE LENGTH
1816	2D06	3F 32 E3	RDSTR2 BSTA, UN	GETDAT	GET NEXT DATA
1817	2D09	3F 2D 40	BSTA, UN	NOFFT	
1818	2D0C	0C 12 23	LODA, R0	OP1	
1819	2D0F	0D 12 24	LODA, R1	OP1+1	
1820	2D12	3F 29 FC	BSTA, UN	STRCT	
1821	2D15	0F 14 9F	LODA, R3	CREATD	
1822	2D18	18 1A	BCTR, EQ	RDSTR3	
1823	2D1A	02	LODZ, R2		
1824	2D1B	C1	STR7, R1		
1825	2D1C	3F 34 A7	BSTA, UN	GCSTRA	

LINE	ADDR	B1	B2	B3	LABEL	OPCODE	OPERAND
1826	2D1F	3F	34	0D		BSTA,UN	STROP2
1827	2D22	0C	09	FA		LODA,R0	CTEMP
1828	2D25	0D	09	FB		LODA,R1	CTEMP+1
1829	2D28	3F	34	14		BSTA,UN	STROP1
1830	2D2B	0F	14	A6		LODA,R3	GCSSTG
1831	2D2E	3F	33	47		BSTA,UN	MOVEB1
1832	2D31	1F	2C	FE		BCTA,UN	RDEL
1833	2D34	EF	14	A5	RDSTR3	COMA,R2	OPLTH NO LENGTHS MUST MATCH
1834	2D37	9C	30	5A		BCFA,EQ	ERR3 NO MATCH. LENGTH MISMATCH
1835	2D3A	3F	33	43		BSTA,UN	MOVEB DESTINATION --- DATA
1836	2D3D	1F	2C	FE		BCTA,UN	RDEL
1837	2D40				*		
1838	2D40				*		
1839	2D40				*		
1840	2D40	1C	30	56	NOFPT	BCTA,EQ	ERR2 <i>type mismatch error</i>
1841	2D43	1D	2A	53		BCTA,GT	ERR4 <i>argument error</i>
1842	2D46	17				RETC,UN	
1843	2D47				*		
1844	2D47				*		
1845	2D47				*		
1846	2D47				*	LET <VAR> = <EXPR>	CR
1847	2D47				*		
1848	2D47				*		
1849	2D47				*		
1850	2D47	3F	34	67	LET	BSTA,UN	GCVAR GET DESTINATION LOCATION
1851	2D4A	1A	17			BCTR,LT	LETSTR STRING
1852	2D4C	1D	2A	53		BCTA,GT	ERR4 MISSING DESTINATION
1853	2D4F	3F	29	FC		BSTA,UN	STRCT
1854	2D52	3F	33	E0		BSTA,UN	SKPSP SKIP SPACES
1855	2D55	F7	3D			COMI,R3	'=' MUST BE
1856	2D57	9C	33	C7		BCFA,EQ	ERR1 SYNTAX ERROR
1857	2D5A	3F	2A	4C		BSTA,UN	ENOSTR GET SOURCE VALUE
1858	2D5D	3F	2C	D2		BSTA,UN	POPCT POP SOURCE TO DESTINATION
1859	2D60	1F	33	C0		BCTA,UN	NXTLIN
1860	2D63				*		
1861	2D63	3F	34	0D	LETSTR	BSTA,UN	STROP2
1862	2D66	0C	14	9F		LODA,R0	CREATD
1863	2D69	98	03			BCFR,EQ	LETST2
1864	2D6B	0E	14	A5		STRA,R2	OPLTH FOUND SAVE LENGTH
1865	2D6E	3F	33	E0	LETST2	BSTA,UN	SKPSP
1866	2D71	F7	3D			COMI,R3	'=' MUST BE
1867	2D73	9C	33	C7		BCFA,EQ	ERR1 BAD SYNTAX
1868	2D76	3F	35	4B		BSTA,UN	EVAL GET SOURCE VALUE
1869	2D79	3F	2D	40		BSTA,UN	NOFPT
1870	2D7C	3F	34	14		BSTA,UN	STROP1
1871	2D7F	0F	14	9F		LODA,R3	CREATD
1872	2D82	18	1D			BCTR,EQ	LETST3
1873	2D84	3F	29	FC		BSTA,UN	STRCT
1874	2D87	02				LODZ,R2	
1875	2D88	C1				STRZ,R1	
1876	2D89	3F	34	A7		BSTA,UN	GCS TRA
1877	2D8C	3F	34	0D		BSTA,UN	STROP2
1878	2D8F	0C	09	FA		LODA,R0	CTEMP
1879	2D92	0D	09	FB		LODA,R1	CTEMP+1
1880	2D95	3F	34	14		BSTA,UN	STROP1
1881	2D98	0F	14	A6		LODA,R3	GCSSTG
1882	2D9B	3F	33	47		BSTA,UN	MOVEB1

LINE	ADDR	B1	B2	B3	LABEL	OPCODE	OPERAND
1883	2DA1	1F	33	C0		BSTA,UN	N LIN
1884	2DA1	FF	14	A5	IETST3	COMA,R2	OPLTH MAKE SURE LENGTHS MATCH IF 33 C0
1885	2DA4	9C	30	5A		BCFA,EQ	ERR3 NO. LENGTH MISMATCH
1886	2DA7	3F	33	43		BSTA,UN	MOVEB TRANSFER SOURCE TO DESTINATION
1887	2DAA	1F	33	C0		BCTA,UN	NXTLIN
1888	2DAD				*		
1889	2DAD				*		
1890	2DAI				*		
1891	2DAD				*	NEXT <VAR> CR	
1892	2DAD				*		
1893	2DAD				*		
1894	2DAD				*		
1895	2DAD	3F	2B	C6	NEXT	BSTA,UN	GPOP
1896	2DB0	E7	FF			COMI,R3	FF
1897	2DB2	9C	30	5E		BCFA,EQ	ERR7
1898	2DE5	05	FF			LODI,R1	FF
1899	2DB7	3F	2B	C6	NEXT1	BSTA,UN	GPOP
1900	2DEA	03				LODZ,R3	
1901	2DBB	CD	2D	FC		STRA,R1	NTEMP1,+
1902	2DEF	EF	03			COMI,R1	3
1903	2DC0	98	75			BCFR,EQ	NEXT1
1904	2DC2	3F	34	67		BSTA,UN	GCVAR
1905	2DC5	3F	2A	4F		BSTA,UN	NOSTR
1906	2DC8	18	34			COMR,R0	NTEMP3
1907	2DCA	9C	30	5E		BCFA,EQ	ER 7 NEST ERROR
1908	2DCD	ED	0D	FF		COMA,R1	NTEMP4
1909	2DD0	9C	30	5E		BCFA,EQ	ERR7
1910	2DD3	3F	32	0B		BSTA,UN	CSINPT
1911	2DD6	08	25			LODR,R0	NTEMP2
1912	2DD8	CC	04	60		STRA,R0	INPT+1
1913	2DDB	08	1F			LCDR,R0	NTEMP1
1914	2DDD	CC	04	5F		STRA,R0	INPT
1915	2DE0	3F	2A	4C		BSTA,UN	ENOSTR
1916	2DE3	3F	3C	F5		BSTA,UN	POPC1
1917	2DF6	04	29			LODI,R0	COMTB2
1918	2DE8	05	CE			LODI,R1	COMTB2
1919	2DEA	3F	28	B7		BSTA,UN	TABUP
1920	2DEF	98	11			BCFR,EQ	NEXT2
1921	2DEF	0C	08	FB		LODA,R0	DST+1
1922	2DF2	E4	02			COMI,R0	2
1923	2DF4	9C	33	C7		BCFA,EQ	ERR1
1924	2DF7	3F	2A	4C		BSTA,UN	ENOSTR
1925	2DFA	1B	07			BCTR,UN	NEXT3
1926	2DFC				*		
1927	2DFC	00			NTEMP1	RES	1
1928	2DFD	00			NTEMP2	RES	1
1929	2DFE	00			NTEMP3	RES	1
1930	2DFF	00			NTEMP4	RES	1
1931	2E00				*		
1932	2E00	3F	3A	7A	NEXT2	BSTA,UN	PPUSH1
1933	2E03	08	79		NEXT3	LODR,R0	NTEMP3
1934	2E05	09	78			LODR,R1	NTEMP4
1935	2E07	3F	32	7D		BSTA,UN	PUSH
1936	2F0A	3F	37	EF		BSTA,UN	FPADD
1937	2E0D	3F	3D	03		BSTA,UN	POPC2
1938	2E10	05	04			LODI,R1	4
1939	2E12	0D	53	91	NEXT5	LODA,R1	CBUF2,-

LINE	ADDR	B1	B2	B3	LABEL	OPCODE	OPFRAND
1940	2F15	CD	ED	FF		STRA,R1	*NTEMP3,I
1941	2F18	59	78			BRNR,R1	NEXT5
1942	2F1A	3F	33	95		PSTA,UN	COMNUM
1943	2F1D	Y7	02			COMI,R3	LT
1944	2E1F	18	13			BCTR,EQ	NEXT4
1945	2E21	05	04			LODI,R1	4
1946	2E23	01	4D	FC	NEXT6	LODA,R1	NTEMP1,-
1947	2E26	C3				STRZ,R3	
1948	2E27	3F	2F	34		BSTA,UN	GPUSH
1949	2E2A	59	77			BRNR,R1	NEXT6
1950	2E2C	07	FF			LODI,R3	FF
1951	2E2F	3F	2F	34		BSTA,UN	GPUSH
1952	2E31	1F	33	C0		BCTA,UN	NXTLIN
1953	2E34	3F	32	18	NEXT4	PSTA,UN	CRINPT
1954	2E37	1F	33	C0		BCTA,UN	NXTLIN
1955	2E3A						
1956	2E3A			*			
1957	2E3A			*			
1958	2E3A			*		IF <EXPR>	<LOGICAL OPERATOR> <EXPR> <STATEMENT> CR
1959	2E3A			*			
1960	2E3A			*			
1961	2E3A			*			
1962	2E3A	3F	35	4B	IF	BSTA,UN	EVAL GET FIRST ARGUMENT - <i>if stat → R0,R1=addr R2=length</i>
1963	2E3D	1A	21			PCTR,LT	IFSTR
1964	2E3F	1D	2A	53		PCTA,GT	ERR4 <i>argument error</i>
1965	2E42	3F	34	1D		BSTA,UN	GETLOP <i>get top operator</i>
1966	2E45	3F	2A	4C		BSTA,UN	ENOSTR
1967	2E48	3F	3D	03		BSTA,UN	POPC2 GET SECOND ARGUMENT FROM STACK
1968	2E4B	3F	3C	F5		BSTA,UN	POPC1 GET FIRST ARGUMENT FROM STACK
1969	2E4E	3F	33	95		BSTA,UN	COMNUM DO FLOATING POINT COMPARE
1970	2E51			*			
1971	2E51	EF	14	1F	IFLOC	COMA,R3	LOP1 <i>is type operator?</i>
1972	2E54	1C	A8	96		BCTA,EQ	*RTNADR <i>match, under statement with</i>
1973	2E57	EF	14	1C		COMA,R3	LOP2 CHECK FOR SECOND MATCH
1974	2E5A	1C	A8	96		PCTA,EQ	*RTNADR
1975	2E5D	1F	33	CC		BCTA,UN	SKPLIN NO MATCH. SKIP STATEMENT
1976	2E60			*			
1977	2E60	CF	14	A5	IFSTR	STRA,R2	OFLTH SAVE LENGTH OF STRING
1978	2E63	3F	34	14		BSTA,UN	STROP1 <i>store R0,R1 in OPI, OPI+1</i>
1979	2E66	3F	34	1D		PSTA,UN	GETLOP <i>get top operator</i>
1980	2E69	3F	35	4B		BSTA,UN	FVAL GET SECOND ARGUMENT
1981	2E6C	3F	2D	40		BSTA,UN	NOFPT <i>→ CC=GT, argument error, CC=0, type mismatch & div2 error skips next 8!</i>
1982	2E6F	EF	14	A5	CE 14 A5	COMA,R2	OFLTH <i>store R2 in OFLTH</i>
1983	2E72	9C	3C	5A	CC CC CC	BCTA,EQ	ERR3 <i>LENGTHS NOT SAME. LENGTH MISMATCH ERROR</i>
1984	2E75	3F	34	0D		BSTA,UN	STROP2 <i>store R0,R1 in OPI, OPI+1</i>
1985	2E78	3F	34	49		PSTA,UN	COMOP DO COMPARE
1986	2E7B	1F	54			PCTR,UN	IFLOC CHECK THEM
1987	2E7D			*			
1988	2E7D			*			
1989	2E7D			*			
1990	2E7D			*		PRINT (FORMAT)	(<EXPR>,<EXPR>...) CR
1991	2E7D			*			
1992	2E7D			*		FORMATS:	# PRINT INTEGER # <EXPR>
1993	2E7D			*		%	= PRINT TAB % CHAR
1994	2E7D			*		@	= SET SCREEN LOCATION @ LINE,CHAR
1995	2E7D			*		&	= PRINT HEX & <EXPR>
1996	2E7D			*		/	= SUPPRESS LINEFEED

1998	2E7D	*				
1999	2E7D	*	EXPRESSIONS:	QUOTED STRING		
2000	2E7D	*		DIMENSIONED OR NORMAL VARIABLE		
2001	2E7D	*		STRING VARIABLE		
2002	2E7D	*				
2003	2E7D	*				
2004	2E7D	*				
2005	2E7D 3F 33 E0		PRINT	BSTA,UN	SKPSP	
2006	2E80 E7 40			COMI,R3	'G'	
2007	2E82 18 0D			BCTR,EQ	PRINT2	
2008	2E84 E7 2F			COMI,R3	'/'	
2009	2E86 18 06			BCTR,EQ	PRINT1	
2010	2E88 3F 31 DE			BSTA,UN	DECPT	
2011	2E8P 3F 00 24			BSTA,UN	LFCR	
2012	2E8E 3F 33 E0		PRINT1	BSTA,UN	SKPSP	
2013	2E91 E7 0D		PRINT2	COMI,R3	CR	
2014	2E93 1C A8 96			BCTA,EQ	*RTNADR	
2015	2F96 E7 27			COMI,R3		QUOTED STRING
2016	2E98 1C 2F AB			BCTA,EQ	PRNTQ	
2017	2F9B E7 40			COMI,R3	'G'	AT LOCATION SET
2018	2E9D 1C 2E D1			BCTA,EQ	PRNTA	
2019	2EA0 E7 23			COMI,R3	'#'	PRINT INTEGER
2020	2EA2 1C 2F 0C			BCTA,EQ	PRNTI	
2021	2EA5 E7 26			COMI,R3	'&'	PRINT HEX
2022	2EA7 1C 2F 3D			BCTA,EQ	PRNTH	
2023	2EAA E7 25			COMI,R3	'%'	PRINT TAB
2024	2EAC 1C 2F 04			BCTA,EQ	PRNTT	
2025	2EAF 3F 31 DE			BSTA,UN	DECPT	
2026	2EB2 3F 35 4B			BSTA,UN	EVAL	
2027	2EB5 1C 2F 58			BCTA,EQ	PRNTF	
2028	2EE8 1A 03			BCTR,LT	PRNTS	
2029	2EBA 1F 33 C7			BCTA,UN	ERR1	SYNTAX ERROR
2030	2EBD	*				
2031	2EBD 3F 34 14		PRNTS	BSTA,UN	STROP1	
2032	2EC0 02		PRNTS1	LOCZ,R2		CHECK FOR DONE
2033	2EC1 1C 2F AE			BCTA,EQ	PRNTD	
2034	2EC4 0C 92 23			LODA,R0	*OP1	GET CHARACTER
2035	2EC7 3F 21 E5			BSTA,UN	WRT	
2036	2ECA 3F 32 25			BSTA,UN	INCOPI	INCREMENT POINTERS
2037	2ECD A6 01			SUBI,R2	1	
2038	2ECF 1B 6F			BCTR,UN	PRNTS1	
2039	2ED1	*				
2040	2ED1 3F 2A 0F		PNTA	BSTA,UN	EVALNS	
2041	2ED4 A5 01			SUBI,R1	1	
2042	2ED6 CD 0F 57			STRA,R1	PNTTMP	
2043	2ED9 3F 33 E7			BSTA,UN	SKPCOM	
2044	2EDC 3F 2A 0F		PRNTA1	BSTA,UN	EVALNS	
2045	2EDF A5 01			SUBI,R1	1	
2046	2EE1 77 08			YESL	WC	
2047	2EE3 D1			RRL ,R1		
2048	2EE4 D0			RRL ,R0		
2049	2EE5 D1			RRL ,R1		
2050	2EE6 D0			RRL ,R0		
2051	2EE7 D1			RRL ,R1		
2052	2EE8 D0			RRL ,R0		
2053	2EE9 D1			RRL ,R1		

LINE	ADDR	B1	B2	B3	LABEL	OPCODE	OPERAND
2054	2EEA	D0				RRL,R0	
2055	2EEF	75	08			CPSL	WC
2056	2EED	44	07			ANDI,R0	07
2057	2EEF	64	10			IORI,R0	10 MAKE 1 IN THE DISPLAY PAGE
2058	2EF1	C2				STRZ,R2	
2059	2EF2	0C	0F	F7		LODA,R0	PNTTMP
2060	2EF5	44	0F			ANDI,R0	0F
2061	2EF7	45	F0			ANDI,R1	F0
2062	2EF9	61				IORZ,R1	
2063	2FFA	C1				STRZ,R1	
2064	2FFB	3F	21	45		BSTA,UN	SETCUR
2065	2EFE	3F	00	64		BSTA,UN	WRTCUR
2066	2F01	1F	2F	AE		BCTA,UN	PRNTD
2067	2F04				*		
2068	2F04	0C	81	43	PRNTT	LODA,R0	*MCUR
2069	2F07	CC	0F	57		STRA,R0	PNTTMP
2070	2F0A	1B	50			BCTR,UN	PRNTA1
2071	2F0C				*		
2072	2F0C	3F	2A	4C	PRNTI	BSTA,UN	FNOSTR
2073	2F0F	3F	30	20		BSTA,UN	MNTSGN
2074	2F12	0C	13	8D		LODA,R0	CBUF1
2075	2F15	19	08			BCTR,GT	PRNTI3
2076	2F17	04	30			LODI,R0	0
2077	2F19	3F	21	F5		BSTA,UN	WRT
2078	2F1C	1F	2F	AE		BCTA,UN	PRNTD
2079	2F1F	0C	1B	B5	PRNTI3	LODA,R0	INTEXP
2080	2F22	E4	07			COMI,R0	7
2081	2F24	1A	11			BCTR,LT	PRNTI1
2082	2F26	0C	1B	12		LODA,R0	EXPSGN
2083	2F29	1A	0C			BCTR,LT	PRNTI1
2084	2F2B	05	06			LODI,R1	6
2085	2F2D	04	2A		PRNTI2	LODI,R0	*
2086	2F2F	04	21	F5		BSTA,UN	WRT
2087	2F32	F9	79			BDRR,R1	PRNTI2
2088	2F34	1F	2F	AE		BCTA,UN	PRNTD
2089	2F37	3F	2F	EA	PRNTI1	BSTA,UN	MNTINT
2090	2F3A	1F	2F	AE		BCTA,UN	PRNTD
2091	2F3D				*		
2092	2F3D	3F	2A	4C	PRNTH	BSTA,UN	ENOSTR
2093	2F40	3F	3C	F5		BSTA,UN	POPC1
2094	2F43	07	00			LODI,R3	0
2095	2F45	F7	04		PRNTH1	COMI,R3	LEN
2096	2F47	1C	2F	AE		BCTA,UN	PRNTD
2097	2F4A	CB	0B			STRR,R3	PNTTMP
2098	2F4C	0F	73	8D		LODA,R3	CBUF1,I
2099	2F4F	C2				STRZ,R2	
2100	2F50	3F	00	6A		BSTA,UN	HXOT
2101	2F53	0B	02			LODR,R3	PNTTMP
2102	2F55	1B	6E			BIRR,R3	PRNTH1
2103	2F57				*		
2104	2F57				*		
2105	2F57				*		
2106	2F57	00			PNTTMP RES		1
2107	2F58				*		
2108	2F58				*		
2109	2F58				*		
2110	2F58	3F	30	20	PRNTH	BSTA,UN	MNTSGN

LINE	ADDR	FI	FC	FO	LABEL	OPCODE	OPERAND
2111	2F5B	04	30			LODI,R0	
2112	2F5D	3F	21	E5		BSTA,UN	WRT
2113	2F60	04	2E			LODI,R0	PRINT DECIMAL POINT BEFORE FIRST DIGIT
2114	2F62	3F	21	E5		BSTA,UN	WRT
2115	2F65	3F	2F	EA		BSTA,UN	MNTINT
2116	2F68	07	07			LODI,R3	?
2117	2F6A	AF	0F	E9		SUBA,R3	DIGCTR
2118	2F6D	03				LODZ,R3	
2119	2F6E	C2				STRZ,R2	
2120	2F6F	53				RRR,R3	
2121	2F70	47	03			ANDI,R3	3
2122	2F72	05	FF			LODI,R1	FF
2123	2F74	0D	27	31	PRNTF2	LODA,R1	FRCSTG,+
2124	2F77	E7	00			COMI,R3	0
2125	2F79	18	0C			BCTR,EQ	PRNTF3
2126	2F7B	77	10			PSSL	RS
2127	2F7D	C2				STRZ,R2	
2128	2F7F	3F	00	6A		BSTA,UN	HXOT
2129	2F81	75	10			CPSL	RS
2130	2F83	A7	01			SUBI,R3	1
2131	2F85	1B	6D			BCTR,UN	PRNTF2
2132	2F87	FC	01		PRNTF3	TMI,R2	1
2133	2F89	98	0A			BCFR,EQ	PRNTF4
2134	2F8B	0D	27	31		LODA,R1	FRCSTG,+
2135	2F8E	50				RRR,R0	
2136	2F8F	50				RRR,R0	
2137	2F90	50				RRR,R0	
2138	2F91	50				RRR,R0	
2139	2F92	3F	30	4F		BSTA,UN	DOUT
2140	2F95	3F	21	E3	PRNTF4	BSTA,UN	WRBL
2141	2F98	04	45			LODI,R0	'E'
2142	2F9A	3F	21	E5		BSTA,UN	WRT
2143	2F9D	0C	1E	12		LODA,R0	EXPSGN
2144	2FA0	3F	30	20		BSTA,UN	ANYSGN
2145	2FA3	0F	1B	B5		LODA,R3	INTEXP
2146	2FA6	3F	21	09		BSTA,UN	BTODOT
2147	2FA9	1B	03			BCTR,UN	PRNTD
2148	2FAB				*		
2149	2FAB	3F	30	33	PRNTQ	BSTA,UN	PRINTQ
2150	2FAE	3F	33	E0	PRNTD	BSTA,UN	SKPSP
2151	2FB1	E7	2C			COMI,R3	;
2152	2FB3	18	07			BCTR,EQ	PRNTD1
2153	2FB5	F7	3B			COMI,R3	;
2154	2FB7	18	0F			BCTR,EQ	PRNTD3
2155	2FB9	1F	2E	91		BCTA,UN	PRINT2
2156	2FBC	05	08		PRNTD1	LODI,R1	8 PRINT 8 SPACES
2157	2FBE	04	20		PRNTD2	LODI,R0	
2158	2FC0	3F	21	E5		BSTA,UN	WRT
2159	2FC3	F9	79			PDOR,R1	PRNTD2
2160	2FC5	1F	2E	8E		BCTA,UN	PRINT1
2161	2FC8	0F	81	41	PRNTD3	LODA,R2	*MCU1
2162	2FCB	F6	04			TMI,R2	4
2163	2FCD	1C	2E	8B		BCTA,EQ	PRINT1-3
2164	2FCE	8E	01			ADLI,R2	1
2165	2FDE	0D	81	43		LODA,R1	*MCUR
2166	2FD5	E5	40			COMI,R1	40
2167	2FD7	9A	02			BCFR,LT	PRNTD4

ADDRESS	OPERAND	OPERAND	OPERAND
2169	2FDE 45 0F	PRNTD4	ANDI,R1 0F
2170	2FDD 65 40		IORI,R1 40 MOVE OVER 4 SPACES
2171	21LF 3F 21 45		BSTA,UN SETCUR
2172	2FE2 3F 00 64		BSTA,UN WRTCUR
2173	2FE5 1F 2E 8E		BCTA,UN PRINT1
2174	2FE8	*	
2175	2FE8	*	
2176	2FE8	*	
2177	2FE8 00	MNTSTG	RES 1
2178	2FE9 00	DIGCTR	RES 1
2179	2FEA	*	
2180	2FEA	*	
2181	2FEA	*	
2182	2FEA 05 04	MNTINT	LODI,R1 4
2183	2FEC 20		EORZ,R0
2184	2FED 08 7A		STRR,R0 DIGCTR
2185	2FEF 0D 47 2D	MNTI2	LODA,R1 IN STG.-
2186	2FF2 E5 FF		COMI,R1 FF
2187	2FF4 14		RETC,EQ
2188	2FF5 00		LODZ,P0
2189	2FF6 18 77		BCTR,EQ MNTI2
2190	2FF8 C2		STRZ,R2
2191	2FF9 01 0F E8		STRA,R1 MNTSTG
2192	2FFC 44 F0		ANDI,R0 F0
2193	2FFE 98 14		BCFR,EQ MNTI4
2194	3000 02		LODZ,R2
2195	3001 3F 30 4F		BSTA,UN IOUT
2196	3004 0C 0F E9		LODA,R0 DIGCTR
2197	3007 84 21		ADDI,R2 1
2198	3009 08 FE	MNTI5	STRR,R0 DIGCTR
2199	300E 0D 47 2D		LODA,R1 INTSTG -
2200	300E E5 FF		COMI,R1 FF
2201	3010 14		RETC,EQ
2202	3011 C2		STRZ,R2
2203	3012 C9 54		STRR,R1 MNTSTG
2204	3014 3F 00 6A	MNTI4	BSTA,UN HXOT
2205	3017 09 4F		LODR,R1 MNTSTG
2206	3019 0C 0F E9		LODA,R0 DIGCTR
2207	301C 84 02		ADDI,R2 2
2208	301E 1B 69		BCTR,UN MNTI5
2209	3020	*	
2210	3020	*	
2211	3020	*	
2212	3020 3F 3C F5	MNTSGN	BSTA,UN POPC1
2213	3023 3F 3B 1F		BSTA,UN FIXNL
2214	3026 0C 1B 13		LODA,R0 INTSGN
2215	3029 F4 80	ANYSGN	TMI,R0 80
2216	302B 9C 21 E3		BCFA,EQ WRBI
2217	302E 04 2D		LODI,P0 -
2218	3030 1F 21 E5		BCTA,UN WRT
2219	3033	*	
2220	3033	*	
2221	3033	*	PRINTQ PRINTS CHARACTERS STARTING AT INPT. UNTIL A QUOTE IS
2222	3033	*	REACHED. INPT IS LEFT POINTING TO THE CHARACTER AFTER THE
2223	3033	*	QUOTE. A DOUBLE QUOTE IS PRINTED AS A QUOTE AND THE PRINT IS
2224	3033	*	CONTINUED.

LINE	ADDR	DI	DE	DO	LABEL	CODE	OPERAND	COMMENT
2225	3033				*			
2226	3033				*			
2227	3033	3F	33	D5	PRINTQ	BSTA,UN	GETCHR	
2228	3036	E7	0D			COMI,R3	CR	
2229	3038	1C	33	C7		BCTA,EQ	ERR1	
2230	303E	E7	27			COMI,R3		CHECK FOR QUOTE
2231	303D	18	06			BCTR,EQ	PRINQ1	
2232	303F	03			PRNTQ2	LOD7,R3		
2233	3040	3F	21	E5		BSTA,UN	WRT	
2234	3043	1B	6E			BCTR,UN	PRINTQ	
2235	3045	3F	33	D5	PRINQ1	BSTA,UN	GETCHR	GET POSSIBLE SECOND QUOTE
2236	3048	E7	27			COMI,R3		
2237	304A	9C	31	DE		BCFA,EQ	DECPT	NO. BACKUP AND RETURN
2238	304D	1B	70			BCTR,UN	PRNTQ2	
2239	304F				*			
2240	304F				*			
2241	304F	44	0F		DOUT	ANDI,R0	0F	
2242	3051	64	30			IORI,R0	0	
2243	3053	1F	21	E5		BCTA,UN	WRT	
2244	3056				*			
2245	3056				*			
2246	3056				*			
2247	3056	07	10		ERR2	LODI,R3	10	TYPE MISMATCH
2248	3058	1B	1D			PCTR,UN	ERROR	
2249	305A	07	03		ERR3	LODI,R3	3	LENGTH MISMATCH
2250	305C	1B	19			BCTR,UN	ERROR	
2251	305E	07	00		ERR7	LODI,R3	00	NEST ERROR
2252	3060	1B	1F			PCTR,UN	ERROR	
2253	3062	07	02		ERR8	LODI,R3	2	STACK OVERFLOW
2254	3064	1B	11			PCTR,UN	ERROR	
2255	3066	07	15		ERR11	LODI,R3	15	IMPROPER VARIABLE NAME
2256	3068	1B	0D			PCTR,UN	ERROR	
2257	306A	07	04		ERR12	LODI,R3	04	LINE NUMBER TOO LONG
2258	306C	1B	09			BCTR,UN	ERROR	
2259	306E	07	14		ERR15	LODI,R3	14	OVERFLOW
2260	3070	1B	05			BCTR,UN	ERROR	
2261	3072	07	13		ERR16	LODI,R3	13	DIVIDE BY ZFPO
2262	3074	1B	01			BCTR,UN	ERROR	
2263	3076				*			
2264	3076	00			ETEMP	RES	1	
2265	3077				*			
2266	3077				*			
2267	3077				*			
2268	3077	04	02		ERROR	LODI,R0	2	
2269	3079	93				LPSL		RESET THE PSL IF FROM ARITH. ROUTINE
2270	307A	CB	7A			STRR,R3	ETEMP	SAVE ERROR MESSAGE CODE
2271	307C	07	05			LODI,R3	5	
2272	307E	3B	1B			BSTR,UN	DIPWRT	***
2273	3080	0B	74			LODR,R3	ETEMP	
2274	3082	3F	30	C7		BSTA,UN	WRTM	DISPLAY ERROR TYPE
2275	3085	07	07			LODI,R3	7	
2276	3087	3F	30	C7		BSTA,UN	WRTM	ERROR ***
2277	308A	0F	04	60		LODA,R2	INPT+1	
2278	308D	AF	08	8A		SUPA,R2	SHPNT+1	
2279	3090	3F	28	65		BSTA,UN	SHLIN	SHOW CURRENT (FAULTY) LINE
2280	3093	3F	25	B2		BSTA,UN	PAUSE	
2281	3096	1F	27	AC		BCTA,UN	OPTION	LET THEM CHANGE SOMETHING

LINE	ADDR	B1	B2	B3	LABEL	OPCODE	OPERAND
2282	3099				*		
2283	3099	00	00		DTEMP	RES	2
2284	309B				*		
2285	309B				*		
2286	309B				*		
2287	309B	00	81	41	DIRWRT	LODA,R0	*MCUI
2288	309E	08	79		STRR,R0	DTEMP	SAVE RESENT CURSOR POSITION
2289	30A0	00	81	43		LODA,R0	*MCUR
2290	30A3	08	75		STRR,R0	DTEMP+1	
2291	30A5	06	10		DIRWNL	LODI,R2	DIRCUR
2292	30A7	05	4F			LODI,R1	DIRCUA
2293	30A9	3F	21	45		BSTA,UN	SETCUR
2294	30AC	03				LODZ,R3	
2295	30AD	01				STRZ,R1	
2296	30AE	3F	00	3A		BSTA,UN	ERASEL
2297	30B1	01				LODZ,R1	
2298	30B2	03				STRZ,R3	
2299	30B3	1F	30	C7		BCTA,UN	WRTM WRITE THE MESSAGE, RETURN
2300	30B6				*		
2301	30B6				*		
2302	30B6				*		
2303	30B6	0A	61		RECCOR	LODR,R2	DTEMP
2304	30BE	09	60			LODR,R1	DTEMP+1
2305	30BA	1F	21	45		BCTA,UN	SETCOR
2306	30BD				*		
2307	30BD				*		
2308	30BD				*		
2309	30BD	03			CKNUM0	LODZ,R3	<i>check of cyphs.</i>
2310	30BE	F4	30		CKNUM	COMI,R0	<i>so ja, cc = 0</i>
2311	30C0	16				RETC,LT	<i>< H 30 5 cc w LT, > 30 3 cc w gT</i>
2312	30C1	F4	39			COMI,R0	'9'
2313	30C3	15				RETC,GT	
2314	30C4	75	C0			CPSL	C0 CLEAR CONDITION CODE BITS
2315	30C6	17				RETC,UN	
2316	30C7				*		
2317	30C7				*		
2318	30C7				*		
2319	30C7	06	00		WRTM	LODI,R2	0
2320	30C9	05	FF			LODI,R1	FF
2321	30CB	02			WRTM2	LODZ,R2	
2322	30CC	F3				COMZ,R3	
2323	30CD	18	0E			BCTR,EQ	WRTM1
2324	30CF	0D	30	ED	WRTM3	LODA,R1	MSG0,+
2325	30D2	F4	2E			COMI,R0	.
2326	30D4	98	79			BCFR,EQ	WRTM3
2327	30D6	86	01			ADDI,R2	1
2328	30D8	1B	71			BCTR,UN	WRTM2
2329	30DA	0D	30	ED	WRTM1	LODA,R1	MSG0,+
2330	30DD	F4	2E			COMI,R0	.
2331	30DF	14				RETC,EQ	CHECK FOR END OF MESSAGE
2332	30E2	F4	0D			COMI,R0	CR
2333	30E2	98	04			BCFR,FQ	WRTM5
2334	30F4	FF	24			ZBSR	LFCR
2335	30F6	1B	72			BCTR,UN	WRTM1
2336	30F8	3F	21	E5	WRTM5	BSTA,UN	WRT
2337	30FB	1B	6D			BCTR,UN	WRTM1 AFTER INCREMENTING HIH BYTE, DO NEXT CHAR
2338	30ED				*		

LINE	ADDR	E1	E2	E3	LABEL	OPCODE	OPERAND
2339	30ED				*		
2340	30ED				*		
2341	30ED	4F	4F	53	MSG0	ALIT	'NEST.'
2342	30F2	4F	50	54	MSG1	ALIT	'OPTION:
2343	30FC	53	54	4B	MSG2	ALIT	'STK OVF.'
2344	3104	4C	45	4E	MSG3	ALIT	'LEN MISMATCH.'
2345	3111	4C	4E	20	MSG4	ALIT	'LN #.'
2346	3116	20	2A	2A	MSG5	ALIT	'***'
2347	311C	20	45	58	MSG6	ALIT	'EXECUTING.'
2348	3127	20	45	52	MSG7	ALIT	'ERROR ***'
2349	3131	0D				DATA	CR
2350	3132	2E				DATA	
2351	3133	4E	4F	20	MSG8	ALIT	'NO STOP STMT.'
2352	3140	F3	54	45	MSG9	ALIT	'STEP MODE'
2353	3149	0D				DATA	CR
2354	314A	2E				DATA	
2355	314B	0D			MSGA	DATA	CR
2356	314C	42	4F	50		ALIT	'BKPT AT LINE #'
2357	315C	4F	55	54	MSGB	ALIT	'OUT OF DATA.'
2358	3168	41	52	47	MSGC	ALIT	'ARG.'
2359	316C	49	4E	53	MSGD	ALIT	'INSPECT VAR.'
2360	3179	0D			MSGF	DATA	CR
2361	317A	53	54	4F		ALIT	'STOPPED.'
2362	3182	4C	49	4E	MSGF	ALIT	'LINE NOT FND.'
2363	318F	54	59	50	MSG10	ALIT	'TYPE MISMATCH.'
2364	319D	53	59	4E	MSG11	ALIT	'SYNTAX.'
2365	31A4	54	4F	4F	MSG12	ALIT	'TOO MANY OPS.'
2366	31B1	44	5C	44	MSG13	ALIT	'DVD BY ZERO.'
2367	31BD	4F	56	46	MSG14	ALIT	'OVF.'
2368	31C1	56	41	52	MSG15	ALIT	'VAR NM.'
2369	31C8				*		
2370	31C8				*		
2371	31C8				*		
2372	31C8	0C	04	60	INCPT	LODA,R0	INPT+1 INCREMENT LOW BYTE OF INPUT POINTER
2373	31CB	84	01			ADDI,R0	1
2374	31CD	CC	04	60		STRA,R0	INPT+1
2375	31D0	16				RETC,LT	
2376	31E1	15				RETC,GT	RETURN IF NO OVERFLOW
2377	31D2	0C	04	5F		LODA,R0	INPT
2378	31D5	84	01			ADDI,R0	1
2379	31D7	CC	04	5F		STRA,R0	INPT
2380	31EA	17				RETC,UN	
2381	31EB				*		
2382	31DB				*		
2383	31DB				*		
2384	31EB	3F	33	E0	SKPDEC	BSTA,UN	SKPSF
2385	31EE	0C	04	60	DECPT	LODA,R0	INPT+1 DECREMENT LOW BYTE OF INPUT POINTER
2386	31F1	A4	01			SUBI,R0	1
2387	31F3	CC	04	60		STRA,R0	INPT+1
2388	31F6	77	08			PPSL	WC
2389	31E8	0C	04	5F		LODA,R0	INPT DECREMENT HIGH BYTE OF INPUT POINTER
2390	31EB	A4	00			SUBI,R0	0 SURTRACT ANY CARRY
2391	31EE	CC	04	5F		STRA,R0	INPT
2392	31F0	7E	08			CPSL	WC
2393	31F2	17				RETC,UN	
2394	31F3				*		
2395	31F3	0C	04	5F	SINPT	LODA,R0	INPT SAVE INPUT POINTER IN STMP

LINE	ADDR	B1	B2	B3	LABEL	OPCODE	OPERAND
2396	31F6	08	06			STRR,R0	STEMP
2397	31F8	0C	04	60		LODA,P0	INPT+1
2398	31FB	08	02			STRR,R0	STEMP+1
2399	31FD	17				RETC,UN	
2400	31FE				*		
2401	31FE	00	00		STEMP	RES	2
2402	3200				*		
2403	3200	08	7C		RINPT	LODR,R0	STEMP
2404	3202	0C	04	5F		STRA,R0	INPT
2405	3205	08	78			LODR,R0	STEMP+1
2406	3207	0C	04	60		STRA,R0	INPT+1
2407	320A	17				RETC,UN	
2408	320B				*		
2409	320B	0C	04	5F	CSINPT	LODA,R0	INPT
2410	320E	08	06			STRR,R0	CINPT
2411	3210	0C	04	60		LODA,R0	INPT+1
2412	3213	08	02			STRR,R0	CINPT+1
2413	3215	17				RETC,UN	
2414	3216				*		
2415	3216	00	00		CINPT	RES	2
2416	3218				*		
2417	3218	08	7C		CRINPT	LODR,R0	CINPT
2418	321A	0C	04	5F		STRA,R0	INPT
2419	321C	08	78			LODR,R0	CINPT+1
2420	321F	0C	04	60		STRA,R0	INPT+1
2421	3222	17				RETC,UN	
2422	3223				*		
2423	3223	00	00		OP1	RES	2
2424	3225				*		
2425	3225	08	7C		INCCP1	LODR,R0	OP1+1
2426	3227	84	01			ADDI,R0	1
2427	3229	08	79			STRR,R0	OP1+1
2428	322B	15				RETC,GT	
2429	322C	16				RETC,LT	
2430	322D	08	74			LODR,R0	OP1
2431	322F	84	01			ADDI,R0	1
2432	3231	08	70			STRR,R0	OP1
2433	3233	17				RETC,UN	
2434	3234				*		
2435	3234	00	00		OP2	RES	2
2436	3236				*		
2437	3236	08	7C		INCCP2	LODR,R0	OP2+1
2438	3238	84	01			ADDI,R0	1
2439	323A	08	79			STRR,R0	OP2+1
2440	323C	16				RETC,LT	
2441	323D	15				RETC,GT	
2442	323F	08	74			LODR,R0	OP2
2443	3240	84	01			ADDI,R0	1
2444	3242	08	70			STRR,R0	OP2
2445	3244	17				RETC,UN	
2446	3245				*		
2447	3245	08	34		FOP	STRR,R0	UTEMP
2448	3247	09	33			STRR,R1	UTEMP+1
2449	3249	3F	32	94	POPNL	BSTA,UN	UTOP
2450	324C	04	03			LODI,R0	3
2451	324E	3B	1A			BSTR,UN	APT
2452	3250	05	04			LODI,R1	4

2453	3252	08	2B	CC	POP1	BSTA, UN	SPCB
2454	3255	08	A2			STRR, R0	PTEMP
2455	3257	08	21			LODR, R0	PTEMP+1
2456	3259	A4	01			SUPI, R0	1
2457	325B	08	1D			STRR, R0	PTEMP+1
2458	325D	77	08			PPSL	WC
2459	325F	08	18			LODR, R0	PTEMP
2460	3261	A4	00			SUPI, R0	0
2461	3263	08	14			STRR, R0	PTEMP
2462	3265	75	08			CPSL	WC
2463	3267	F9	69			BDRR, R1	POP1
2464	3269	17				RETC, UN	
2465	326A			*			
2466	326A			*			
2467	326A			*			
2468	326A	88	0E	APT		ADDR, R0	PTEMP+1
2469	326C	08	0C			STRR, R0	PTEMP+1
2470	326F	77	08			PPSL	WC
2471	3270	08	07			LODR, R0	PTEMP
2472	3272	84	00			ADDI, R0	0
2473	3274	08	03			STRR, R0	PTEMP
2474	3276	75	08			CPSL	WC
2475	3278	17				RETC, UN	
2476	3279			*			
2477	3279	00	00	PTEMP	RES		2
2478	327B	00	00	UTEMP	RES		2
2479	327D			*			
2480	327E	08	7C	PUSH		STRR, R0	UTEMP
2481	327F	09	7B			STRR, R1	UTEMP+1
2482	3281	05	04	PUSHNL		LODI, R1	4
2483	3283	3E	0F			BSTR, UN	UTOP
2484	3285	0B	F2	PUSH1		LODR, R3	*PTEMP
2485	3287	3E	32	D1		BSTA, UN	DECSP
2486	328A	CF	92	CF		STRA, R3	*SF
2487	328D	04	01			LODI, R0	1
2488	328F	3E	59			BSTR, UN	APT
2489	3291	F9	72			BDRR, R1	PUSH1
2490	3293	17				RETC, UN	
2491	3294			*			
2492	3294	08	65	UTOP		LODR, R0	UTEMP
2493	3296	08	61			STRR, R0	PTEMP
2494	3298	08	62			LODR, R0	UTEMP+1
2495	329A	08	5F			STRR, R0	PTEMP+1
2496	329C	17				RETC, UN	
2497	329D			*			
2498	329E	08	31	INCSP		LODR, R0	SP+1
2499	329F	84	01			ADDI, R0	1
2500	32A1	08	2D			STRR, R0	SP+1
2501	32A3	9E	06			PCFR, EQ	INCSP1
2502	32A5	08	28			LODR, R0	SP
2503	32A7	84	01			ADDI, R0	1
2504	32A9	08	24			STRR, R0	SP
2505	32AB	0E	22	INCSP1		LODR, R0	SP
2506	32AD	EC	00	05		COMA, R0	ENDRAM
2507	32B0	1D	30	62		BCTA, GT	ERR8
2508	32B3	1A	0A			BCTR, LT	INCSP2
2509	32B5	08	19			LCDR, R0	SP+1

LINE	ADDR	E1	E2	E3	LABEL	OPCODE	OPERAND
2510	32E7	EC	00	06		COMA,R0	ENDRAM+1
2511	32BA	1D	30	62		BCTA,GT	ERR8
2512	32BD	08	10			LODR,R0	SP
2513	32EF	EC	15	24	INCSP2	COMA,R0	TABEND
2514	3202	15				RETC,GT	
2515	32C3	1E	30	62		BCTA,LT	ERR8
2516	3206	08	08			LODR,R0	SP+1
2517	3208	EC	15	25		COMA,R0	TABEND+1
2518	32CB	1E	30	62		BCTA,LT	ERR8
2519	320E	17				RETC,UN	
2520	32CF				*		
2521	32CF	00	00		SP	RES	2
2522	32D1				*		
2523	32D1	08	7D		DECSP	LODR,R0	SP+1
2524	32D3	A4	01			SUBI,R0	1
2525	32D5	C8	79			STRR,R0	SP+1
2526	32D7	77	08			PPSL	WC
2527	32D9	08	74			LODR,R0	SP
2528	32DE	A4	00			SUBI,R0	0
2529	32DD	C8	70			STRR,R0	SP
2530	32DF	75	08			CPSL	WC
2531	32E1	1E	40			BCTR,UN	INCSP1
2532	32E3				*		
2533	32E3				*		
2534	32E3				*		
2535	32E3	3F	32	08	GETDAT	BSTA,UN	CSINPT
2536	32E6	0C	0C	5F		LODA,R0	DATPNT
2537	32E9	0C	04	5F		STRA,R0	INPT
2538	32EC	0C	0C	60		LODA,R0	DATPNT+1
2539	32EF	0C	04	60		STRA,R0	INPT+1
2540	32F2	08	0E			LODR,R0	PLATA
2541	32F4	18	2B			BCTR,EQ	GETD2
2542	32F6	3F	33	E0		BSTA,UN	SKPSP
2543	32F9	E7	2C			COMI,R3	.
2544	32FB	18	06			BCTR,EQ	GETD3
2545	32FD	3F	31	DE		BSTA,UN	DECPT
2546	3300	1B	30			BCTR,UN	GETD4
2547	3302				*		
2548	3302				*		
2549	3302				*		
2550	3302	00			PDATA	RES	1
2551	3303				*		
2552	3303				*		
2553	3303				*		
2554	3303	3F	35	4B	GETD3	BSTA,UN	EVAL
2555	3306	3F	34	14		BSTA,UN	STROP1
2556	3309	13				SPSL	
2557	330A	C3				STRZ,R3	
2558	330B	04	FF			LODI,R0	FF
2559	330D	C8	73			STRR,R0	PDATA
2560	332F	0C	04	5F		LODA,R0	INPT
2561	3312	CC	0C	5F		ST A,R0	DATPNT
2562	3315	CC	04	60		LODA,R0	INPT+1
2563	3318	CC	0C	60		STRA,R0	DATPNT+1
2564	331B	3F	32	18		BSTA,UN	CRINPT
2565	331E	03				LODZ,R3	
2566	331F	93				LPSL	

FE7	20	FC, I			
2568	3321	3F 33	FE GETD2	BSTA, UN	GETLIN SKIP OVER POSSIBLE LINE NUMBER
2569	3324	04 29		LODI, R0	COMTR2
2570	3326	05 CE		LODI, R1	COMTB2
2571	3328	3F 28	B7	BSTA, UN	TALUP
2572	332B	98 05		BCFR, EQ	GETD4
2573	332D	0C 08	FB	LODA, R0	DST+1
2574	3330	18 51		FCTR, EQ	GETD3
2575	3332	3F 33	DE GETD4	BSTA, UN	GETCHR
2576	3335	E7 0D		COMI, R3	CR
2577	3337	98 79		BCFR, FC	GETD4
2578	3339	0C 84	FF	LODA, R0	*INPT
2579	333C	9A 63		BCFR, LT	GETD2
2580	333E	07 0B		LODI, R3	0B
2581	3340	1F 30	77	BCTA, UN	ERROR
2582	3343		*		
2583	3343		*		
2584	3343		*		
2585	3343	0F 14	A5 MOVEB	LODA, R3	OPLTH
2586	3346	14		RETC, EQ	
2587	3347	0C 92	23 MOVEB1	LODA, R0	*OP1
2588	334A	3F 2B	2E	BSTA, UN	PUSOP2
2589	334D	3F 32	25	BSTA, UN	INCOF1
2590	3350	FB 7E		BDRR, R3	MOVEB1
2591	3352	17		RETC, UN	
2592	3353		*		
2593	3353		*		
2594	3353		*		RETURNS NAME OF VARIABLE IN NAMPUF. VARIABLE NAME IS FROM
2595	3353		*		1-16 CHARACTERS. LENGTH RETURNED IN R2.
2596	3353		*		CC = FC IF FLOATING POINT
2597	3353		*		LT IF STRING, '\$' NOT INCLUDED IN NAME
2598	3353		*		GT IF NO NAME FOUND
2599	3353		*		
2600	3353		*		
2601	3353	06 FF		GETNAM IODI, R2	FF
2602	3355	3F 33	E0	BSTA, UN	SKPSF
2603	3358	E7 24		GETNM5 COMI, R3	'\$'
2604	335A	18 1A		BCTR, EQ	GETNM3
2605	335C	3E 26		BSTR, UN	CKALPH
2606	335F	98 13		BCFR, EQ	GETNM6
2607	3360	03		LODZ, R3	
2608	3361	E6 0F		COMI, R2	F
2609	3363	1C 30	66	BCTA, EQ	ERR11 NAME TOO LONG
2610	3366	CF 27	36	STRA, R2	NAMPUF, +
2611	3369	3F 33	D5	BSTA, UN	GETCHR
2612	336C	3F 30	BD	BSTA, UN	CKNUM0
2613	336F	18 6F		BCTR, EQ	GETNM1
2614	3371	1B 65		PCTR, UN	GETNM5
2615	3373	3F 31	DE GETNM6	BSTA, UN	DECP1
2616	3376	8E 01		GETNM3 ADEI, R2	1
2617	3378	18 07		BCTR, EQ	GETNM7
2618	337A	E7 24		COMI, R3	'\$'
2619	337C	1C 37	75	BCTA, FC	RETNLT
2620	337F	20		FORZ, R0	
2621	3380	17		RETC, UN	
2622	3381	04 01		GETNM7 IODI, R0	1
2623	3383	17		RETC, UN	

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skips

check of alphanumeric, so ja CC=0

→ check if char is upper, so ja, CC=0
als upper in name, dan yes \$ not found

→ als ie char = \$ of char dan yes name given, CC=GT
als mintha 1 char in name, en dan \$ CC=LT

CLEAR CC

SET GT INTO CC

LINE ADDR B1 B2 B3 LABEL OPCODE OPERAND

2624	3384			*		
2625	3384			*		
2626	3384			*		
2627	3384	F7 41	CKALPH	COMI,R3	A	
2628	3386	16		RETC,LT		
2629	3387	F7 FA		COMI,R3	Z	
2630	3389	15		RETC,GT		
2631	338A	75 C0		CPSL	C0	
2632	338C	17		RETC,UN		
2633	338D		*			
2634	338D		*			
2635	338D		*			
2636	338D	00 00 00	CBUF1	RES	4	
2637	3391	00 00 00	CBUF2	RES	4	
2638	3395		*			
2639	3395		*			
2640	3395		*	DOES COMPARE FLOATING BUF1 WITH BUF2	RETURNS CC IN R3	
2641	3395		*			
2642	3395		*			
2643	3395	08 77	COMNUM	LODR,R0	CBUF1+1	
2644	3397	28 79		EORR,R0	CBUF2+1	
2645	3399	9A 07		BCFR,LT	COMN1	SIGN 'MANT1' SIGN 'MANT2'
2646	339B	08 71		LODR,R0	CBUF1+1	
2647	339D	9A 0D		BCFR,LT	COMGT	
2648	339F		*			
2649	339F	07 02	COMLT	LODI,R3	LT	LESS THAN CONDITION
2650	33A1	17		RETC,UN		
2651	33A2		*			
2652	33A2	08 69	COMN1	LODR,R0	CBUF1	
2653	33A4	28 6B		EORR,R0	CBUF2	
2654	33A6	9A 07		BCFR,LT	COMN3	
2655	33A8	08 63		LODR,R0	CBUF1	
2656	33AA	1A 73		BCFR,LT	COMLT	
2657	33AC		*			
2658	33AC	07 01	COMGT	LODI,R3	GT	GREATER THAN CONDITION
2659	33AE	17		RETC,UN		
2660	33AF		*			
2661	33AF	0E FF	COMN3	LODI,R2	FF	
2662	33B1	07 04		LODI,R3	4	
2663	33B3	0E 33 8D	COMN4	LODA,R2	CBUF1.4	
2664	33B6	FF 73 91		COMA,R2	CBUF2.1	
2665	33B8	1A 64		BCFR,LT	COMLT	
2666	33BB	19 6F		BCFR,LT	COMGT	
2667	33BD	FB 74		BDRR,R3	COMN4	
2668	33BF	17		RETC,UN		
2669	33C0		*			
2670	33C0		*			
2671	33C0		*			
2672	33C0	3B 1F	LXTLIN	BSTR,UN	SKPSP	
2673	33C2	F7 01		COMI,R3	CR	
2674	33C4	1C A8 96		BCTA,EQ	*RTNADR	
2675	33C7	07 11	ERR1	LODI,R3	11	
2676	33C9	1F 30 77		BCTA,UN	ERROR	
2677	33CC		*			
2678	33CC		*			
2679	33CC		*			
2680	33CC	3P 07	SKPLIN	BSTR,UN	GFTCHR	

check of signumit → ab < +41' CC is LT, ab > +57' CC is GT as check CC=0

CC SF DJ RS FA, EQ SETCC NOT

LINE	ADDR	F1	F2	F3	LABEL	OPCODE	OPERAND
2681	33CF	E7	0D			COMI,R3	C
2682	33D0	1C	A8	96		BCTA,FC	*RTNADR
2683	33D3	1E	77			BCTR,UN	SKPLIN
2684	33D5				*		
2685	33D5				*		
2686	33D5				*		
2687	33D5	0F	84	5F	GETCHR	LODA,R3	*INPT GET CHARACTER
2688	33D8	9E	31	C8		BCFA,LT	INCPT IF NCT, UPDATE INPT AND RETURN
2689	33DB	07	08		ERR10	LODI,R3	8
2690	33DD	1F	30	77		BCTA,UN	ERROR <i>start over flow error</i>
2691	33E0				*		
2692	33E0				*		
2693	33F0				*		
2694	33E0	3B	73		SKPSP	BSTR,UN	GETCHR <i>skip spaces but not tabs</i>
2695	33E2	E7	20			COMI,R3	
2696	33E4	18	7A			BCTR,FQ	SKPSP
2697	33E6	17				RETC,UN	
2698	33E7				*		
2699	33E7				*		
2700	33E7				*		
2701	33E7	3B	77		SKPCOM	BSTR,UN	SKPSP
2702	33E9	E7	2C			COMI,R3	
2703	33EB	9E	5A			BCFR,FQ	ERR1
2704	33ED	17				RETC,UN	
2705	33EE				*		
2706	33EE				*		<i>* get line number in LINNUM in set points of it char. that</i>
2707	33EE				*		
2708	33EE	3B	70		GETLIN	BSTR,UN	SKPSP SKIP THE SPACES
2709	33F0	20				EORZ,R0	
2710	33F1	0E	04			LODI,R1	4
2711	33F3	CD	47	69	GETLI1	STRA,R1	LINNUM, - ZERO LINNUM
2712	33F6	59	7B			BRNR,R1	GETLI1
2713	33F8	05	FF			LODI,R1	FF
2714	33FA	3F	30	BD	GETLI2	BSTA,UN	CKNUM0 <i>check if line number is greater</i>
2715	33FD	9C	31	DE		BCFA,EQ	DECPT <i>no use, begin with 000 decimal pointer in return</i>
2716	3400	E5	04			COMI,R1	4
2717	3402	1C	30	6A		BCTA,EQ	ERR12 LINE NUMBER TOO LONG
2718	3405	CD	27	69		STRA,R1	LINNUM, + STORE THE NUMBER IN THE BUFFER
2719	3408	3F	33	D5		BSTA,UN	GETCHR
2720	340B	1B	6D			BCTR,UN	GETLI2 <i>get next character</i>
2721	340D				*		
2722	340D				*		
2723	340D				*		
2724	340D	CC	12	34	STROP2	STRA,R0	OP2
2725	3410	CD	12	35		STRA,R1	OP2+1
2726	3413	17				RETC,UN	
2727	3414				*		
2728	3414				*		
2729	3414				*		
2730	3414	CC	12	23	STROP1	STRA,R0	OP1
2731	3417	CD	12	24		STRA,R1	OP1+1
2732	341A	17				RETC,UN	
2733	341B				*		
2734	341B				*		
2735	341B				*		
2736	341F	00			LOP1	RES	1
2737	341C	00			LOP2	RES	1

LINE	ADDR	R1	B2	B3	LABEL	OPCODE	OPERAND
2738	341D				*		
2739	341D				*		
2740	341D				*	GETS THE NEXT LOGICAL OPERATOR(S):	=, >, <, >=, <=, <
2741	341D				*		
2742	341D				*		
2743	341D	05	FF		GETLUP	LODI, R1	FF
2744	341F	C9	7B		STRR, R1		LOP2
2745	3421	3F	33	E0	GETL6	BSTA, UN	SKPSP
2746	3424	F7	3D		COMI, R3		'='
2747	3426	18	0D		BCTR, EQ		GETL1
2748	3428	E7	3C		COMI, R3		'<<>>'
2749	342A	18	0D		BCTR, EQ		GETL2
2750	342C	F7	3E		COMI, R3		'>><<'
2751	342E	9C	34	42	BCFA, EQ	GETL7	- syntax error als you write 4 1 e operator
2752	3431	04	01		LODI, R0	GT	
2753	3433	1B	06		BCTR, UN	GETL4	
2754	3435	04	00		LODI, R0	EQ	
2755	3437	1B	02		BCTR, UN	GETL4	
2756	3439	04	02		GETL2	LODI, R0	LT
2757	343E	01	34	1E	GETL4	STRA, R1	LOP1, + STORE IT
2758	343E	01			LODZ, R1		CHECK R1 FOR FIRST CHAR
2759	343F	15			RETC, GT		als mit 1 e operator RETURN
2760	3440	1B	5F		BCTR, UN	GETL6	
2761	3442	01			GETL7	LODZ, R1	4 1 e operator R1=FF, das syntax error
2762	3443	1E	33	C7	BCTA, LT	ERR1	SYNTAX ERROR
2763	3446	1F	31	DE	BCTA, UN	DECPT	als nur 1 e operator pointer -1 zu return
2764	3449				*		
2765	3449				*	compare 2 strings	OP1 = address string 1, OP2 = address string 2, OP.LTH = length string
2766	3449				*	als 1 e char dat ≠	OP1 < OP2 da cc is LT als OP1 > OP2 cc is GT, als gleich ist = da cc=0 (cc=R3)
2767	3449	07	00		COMOP	LODI, R3	0 INITIALIZE RETURN STATUS
2768	344B	0E	14	A5		LODA, R2	OPLTH GET LENGTH OF COMPARE
2769	344F	14			RETC, EQ		
2770	344F	0C	92	23	COMOP1	LODA, R0	*OP1
2771	3452	EC	92	34		COMA, R0	*OP2
2772	3455	1F	33	9F		BCTA, IT	COMLT
2773	3458	1F	33	AC		BCTA, GT	COMGT
2774	345B	3F	32	25		BSTA, UN	INCOPI OP1 + 1
2775	345E	3F	32	36		BSTA, UN	INCOPI2 OP2 + 1
2776	3461	FA	6C			BDRR, R2	COMOP1
2777	3463	20				EORZ, R0	CC=0
2778	3464	17				RETC, UN	
2779	3465				*		
2780	3465				*		
2781	3465				*		
2782	3465	00			GCS1	RES	1
2783	3466	00			GCS2	RES	1
2784	3467				*		
2785	3467				*		
2786	3467				*		
2787	3467	20			GCVAR	EORZ, R0	
2788	3468	C8	35			STRR, R0	CREATD
2789	346A	3F	36	DA		BSTA, UN	LOKVAR
2790	346D	14				RETC, EQ	
2791	346E	16				RETC, LT	
2792	346F	3F	33	53	GCVAR2	BSTA, UN	GETNAM
2793	3472	15				RETC, GT	
2794	3473	CA	30			STRR, R2	OPLTH

2795	3475	3F 33	AC	BSTA,UN	SKPSP	
2796	3478	3F 33	EO	COMI,R3	COMGT	CHECK THE DIMENSIONED VARIABLE
2797	347B	EF 2E		BCTA,EO	DECPT	
2798	347D	1C 33	AC	BSTA,UN	2	Increment input pointer
2799	3480	3F 31	DE	LODI,R0	LEN	
2800	3483	04 02		LODI,R1	OPLTH	
2801	3485	05 04		LODI,R3	0	
2802	3487	0A 1C		BSTA,UN	GCSUB	
2803	3489	07 00		LODI,R1	5	CLEAR THE VARIABLE AND NEXT BYTE
2804	348B	3F 34	D0	EORZ,R0	GCFPT1	
2805	348E	05 05		BSTA,UN	PUSOP2	
2806	3490	20		BDRR,R1	GCFPT1	
2807	3491	3F 2B	2E	LODA,R0	DST	
2808	3494	F9 7A		LODA,R1	DST+1	
2809	3496	0C 08	FA GETDST	CPSL	C0	
2810	3499	ED 08	FB	RETC,UN		
2811	349C	75 C0				
2812	349E	17				
2813	349F		*			
2814	349F	00	CREATD RES	1		
2815	34A0		*			
2816	34A0	04 FF	GCSTR	LODI,R0	FF	
2817	34A2	C9 7F		STRR,R0	CREATD	
2818	34A4	17		RETC,UN		
2819	34A5		*			
2820	34A5	00	OPLTH RES	1		
2821	34A6	00	GCSSTG RES	1		
2822	34A7		*			
2823	34A7	C9 7D	GCSTRA	STRR,R1	GCSSTG	
2824	34A9	0A 7A		LODR,R2	OPLTH	
2825	34AE	60 00		IORI,R2	00	MAKE IT A STRING
2826	34AD	04 03		LODI,P0	3	
2827	34AF	07 00		LODI,R3	0	
2828	34B1	3F 34	D0	BSTA,UN	GCSUB	
2829	34B4	08 70		LODR,R0	GCSSTG	
2830	34B6	C1	GCSTR1	STRZ,R1		
2831	34B7	3F 2F	2F	BSTA,UN	PUSOP2	
2832	34BA	04 20	GCSTR3	LODI,R0		
2833	34EC	3F 2F	2E	PSTA,UN	PUSOP2	
2834	34BF	F9 79		BDRR,R1	GCSTR3	
2835	34C1	20		EORZ,R0		
2836	34C2	3F 2F	2F	BSTA,UN	PUSOP2	
2837	34C5	06 0A		LODI,R2	SDFLT	
2838	34C7	3F 34	96	BSTA,UN	GETDST	
2839	34CA	07 FF		LODI,R3	FF	SET LT CONDITION
2840	34CC	17		RETC,UN		
2841	34CD	00	GCVT1	RES	1	
2842	34CE	00	GCVT2	RES	1	
2843	34CF	00	GCVT3	RES	1	
2844	34D0		*			
2845	34D0	C8 7B	GCSUB	STRR,R0	GCVT1	2 OR 3
2846	34D2	C9 7A		STRR,R1	GCVT2	LENGTH OF VARIABLE
2847	34D4	CE 95	24	STRA,R2	*TABEND	LENGTH OF NAME
2848	34D7	CE 76		STRR,R3	GCVT3	HIGH BYTE OF LEN OF VAR
2849	34D9	0C 15	24	LODA,R0	TABEND	
2850	34DC	CC 12	34	STRA,R0	OP2	
2851	34DF	0C 15	25	LODA,R0	TABEND+1	

LINE	ADDR	B1	B2	B3	LABEL	OPCODE	OPERAND
2852	34E2	CC	12	35		STRA,R0	OP2+1
2853	34E5	04	27			LODI,R0	NAMBUF
2854	34E7	CC	12	23		STRA,R0	OP1
2855	34FA	04	36			LODI,R0	NAMBUF
2856	34EC	CC	12	24		STRA,R0	OP1+1
2857	34EF	3F	32	36		BSTA,UN	INCOP2 <i>→ in 1st slot of byte-length names</i>
2858	34F2	0D	14	A5		LODA,R1	OPLTH
2859	34F5	8D	12	35		ADDA,R1	OP2+1 <i>(length of string) + TABEND in R0 & 1</i>
2860	34F8	77	08			PPSL	WC
2861	34FA	0C	12	34		LODA,R0	OP2
2862	34FD	84	00			ADDI,R0	0
2863	34FF	75	01			CPSL	CRY
2864	3501	89	4A			ADDR,R1	GCVT1) <i>del 2 of 3 to 5 TABEND</i>
2865	3503	84	00			ADDI,R0	0
2866	3505	CC	08	FA		STRA,R0	DST <i>same as R0,R1 in DST</i>
2867	3508	CD	08	FB		STRA,R1	DST+1
2868	350B	75	01			CPSL	CRY
2869	350D	8D	14	CE		ADDA,R1	GCVT2 <i>del length variable in 5 op</i>
2870	3510	8C	14	CF		ADDA,R0	GCVT3
2871	3513	75	08			CPSL	WC
2872	3515	08	0D			STRR,R0	TABEND <i>same in TABEND</i>
2873	3517	C9	0C			STRR,R1	TABEND+1
2874	3519	3F	2B	2E		BSTA,UN	PUSOP2 <i>R0 → 072, 072+1</i>
2875	351C	01				LODZ,R1	
2876	351D	3F	2B	2F		BSTA,UN	PUSOP2 <i>store begin of length variable in buffer</i>
2877	3520	3F	33	43		BSTA,UN	MOVEB <i>same name in buffer</i>
2878	3523	17				RETC,UN	
2879	3524				*		
2880	3524				*		
2881	3524				*		
2882	3524	00	00		TABEND RES		2
2883	3526				*		
2884	3526	03			PUSHOP	LODZ,R3	
2885	3527	09	0F			LODR,R1	OPSP
2886	3529	CD	67	55		STRA,R1	OPSTK,I
2887	352C	85	01			ADDI,R1	1
2888	352E	C9	08			STRR,R1	OPSP
2889	3530	E5	10			COMI,R1	10
2890	3532	16				RETC,LT	
2891	3533	07	12		ERR5	LODI,R3	12
2892	3535	1F	30	77		BCTA,UN	ERROR <i>stack overflow error</i>
2893	3538				*		
2894	3538	02			OPSP RES		1
2895	3539				*		
2896	3539	09	7D		POPCP	LODR,R1	OPSP
2897	353B	A5	01			SUBI,R1	1
2898	353D	1A	74			BCTR,LT	ERR5 <i>OP STACK OVERFLOW</i>
2899	353F	0E	67	55		LODA,R1	OPSTK,I
2900	3542	C3				STRZ,R3	
2901	3543	C9	73			STRR,R1	OPSP
2902	3545	17				RETC,UN	
2903	3546				*		
2904	3546				*		
2905	3546				*		
2906	3546	02			GOT RES		1
2907	3547				*		
2908	3547				*		

LINE	ADDR	D1	D2	D3	LABEL	OPCODE	OPERAND
2920	3547						
2910	3547	20			SFTGOT	EORZ,R0	
2911	3548	C8	7C			STRR,R0	GOT
2912	354A	17				RETC,UN	
2913	354B				*		
2914	354B				*		
2915	354B				*	EVAL.RETURNS CC = EQ IF NORMAL, VALUE ON STACK	
2916	354B				*	LT IF STRING, R0, R1 = ADDRESS. R2 = LENGTH	
2917	354B				*	GT IF NOT FOUND	
2918	354B				*		
2919	354B				*		
2920	354B	04	01		EVAL	LODI,R0	1
2921	354D	C8	77			STRR,R0	GOT
2922	354F	20				EORZ,R0	INITIALIZE OPERATOR STACK POINTER
2923	3550	C8	66			STRR,R0	OPSP
2924	3552	07	07		EVALNL	LODI,R3	7 THIS INDICATED BEGINNING
2925	3554	3B	50			BSTR,UN	PUSHOP INITILIZE OPERATOR STACK
2926	3556	3F	36	47		BSTA,UN	CKNEG
2927	3559	3F	36	DA	EVAL2	BSTA,UN	LOKVAR TRY TO READ A VARIABLE
2928	35EC	16				RETC,LT	→ << LT, don't stop in under at this
2929	355D	98	07			BCFR,EQ	EVAL15
2930	355F	3F	32	7D		BSTA,UN	PUSH
2931	3562	3B	63			BSTR,UN	SETGOT
2932	3564	1B	06			BCTF,UN	EVAL1
2933	3566	3F	39	C5	EVAL15	BSTA,UN	ECONST TRY TO READ A CONSTANT
2934	3569	3C	35	47		BSTA,EQ	SETGOT
2935	356C	3F	33	E0	EVAL1	BSTA,UN	SKPSP
2936	356F	03				LODZ,R3	
2937	3570	05	05			LODI,R1	5 NUMBER OF OPERATORS
2938	3572	ED	56	F4	EVAL3	COMA,R1	OPTBL,-
2939	3575	1C	35	A9		BCTA,EQ	ECP OPERATOR MATCH
2940	3578	59	78			BRNR,R1	EVAL3
2941	357A	F7	29			COMI,R3	') '
2942	357C	1C	35	F0		BCTA,EQ	EDEL1
2943	357F	F7	28			COMI,R3	' ('
2944	3581	1C	35	D5		BCTA,EQ	EDEL
2945	3584	3F	31	DE		BSTA,UN	DECPT
2946	3587	04	36			LODI,R0	FCNTAB
2947	3589	05	68			LODI,R1	FCNTAB
2948	358B	3F	28	B7		BSTA,UN	TABUP
2949	358E	1C	36	2C		BCTA,EQ	EFCN
2950	3591	3F	35	39	EVAL7	BSTA,UN	POPOP
2951	3594	F7	07			COMI,R3	7
2952	3596	98	04			BCFR,EQ	EVAL8
2953	3598	0C	15	46		LODA,R0	GOT
2954	359B	17				RETC,UN	
2955	359C	03			EVAL8	LODZ,R3	
2956	359D	44	07			ANDI,R0	7
2957	359F	F4	03			COMI,R0	3
2958	35A1	1D	33	C7		BCTA,GT	ERR1 SYNTAX ERROR
2959	35A4	3F	35	F8		BSTA,UN	DOOP
2960	35A7	1B	68			BCTR,UN	EVAL7
2961	35A9				*		
2962	35A9	0D	76	59	EOP	LODA,R1	OPCOD,I GET OPERATOR CODE
2963	35AC	D1				RRL,R1	
2964	35AE	E1				RRL,R1	
2965	35AF	D1				RRL,R1	

LINE	ADDR	P1	P2	P3	LABEL	OPCODE	OPERAND
2966	35AF	61				IORZ, R1	
2967	35B0	C8	1B			STRR, R0	TEMPOP SAVE OPERATOR
2968	35B2	3F	35	39	EOP1	BSTA, UN	POPOP GET OPERATOR FROM STACK
2969	35B5	03				LODZ, R3	
2970	35B6	C1				STRZ, R1	
2971	35E7	47	07			ANDI, R3	?
2972	35B9	08	12			LODR, R0	TEMPOP
2973	35BB	44	07			ANDI, R0	?
2974	35BD	E3				COMZ, R3	
2975	35FE	9A	0F			BCFR, LT	EOP2 IF INPUT = STACK, DC OPERATION ON STACK
2976	35C0	01				LODZ, R1	
2977	35C1	C3				STRZ, R3	
2978	35C2	3F	35	26		BSTA, UN	PUSHOP
2979	35CE	0B	06			LODR, R3	TEMPOP GET INPUT OPERATOR
2980	35C7	3F	35	26		BSTA, UN	PUSHOP PUSH IT ONTO STACK
2981	35CA	1F	35	59		BCTA, UN	EVAL2
2982	35CD				*		
2983	35CD				*		
2984	35CD				*		
2985	35CD	00				TEMPOP RES	1
2986	35CE				*		
2987	35CF	01			EOP2	LODZ, R1	
2988	35CF	C3				STRZ, R3	
2989	35D0	3F	35	F8		BSTA, UN	DOOP
2990	35D3	1F	51			BCTR, UN	EOP1
2991	35D5				*		
2992	35D5	07	05		EDEL	LODI, R3	5
2993	35D7	3F	35	26		BSTA, UN	PUSHOP
2994	35DA	3F	36	47		BSTA, UN	CKNEG
2995	35DD	1F	35	59		BCTA, UN	EVAL2
2996	35E0				*		
2997	35E0	3F	35	39	EDEL1	BSTA, UN	POPOP
2998	35E3	03				LODZ, R3	
2999	35E4	44	07			ANDI, R0	?
3000	35E6	F4	07			COMI, R0	?
3001	35E8	1C	33	C7		BCTA, EQ	ERR1
3002	35EB	F4	05			COMI, R0	5
3003	35ED	1C	35	6C		BCTA, EQ	EVAL1
3004	35F0	F4	06			COMI, R0	6
3005	35F2	18	21			BCTR, EQ	EFCNEX
3006	35F4	3B	02			BSTR, UN	DOOP
3007	35F6	1B	68			BCTR, UN	EDFL1
3008	35F8				*		
3009	35F8	F7	03		DOOP	COMI, R3	3
3010	35FA	98	06			BCFR, EQ	DOOP1
3011	35FC	3F	3D	11		BSTA, UN	POPPOP
3012	35FE	1F	3C	D9		BCTA, UN	FPABS1
3013	3602	53			DOOP1	RRR, R3	
3014	3603	53				RRR, R3	
3015	3604	47	0E			ANDI, R3	0E
3016	3606	0F	76	5E		LODA, R3	OPJUMP, I
3017	3609	CC	08	FA		STRA, R0	DST
3018	360C	0F	36	5E		LODA, R3	OPJUMP, +
3019	360F	CC	08	FB		STRA, R0	DST+1
3020	3612	1F	A8	FA		BCTA, UN	*DST
3021	3615				*		
3022	3615	53			EFCNEX	RRR, R3	

3022	3616	53		DDD,R3				
3024	3617	53		ANDI,R3				
3025	3618	47	1F	ANDI,R3	1F			
3026	361A	0F	76 B0	LODA,R3	FCNJMP,1			
3027	361D	00	08 FA	STRA,R0	DST			
3028	3620	0F	36 F0	LODA,R3	FCNJMP,1			
3029	3623	00	08 FB	STRA,R0	DST+1			
3030	3626	3F	A8 FA	BSTA,UN	*DST			
3031	3629	1F	35 6C	BCTA,UN	EVAL1			
3032	362C		*					
3033	362C	3F	33 E0 EFCN	BSTA,UN	SKPSP			
3034	362F	E7	28	COMI,R3	'('			
3035	3631	9C	33 C7	PCFA,EQ	ERR1	SYNTAX ERROR		
3036	3634	0D	08 FB	LODA,R1	DST+1			
3037	3637	D1		RRL,R1				
3038	3638	L1		RRL,R1				
3039	3639	D1		RRL,R1				
3040	363A	65	06	IORI,R1	6	FUNCTION CODE		
3041	363C	01		LODZ,R1				
3042	363D	C3		ST 2,R3				
3043	363E	3F	35 26	BSTA,UN	PUSHOP	PUSH CODE AND FUNCTION ONTO OPSTK		
3044	3641	3F	36 47	BSTA,UN	CKNEG			
3045	3644	1F	35 59	BCTA,UN	EVAL2			
3046	3647		*					
3047	3647	3F	33 E0 CKNEG	BSTA,UN	SKPSP			
3048	364A	E7	2D	COMI,R3				
3049	364C	9C	31 DF	PCFA,E0	DECPT			
3050	364F	07	23	LODI,R3	3			
3051	3651	1F	35 26	BCTA,UN	PUSHOP			
3052	3654		*					
3053	3654	5E	2A 2F OPTBL	ALIT	'* / + -'			
3054	3659	00	OPCOD	DATA	0			
3055	365A	01		DATA	1	*		
3056	365E	01		DATA	1	/		
3057	365C	02		DATA	2	+		
3058	365D	02		DATA	2	-		
3059	365F		*					
3060	365F	3F	97	CPJUMP	ACON	FPEXP		
3061	3662	38	91		ACON	FPMULT		
3062	3662	38	94		ACON	FPDIV		
3063	3664	37	EF		ACON	FFADD		
3064	3666	37	FD		ACON	FPSUP		
3065	3668		*					
3066	3668		*					
3067	3668	45	58 50 FCNTAB	ALIT	'EXP.'			
3068	366C	00	00	ACON	0			
3069	366F	43	4F 53	ALIT	'COS.'			
3070	3672	00	02	ACON	2			
3071	3674	53	49 4E	ALIT	'SIN.'			
3072	3678	00	04	ACON	4			
3073	367A	54	41 4F	ALIT	'TAN.'			
3074	367E	00	06	ACON	6			
3075	3680	41	42 53	ALIT	'ARS.'			
3076	3684	00	08	ACON	8			
3077	3686	53	47 4E	ALIT	'SGN.'			
3078	368A	00	0A	ACON	A			
3079	368C	52	4E 44	ALIT	'RND.'			

LINE ADDR B1 B2 B3 LABEL OPCODE OPERAND

3080	3690	00	00		ACON	C
3081	3692	53	51	52	ALIT	SQR.
3082	3696	00	00		ACON	E
3083	3698	40	4E	54	ALIT	INT.
3084	369C	00	10		ACON	10
3085	369F	45	F2	43	ALIT	FRC.
3086	36A2	00	12		ACON	12
3087	36A4	40	4F	2E	ALIT	LN.
3088	36A7	00	14		ACON	14
3089	36A9	40	4F	47	ALIT	LOG.
3090	36AD	00	16		ACON	16
3091	36AF	FF			DATA	FF
3092	36B0			*		
3093	36B0	3F	2F		FCNJMP	ACON
3094	36B2	3D	87		ACON	FPCOS
3095	36B4	3D	68		ACON	FPSIN
3096	36B6	3D	D6		ACON	FPTAN
3097	36B8	3C	D0		ACON	FPABS
3098	36BA	3C	C4		ACON	FPSGN
3099	36BC	3E	68		ACON	FPRND
3100	36BE	3F	C1		ACON	FPSQ T
3101	36C0	3C	E6		ACON	FPINT
3102	36C2	3D	20		ACON	FPRRC
3103	36C4	3F	AD		ACON	FPLN
3104	36C6	3F	AC		ACON	FPLOG
3105	36C8			*		
3106	36C8			*		
3107	36C8			*		
3108	36C8	08	0E		INCL	LODR,R0
3109	36CA	84	01		ADDI,R0	1
3110	36CC	08	0A		STRR,R0	LTEMP+1
3111	36CE	1F			RETC,GT	
3112	36CF	16			RETC,LT	
3113	36D0	08	05		LODR,R0	LTEMP
3114	36D2	84	01		ADDI,R0	1
3115	36D4	08	01		STRR,R0	LTEMP
3116	36D6	17			RETC,UN	
3117	36D7			*		
3118	36D7			*		
3119	36D7			*		
3120	36D7	00	00	00	LTEMP	RES 3
3121	36DA			*		
3122	36DA			*		
3123	36DA			*		
3124	36DA	3F	31	DB	LOKVAR	BSTA,UN
3125	36DD	3F	31	F3	BSTA,UN	SKPDEC
3126	36E0	F7	27		CCMI,R3	SINPT
3127	36E2	1C	37	59	BCTA,EQ	LOKV9
3128	36E5	0C	00	04	LODA,R0	IBST
3129	36E8	C8	6D		STRR,R0	LTEMP
3130	36FA	20			EORZ,R0	
3131	36FB	C8	6F		STRR,R0	LTEMP+1
3132	36ED	08	F8		LODR,R0	*LTEMP
3133	36EF	1C	33	AC	BCTA,EQ	COMGT
3134	36F2	C8	65		STRR,R0	LTEMP+2
3135	36F4	44	0F		ANDI,R0	0F
3136	36F6	C1			STRZ,R1	

variable table: type || length

MSB NEXT VAR

LSB NEXT VAR

NAME

NAME

VALUE

VALUE

type: BIT 0 = 1 → string
BIT 4 = 1 → DIMENSIONED VARIABLE

another variable to be seen

shift status for 1 character, first pointer - 1
INPT SET UP AT BEGINNING OF WORD some input pointer in STEN?

start is set buffer = start table variable name + value

12 byte variable type || length

137	E7	F	TR.1		
3138	36F9	08 DC	LODR,R0	LTEMP	GET HIGH BYTE OF FORWARD REFERENCE
3139	36FB	08 2E	STRR,R0	FREF	SAVE IT <i>BSTR,UN,INCL LTEMP+1</i>
3140	36FD	3B 49	BSTR,UN	INCL	
3141	36FF	08 D6	LODR,R0	*LTEMP	GET LOW BYTE OF FORWARD REFERENCE
3142	3701	08 29	STRR,R0	FREF+1	SAVE IT
3143	3703	3B 43	BSTR,UN	INCL	
3144	3705	3F 33 D5	BSTA,UN	GETCHR	GET CHARACTER FROM INPUT
3145	3708	EB CD	COMR,R3	*LTEMP	CHECK FOR MATCH
3146	370A	98 0F	BCFR,EQ	LOKV3	NO MATCH, SKIP VARIABLE
3147	370C	F9 75	BDRR,R1	LOKV2	SEE IF END
3148	370E	3F 33 D5	BSTA,UN	GETCHR	GET NEXT CHARACTER <i>in R3</i>
3149	3711	3F 30 BD	BSTA,UN	CKNUM0	
3150	3714	18 05	BCTR,EQ	LOKV3	NOT A MATCH IF STILL A NUMBER LEFT
3151	3716	3F 33 84	PSTA,UN	CKALPH	<i>alpha variable?</i>
3152	3719	98 12	BCFR,EQ	LOKV5	<i>20 me, last of \$</i>
3153	371B	3F 32 00	BSTA,UN	RINPT	<i>STEP → INPT</i>
3154	371F	08 0B	LODR,R0	FREF	
3155	3720	09 0A	LODR,R1	FREF+1	GET THE FORWARD REFERENCE
3156	3722	CC 16 D7	STRA,R0	LTEMP	
3157	3725	CD 16 D8	STRA,R1	LTEMP+1	RESET TABLE POINTER
3158	3728	1F 36 ED	BCTA,UN	LOKV1A	
3159	372B		*		
3160	372B	00 00	FREF	RES	2
3161	372D		*		
3162	372D	3F 36 08	LOKV5	BSTA,UN	INCL POINT TO FIRST BYTE OF VARIABLE
3163	3730	F7 24	COMI,R3	'\$'	<i>string variable → variable name \$</i>
3164	3732	98 09	BCFR,EQ	LOKV8	
3165	3734	3F 31 08	BSTA,UN	INCPT	
3166	3737	0F 96 D7	LODA,R2	*LTEMP	GET LENGTH OF STRING
3167	373A	3F 36 08	PSTA,UN	INCL	
3168	373D	3F 31 DE	LOKV8	BSTA,UN	DECPT
3169	3740	0C 16 D7	LODA,R0	LTEMP	
3170	3743	0E 16 D8	LODA,R1	LTEMP+1	GET THE POINTERS
3171	3746	F7 24	COMI,R3	'\$'	
3172	3748	98 07	BCFR,EQ	LOKV6	NOT A STRING
3173	374A	0F 16 D9	LODA,R3	LTEMP+2	
3174	374D	9E 37 1B	BCFA,LT	LOKV3	<i>CC = LT last string</i>
3175	3750	17	RETC,UN		
3176	3751		*		
3177	3751	0F 16 D9	LOKV6	LODA,R3	LTEMP+2 GET DATA BYTE
3178	3754	47 C0	ANDI,R3	C0	
3179	3756	19 22	BCTR,GT	LOKV7	BRANCH IF DIMENSIONED
3180	3758	17	RETC,UN		
3181	3759		*		
3182	3759	06 00	LOKV9	LODI,R2	0
3183	375B	3F 31 08	BSTA,UN	INCPT	
3184	375E	3F 33 D5	LOKV10	BSTA,UN	GETCHR
3185	3761	F7 27	COMI,R3		<i>string R2 = loop</i>
3186	3763	18 04	BCTR,EQ	LOKV11	BU PRINT "string"
3187	3765	86 01	ADDI,R2	1	
3188	3767	1B 75	BCTR,UN	LOKV10	
3189	3769	0C 11 FE	LOKV11	LODA,R0	STEMP
3190	376C	0F 11 FF	LODA,R1	STEMP+1	
3191	376F	85 01	ADDI,R1	1	
3192	3771	98 02	BCFR,EQ	RETNLT	
3193	3773	84 01	ADDI,R0	1	

LINE	ADDR	D1	B2	D3	LABEL	OPCODE	OPERAND	
3194	3775	07	FF		SETIT	ICDI,R3	FF	SET IT CONDITION
3195	3777	17			RETC,UN			<i>R0, R1 is address is left shift, CC & LT</i>
3196	3778				*			
3197	3778				*			
3198	3778				*			
3199	3778	00	00		LVT2	RES	2	
3200	377A				*			
3201	377A				*			
3202	377A				*			
3203	377A	C8	7C		LCKV7	STRR,R0	LVT2	
3204	377C	CD	17	79		STRA,R1	LVT2+1	
3205	377F	3F	33	E2		BSTA,UN	SKPSP	
3206	3782	F7	28			COMI,R3	'(' XXXXXX	
3207	3784	9C	33	C7		KCFA,EQ	ERR1	<i>Square error.</i>
3208	3787	3F	36	DA		BSTA,UN	LOKVAR	
3209	378A	3F	32	7D		BSTA,UN	PUSH	
3210	378D	3F	31	C8		BSTA,UN	INCPT	
3211	3790	3F	3C	F5		BSTA,UN	PO C1	
3212	3793	3F	2A	17		BSTA,UN	DTOBNI	
3213	3796	20				KORZ,R0		
3214	3797	A5	01			SUBI,R1	1	
3215	3799	77	08			PPSL	WC	
3216	379B	75	01			CPSL	CRY	
3217	379D	D1				RRL,R1		
3218	379E	D2				RRL,R0		
3219	379F	D1				RRL,R1		
3220	37A0	D2				RRL,R0		
3221	37A1	8D	17	79		ADDA,R1	LVT2+1	
3222	37A4	9C	17	78		ADDA,R0	LVT2	
3223	37A7	75	C8			CPSL	C0+WC	
3224	37A9	17				RETC,UN		
3225	37AA				*			
3226	37AA				*			*****
3227	37AA				*			
3228	37AA				*			TRANSFER ROUTINE
3229	37AA				*			
3230	37AA				*			THIS ROUTINE TRANSFERS THE OPERANDS FROM THE STACK TO OPB AND OPA
3231	37AA				*			
3232	37AA	04	27		TRAN	LODI,R0	OPB	
3233	37AC	25	41			LODI,R1	OPB	
3234	37AF	3F	32	45		BSTA,UN	POP	POP SECOND OPERAND OFF STACK
3235	37B1	24	27			LODI,R0	OPA	
3236	37B3	05	48			LODI,R1	OPA	
3237	37F5	3F	32	45		BSTA,UN	POP	POP FIRST OFFRANND OFF STACK
3238	37F8	27	00			LODI,R3	00	
3239	37BA	77	08			PPSL	WC	
3240	37BC	17				RETC,UN		
3241	37BD				*			
3242	37BD				*			*****
3243	37BD				*			
3244	37BD				*			SUBTRACTION ROUTINE
3245	37BD				*			
3246	37BD				*			THIS ROUTINE SUBTRACTS TWO PINARY FLOATING POINT NUMBERS
3247	37BD				*			
3248	37BD	3F	6E		FPSUP	PSTR,UN	TRAN	TRANSFER OPERANDS
3249	37FE	3F	38	4F		BSTA,UN	TCON	PERFORM TWO'S COMPLEMENT
3250	3702	1F	27			PCUP,UN	ADDI	

3251	37C4	06	27	ADDC	LODI,R2	OPB	
3253	37C6	07	4D		LODI,R3	OPB	
3254	37C8	1B	07		BCTR,UN	ADDF	
3255	37CA			*			
3256	37CA	06	27	ADDE	LODI,R2	OPA	
3257	37CC	07	48		LODI,R3	OPA	
3258	37CE	0D	07 4D		LODA,R1	OPB	FETCH EXP OF OPERAND 1 IN R1
3259	37D1	CF	07 45	ADDE	STRA,R2	ADR	SET INDIRECT ADDRESS WITH TO ADDR IN REGS
3260	37E4	CF	07 46		STRA,R3	ADR+1	
3261	37D7	07	01	ADDF	LODI,R3	1	SFT BYTE COUNTER
3262	37D9	77	01		IPSL	CRY	SET CARRY
3263	37EB	0F	E7 4E		LODA,R3	*ADR,I	FETCH MS BYTE OF MATISSA
3264	37DE	1A	02		BCTR,LT	ADDC	IF BYTE IS NEGATIVE, BRANCH
3265	37E0	75	01		CPSL	CRY	
3266	37E2	06	04	ADDG	LODI,R2	LEN	SET END OF BYTE COUNTER
3267	37E4	3F	38 33		BSTA,UN	RRIN	ROTATE RIGHT MANTISSA AND INCR EXPONENT
3268	37E7	0C	87 45		LODA,R0	*ADR	TEST TWO EXPONENTS
3269	37EA	E1			COMZ,R1		
3270	37EB	9E	6A		BCTR,EQ	ADDF	IF NOT EQUAL, CONTINUE
3271	37ED	1B	16		BCTR,UN	ADDF	IF EQUAL, ALIGNN READY, GO BACK
3272	37EF			*			
3273	37EF			*****			
3274	37EF			*			
3275	37EF			*		ADDITION ROUTINE	
3276	37EF			*			
3277	37EF			*		THIS ROUTINE ADDS TWO BINARY FLOATING POINT NUMBERS	
3278	37EF			*			
3279	37EF	3F	37 AA	FPADD	BSTA,UN	TRAN	TRANSFER OPERANDS FROM STACK TO OPA OPB
3280	37F2	75	02	ADDJ	CPSL	COM	ARITHMETIC COMPARE
3281	37F4	20			EORZ,R0		
3282	37F5	CC	07 4C		STRA,R0	OPA+LEN	
3283	37F8	CC	07 51		STRA,R0	OPB+LEN	
3284	37FB	0D	07 48		LODA,R1	OPA	COMPARE EXPONENTS OF THE TWO OPERANDS
3285	37FE	FD	07 4D		COMA,R1	OPB	
3286	3801	19	41		BCTR,GT	ADDC	ALIGN OPERAND 2 OPA>OPB
3287	3803	1A	45		BCTR,LT	ADDD	ALIGN OPERAND 1 OPB>OPA
3288	3805	75	01	ADDF	CPSL	CRY	
3289	3807	07	04		LODI,R3	LEN	SET BYTE COUNTER
3290	3809	0F	67 4D	ADDK	LODA,R3	OPB,I	ADD MANT OF OPER 1 TO MANT OF OPER 2 AND
3291	380C	9F	67 48		ADDA,R3	OPA,I	STORE INTO OPER 2
3292	380F	CF	67 4D		STRA,R3	OPB,I	
3293	3812	FB	75		BDRR,R3	ADDK	DECR BYTE COUNTER AND BRANCH IF NOT DONE
3294	3814	04	27	ROOF	LODI,R0	OPB	
3295	3816	05	4D		LODI,R1	CPB	
3296	3818	3F	38 28		BSTA,UN	OVFL	
3297	381B	3F	39 94		BSTA,UN	NORM	NORMALIZE RESULT
3298	381F	24	02	PUSHRS	LODI,R0	2	
3299	3820	93			LPSL		
3300	3821	04	27		LODI,R0	OPB	
3301	3823	05	4D		LODI,R1	OPB	
3302	3825	1F	32 7D		BCTA,UN	PUSH	
3303	3828			*			
3304	3828			*****			
3305	3828			*			
3306	3828			*		OVERFLOW ROUTINE	
3307	3828			*			

LINE	ADDR	B1	B2	B3	LABEL	OPCODE	OPERAND
3308	3828			*			THIS ROUTINE INCREMENTS THE EXPONENT AND ROTATES THE MANTISSA
3309	3828			*			RIGHT IF THE OVF FLAG IS 1.
3310	3828			*			
3311	3828	CC	07	45	OVFL	STRA,R0	ADR
3312	382B	CI	07	46		STRA,R1	ADR+1
3313	382E	06	04		OVFF	LODI,R2	LEN
3314	3830	B5	04		OV45	TPSL	OVF
3315	3832	16				RETC,LT	NO OVERFLOW
3316	3833	07	00		RRIN	LODI,R3	0
3317	3835	0F	F7	45		LODA,R3	*ADR,I
3318	3838	F4	7F			COMI,R0	7F
3319	383A	1C	30	6E		BCTA,EQ	ERR15
3320	383D	D8	00			BIRR,R0	\$+2
3321	383F	CF	E7	45	LPA	STRA,R3	*ADR,I
3322	3842	02				LODZ,R2	
3323	3843	E3				CCMZ,R3	
3324	3844	14				RETC,EQ	
3325	3845	0F	A7	45		LODA,R3	*ADR,+
3326	3848	50				RRR,R0	
3327	3849	1E	74			BCTR,UN	LPA
3328	384B			*			
3329	384B			*			*****
3330	384B			*			
3331	384B			*			TWO'S COMPLEMENT ROUTINE
3332	384B			*			
3333	384B			*			THIS ROUTINE PERFORMS A TWO'S COMPLEMENT OF THE BINARY
3334	384B			*			FLOATING POINT NUMBER ADDRESSED BY ADR.
3335	384B			*			
3336	384B	07	03		TCOM	LODI,R3	LEN-1
3337	384D	06	27		TWOA	LODI,R2	OPB
3338	384F	04	4E			LODI,R0	OPB
3339	3851	CE	07	45	TWOB	STRA,R2	ADR
3340	3854	CC	07	46		STRA,R0	ADR+1
3341	3857	03			TWOC	LODZ,R3	
3342	3858	C2				STRZ,R2	
3343	3859	77	01			PPSL	CRY
3344	385B	20			LPB	EORZ,R0	
3345	385C	AF	E7	45		SUBA,R3	*ADR,I
3346	385F	CF	E7	45		STRA,R3	*ADR,I
3347	3862	FB	77			BDRR,R3	LPB
3348	3864	1B	4A			BCTR,UN	OV45
3349	3866			*			
3350	3866			*			*****
3351	3866			*			
3352	3866	0C	07	47	MDIB	LODA,R0	FLAG
3353	3869	9C	30	72		BCFA,EQ	ERR16
3354	386C	20			MDIC	EORZ,R0	DIVIDE BY ZERO ERROR
3355	386D	CF	27	4D	MDIN	STRA,R3	OPB,+
3356	3870	F7	03			COMI,R3	LEN-1
3357	3872	98	79			BCFR,EQ	MDIN
3358	3874	04	80			LODI,R0	80
3359	3876	CC	07	4D		STRA,R0	OPB
3360	3879	1F	38	1E		BCTA,UN	PUSHRS
3361	387C			*			
3362	387C	06	27		MDIE	LODI,R2	OPA
3363	387E	04	48			LODI,R0	OPA
3364	3880	07	03			LODI,R3	LEN-1

LINE	ADDR	B1	B2	B3	LABEL	OPCODE	OPERAND
3365	3882	3B	4L			EORZ,UN	T 0
3366	3884	01				LOI2,R1	
3367	3885	19	07			BCTR,GT	MDIL
3368	3887	22				EORZ,R0	
3369	3888	CC	07	4C		STRA,R0	SIGN
3370	388B	3F	38	4B	MDID	BSTA.UN	TCOM
3371	388E	20			MDIL	EORZ,R0	
3372	388F	1F	24			BCTR,UN	MDIF
3373	3891				*		
3374	3891				*****		
3375	3891				*		
3376	3891				*	MULTIPLICATION ROUTINE	
3377	3891				*		
3378	3891				*	THIS ROUTINE MULTIPLIES TWO BINARY FLOATING POINT NUMBERS	
3379	3891				*		
3380	3891	20			FPMULT	EORZ,R0	
3381	3892	1B	02			BCTR,UN	MDIA
3382	3894				*		
3383	3894				*****		
3384	3894				*		
3385	3894				*	DIVISION ROUTINE	
3386	3894				*		
3387	3894				*	THIS ROUTINE DIVIDES TWO BINARY FLOATING POINT NUMBERS	
3388	3894				*		
3389	3894	04	FF		FFDIV	LODI,R0	FF
3390	3896	CC	07	47	MDIA	STRA,R0	FLAG
3391	3899	3F	37	AA		BSTA,UN	TPAN
3392	389C	0D	07	4E		LODA,R1	OPB+1
3393	389F	18	45			BCTR,FQ	MDIB
3394	38A1	04	FF			LODI,R0	FF
3395	38A3	CC	07	4C		STRA,R0	SIGN
3396	38A6	0E	07	49		LODA,R2	OPA+1
3397	38A9	1C	38	6C		BCTA,EQ	MDIC
3398	38AC	1A	4E			BCTR,LT	MDIF
3399	38AE	01				LOD2,R1	
3400	38AF	1A	5A			BCTR,LT	MDID
3401	38P1	20				EORZ,R0	
3402	38B2	CC	07	4C		STRA,P0	SIGN
3403	38B5	07	24		MDIF	LODI,R3	LEN
3404	38B7	CF	47	51	MDIG	STRA,R3	OPB+LEN,-
3405	38BA	FB	7B			BRNR,R3	MDIG
3406	38BC	0C	07	47		LODA,R0	FLAG
3407	38BF	9C	39	1F		BCFA,EQ	DIV
3408	38C2	06	19		MUL	LODI,R2	MLEN
3409	38C4	75	01		MULA	CPSL	CRY
3410	38C6	07	06			LODI,R3	LEN2-2
3411	38C8	0F	67	4D	MULB	LODA,R3	OPB,I
3412	38CB	D0				RRL,R0	
3413	38CC	CF	67	4D		STRA,R3	OPB,I
3414	38CF	FB	77			BDHR,R3	MULB
3415	38D1	FE	01			TPSL	CRY
3416	38I3	98	1B			BCFR,EQ	MULE
3417	38D5	07	03			LODI,R3	LEN-1
3418	38D7	75	01			CPSL	CRY
3419	38D9	0F	47	51	MULC	LCDA,R3	OPB+LEN,-
3420	38DC	8F	67	49		ADDA,R3	OPA+1,I
3421	38DF	CF	67	51		STRA,R3	OPB+LEN,I

LINE	ADDR	B1	B2	B3	LABEL	OPCODE	OPERAND
3422	38F2	5B	75			BRNR,R3	MULC
3423	38F4	07	03			LODI,R3	LEN-1
3424	38F6	0F	67	4D	MULD	LODA,R3	OPB,I
3425	38F9	84	00			ADDI,R0	2
3426	38FB	CF	67	4D		STRA,R3	OPB,I
3427	38FD	FB	76			BDRP,R3	MULD
3428	38FE	FA	52		MULF	BDRR,R2	MUIA
3429	38FF	75	01			CPSL	CRY
3430	38F4	0D	07	48		LODA,R1	OPA
3431	38F7	8D	07	4D		ADDA,R1	OPB
3432	38FA	B5	04			TPSL	OVF
3433	38FC	9C	39	82		BCFA,EQ	MDIH
3434	38FF	20				FORZ,R0	
3435	3900	B5	01			TPSL	CRY
3436	3902	9C	39	64		BCFA,EQ	MDIH
3437	3925	1F	30	6F	ERRG	BCTA,UN	ERR15 ARITHMETIC ERROR
3438	3908				*		
3439	3908	F7	03		DIVA	COMI,R3	LEN-1
3440	390A	98	17			BCFR,EQ	DIVD
3441	390C	77	01		DIVE	PPSL	CRY CLEAR BORROW
3442	390E	07	03			LODI,R3	LEN-1
3443	3910	0F	67	48	DIVC	LODA,R3	OPA,I
3444	3913	AF	67	4D		SUBA,R3	OPB,I
3445	3916	CF	67	48		STRA,R3	OPA,I
3446	3919	FB	75			BDRR,R3	DIVC
3447	391B	77	01			PPSL	CRY
3448	391D	1F	10			BCTR,UN	DIVE
3449	391F				*		
3450	391F	06	1F		DIV	LODI,R2	DLFN
3451	3921	77	02			PP L	COM LOGICAL COMPARE
3452	3923	0F	27	48	DIVD	LODA,R3	OPA,+
3453	3926	EF	67	4D		COMA,R3	OPB,I
3454	3929	18	5D			BCTR,EQ	DIVA
3455	392B	19	5F			PCTR,GT	DIVB
3456	392D	75	01			CPSL	CRY
3457	392F	07	04		DIVE	LODI,R3	LEN
3458	3931	0F	47	51	DIVF	LODA,R3	OPB+LEN,-
3459	3934	10				RRL,R0	
3460	3935	CF	67	51		STRA,R3	OPB+LEN,I
3461	3938	5F	77			BRNF,R3	DIVF
3462	393A	07	03			LODI,R3	LEN-1
3463	393C	0F	67	48	DIVG	LODA,R3	OPA,I
3464	393F	10				RRL,R0	
3465	3940	CF	67	48		STRA,R3	OPA,I
3466	3943	FB	77			BDRR,R3	DIVG
3467	3945	FA	50			BDRR,R2	DIVD
3468	3947	0F	27	50	DIVH	LODA,R3	OPB+LEN-1,+
3469	394A	CF	67	4D		STRA,R3	OPB,I
3470	394D	E7	04			COMI,R3	LEN
3471	394F	98	76			BCFR,EQ	DIVE
3472	3951	77	01			PPSL	CRY
3473	3953	0D	07	48		LODA,R1	OPA
3474	3956	AD	07	4D		SUBA,R1	OPB
3475	3959	04	01			LODI,R0	1
3476	395F	F5	04			TP L	OVF
3477	395D	98	1A			BCFR,EQ	MDIK
3478	395F	F5	01			TPSL	CRY

79	L	9C	6E	1, E6		
3480	3964	CC 07 4D	MDII	STRA, R0	C. B	
3481	3967	3B 2B		BSTR, UN	NORM	
3482	3969	75 01		CPSL	CRY	
3483	396B	0C 07 4D		LODA, R0	OPB	
3484	396E	81		ADDZ, R1		
3485	396F	CC 07 4D		STRA, R0	OPB	
3486	3972	B5 04		TPSL	OVF	
3487	3974	18 11		BCTR, EQ	MDIJ	
3488	3976	1F 30 6E		BCTA, UN	ERR15	
3489	3979	75 01	MDIK	CPSL	CRY	
3490	397B	81		ADDZ, R1		
3491	397C	C1		STRZ, R1		
3492	397D	20		EORZ, R0		
3493	397E	B5 04		TPSL	OVF	
3494	3980	18 62		BCTR, EQ	MDII	
3495	3982	CD 07 4D	MDIH	STRA, R1	OPB	
3496	3985	3B 0D		BSTR, UN	NORM	
3497	3987	07 04	MDIJ	LODI, R3	LEN	
3498	3989	0C 07 4C		LODA, R0	SIGN	
3499	398C	BC 38 4D		BSFA, EQ	TWOA	
3500	398F	75 04		CPSL	OVF	
3501	3991	1F 38 14		BCTA, UN	ROOF	ROUND RESULT
3502	3994		*			
3503	3994		*****			
3504	3994		*			
3505	3994		*	NORMALIZE ROUTINE		
3506	3994		*			
3507	3994		*	THIS ROUTINE NORMALIZES THE RESULT		
3508	3994		*			
3509	3994	06 04 03	NORM	LODI, R2	LEN	
3510	3996	75 02	NORA	CPSL	COM	
3511	3998	02	NOR1	LODZ, R2		
3512	399C	03		STRZ, R3		
3513	399A	0C 07 4E		LODA, R0	OPB+1	
3514	399D	E4 C0		COMI, R0	C0	
3515	399F	16		RETC, LT		
3516	39A0	E4 3F		COMI, R0	3F	
3517	39A2	15		RETC, GT		
3518	39A3	0C 07 4D		LODA, R0	OPB	
3519	39A6	F4 80		COMI, R0	80	
3520	39A8	18 12		BCTR, EQ	LPE	
3521	39AA	F8 00		BDRR, R0	\$+2	
3522	39AC	CC 07 4D		STRA, R0	OPB	
3523	39AF	75 01		CPSL	CRY	
3524	39B1	0F 67 4D	LPD	LODA, R3	OPB, I	
3525	39B4	D0		RRL, R0		
3526	39B5	CF 67 4D		STRA, R3	OPB, I	
3527	39B8	FB 77		BDRR, R3	LPD	
3528	39BA	1B 5C		BCTR, UN	NOR1	
3529	39BC	0F 67 4D	IPE	LODA, R3	OPB, I	
3530	39BF	9C 30 6E		BCFA, EQ	ERR15	
3531	39C2	FB 78		BDRR, R3	LPE	
3532	39C4	17		RETC, UN		
3533	39C5	3F 33 E0	ECONST	BSTA, UN	SKPSP	
3534	39C8	20		EORZ, R0		
3535	39C9	C8 2D		STRR, R0	ECONSS	

LINE	ADDR	B1	B2	B3	LABEL	OPCODE	OPERAND
3536	39C9	F7	2B			COMI,R3	'+'
3537	39CD	18	0D			BCTR,EQ	ECONS0
3538	39CF	F7	2D			COMI,R3	'-'
3539	39D1	98	06			BCFR,EQ	ECONS4
3540	39D3	04	FF			LODI,R0	FF
3541	39D5	C8	21			STRR,R0	ECONSS
3542	39D7	1F	03			BCTR,UN	ECONS0
3543	39D9	3F	31	DE	ECONS4	BSTA,UN	DECPT
3544	39DC	3F	3A	CA	ECONS0	BSTA,UN	EASCII CHANGE ASCII STRING OF NUMBERS TO FPT
3545	39DF	3F	33	D5		BSTA,UN	GETCHR GET NEXT CHARACTER
3546	39E2	F7	2E			COMI,R3	'.' DECIMAL POINT
3547	39E4	18	1C			BCTR,EQ	ECONS1 EVALUATE THE FRACTIONAL PART NOW
3548	39E6	E6	00			COMI,R2	00
3549	39E8	18	0F			BCTR,EQ	ECONS9
3550	39EA	F7	45			COMI,R3	'F' EXPONENT NOTATION FOLLOWING
3551	39EC	1C	3A	26		BCTR,EQ	ECONS5 EVALUATE THE EXPONENT NOW
3552	39EF	3F	31	DE		BSTA,UN	DECPT
3553	39F2	3F	3A	61		BSTA,UN	NEGATE
3554	39F5	20				EORZ,R0	
3555	39F8	17				RETC,UN	
3556	39F7	00			ECSTR	RES	1
3557	39F8	00			ECONSS	RES	1
3558	39F9				*		
3559	39F9	3F	3D	11	ECONS9	BSTA,UN	POPOPE
3560	39FC	3F	31	DE		BSTA,UN	DECPT
3561	39FF	04	01			LODI,R0	1
3562	3A01	17				RETC,UN	
3563	3A02	3F	3A	CA	ECONS1	BSTA,UN	EASCII GET THE FRACTIONAL PART OF THE NUMBER
3564	3A05	CA	70		ECONS2	STRR,R2	ECSTR STORE THE NUMBER OF CHARACTERS GOTTEN IN
3565	3A07	02				LODZ,R2	
3566	3A28	18	0A			BCTR,EQ	ECONS3 FINISHED WITH THE FRAC PART
3567	3A0A	3F	3A	88		BSTA,UN	PUSH10 PUSH A FPT 10 ONTO THE STACK
3568	3A0D	3F	38	94		BSTA,UN	FPDIV DIVIDE THE FRACTIONAL PART BY 10
3569	3A10	0A	65			LODR,R2	ECSTR
3570	3A12	FA	71			BDRR,R2	ECONS2
3571	3A14	3F	37	FF	ECONS3	BSTA,UN	FPADD ADD INTEGER AND FRACTIONAL PARTS
3572	3A17	3F	3A	61		BSTA,UN	NEGATE
3573	3A1A	3F	33	EQ		BSTA,UN	SKPSP GET NEXT CHARACTER FROM LINE
3574	3A1D	F7	45			COMI,R3	'E' EXPONENT TO FOLLOW
3575	3A1F	18	0F			BCTR,EQ	ECONS5
3576	3A21	3F	31	DE		BSTA,UN	DECPT RESTORE THE INPUT POINTER
3577	3A24	20				EORZ,R0	
3578	3A25	17				RETC,UN	RETURN WITH THE NUMBER
3579	3A26	20			ECONS5	EORZ,R0	
3580	3A27	C8	4F			STRR,R0	ECONSS
3581	3A29	3F	33	EQ		BSTA,UN	SKPSP
3582	3A2C	F7	2B			COMI,R3	'+'
3583	3A2E	18	0D			BCTR,EQ	ECONS7
3584	3A30	F7	2D			COMI,R3	'-'
3585	3A32	98	06			BCFR,EQ	ECONS8
3586	3A34	04	FF			LODI,R0	FF
3587	3A36	C8	40			STRR,R0	ECONSS
3588	3A38	1B	03			BCTR,UN	ECONS7
3589	3A3A	3F	31	DE	ECONS6	BSTA,UN	DECPT
3590	3A3D	3F	3A	AA	ECONS7	BSTA,UN	GET3C CONVERT UP TO 3 ASCII CHARS TO NUMBER IN R2
3591	3A40	02				LODZ,R2	
3592	3A41	14				FF C.FG	

LINE	ADDR	SI	SC	DS	LABEL	OPCODE	OPERAND
3593	3A42	CE	19	F7	ECONSS	PUSH1	PUSH A 1 ONTO THE STACK
3594	3A45	CE	19	F7	ECONSS	ECSTR	
3595	3A48	3F	3A	88	BSTA,UN	PUSH10	PUSH A 10 ONTO THE STACK
3596	3A4B	3F	38	91	BSTA,UN	FPMULT	MULTIPLY THE RUNNING EXPONENT BY 10
3597	3A4E	0E	19	F7	LODA,R2	ECSTR	
3598	3A51	FA	72		BDRR,R2	ECONSS	
3599	3A53	0C	19	F8	LODA,R0	ECONSS	
3600	3A56	3C	38	91	BSTA,EQ	FPMULT	
3601	3A59	0C	19	F8	LODA,R0	ECONSS	
3602	3A5C	3E	38	94	BSTA,LT	FPMULT	
3603	3A5F	20			EORZ,R0		
3604	3A60	17			RETC,UN		
3605	3A61				*		
3606	3A61				*		
3607	3A61				*		
3608	3A61	0C	19	F8	NEGATE LODA,R0	ECONSS	
3609	3A64	14			RETC,EQ		
3610	3A65	3F	3D	11	BSTA,UN	POPOPB	
3611	3A68	77	08		PPSL	WC	
3612	3A6A	3F	38	4B	BSTA,UN	TCON	
3613	3A6D	75	08		CPSL	WC	
3614	3A6F	3F	3D	18	BSTA,UN	PUSOPB	
3615	3A72	17			RETC,UN		
3616	3A73				*		
3617	3A73	04	3A		PUSH0 LODI,R0	FP0	
3618	3A75	0E	96		LODI,R1	FP0	
3619	3A77	1F	32	7D	BCTA,UN	PUSH	
3620	3A7A	04	3A		PPUSH1 LODI,R0	FP1	
3621	3A7C	05	9A		LODI,R1	FP1	
3622	3A7E	1F	32	7D	BCTA,UN	PUSH	
3623	3A81	04	3A		PPUSH2 LODI,R0	FP2	
3624	3A83	05	9E		LODI,R1	FP2	
3625	3A85	1F	32	7D	BCTA,UN	PUSH	
3626	3A88	04	3A		PUSH10 LODI,R0	FP10	
3627	3A8A	05	A2		LODI,R1	FP10	
3628	3A8C	1F	32	7D	BCTA,UN	PUSH	
3629	3A8F	04	3A		PPUSM1 LODI,R0	FPM1	
3630	3A91	0E	A6		LODI,R1	FPM1	
3631	3A93	1F	32	7D	BCTA,UN	PUSH	
3632	3A96				*		
3633	3A96				*		
3634	3A96				*		
3635	3A96	80			FP0 DATA	80	
3636	3A97	00			DATA	00	
3637	3A98	00	00		ACON	0000	
3638	3A9A	01	40		FP1 ACON	0140	
3639	3A9C	00	00		ACON	0000	
3640	3A9E	02	40		FP2 ACON	0240	
3641	3AA0	00	00		ACON	0000	
3642	3AA2	04	50		FP10 ACON	0450	
3643	3AA4	00	00		ACON	0000	
3644	3AA6	01	C0		FPM1 ACON	01C0	
3645	3AA8	00	00		ACON	0000	
3646	3AAA				*		
3647	3AAA	20			GET3C EORZ,R0		
3648	3AAB	CC	19	F7	GET3C3 STRA,R0	ECSTR	
3649	3AAE	3F	33	DE	BSTA,UN	GETCHR	

* END 300 (515) END IN BINARY IN BR

LINE	ADDR	B1	B2	B3	LABEL	OPCODE	OPERAND
3650	3AB1	3F	30	BD		BSTA,UN	CKNUM0
3651	3AB4	98	0E			PCFR,EQ	GET3C1
3652	3AB6	0C	19	F7		LODA,R0	ECSTR
3653	3AB9	06	09			LODI,R2	9
3654	3ABB	C1				STRZ,R1	
3655	3ABC	81			GET3C2	ADDZ,R1	
3656	3ABD	FA	7D			BD R,R2	GET3C2
3657	3ABF	47	0F			ANDI,R3	F
3658	3AC1	83				ADDZ,R3	
3659	3AC2	1B	57			BCTR,UN	GET3C3
3660	3AC4	0E	19	F7	GET3C1	LODA,R2	ECSTR
3661	3AC7	1F	31	DE		BCTA,UN	DECPT
3662	3ACA				*		
3663	3ACA	3F	31	DE	EASCI1	BSTA,UN	SKPDEC
3664	3ACD	3F	3A	73		BSTA,UN	PUSH0 INITIALIZE THE NUMBER
3665	3AD0	20				EORZ,R0	
3666	3AD1	C8	3E		EASCI1	STRR,R0	FASTG
3667	3AD3	C2				STRZ,R2	
3668	3AD4	0F	84	5F		LODA,R3	*INPT
3669	3AD7	3F	30	BD		BSTA,UN	CKNUM0
3670	3ADA	1F				RETC,GT	
3671	3ADB	16				RETC,LT	
3672	3ADC	3F	3A	88		BSTA,UN	PUSH10
3673	3ADF	3F	3E	91		BSTA,UN	FPMULT
3674	3AF2	3F	33	D5		BSTA,UN	GETCHR
3675	3AE5	47	0F			ANDI,R3	0F MAKE IT DECIMAL
3676	3AE7	1E	24			PCTR,EQ	EASCI2
3677	3AE9	D3				RRL ,R3	
3678	3AEA	D3				RRL ,R3	
3679	3AEB	D3				RRL ,R3	SET IT UP TO BE THE FIRST BYTE OF MANTISSA
3680	3AFC	CF	07	4E		STRA,R3	OPB+1
3681	3AFF	04	04			LODI,R0	4
3682	3AF1	CC	07	4D		STRA,R0	OPB
3683	3AF4	20				EORZ,R0	
3684	3AF5	CC	07	4F		STRA,R0	OPB+2
3685	3AF8	CC	07	50		STRA,R0	OPB+3
3686	3AFB	77	08			PPSL	WC
3687	3AFD	3F	39	94		BSTA,UN	NORM NORMALIZE THE DIGIT
3688	3B00	04	02			LODI,R0	2
3689	3B02	93				LPSL	
3690	3B03	04	27			LODI,R0	OPB
3691	3B05	05	4D			LODI,R1	OPB
3692	3B07	3F	32	7D		BSTA,UN	PUSH PUSH THE DIGIT
3693	3B0A	3F	37	EF		BSTA,UN	FPADD ADD THIS DIGIT TO ALL THE REST
3694	3B0D	0E	02		EASCI2	LODR,R0	EASTG
3695	3B0F	D8	40			BIRR,R0	EASCI1
3696	3B11				*		
3697	3B11				*		
3698	3B11				*		
3700	3B11	00			FASTG	RES	1
3700	3B12	00			FXPSGN	RES	1
3701	3B13	00			INTSGN	RES	1
3702	3B14	00			BYTON	RES	1
3703	3B15				*		
3704	3B15				*		
3705	3B15				*		
3706	3B15	00	00		FIXNL	LODI,R1	0

07	7	2			2, R1	
3708	3B18	CD 47	2D	FIXNL1	STRA, R1	INTSTG, -
3709	3B1B	59 7B			BRNR, R1	FIXNL1
3710	3B1D	CC 1B	B5		STRA, R0	INTEXP
3711	3B20	CA 70			STRR, R0	EXPSGN
3712	3B22	CA 6F			STRR, R0	INTSGN
3713	3B24	0C 13	8E		LODA, R0	CBUF1+1
3714	3B27	F4 80			TMI, R0	80
3715	3B29	98 20			BCFR, EQ	FIXNL2
3716	3B2B	05 04			LODI, R1	4
3717	3B2D	0D 53	8D	FIXNL3	LODA, R1	CBUF1, -
3718	3B30	CD 67	4D		STRA, R1	OPB, I
3719	3B33	59 78			BRNR, R1	FIXNL3
3720	3B35	77 08			PPSL	WC
3721	3B37	3F 38	4B		BSTA, UN	TCOM
3722	3B3A	7E 08			CPSL	WC
3723	3B3C	05 04			LODI, R1	4
3724	3B3E	0D 47	4D	FIXNL4	LODA, R1	OPB, -
3725	3B41	CD 73	8D		STRA, R1	CBUF1, I
3726	3B44	59 78			BRNR, R1	FIXNL4
3727	3B46	04 FF			LODI, R0	FF
3728	3B48	CC 1B	13		STRA, R0	INTSGN
3729	3B4B	0C 13	8D	FIXNL2	LODA, R0	CPUF1 EXPONENT
3730	3B4E	91 3B	C0		BCFA, GT	FIXNL6
3731	3B51	04 01			LODI, R0	1
3732	3B53	CC 1B	14		STRA, R0	BYTON
3733	3B56	C2			STRZ, R2	
3734	3B57	07 40			LODI, R3	40
3735	3B59	3F 3C	5B	FIXNL6	BSTA, UN	INTX2
3736	3B5C	0D 1B	14		LODA, R1	BYTON
3737	3B5F	0D 73	8D		LODA, R1	CBUF1, I
3738	3B62	43			ANDZ, R3	
3739	3B63	E3			COMZ, R3	
3740	3B64	98 03			BCFR, EQ	FIXNL7
3741	3B66	3F 3C	47		BSTA, UN	INTAD
3742	3B69	86 01		FIXNL7	ADDI, R2	1
3743	3B6B	EE 13	8D		COMA, R2	CBUF1
3744	3B6E	19 30			BCTR, GT	FIXNL8
3745	3B70	53			RRR, R3	
3746	3B71	F7 80			TMI, R3	80
3747	3B73	98 64			BCFR, EQ	FIXNL6
3748	3B75	0C 1B	14		LODA, R0	BYTON
3749	3B78	84 01			ADDI, R0	1
3750	3B7A	CC 1B	14		STRA, R0	BYTON
3751	3B7D	E4 04			COMI, R0	4
3752	3B7F	9C 3B	59		BCFA, EQ	FIXNL6
3753	3B82			*		
3754	3B82	07 00			LODI, R3	0
3755	3B84	3F 3C	5B	FIXNL11	BSTA, UN	INTX2
3756	3B87	0C 07	30		LODA, R0	INTSTG+3
3757	3B8A	44 F0			ANDI, R0	F0
3758	3B8C	18 09			BC R, EQ	FIXNL3
3759	3B8E	87 01			ADDI, R3	1
3760	3B90	05 04			LODI, R1	4 ROTATE 4 BITS
3761	3B92	3F 3C	B2	ROTL11	BSTA, UN	INTROT
3762	3B95	F9 7B			BDRR, R1	ROTL11
3763	3B97	86 01		FIXNL13	ADDI, R2	1

LINE	ADDR	R1	R2	B3	LABEL	OPCODE	OPFRAND
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3764	3B99	FF	13	8D		COMA,R2	CBUF1
3765	3B9C	99	66			BCFR,GT	FIXN11
3766	3B9E	CB	15		FIXN10	ST R,R3	INTEXP
3767	3BA0	05	04		FIXN18	LODI,R1	4
3768	3BA2	0D	47	2D	FIXN60	LODA,R1	INTSTG,-
3769	3BA5	FF	FF			COMI,R1	FF
3770	3BA7	18	17			PCTR,EQ	FIXN16
3771	3BA9	C2				STRZ,R2	
3772	3BAA	44	F0			ANDI,R0	F0
3773	3BAC	98	09			BCFR,EQ	FIXN15
3774	3BAE	46	0F			ANDI,R2	0F
3775	3BB0	18	70			BCTR,EQ	FIXN60
3776	3BB2	D1				RRL ,R1	
3777	3BB3	1B	05			BCTR,UN	FIXN17
3778	3BB5				*		
3779	3BB5				*		
3780	3BB5				*		
3781	3BB5	00			INTEXP RES		1
3782	3BB6	00			BITON RES		1
3783	3BB7				*		
3784	3BB7				*		
3785	3BB7				*		
3786	3BB7	D1			FIXN15	RRL ,R1	
3787	3BB8	8F	01			ADDI,R1	1
3788	3BBA	89	79		FIXN17	ADDR,R1	INTEXP
3789	3BBC	85	01			ADDI,R1	1
3790	3BBE	C9	75			STRR,R1	INTEXP
3791	3BC0	0E	13	8D	FIXN16	LODA,R2	CBUF1
3792	3BC3	75	02			CPSL	COM
3793	3BC5	E6	16			COMI,R2	16
3794	3BC7	77	02			PPSL	COM
3795	3BC9	15				RETC,GT	
3796	3BCA	0C	13	8E		LODA,R0	CBUF1+1
3797	3BCD	14				RETC,EQ	
3798	3BCE	04	17			LODI,R0	17
3799	3BD0	A2				SUPZ,R2	
3800	3BD1	CC	1C	46		STRA,R0	FIXT2
3801	3BD4	04	03			LODI,R0	3
3802	3BD6	CC	1B	14		STRA,R0	BYTON
3803	3BDE	06	01			LODI,R2	1
3804	3BDB	CA	59			STRR,R2	BITON
3805	3BDD	0D	1B	14	FIXN18	LODA,R1	BYTON
3806	3BF0	0D	73	8D		LOLA,R1	CBUF1,I
3807	3BE3	07	00			LODI,R3	0
3808	3BE5	42				ANDZ,R2	
3809	3BE6	E2				COMZ,R2	
3810	3BE7	98	02			BCFR,EQ	FIXN20
3811	3BE9	07	50			LODI,R3	F0
3812	3BEB	3F	3C	7A	FIXN20	BSTA,UN	FRCD2
3813	3BEF	08	46			LODR,R0	BITON
3814	3BF0	84	01			ADDI,R0	1
3815	3BF2	C8	42			STRR,R0	BITON
3816	3BF4	FC	1C	46		COMA,R0	FIXT2
3817	3BF7	15				RETC,GT	
3818	3BF8	D2				RRL ,R2	
3819	3BFG	F6	01			TMI ,R2	1
3820	3BFB	9C	3F	DD		BCFA,EQ	FIXN18

221	FE	0	3	14	DA, E	
3822	3C01	A4	01		SUBI, R0	1
3823	3C03	CC	1B	14	STRA, R0	BYTON
3824	3C06	9C	3B	DD	BCFA, FQ	FIXN18
3825	3C09	07	00	FIXN22	LODI, R3	0
3826	3C0B	3F	3C	7A	BSTA, UN	FRC02
3827	3C0F	0C	1B	B6	LODA, R0	BITON
3828	3C11	84	01		ADDI, R0	1
3829	3C13	CC	1B	B6	STRA, R0	BITON
3830	3C16	E8	2E		COMR, R0	FIXT2
3831	3C18	15			RETC, GT	
3832	3C19	0F	07	31	LODA, R2	FRCSTG
3833	3C1C	02			LODZ, R2	
3834	3C1D	44	F0		ANDI, R0	F0
3835	3C1F	98	68		BCFR, EQ	FIXN22
3836	3C21	0C	1B	B5	LODA, R0	INTEXP
3837	3C24	84	01		ADDI, R0	1
3838	3C26	CC	1B	B5	STRA, R0	INTEXP
3839	3C29	04	FF		LODI, R0	FF
3840	3C2B	CC	1B	12	STRA, R0	EXPSCN
3841	3C2E	77	18		PPSL	RS+WC
3842	3C30	06	04		LODI, R2	04
3843	3C32	75	01	FIXN23	CPSL	CRY
3844	3C34	05	04		LODI, R1	04
3845	3C36	0D	47	31	FIXN24	LODA, R1
3846	3C39	D0			RRL, R0	FRCSTG, -
3847	3C3A	CD	67	31	STRA, R1	FRCSTG, I
3848	3C3D	59	77		BRNF, R1	FIXN24
3849	3C3F	FA	71		BDRR, R2	FIXN23
3850	3C41	75	1E		CPSL	WC+RS
3851	3C43	1F	3C	09	BCTA, UN	FIXN22
3852	3C46			*		
3853	3C46			*		
3854	3C46			*		
3855	3C46	00		FIXT2	RFS	1
3856	3C47			*		
3857	3C47			*		
3858	3C47			*		
3859	3C47	05	FF	INTAD	LODI, R1	FF
3860	3C49	77	09		PPSL	WC+CRY
3861	3C4B	0D	27	2D	INTAD1	LODA, R1
3862	3C4F	84	66		ADDI, R0	66
3863	3C50	94			IA, R0	
3864	3C51	CD	67	2D	STRA, R1	INTSTG, I
3865	3C54	F5	03		COMI, R1	3
3866	3C56	98	73		BCFR, EQ	INTAD1
3867	3C58	75	08		CPSL	WC
3868	3C5A	17			RETC, UN	
3869	3C5B			*		
3870	3C5B			*		
3871	3C5B			*		
3872	3C5B	77	18	INTX2	PPSL	WC+RS
3873	3C5D	05	FF		LODI, R1	FF
3874	3C5F	75	01		CPSL	CRY
3875	3C61	0D	27	2D	INTX2A	LODA, R1
3876	3C64	C2			STRZ, R2	INTSTG, +
3877	3C66	13			SPSL	

LINE	ADDR	B1	B2	B3	LABEL	OPCODE	OPERAND
3878	3C66	75	01			CPSL	CRY
3879	3C68	86	66			ADDI,R2	66
3880	3C6A	93				LPSL	
3881	3C6B	02				LODZ,R2	
3882	3C6C	ED	67	2D		ADDA,R1	INTSTG,I
3883	3C6F	94				DAR,R0	
3884	3C70	CD	67	2D		STRA,R1	INTSTG,I
3885	3C73	E5	03			COMI,R1	3
3886	3C75	98	6A			BCFR,EQ	INTX2A
3887	3C77	75	18			CPSL	WC+RS
3888	3C79	17				RETC,UN	
3889	3C7A						
3890	3C7A			*			
3891	3C7A			*			
3892	3C7A	05	FF		FRCD2	LODI,R1	FF
3893	3C7C	0D	27	31	FRCD2A	LODA,R1	FRCSTG,+
3894	3C7F	E4	20		FRCD2C	COMI,R2	20
3895	3C81	1A	06			BCTR,LT	FRCD2E
3896	3C83	A4	20			SUBI,R0	20
3897	3C85	87	10			ADDI,R3	10
3898	3C87	1B	76			BCTR,UN	FRCD2C
3899	3C89	F4	10		FRCD2E	TMI,R0	10
3900	3C8B	98	04			BCFR,EQ	FRCD2D
3901	3C8D	87	05			ADDI,R3	5
3902	3C8F	44	0F			ANDI,R0	0F
3903	3C91	E4	02		FRCD2D	COMI,R0	2
3904	3C93	1A	06			BCTR,LT	FRCD2E
3905	3C95	A4	02			SUBI,R0	2
3906	3C97	87	01			ADDI,R3	1
3907	3C99	1B	76			BCTR,UN	FRCD2D
3908	3C9B	F4	01		FRCD2E	TMI,R0	1
3909	3C9D	98	04			BCFR,EQ	FRCD2F
3910	3C9F	04	50			LODI,R0	50
3911	3CA1	1B	01			BCTR,UN	FRCD2G
3912	3CA3	20			FRCD2F	EORZ,R0	
3913	3CA4	C8	0B		FRCD2G	STRR,R0	FIXTMP
3914	3CA6	03				LODZ,R3	
3915	3CA7	CD	67	31		ST A,R1	FRCSTG,I
3916	3CAA	0B	05			LODR,R3	FIXTMP
3917	3CAC	E5	03			COMI,R1	3
3918	3CAE	98	4C			BCFR,EQ	FRCD2A
3919	3CB0	17				RETC,UN	
3920	3CB1			*			
3921	3CB1			*			
3922	3CB1			*			
3923	3CB1	00			FIXTMP RES		1
3924	3CB2			*			
3925	3CB2			*			
3926	3CB2			*			
3927	3CB2	77	18		INTROT	PPSL	RS+WC
3928	3CB4	75	01			CPSL	CRY
3929	3CF6	05	04			LODI,R1	4
3930	3CF8	01	47	2D	INTR1	LODA,R1	INTSTG,-
3931	3CFB	50				RRR,R0	
3932	3CEC	CD	67	2D		STRA,R1	INTSTG,I
3933	3CFF	59	77			ERNR,R1	INTR1
3934	3CC1	75	18			CPSL	WC+RS

	335	13 1		C,U		
	3936	3CC4		*		
	3937	3CC4		*		
	3938	3CC4		*		
	3939	3CC4 3F 3C F5	FPASN	BSTA,UN	POPC1	
	3940	3CC7 0C 13 8E		LODA,R0	CBUF1+1	
	3941	3CCA 9E 3A 7A		BCFA,LT	PPUSH1	
	3942	3CCD 1F 3A 8F		BCTA,UN	PPUSM1	
	3943	3CD0		*		
	3944	3CD0		*		
	3945	3CD0		*		
	3946	3CD0 3F 3D 11	FPABS	BSTA,UN	POPOPB	
	3947	3CD3 0C 07 4E		LODA,R0	OPB+1	
	3948	3CD6 9E 3D 18		BCFA,LT	PUSOPB	
	3949	3CD9 3B 03	FPABS1	BSTR,UN	INVOPB	
	3950	3CDB 1F 3D 18		BCTA,UN	PUSOPB	
	3951	3CDE		*		
	3952	3CDE		*		
	3953	3CDE		*		
	3954	3CDE 77 08	INVOFB	PPSL	WC	
	3955	3CE0 3F 38 4B		BSTA,UN	TCOM	
	3956	3CE3 75 08		CPSL	WC	
	3957	3CE5 17		RETC,UN		
	3958	3CE6		*		
	3959	3CE6		*		
	3960	3CE6		*		
	3961	3CE6 3F 3C F5	FPINT	BSTA,UN	POPC1	
127	3962	3CE9 3F 3C FC		BSTA,UN	PUSHC1	
	3963	3CEC 3F 3C FC		BSTA,UN	PUSHC1	
	3964	3CEF 3F 3D 20		BSTA,UN	FPFRG	
	3965	3CF2 1F 37 BD		BCTA,UN	FPSUB	
	3966	3CF5		*		
	3967	3CF5		*		
	3968	3CF5 04 33	POPC1	LODI,R0	CBUF1	
	3969	3CF7 05 8D		LODI,R1	CBUF1	
	3970	3CF9 1F 32 45		BCTA,UN	POP	
	3971	3CFC 04 33	PUSHC1	LODI,R0	CBUF1	
	3972	3CFE 05 8D		LODI,R1	CBUF1	
	3973	3D00 1F 32 7D		BCTA,UN	PUSH	
	3974	3D03 04 33	POPC2	LODI,R0	CBUF2	
	3975	3D05 05 91		LODI,R1	CBUF2	
	3976	3D07 1F 32 45		BCTA,UN	POP	
	3977	3D0A 04 33	PUSHC2	LODI,R0	CBUF2	
	3978	3D0C 05 91		LODI,R1	CBUF2	
	3979	3D0E 1F 32 7D		BCTA,UN	PUSH	
	3980	3D11 04 27	POPCFB	LODI,R0	OPB	
	3981	3D13 05 4D		LODI,R1	OPB	
	3982	3D15 1F 32 45		BCTA,UN	POP	
	3983	3D18 04 27	PUSOPB	LODI,R0	OPB	
	3984	3D1A 05 4D		LODI,R1	OPB	
	3985	3D1C 1F 32 7D		BCTA,UN	PUSH	
	3986	3D1F		*		
	3987	3D1F		*		
	3988	3D1F		*		
	3989	3D1F 00	INVERT RES		1	
	3990	3D20		*		
	3991	3D20		*		

LINE	ADDR	B1	B2	B3	LABEL	OPCODE	OPERAND
3992	3D20				*		
3993	3D20	3E	6F		FFFFC	BSTR,UN	POPOPB
3994	3D22	20				EORZ,R0	
3995	3D23	C8	7A			STRR,R0	INVERT
3996	3D25	0C	07	4E		LODA,R0	OPB+1
3997	3D28	9A	07			BCFR,LT	PPFRC1
3998	3D2A	04	FF			-LODI,R0	FF
3999	3D2C	C8	71			STRR,R0	INVERT
4000	3D2F	3F	3C	DE		BSTA,UN	INVOPB
4001	3D31	0C	07	4D	PPFRC1	LODA,R0	OPB
4002	3D34	99	29			BCFR,GT	FRC4
4003	3D36	F4	17			COMI,R0	17
4004	3D38	9E	3A	73		BCFA,LT	PUSH0
4005	3D3B	00				LODZ,R0	
4006	3D3C	C2				STRZ,R2	
4007	3D3E	0E	00			LODI,R1	0
4008	3D3F	07	40			LODI,R3	40
4009	3D41	20			FRCV	FORZ,R0	
4010	3D42	F6	00		FRC1	COMI,R2	0
4011	3D44	18	06			BCTR,EQ	FRC3
4012	3D46	A6	01			SUBI,R2	1
4013	3D48	63				IORZ,R3	
4014	3D49	F3				RRR,R3	
4015	3D4A	9A	76			BCFR,LT	FRC1
4016	3D4C	24	FF		FRC3	EORI,R0	FF
4017	3D4F	41	27	4D		ANDA,R1	OPB,+
4018	3D51	CD	67	4D		STRA,R1	OPB,I
4019	3D54	02				LODZ,R2	
4020	3D55	98	6A			BCFR,EQ	FRC0
4021	3D57	77	08			PPSL	WC
4022	3D59	3F	39	94		BSTA,UN	NORM
4023	3D5C	04	02			LODI,R0	2
4024	3D5F	S3				LPSL	
4025	3D5F	0C	1D	1F	FRC4	LODA,R0	INVERT
4026	3D62	3E	3C	DE		BSTA,LT	INVOPB
4027	3D65	1F	3D	18		BCTA,UN	PUSOPB
4028	3D68				*		
4029	3D68				*		
4030	3D68				*		
4031	3D68	3F	3D	E2	FPSIN	BSTA,UN	QUAD
4032	3D6B	3F	3C	F5		BSTA,UN	POPC1
4033	3D6E	06	04			LODI,R2	4
4034	3D70	3F	3C	FC	FPSIN1	BSTA,UN	PUSHC1
4035	3D73	FA	7B			BDRR,R2	FPSIN1
4036	3D75	3F	38	91		BSTA,UN	FPMULT
4037	3D78	3F	38	91		BSTA,UN	FPMULT
4038	3D7B	3F	3D	03		BSTA,UN	POPC2 ...
4039	3D7E	04	3D			LODI,R0	SINFAC
4040	3D80	05	A6			LODI,R1	SINFAC
4041	3D82	06	FF			LODI,R2	FF
4042	3D84	1F	3E	0E		BCTA,UN	SERIES
4043	3D87				*		
4044	3D87				*		
4045	3D87				*		
4046	3D87	3F	3D	E2	FPCOS	BSTA,UN	QUAD
4047	3D8A	3F	3C	F5		BSTA,UN	POPC1
4048	3D8D	3F	3A	7A		BSTA,UN	PPUSH1

Before $x = \pi \cdot \sin(\frac{1}{4}\pi) = x'$
~~sin of sin~~

of sin x, x^3
 $\sin x = x - \frac{1}{3!}x^3 + \frac{1}{5!}x^5$

cos $x = 1 - \frac{1}{2!}x^2$
 1 of sin

40	00	I, R			
4050	3D92 3F 3C FC FPCOS1	BSTA, UN	JSHC1		
4051	3D95 FA 7B	BDRR, R2	FPCOS1		
4052	3D97 3F 38 91	BSTA, UN	PPMULT		
4053	3D9A 3F 3D 03	BSTA, UN	POPC2		
4054	3D9D 04 3D	LODI, R0	COSFAC		
4055	3D9F 05 BE	LODI, R1	COSFAC		
4056	3DA1 06 FF	LODI, R2	FF		
4057	3DA3 1F 3F 0B	BC A, UN	SERIES		
4058	3DA6				
4059	3DA6				
4060	3DA6				
4061	3DA6 FE	SINFAC DATA	FE		
4062	3DA7 AA	DATA	AA		
4063	3DA8 AA	DATA	AA		
4064	3DA9 AB	DATA	AB		
4065	3DAA FA	DATA	FA		
4066	3DAB 44	DATA	44		
4067	3DAC 44	DATA	44		
4068	3DAD 44	DATA	44		
4069	3DAE F4	DATA	F4		
4070	3DAF 97	DATA	97		
4071	3DE0 F9	DATA	F9		
4072	3DF1 80	DATA	80		
4073	3DB2 EE	DATA	EE		
4074	3DE3 5C	DATA	5C		
4075	3DE4 77	DATA	77		
4076	3DB5 8E	DATA	8E		
4077	3DB6 E7	DATA	E7		
4078	3DB7 94	DATA	94		
4079	3DBE 66	DATA	66		
4080	3DE9 FB	DATA	FB		
4081	3DBA E0	DATA	E0		
4082	3DBB 58	DATA	58		
4083	3DEC 49	DATA	49		
4084	3DED 1A	DATA	1A		
4085	3DBE				
4086	3DBE				
4087	3DBE				
4088	3DEE 00	COSFAC DATA	00		
4089	3DEF C0	DATA	C0		
4090	3DC0 00	DATA	00		
4091	3DC1 00	DATA	00		
4092	3EC2 FC	DATA	FC		
4093	3DC3 55	DATA	55		
4094	3DC4 55	DATA	55		
4095	3DC5 55	DATA	55		
4096	3DC6 F7	DATA	F7		
4097	3DC7 A4	DATA	A4		
4098	3DC8 FA	DATA	FA		
4099	3DC9 50	DATA	50		
4100	3DCA F1	DATA	F1		
4101	3DCB 68	DATA	68		
4102	3DCC 06	DATA	06		
4103	3DCE 80	DATA	80		
4104	3DCE FE	DATA	FE		
4105	3DCF B6	DATA	B6		

LINE ADDR B1 B2 B3 LABEL OPCODE OPEPAND

4106	3DI0	06			DATA	06
4107	3DI1	C2			DATA	C2
4108	3DD2	E4			DATA	E4
4109	3DD3	47			DATA	47
4110	3DI4	FB			DATA	FB
4111	3DD5	61			DATA	61
4112	3DD6		*			
4113	3DD6		*			
4114	3DI6		*			
4115	3DE6	3F 3C 68	FPTAN	BSTA, UN	FPSIN	
4116	3DD9	3F 3C FC		BSTA, UN	PUSHC1	
4117	3DDC	3F 3D 87		BSTA, UN	FPCOS	
4118	3DDF	1F 38 94		BCTA, UN	FPDIV	
4119	3DE2		*			
4120	3DF2		*			
4121	3DE2		*			
4122	3DE2	3F 3C F5	QUAD	BSTA, UN	POPC1	
4123	3DE5	3F 3C FC		BSTA, UN	PUSHC1	
4124	3DE8	3F 3C FC		BSTA, UN	PUSHC1	
4125	3DFE	3F 0F		BSTR, UN	PUSHQU	
4126	3DED	3F 38 94		BSTA, UN	FPDIV	
4127	3DF0	3F 3C E6		BSTA, UN	FPINT	
4128	3DF3	3B 07		BSTR, UN	PUSHQU	
4129	3DFE	3F 38 91		BSTA, UN	FPMULT	
4130	3DF8	3F 37 BD		BSTA, UN	FPSUB	
4131	3DFB	17		RETC, UN		
4132	3DFC		*			
4133	3DFC		*			
4134	3DFC		*			
4135	3DFC	04 3E	PUSHQU	LODI, R0	QUADC	
4136	3DFE	05 03		LODI, R1	QUADC	
4137	3E00	1F 32 7D		BC A, UN	PUSH	
4138	3E03		*			
4139	3E03		*			
4140	3E03		*			
4141	3E03	02 64	QUADC	AON	0264	
4142	3E05	87		DATA	87	
4143	3E06	EE		DATA	EE	
4144	3E07	00 00 00	SRTEMP	RES	4	
4145	3E0B		*			
4146	3E0B		*			
4147	3E0B		*			
4148	3E0B	C8 7A	SERIES	STRR, R0	SRTEMP	
4149	3E0D	C9 79		STRR, R1	SRTEMP+1	
4150	3E0F	CA 79		STRR, R2	SRTEMP+3	
4151	3E11	20		EORZ, R0		
4152	3E12	C8 75		STRR, R0	SRTEMP+2	
4153	3E14	3F 3D 0A	SERIEZ	BSTA, UN	PUSHC2	
4154	3E17	08 6E		LODR, R0	SRTEMP	
4155	3E19	09 6D		LODR, R1	SRTEMP+1	
4156	3E1B	3F 32 7D		BSTA, UN	PUSH	
4157	3E1F	3F 38 91		BSTA, UN	FPMULT	
4158	3E21	3F 37 EF		BSTA, UN	FPADD	
4159	3E24	3F 3D 0A		BSTA, UN	PUSHC2	
4160	3E27	3F 3C FC		BSTA, UN	PUSHC1	
4161	3E2A	08 5E		LODR, R0	SRTEMP+3	
4162	3E2C	18 06		RCTR, R0	SERIEZ	

$$DC - \pi \text{INT}(x/\pi)$$

$$(\text{def } N \times 2\pi \text{ of } \sin \text{ phal})$$

$$03 \ 64 \} = 2\pi!$$

$$\pi$$

$$87 \ ED$$

MSB $\frac{1}{2}$ $\frac{1}{2}$
LSB $\frac{1}{2}$ $\frac{1}{2}$
FF/

overman, integrat factor
def to recks up

33	E 31	FC	A, UN	F	
4164	3E31 3F 38 91		BSTA, UN	FPMULT	
4165	3E34 3F 38 91	SERIE3	BSTA, UN	FPMULT	BSTA, UN PUSH
4166	3E37 3F 3D 03		BSTA, UN	POPC2	
4167	3E3A 0C 13 91		LODA, R0	CBUF2	
4168	3E3D 7F 02		CPSL	COM	
4169	3E3F E4 E9		COMI, R0	E9	-17
4170	3E41 77 02		PSSL	COM	
4171	3E43 1C		RETC, LT		
4172	3E44 08 43		LODR, R0	SRTEMP+2	
4173	3E46 84 01		ADDI, R0	1	
4174	3E48 E4 06		COMI, R0	6	6 factor present?
4175	3E4A 14		RETC, EQ		
4176	3E4B CC 1E 09		STRA, R0	SRTEMP+2	5 loc NR factor
4177	3E4E 0C 1E 08		LODA, R0	SRTEMP+1	
4178	3E51 84 04		ADDI, R0	4	
4179	3E53 CC 1E 08		STRA, R0	SRTEMP+1	
4180	3E56 9C 3E 14		BCFA, EQ	SERIE2	total adies + 4 (regard for)
4181	3E59 0C 1E 07		LODA, R0	SRTEMP	
4182	3E5C 84 01		ADDI, R0	1	
4183	3E5E CC 1E 07		STRA, R0	SRTEMP	
4184	3E61 1F 3F 14		BCTA, UN	SERIE2	
4185	3E64	*			
4186	3E64	*			
4187	3E64	*			
4188	3E64 00 00 00	RNDSTR RES		4	
4189	3E68	*			
4190	3E68	*			
4191	3E68	*			
4192	3E68 08 7B	FPRND	LODR, R0	RNDSTR+1	
4193	3E6A 3E 1C		BSTR, UN	RANDOM	
4194	3E6C 44 7F		ANDI, R0	7F	
4195	3E6E C8 75		STRR, R0	RNDSTR+1	
4196	3E70 07 02		LODI, R3	2	
4197	3E72 06 01		LODI, R2	1	
4198	3E74 0F 3F 64	FPRND1	LODA, R2	RNDSTR, +	
4199	3E77 3B 0F		BSTR, UN	RANDOM	
4200	3E79 CF 7E 64		STRA, R2	RNDSTR, I	
4201	3E7C FB 7C		BDRR, R3	FPRND1	
4202	3E7E 04 3F		LODI, R0	RNDSTR	
4203	3E80 05 64		LODI, R1	RNDSTR	
4204	3E82 3F 32 7D		BSTA, UN	PUSH	
4205	3E85 1F 38 91		BCTA, UN	FPMULT	
4206	3E88	*			
4207	3E88	*			
4208	3E88	*			
4209	3E88 00	RANDOM	LODZ, R0		
4210	3E89 98 02		BCFR, EQ	RAND1	
4211	3E8B 84 01		ADDI, R0	1	
4212	3E8C C1	RAND1	STRZ, R1		
4213	3E8E 45 8E		ANDI, R1	8E	
4214	3E90 77 08		PSSL	WC	
4215	3E92 18 0E		BCTR, EQ	RAND3	
4216	3E94 D1	RAND2	RRL, R1		
4217	3E95 45 FE		ANDI, R1	FE	
4218	3E97 B5 01		TSSL	CRY	
4219	3E99 98 79		BCFR, EQ	RAND2	

LINE	ADDR	B1	B2	B3	LABEL	OPCODE	OPERAND			
4220	3E9B	45	FF			ANDI,R1	FF	3E9B 70 80	RNDIZE	REDD, R0
4221	3E9D	18	06			BCTR,EQ	RAND4	3E9B F4 80		THI, R0 80
4222	3E9F	L0			RAND3	RRL,R0		3E9B 1C 25 RE		BCTR,Z PAUSE 2
4223	3EA0	44	FF			ANDY,R0	FE	3E9B 0C 1E 65		LODA, R0 RNDSTK+1
4224	3EA2	75	08			CPSL	WC	3E9B 04 01		ADDI, R0 L
4225	3EA4	17				RETC,UN		3EA3 44 7F		ANDI, R0 7F
4226	3EA5	L0			RAND4	RRL,R0		3EA5 CC 1E 65		STRA, R0 RNDSTK+1
4227	3EA6	44	FE			ANDI,R0	FE	3EA8 1F 3E 90		BCTR, UN RNDIZE
4228	3EA8	84	01			ADDI,R0	1			
4229	3EAA	75	0E			CP L	WC			
4230	3EAC	17				RETC,UN				
4231	3EAD				*					
4232	3EAD				*					
4233	3EAD				*					
4234	3EAD	3F	3C	F5	FPLN	BSTA,UN	POPC1			
4235	3FB0	04	07			LODI,R0	7			
4236	3EB2	CC	07	4D		STRA,R0	OPB			
4237	3FB5	0C	13	8D		LODA,R0	CBUF1			
4238	3FB8	9A	04			BCFR,LT	FPLN1			
4239	3EBA	24	FF			EORI,R0	FF			
4240	3EBC	84	01			ADDI,R0	1			
4241	3EBE	CC	07	4E	FPLN1	STRA,R0	OPB+1			
4242	3EC1	20				EORZ,R0				
4243	3EC2	CC	07	4F		STRA,R0	OPB+2			
4244	3FC5	CC	07	50		STRA,R0	OPB+3			
4245	3EC8	0C	13	8F		LODA,R0	CBUF1+1			
4246	3FCB	0D	30	6E		BCFA,GT	ERR15	OVERFLOW--LN OF 0 OR NEG NUMBER		
4247	3ECE	77	08			PPSL	WC			
4248	3EI0	3F	39	94		BSTA,UN	NORM			
4249	3ED3	04	02			LODI,R0	2			
4250	3ED5	93				LPSL				
4251	3ED6	0C	13	8D		LODA,R0	CBUF1			
4252	3ED9	3E	3C	DE		BSTA,LT	INVOPB			
4253	3EIC	20				EORZ,R0				
4254	3EDD	CC	13	8D		STRA,R0	CBUF1			
4255	3IE0	04	3F			LODI,R0	FPLN2			
4256	3EE2	05	12			LODI,R1	FPLN2			
4257	3EE4	3F	32	7E		BSTA,UN	PUSH			
4258	3EE7	3F	3D	18		BSTA,UN	PUSOPB			
4259	3EEA	3F	38	91		BSTA,UN	FPMULT			
4260	3FED	3F	3C	FC		BSTA,UN	PUSHC1			
4261	3FE0	3F	3A	7A		BSTA,UN	PPUSH1			
4262	3EF3	3F	37	BD		BSTA,UN	FPSUB			
4263	3FE6	3F	3C	F5		BSTA,UN	POPC1			
4264	3FF9	06	03			LODI,R2	3			
4265	3FFB	3F	3C	FC	FPLN4	BSTA,UN	PUSHC1			
4266	3FFE	FA	7F			BDRR,R2	FPLN4			
4267	3F00	3F	38	91		BSTA,UN	FPMULT			
4268	3F03	3F	3D	03		BSTA,UN	POPC2			
4269	3F06	3F	37	FF		BSTA,UN	FFADD			
4270	3F09	04	3F			LODI,R0	LNFA			
4271	3F0B	05	16			LODI,R1	LNFA			
4272	3F0D	06	00			LODI,R2	0			
4273	3F0F	1F	3F	0F		BCTA,UN	SERIES			
4274	3F12				*					
4275	3F12				*					
4276	3F12				*					

4277	3F12 00 50	RDIN2	ACON	0250
4278	3F14 00		DATA	
4279	3F15 09		DATA	09
4280	3F16	*		
4281	3F16	*		
4282	3F16	*		
4283	3F16 00	LNFA	DATA	00
4284	3F17 00		DATA	00
4285	3F18 00		DATA	00
4286	3F19 00		DATA	00
4287	3F1A FF		DATA	FF
4288	3F1B 55		DATA	55
4289	3F1C 55		DATA	55
4290	3F1D 55		DATA	55
4291	3F1E FF		DATA	FF
4292	3F1F FF		DATA	FF
4293	3F20 FF		DATA	FF
4294	3F21 FC		DATA	FC
4295	3F22 FE		DATA	FE
4296	3F23 66		DATA	66
4297	3F24 66		DATA	66
4298	3F25 66		DATA	66
4299	3F26 FE		DATA	FE
4300	3F27 AA		DATA	AA
4301	3F28 AA		DATA	AA
4302	3F29 AA		DATA	AA
4303	3F2A FE		DATA	FE
4304	3F2B 49		DATA	49
4305	3F2C 24		DATA	24
4306	3F2D 96		DATA	96
4307	3F2E	*		
4308	3F2E	*		
4309	3F2E	*		
4310	3F2E 00	PFESTG	RES	1
4311	3F2F	*		
4312	3F2F	*		
4313	3F2F	*		
4314	3F2F 3F 3C F5	FPEXP2	BSTA,UN	POP01
4315	3F32 3F 3C FC	FPEXP3	BSTA,UN	PUSHC1
4316	3F35 3F 2A 17		BSTA,UN	DT0BNL
4317	3F38 01		LODZ,R1	
4318	3F39 02		STRZ,R2	
4319	3F3A 3F 3A 7A		BSTA,UN	PPUSH1
4320	3F3D 02		LODZ,R2	
4321	3F3E 18 10		ECTR,EQ	FPEXPD
4322	3F40 0A 60	FPEXPA	STRR,R2	PFESTG
4323	3F42 04 3F		LODI,R0	FPE
4324	3F44 05 7B		LODI,R1	FPE
4325	3F46 3F 32 7D		BSTA,UN	FUSH
4326	3F49 3F 38 91		BSTA,UN	FPMULT
4327	3F4C 0A 60		LODR,R2	PFESTG
4328	3F4E FA 70		BDRR,R2	FPEXPA
4329	3F50 3F 3D 03	FPEXPD	BSTA,UN	FOIC2
4330	3F53 3F 3F 20		BSTA,UN	PPFRC
4331	3F56 3F 3C F5		BSTA,UN	POP01
4332	3F59 3F 3D 0A		BSTA,UN	FUSHC2
4333	3F5C 3F 3A 7A		BSTA,UN	PPUSH1

FPEXP2 BSTA,UN FPEXP4 1F 1F 96

LINE	ADDR	B1	B2	B3	LABEL	OPCODE	OPERAND
4334	3F5F	06	03			LODI,R2	3
4335	3F61	3F	3C	FC	FPEXPB	BSTA,UN	PUSHC1
4336	3F64	FA	7B			BDRR,R2	FPEXPB
4337	3F66	3F	38	91		BSTA,UN	FPMULT
4338	3F69	3F	3D	03		BSTA,UN	POPC2
4339	3F6C	3F	37	EF		BSTA,UN	FPADD
4340	3F6F	04	3F			LODI,R0	EXPFAC
4341	3F71	0E	7F			LODI,R1	EXPFAC
4342	3F73	06	00			LODI,R2	00
4343	3F75	3F	3E	0B		BSTA,UN	SERIES
4344	3F78	1F	38	91		BSTA,UN	FPMULT
4345	3F7B				*		
4346	3F7B				*		
4347	3F7B				*		
4348	3F7B	02			FPE	DATA	02
4349	3F7C	E6				DATA	E6
4350	3F7D	FC				DATA	FC
4351	3F7E	29				DATA	29
4352	3F7F				*		
4353	3F7F				*		
4354	3F7F				*		
4355	3F7F	00			EXPFAC	DATA	00
4356	3F80	40				DATA	40
4357	3F81	00				DATA	00
4358	3F82	00				DATA	00
4359	3F83	FE				DATA	FE
4360	3F84	55				DATA	55
4361	3F85	55				DATA	55
4362	3F86	55				DATA	55
4363	3F87	FC				DATA	FC
4364	3F88	55				DATA	55
4365	3F89	55				DATA	55
4366	3F8A	55				DATA	55
4367	3F8B	FA				DATA	FA
4368	3F8C	44				DATA	44
4369	3F8D	44				DATA	44
4370	3F8E	48				DATA	48
4371	3F8F	F7				DATA	F7
4372	3F90	5B				DATA	5B
4373	3F91	05				DATA	05
4374	3F92	B0				DATA	B0
4375	3F93	F4				DATA	F4
4376	3F94	68				DATA	68
4377	3F95	06				DATA	06
4378	3F96	86				DATA	86
4379	3F97				*		
4380	3F97				*		
4381	3F97				*		
4382	3F97	3F	3C	F5	FPEXP	BSTA,UN	POPC1
4383	3F9A	3F	3D	03		BSTA,UN	POPC2
4384	3F9D	3F	3C	FC		BSTA,UN	PUSHC1
4385	3FA0	3F	3D	0A		BSTA,UN	PUSHC2
4386	3FA3	3F	3E	AD		BSTA,UN	FPLN
4387	3FA6	3F	38	91		BSTA,UN	FPMULT
4388	3FA9	1F	3F	2F		BSTA,UN	FPEXP2
4389	3FAC				*		
4390	3FAC				*		

IF IF R2 BCTA, UN MLT EXT

1/2 .5
1/6 .16666666

1/24 .04166666

1/120 .00833333

1/720 .00138888

1/5040 .00019841

4392	3FAC	3F	3E	AD	FPLOG	BSTA,UN	FPLN
4393	3FAF	04	3F			LODI,R0	LOGCON
4394	3FB1	05	B9			LODI,R1	LOGCON
4395	3FB3	3F	32	7D		BSTA,UN	PUSH
4396	3FB6	1F	38	91		BCTA,UN	FPMULT
4397	3FB9				*		
4398	3FB9				*		
4399	3FB9				*		
4400	3FB9	FF			LOGCON	DATA	FF
4401	3FBA	6F				DATA	6F
4402	3FBB	2D				DATA	2D
4403	3FBC	EB				DATA	EB
4404	3FBD				*		
4405	3FBD				*		
4406	3FBD				*		
4407	3FBD	00	40		FP.5	ACON	0040
4408	3FBF	00	00			ACON	0000
4409	3FC1				*		
4410	3FC1				*		
4411	3FC1				*		
4412	3FC1	3F	3E	AD	FPSORT	BSTA,UN	FPLN
4413	3FC4	04	3F			LODI,R0	FP.5
4414	3FC6	05	ED			LODI,R1	FP.5
4415	3FC8	3F	32	7D		BSTA,UN	PUSH
4416	3FCB	3F	38	91		BSTA,UN	FPMULT
4417	3FCE	1F	3F	2F		BCTA,UN	FPEXP2

3FD1 13 SETCC STSL

3FD2 E6 00 COMI, R2 00

3FD4 1D 03 BCTR, Z A

3FD6 93 LPSL

3FD7 1B 06 BCTR, UN B

3FD9 93 A LTSL

3FDB 1A 09 BCTR, IV C

3FDC 0C 13 8E LODH, KO CBUR1+1

3FDE 1E 33 9F BCTR, N COMLT

3FE2 1F 33 AC BCTR, UN COMGT

3FE5 1C 13 8E C LODH, RO CBUR1+1

3FE8 1E 33 AC BCTR, N COMGT

3FEB 1F 33 9F BCTR, UN COMLT

*

3FEE CE 14 45 STARR2 STAB, R2 CPLTH

1F 34 0D BCTR, UN STROP2

*

CC is LT in return.
CC is GT in return

Central Data Corporation
PO Box 2484, Station A
Champaign, IL 61820
(217) 359-8010

Dear BASIC Customer:

The following following changes have been made to the 8K BASIC program. These changes are in versions 1.3 and higher.

→ x 33B9	9C 3F D1 C0
→ x 3FD1	13 E6 00 18 03 93 1B 06 93 1A 09 0C 13 8E
	1E 33 9F 1F 33 AC 0C 13 8E 1E 33 AC 1F 33
	9F
→ x 3995	03
x 25B9	1F 3E 98
x 3E88	00 98 02 84 01 C1 D1 D1 45 FC 81 D1 45 F8
	81 17 70 F4 80 1C 25 BE 0C 1E 65 84 01 44
	7F CC 1E 65 1F 3E 98
x 1780	33 8E 3F 38 91 0C 17 AF 14 15 3F 3D 03 3F
	3A 7A 3F 3D 0A 1F 38 94 3F 3C F5 0C 97 80
	CC 17 AF 3F 3C FC 3F 3C D0 3F 3C F5 1F 3F
	32
3F2F — x 2F2F	1F 17 96
x 3F78	1F 17 82
x 2C25	3F 3F EE
x 3FEE	CE 14 A5 1F 34 0D

CE 14 A5 1F 34 0D
17 82
17 96

5. 8K BASIC Program Listing

This section contains the program listings for the editor
and BASIC.

LINE	ADDR	B1	B2	B3	LABEL	OPCODE	OPERAND
0002	0000				FRNT		
0003	0000				ETX	EQU	03
0004	0000				BS	EQU	08 BACKSPACE KEY (CTRL-H)
0005	0000				CTRLP	EQU	10 CTRL-P
0006	0000				CTPLO	EQU	0F CTRL-O
0007	0000				CTRLU	EQU	15 CTRL-U
0008	0000				ESC	EQU	1B ESCAPE (SHIFT CTRL-K)
0009	0000				CRCD	EQU	0D CARRIAGE RETURN (CTRL-M)
0010	0000				*		
0011	0000				*		
0012	0000				*	THE FOLLOWING ARE DEFINITIONS FOR THE SUPERVISOR SUBROUTINES	
0013	0000				*		
0014	0000				*		
0015	0000				IFCR	EQU	0024
0016	0000				FRASEL	EQU	003A
0017	0000				WRTCUR	EQU	0064
0018	0000				HXOT	EQU	006A
0019	0000				SUPENT	EQU	0083
0020	0000				SERC	EQU	024F
0021	0000				SERI	EQU	02F9
0022	0000				KBIN	EQU	030F
0023	0000				SWCHR	EQU	0396
0024	0000				*		
0025	0000				*		
0026	0000				*	THE FOLLOWING ARE DEFINITIONS FOR THE FLOPPY PORTS	
0027	0000				*		
0028	0000				*		
0029	0000				FCMR	EQU	0 COMMAND REGISTER
0030	0000				FTR	EQU	1 TRACK REGISTER
0031	0000				FSR	EQU	2 SECTOR REGISTER
0032	0000				FDR	EQU	3 DATA REGISTER
0033	0000				FCMRH	EQU	10 COMMAND REGISTER, WITH HOLD OPTION
0034	0000				FDRH	EQU	13 DATA REGISTER WITH HOLD OPTION
0035	0000				*		
0036	0000				*		
0037	0000				*	BRANCH INSTRUCTION CONDITION DEFINITIONS	
0038	0000				*		
0039	0000				*		
0040	0000				EQ	EQU	0
0041	0000				GT	EQU	1
0042	0000				LT	EQU	2
0043	0000				UN	EQU	3
0044	0000				*		
0045	0000				*		
0046	0000				*	REGISTER DEFINITIONS	
0047	0000				*		
0048	0000				*		
0049	0000				R0	EQU	0
0050	0000				R1	EQU	1
0051	0000				R2	EQU	2
0052	0000				R3	EQU	3
0053	0000				*		
0054	0000				*		
0055	0000				*	PROGRAM STATUS WORD DEFINITIONS	
0056	0000				*		
0057	0000				*		
0058	0000				CRY	EQU	1

01	C1	E1			
0000	0000	OVF	EQU	4	
0001	0000	WC	EQU	8	
0002	0000	RS	EQU	10	
0003	0000	*			
0004	0000	*			
0005	0000	*	GENERAL DEFINITIONS		
0006	0000	*			
0007	0000	*			
0008	0000	EBC	EQU	83	END OF TEXT BUFFER CODE
0009	2000	START	ORG	2000	
0070	2002 1F 20 4F	BCTA,UN	EDITOR		
0071	2003 40	BSTART	DATA	40	
0072	2004 5C	IBST	DATA	5C	
0073	2005 60	ENDRAM	DATA	60	
0074	2006 42 4C 4F LITS	ALIT	BLOCKS LEFT:	42 4C 4F 43 20 4C 45 46 54 5A 1 2 20 20 20	
0075	2014 FF	DATA	FF		
0076	2015 43 4F 4D COMMSG	ALIT	COMMAND:	43 4F 4D 4D 41 4E 44 3A 20 20 20	
0077	201F FF	DATA	FF		
0078	2020 20 4F 4B OKMSG	ALIT	'OK'	20 4F 4B	
0079	2023 FF	DATA	FF		
0080	2024 54 4F 4F TMMSC	ALIT	'TOO MUCH'	54 4F 4F 40 4D 53 43 48	
0081	202C FF	DATA	FF		
0082	202D 53 55 4D SCMSG	ALIT	'SUMHECK ERROR'	53 53 4D 43 48 43 43 48 20 43 52 52 47 48 20	
0083	203A FF	DATA	FF		
0084	203B 00	COMS	RES	1	
0085	203C 00 00 00	NAME	RES	10	
0086	204C 00	TMPS	RES	1	
0087	204D 00	TEMP	RES	1	
0088	204F 04 02	EDITOR	LODI,R0	02	
0089	2050 93		LPSL		
0090	2051 76 40		PPSU	40	SET FLAG BIT
0091	2053 3F 22 4E	BSTA,UN	BEGIN		
0092	2056	*			
0093	2056	*			
0094	2056	*			
0095	2056 3F 21 4E	FBDN	PSTA,UN	DISP	
0096	2059	*			
0097	2059	*			
0098	2059	*			
0099	2059 05 0F	COMD	LODI,R1	0F	
0100	205B 06 10		LODI,R2	10	
0101	205D 3F 21 45	BSTA,UN	SETCUR		
0102	2060 BF 24	ZBSR	LFCR		
0103	2062 05 F0	LODI,R1	F0		
0104	2064 06 10	LODI,R2	10		
0105	2066 3F 21 45	BSTA,UN	SETCUR		
0106	2069 05 06	LODI,R1	LITS		
0107	206E 3F 24 23	BSTA,UN	BLKW		
0108	207E 3F 21 F7	BSTA,UN	FINDND		
0109	2071 0F 00 04	LODA,R3	IBST		
0110	2074 AF 04 61	SUPA,R3	DUMA		
0111	2077 A7 01	SUBI,R3	01		
0112	2079 3F 21 09	BSTA,UN	BTODCT		
0113	207C 06 13	LODI,R2	13		
0114	207E 05 20	LODI,R1	20		
0115	2080 3F 21 45	BSTA,UN	SETCUR		

LINE	ADDR	R1	R2	P3	LABEL	OPCODE	OPERAND
------	------	----	----	----	-------	--------	---------

0110	2083	05	15			LODI,R1	COMMSG
------	------	----	----	--	--	---------	--------

0117	2085	3F	24	23		PSTA,UN	ELKW
------	------	----	----	----	--	---------	------

0118	2086	70			PL1	REED,R0	
------	------	----	--	--	-----	---------	--

0119	2089	F4	80			TMI,R0	82
------	------	----	----	--	--	--------	----

0110	208F	18	7B			BCTR,FQ	PL1
------	------	----	----	--	--	---------	-----

0121	208D	3F	21	20		PSTA,UN	OLC
------	------	----	----	----	--	---------	-----

0122	2080	04	20			LODI,R0	COMS
------	------	----	----	--	--	---------	------

0123	2082	05	3F			LODI,R1	COMS
------	------	----	----	--	--	---------	------

0124	2094	06	11			LODI,R2	11
------	------	----	----	--	--	---------	----

0125	2096	3F	22	59		PSTA,UN	ARROW
------	------	----	----	----	--	---------	-------

0126	2090	00	02	83		ICFA,FQ	SUPENT
------	------	----	----	----	--	---------	--------

0127	209C	00	00	3E		LODA,R0	COMS
------	------	----	----	----	--	---------	------

0128	209F	3F	21	20		PSTA,UN	OLC
------	------	----	----	----	--	---------	-----

0129	20A2	20				FORZ,R0	
------	------	----	--	--	--	---------	--

0130	20A3	C1				STRZ,R1	
------	------	----	--	--	--	---------	--

0131	20A4	07	FF			LODI,R3	FF
------	------	----	----	--	--	---------	----

0132	20A6	0F	22	30	NI	LODA,R3	NAME,+
------	------	----	----	----	----	---------	--------

0133	20A9	18	76			BCTR,FQ	CK0
------	------	----	----	--	--	---------	-----

0134	20AF	E7	10			COMI,R3	10
------	------	----	----	--	--	---------	----

0135	20A1	9A	2C			RCFR,LT	FADD
------	------	----	----	--	--	---------	------

0136	20AF	F4	30			COMI,R0	'0'
------	------	----	----	--	--	---------	-----

0137	20F1	1A	26			BCTR,LT	DS
------	------	----	----	--	--	---------	----

0138	20E3	E4	39			COMI,R0	'9'
------	------	----	----	--	--	---------	-----

0139	20F5	19	22			BCTR,GT	DS
------	------	----	----	--	--	---------	----

0140	20E7	01				LODZ,R1	
------	------	----	--	--	--	---------	--

0141	20E6	00	09			LODI,R2	09
------	------	----	----	--	--	---------	----

0142	20EA	81			ONE	ADDZ,R1	
------	------	----	--	--	-----	---------	--

0143	20EB	P5	01			TPSL	CRY
------	------	----	----	--	--	------	-----

0144	20ED	18	2F			BCTR,FQ	D255
------	------	----	----	--	--	---------	------

0145	20EF	FA	79			BDRR,R2	ONE
------	------	----	----	--	--	---------	-----

0146	20C1	C1				STRZ,R1	
------	------	----	--	--	--	---------	--

0147	20C2	0F	60	30		LODA,R3	NAME,I
------	------	----	----	----	--	---------	--------

0148	20C5	A4	32			SURI,R0	'0'
------	------	----	----	--	--	---------	-----

0149	20C7	81				ADDZ,R1	
------	------	----	--	--	--	---------	--

0150	20C9	C1				STRZ,R1	
------	------	----	--	--	--	---------	--

0151	20C0	P5	01			TPSL	CRY
------	------	----	----	--	--	------	-----

0152	20CF	98	59			RCFR,FQ	NI
------	------	----	----	--	--	---------	----

0153	20CD	05	FF		D255	LODI,R1	FF
------	------	----	----	--	------	---------	----

0154	20CF	1E	0A			BCTR,UN	FADD
------	------	----	----	--	--	---------	------

0155	20F1	E7	20		CK0	COMI,R3	00
------	------	----	----	--	-----	---------	----

0156	20D3	98	06			RCFR,FQ	FADD
------	------	----	----	--	--	---------	------

0157	20D5	05	01			LODI,R1	01
------	------	----	----	--	--	---------	----

0158	20D7	1E	02			BCTR,UN	FADD
------	------	----	----	--	--	---------	------

0159	20D9	05	20		IS	LODI,R1	00
------	------	----	----	--	----	---------	----

0160	20DB	0F	00	3B	FADD	LODA,R3	COMS
------	------	----	----	----	------	---------	------

0161	20DE	E7	42			COMI,R3	'B'
------	------	----	----	--	--	---------	-----

0162	20F0	10	22	0A		PCTA,FQ	PACK
------	------	----	----	----	--	---------	------

0163	20F3	F7	43			COMI,R3	'C'
------	------	----	----	--	--	---------	-----

0164	20F5	10	25	E2		PCTA,FQ	CHANGE
------	------	----	----	----	--	---------	--------

0165	20F8	F7	44			COMI,R3	'D'
------	------	----	----	--	--	---------	-----

0166	20FA	10	24	2E		PCTA,FQ	DFLT
------	------	----	----	----	--	---------	------

0167	20FD	F7	46			COMI,R3	'F'
------	------	----	----	--	--	---------	-----

0168	20FE	10	22	10		PCTA,FQ	FORWD
------	------	----	----	----	--	---------	-------

0169	20F2	F7	49			COMI,R3	'I'
------	------	----	----	--	--	---------	-----

0170	20F4	10	22	E2		PCTA,FQ	INST
------	------	----	----	----	--	---------	------

0171	20F7	E7	4C			COMI,R3	'L'
------	------	----	----	--	--	---------	-----

0172	20F9	10	24	BB		PCTA,FQ	LOADER
------	------	----	----	----	--	---------	--------

	1	2	E7 52		C	R3	R	
	0174	20FE	1C 27 81		BCTA,EQ		BAS.	
	0175	2101	E7 53		COMI,R3		'S'	CONF R3 OR E7 52
	0176	2103	1C 25 41		BCTA,EQ		TAPEO	
	0177	2106	1F 20 59		PCTA,UN		COMD	
	0178	2109		*				
	0179	2109		*				
	0180	2109		*				
	0181	2109	E7 63	ETODCT	COMI,R3	63		
	0182	210B	99 07		BCFR,GT	NO100		
	0183	210D	04 31		LODI,R0	'1'		
	0184	210F	3F 21 F5		BSTA,UN	WRT		
	0185	2112	A7 64		SUBI,R3	64		
	0186	2114	06 00	NO100	LODI,R2	00		
	0187	2116	E7 09	SUB10	COMI,R3	09		
	0188	2118	99 06		BCFR,GT	TENIN		
	0189	211A	A7 0A		SUBI,R3	A		
	0190	211C	86 01		ADDI,R2	1		
	0191	211E	1B 76		RCTR,UN	SUB10		
	0192	2120	02	TENIN	LODZ,R2			
	0193	2121	64 30		IORI,R0	'0'		
	0194	2123	3F 21 F5		BSTA,UN	WRT		
	0195	2126	03		LODZ,R3			
	0196	2127	64 30		IO I,R0	'0'		
	0197	2129	1F 21 E5		BCTA,UN	WRT		
	0198	212C		*				
	0199	212C		*				
	0200	212C		*				
19	0201	212C	E4 2B	OLC	COMI,R0	2B	GO TO END OF FILE	
	0202	212E	1C 21 EF		BCTA,EQ	ENDF		
	0203	2131	E4 2D		COMI,R0	2D	GO TO BEGINNING OF FILE	
	0204	2133	1C 22 49		BCTA,EQ	BEGN		
	0205	2136	E4 20		COMI,R0		FORWARD 15 LINES	
	0206	2139	1C 22 0E		BCTA,EQ	F15		
	0207	213B	E4 2F		COMI,R0		BACKWARD 15 LINES	
	0208	213D	1C 22 08		BCTA,EQ	B15		
	0209	2140	17		RETC,UN			
	0210	2141		*				
	0211	2141		*				
	0212	2141		*				
	0213	2141	17 FF	MCU1	ACON	17FE		
	0214	2143	17 FF	MCUR	ACON	17FF		
	0215	2145		*				
	0216	2145		*				
	0217	2145		*				
	0218	2145	3F 23 F4	SETCUR	BSTA,UN	ERAS2		
	0219	2148	CA F7		STRR,R2	*MCU1		
	0220	214A	09 F7		STRR,R1	*MCUR		
	0221	214C	17		RETC,UN			
	0222	214D		*				
	0223	214D		*				
	0224	214D		*				
	0225	214D	00	LINE	RES	1		
	0226	214E		*				
	0227	214E		*				
	0228	214E		*				
	0229	214E	3F 24 87	DISP	BSTA,UN	MTDA	MOVE LINE ADDRESS TO DUMMY ADDRESS	

LINE	ADDR	R1	R2	R3	LABEL	OPCODE	OPERAND
0230	2151	C1				STRZ,R1	
0231	2152	2F				FORZ,R0	
0232	2153	C0	EE			STRR,R0	*MCUR
0233	2155	C0	04	62		STRA,R0	DUM2
0234	2158	C0	73			STRR,R0	LINE
0235	215A	EB	74		LINE	ZPSR	LFGR
0236	215C	08	F5			LODR,R0	*MCUR
0237	215F	44	0F			ANDI,R0	0F
0238	2160	14				RETC,EQ	
0239	2161	0D	F4	61		LODA,R1	*DUMA,I
0240	2164	1F	21	A8		BCTA,LT	CLREND
0241	2167	09	04			LODR,R0	LINE
0242	2169	84	01			ADDI,R0	1
0243	216B	C8	02			STRR,R0	LINE
0244	216D	C3				STRZ,R3	
0245	216F	F4	09			COMI,R0	09
0246	2172	19	05			BCTR,GT	TWOCH
0247	2172	3F	21	F3		BSTA,UN	WRTBLK
0248	2175	1B	07			BCTR,UN	WR2ND
0249	2177	04	31		TWOCH	LODI,R0	1
0250	2179	3F	21	E5		BSTA,UN	WRT
0251	217C	A7	0A			SUBI,R3	A
0252	217E	67	30		WR2ND	IORI,R3	0
0253	2180	03				LOEZ,R3	
0254	2181	3F	21	E5		BSTA,UN	WRT
0255	2184	3F	21	E3		BSTA,UN	WRTBLK
0256	2187	0D	F4	61	NXTC	LODA,R1	*DUMA,I
0257	218A	1A	1C			ECTF,LT	CLREND
0258	218C	C3				STRZ,R3	CLEAR LAST PART OF PAGE IF END OF FILE
0259	218E	D9	05			BIRR,R1	NA1
0260	218F	3F	24	9D		PSTA,UN	A1DA
0261	2192	9A	14			BCFR,LT	CLREND
0262	2194	F7	0D		NA1	COMI,R3	CRCD
0263	2196	1C	21	FA		BCTA,FO	LINE
0264	2199	03				LODZ,P3	
0265	219A	3F	21	E5		BSTA,UN	WRT
0266	219D	1B	08			BCTR,UN	NXTC
0267	219F				*		
0268	219F				*		
0269	219F				*		
0270	219F	20			ERASE	EORZ,R0	
0271	21A0	C0	81	43		STRA,R0	*MCUR
0272	21A3	3F	03			BSTR,UN	CLREND
0273	21A5	EB	24			ZPSR,UN	LFGR
0274	21A7	17				RETC,UN	
0275	21A8				*		
0276	21A8				*		
0277	21A8				*		
0278	21A9	0C	81	43	CLREND	LODA,R0	*MCUR
0279	21AB	F4	2F			TMI,R0	0F
0280	21AD	14				RETC,EQ	
0281	21AF	BB	24			ZPSR,UN	LFGR
0282	21B2	1B	70			ECTF,UN	CLREND
0283	21B2				*		
0284	21B2				*		
0285	21B2				*		
0286	21B2	00			FTEMP	FES	1

0288	21B3	*			
0289	21F3	*			
0290	21B3 3F 24 87	FWDX	BSTA,UN	MTDA	
0291	21B6 C2	FWDX2	STRZ,R2		
0292	21F7 01		LODZ,R1		
0293	21B8 14		RETC, EQ		
0294	21B9 20		EORZ,R0		
0295	21BA CC 04 62		STRA,R0	DUM2	
0296	21BD 0E E4 61	NXTCHR	LODA,R2	*DUMA, I	
0297	21C0 1A 1D		BCTR,LT	ENDFW	
0298	21C2 CE 6E		STRR,R0	FTEMP	
0299	21C4 DA 11		BIRR,R2	CRCK	
0300	21C6 3F 24 9D		BSTA,UN	AIDA	
0301	21C9 1A 0C		BCTR,LT	CRCK	
0302	21CB 3F 24 69		BSTA,UN	SIDA	
0303	21CE 06 FF		LODI,R2	FF	
0304	21D0 04 83		LODI,R0	EBC	
0305	21D2 CE E4 61		STRA,R2	*DUMA, I	
0306	21E5 1B 08		BCTR,UN	ENDFW	
0307	21E7 08 59	CRCK	LODR,R0	FTEMP	<i>check CR</i>
0308	21D9 E4 0D		COMI,R0	CRCD	
0309	21DB 98 60		BCFR, EQ	NXTCHR	
0310	21DL F9 5E		BDRR,R1	NXTCHR	
0311	21DF CE 04 62	ENDFW	STRA,R2	DUM2	
0312	21E2 17		RETC,UN		
0313	21E3	*			
0314	21E3	*			
0315	21E3	*			
0316	21E3	WRBL	EQU	\$	
0317	21F3 04 20	WRTELK	LODI,R0		
0318	21E5	*			
0319	21F5	*			
0320	21F5	*			
0321	21E5 77 10	WRT	PPSL	RS	
0322	21E7 C3		STRZ,R3		
0323	21E8 3F 03 96		BSTA,UN	SWCHR	
0324	21FB 75 10		CPSL	RS	
0325	21FD 17		RETC,UN		
0326	21EE	*			
0327	21EE	*			
0328	21EE	*			
0329	21EE 3B 07	ENDF	PSTR,UN	FINDND	
0330	21F0 3F 24 92		BSTA,UN	MTCA	
0331	21F3 05 01		LODI,R1	1	
0332	21F5 1B 13		BCTR,UN	BACK	
0333	21F7	*			
0334	21F7	*			
0335	21F7	*			
0336	21F7 3F 24 87	FINDND	BSTA,UN	MTDA	
0337	21FA 05 FF	FINDND2	LODI,R1	FF	
0338	21FC 3F 21 B6		BSTA,UN	FWDX2	
0339	21FF 0C 84 61		LODA,R0	*DUMA	
0340	2202 16		RETC,LT		
0341	2203 0C 04 62		LODA,P0	DUM2	
0342	2206 1B 72		BCTR,UN	FINDND2	
0343	2208	*			

LINE	ADDR	R1	R2	B3	LABEL	OPCODE	OPERAND
0344	2208				*		
0345	2208				*		
0346	2208	05	0F	R15	LODI,R1	F	DECIMAL 15
0347	220A				*		
0348	220A				*		
0349	220A				*		
0350	220A	3B	0D		BACK	BSTR,UN	BACKX
0351	220C	1B	05			BCTR,UN	FBD
0352	220E				*		
0353	220F				*		
0354	220E				*		
0355	220F	05	0F	R15	LODI,R1	F	DECIMAL 15
0356	2210				*		
0357	2210				*		
0358	2210				*		
0359	2210	3F	21	B3	FORWD	BSTA,UN	FWDX
0360	2213	3F	24	92	FBD	BSTA,UN	MTCA
0361	2216	1F	20	56		BCTA,UN	FBDN
0362	2219				*		
0363	2219				*		
0364	2219				*		
0365	2219	3F	24	07	BACKX	BSTA,UN	MTDA
0366	221C	02				STRZ,R2	
0367	221D	20				EORZ,R0	
0368	221F	0C	04	62		STRA,R0	DUM2
0369	2221	85	01			ADDI,R1	1
0370	2223	1B	03			BCTR,UN	CHEK
0371	2225	0F	04	61	SUBL	LODA,R2	*DUMA,-
0372	2228	03			CHEK	STRZ,R3	
0373	2229	F6	00			COMI,R2	00
0374	222B	98	08			BCFR,EQ	NOSU
0375	222D	3F	24	69		BSTA,UN	SIDA
0376	2230	4C	00	03		COMA,R0	BSTART
0377	2233	1A	14			BCTR,LT	BEGN
0378	2235	F7	0D		NOSU	COMI,R3	CRCD
0379	2237	98	6C			BCFR,EQ	SUBL
0380	2239	F9	6A			ED R,R1	SUBL
0381	223B	FE	00			COMI,R2	00
0382	223D	3C	24	9D		BSTA,EQ	A1DA
0383	2240	8C	01			ADDI,R2	1
0384	2242	3C	24	9D		BSTA,EQ	A1DA
0385	2245	0E	04	62		STRA,R2	DUM2
0386	2248	17				RETC,UN	
0387	2249				*		
0388	2249				*		
0389	2249				*		
0390	2249	3B	03		BEGN	BSTR,UN	BEGIN
0391	224F	1F	20	56		BCTA,UN	FBDN
0392	224F				*		
0393	224F				*		
0394	224F				*		
0395	224F	0C	00	03	BEGIN	LODA,R0	BSTART
0396	2251	0C	04	5F		STRA,R0	CURA
0397	2254	20				FORZ,R0	
0398	2255	0C	04	60		STRA,R0	CUR2
0399	2258	17				RETC,UN	
0400	2259				*		

0401	2250																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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LINE	ADDER	B1	B2	B3	IABEL	OPCODE	OPERAND
0458	2209	E4	03			COMI,R0	ETX
0459	220B	18	05			BCTR,FO	BYFAS
0460	220D	3F	25	06		BSTA,UN	CKCTRL
0461	2210	1A	0F			BCTR,LT	NEXI
0462	22D2	CD	E4	63	BYPAS	STRA,R1	*TMPA,I
0463	22D5	E4	03			COMI,R0	ETX
0464	22D7	18	3D			BCTR,FO	ENDI
0465	22D9	E4	0F			COMI,R0	CRCD
0466	22DB	3C	00	24		BSTA,EQ	LFGR
0467	22DE	3F	02			BSTR,UN	INSTS
0468	22E0	1B	5F			BCTR,UN	NEXI
0469	22E2				*		
0470	22E2	04	01		INSTS	LODI,R0	1
0471	22E4	00	02			LODI,R2	2
0472	22E6	3F	24	A9		BSTA,UN	ADDANY
0473	22E9	FC	00	04		COMA,R0	IBST
0474	22FC	1A	0A			BCTR,LT	INCR
0475	22FE	3F	24	69		BSTA,UN	SIDA
0476	22F1	04	FE			LODI,R0	FE
0477	22F3	CC	04	62		STRA,R0	DUM2
0478	22F6	1B	19			BCTR,UN	ENDINS
0479	22F8	19	0D		INCR	RIIR,R1	RETCUN
0480	22FA	04	01			LODI,R0	1
0481	22FC	8C	04	63		ADDA,R0	TMPA
0482	22FF	EC	00	05		COMA,R0	ENDRAM
0483	2302	9A	04			BCTR,LT	STRTMP
0484	2304	CC	04	63		STRA,R0	TMPA
0485	2307	17			RETCUN	RETC,UN	
0486	2308	04	01		STRTMP	LODI,R0	1
0487	230A	06	02			LODI,R2	2
0488	230C	3F	24	03		BSTA,UN	SUBANY
0489	230F	05	FF			LODI,R1	FF
0490	2311	04	03		ENDINS	LODI,R0	FTX
0491	2313	CD	E4	63		STRA,R1	*TMPA,I
0492	2316				*		
0493	2316				*	DUMA HAS THE ADDRESS OF NEW LAST BYTE OF BUFFER	
0494	2316				*		
0495	2316	0C	04	61	ENDI	LODA,R0	DUMA
0496	2319	CC	04	63		STRA,R0	TMPA
0497	231C	0F	04	62		LODA,R3	DUM2
0498	231F	3F	21	F7		BSTA,UN	FINDND
0499	2322	3F	24	70		BSTA,UN	SDCA
0500	2325	0D	04	62		LODA,R1	DUM2
0501	2328	20				EORZ,R0	
0502	2329	CC	04	62		STRA,R0	DUM2
0503	232C	CC	04	64		STRA,R0	TMP2
0504	232F	0D	E4	61	DOWN	LODA,R1	*DUMA,I
0505	2332	0F	E4	63		STRA,R3	*TMPA,I
0506	2335	04	01			LODI,R0	1
0507	2337	06	06			LODI,R2	6
0508	2339	3F	24	03		BSTA,UN	SUBANY
0509	233C	98	05			ECFR,EQ	NCK
0510	233F	0C	04	66		LODA,R0	BSA2
0511	2341	18	1F			BCTR,EC	INSTDN
0512	2343				*		
0513	2343	A4	01		NCK	SUPI,R1	1
0514	2345	E5	FF			COMI,R1	FF

0515	2347	98	08	08	LCR, EQ	JS1
0516	2349	3F	24	69	BSTA, UN	S11
0517	234C	EC	00	03	COMA, R0	BSTART
0518	234F	1A	10		BCTR, LT	INSTDN
0519	2351	A7	01	NS1DA	SUBI, R3	01
0520	2353	E7	FF		COMI, R3	FF
0521	2355	98	58		BCFR, EQ	DOWN
0522	2357	0C	04	63	LODA, R0	TMPA
0523	235A	A4	01		SUBI, R0	01
0524	235C	CC	04	63	STRA, R0	TMPA
0525	235F	1B	4F		BCTR, UN	DOWN
0526	2361			*		
0527	2361	3F	23	89	INSTDN	BSTA, UN
0528	2364	3F	24	87	BSTA, UN	MTDA
0529	2367	C1			STRZ, R1	
0530	2368	20			FORZ, R0	
0531	2369	CC	04	62	STRA, R0	DUM2
0532	236C	07	FF		LODI, R3	FF
0533	236E	0F	A4	63	INSERT	LODA, R3
0534	2371	E4	03		COMI, R0	ETX
0535	2373	18	0F		BCTR, EQ	INSTE
0536	2375	CD	E4	61	STRA, R1	*DUMA, I
0537	2378	E7	FF		COMI, R3	FF
0538	237A	3C	24	1A	BSTA, EQ	A1TA
0539	237D	D9	6F		PIRR, R1	INSERT
0540	237F	3F	24	9D	BSTA, UN	AIDA
0541	2382	1A	6A		BCTR, LT	INSERT
0542	2384	0F	01		INSTE	LODI, R1
0543	2386	1F	22	0A	BCTA, UN	BACK
0544	2389			*		
0545	2389	0C	00	04	IBADD	LODA, R0
0546	238C	CC	04	63		STRA, R0
0547	238F	20				FORZ, R0
0548	2390	CC	04	64		STRA, R0
0549	2393	17				RETC, UN
0550	2394			*		
0551	2394	3R	0D		PACKN	BSTR, UN
0552	2396	1E	22	C1		BCTA, LT
0553	2399	04	01			LODI, R0
0554	239B	06	02			LODI, R2
0555	239D	3F	24	03		BSTA, UN
0556	23A0	1F	22	C1		BCTA, UN
0557	23A3			*		
0558	23A3			*		
0559	23A3			*		
0560	23A3	3F	23	D6	BACK1	BSTA, UN
0561	23A6	16				RETC, LT
0562	23A7	0C	04	66		LODA, R0
0563	23AA	A4	10			SUBI, R0
0564	23AC	CC	04	66		STRA, R0
0565	23AF	CC	01	43		STRA, R0
0566	23P2	77	08			FPSL
0567	23B4	0C	04	65		LODA, R0
0568	23B7	A4	00			SUBI, R0
0569	23B9	CC	04	65		STRA, R0
0570	23EC	CC	01	41		STRA, R0
0571	23EF	75	08			CPSL

ADDR	FI	F2	F3	LABEL	OPCODE	OFFHAND
0522	2301	04	1C		LODI,R0	1C
0523	2302	0C	84 65		ST A,R0	*BSA1
0524	2306	A5	21		SUBI,R1	1
0525	2308	F5	FF		COMI,R1	FF
0526	230A	98	08		BCFR,IQ	NOSUB1
0527	230C	0C	24 63		LODA,R0	TMPA
0528	230F	A4	01		SUPI,R0	1
0529	2311	0C	04 63		STRA,R0	TMIA
0530	2314	20		NOSUP1	FOR2,R0	
0531	2315	17			RETC,UN	
0532	23D6			*		
0533	23D6			*		
0534	2316			*		
0535	231C	0C	81 43	ERAS1	LODA,R0	*MCUR
0536	23D9	0C	04 66		STRA,R0	BSA2
0537	23DC	0C	81 41		LODA,R0	*MCU1
0538	23DF	0C	04 65		STRA,R0	PSA1
0539	23E0	F4	10		COMI,R0	10
0540	23F4	98	08		BCFR,IQ	EROLD
0541	23F6	0C	04 66		LODA,R0	PSA2
0542	23F9	44	F2		ANTI,R0	F2
0543	23FB	F4	50		COMI,R0	50
0544	23FD	10			RETC,LT	
0545	23FE	04	20	EROLD	LODI,R0	
0546	23F0	0C	84 65		STRA,R0	*BSA1
0547	23F3	17			RETC,UN	
0548	2314			*		
0549	2314	0C	81 43	ERAS2	LODA,R0	*MCUR
0550	23F7	0C	04 66		STRA,R0	BSA2
0551	23FA	0C	81 41		LODA,R0	*MCU1
0552	23FD	0C	04 65		STRA,R0	PSA1
0553	2402	1F	6C		BCTE,UN	EROLL
0554	2402			*		
0555	2402	00		STORE	RFS	1
0556	2403	08	7D	SUBANY	STRE,R0	STORE
0557	2405	0E	64 60		LODA,R2	CUR2,I
0558	2408	A8	78		SUBR,R0	STORE
0559	240A	0E	64 60		STRA,R2	CUR2,I
0560	240E	77	08		PPSL	WC
0561	242F	0F	64 5F		LODA,R2	CURA,I
0562	2412	A4	00		SUBI,R0	0
0563	2414	0F	64 5F		STRA,R2	CURA,I
0564	2417	75	08		CPSL	WC
0565	2419	17			RETC,UN	
0566	241A			*		
0567	241A	04	01	A1TA	LODI,R0	1
0568	241C	8C	04 63		ADLA,R0	TMPA
0569	241F	0C	04 63		STRA,R0	TMIA
0570	2422	17			RETC,UN	
0571	2423			*		
0572	2417	0D	60 20	PLEW	LODA,R1	START,I
0573	2426	16			RETC,LT	
0574	2427	3F	21 F5		FSTA,UN	WRT
0575	242A	85	01		ADPI,R1	1
0576	242C	1F	75		BCTR,UN	RLKW
0577	242F			*		
0578	242F	3F	21 B3	DELT	FSTA,UN	FWDX

0630	2431	3B 05	5	P	UN	HIT	
0630	2433	0F 01		LODI,R1	1		
0631	2435	1F 22 0A		PCTA,UN	BACK		
0632	2438		*				
0633	2438	0F 04 5F	SHIF	LODA,R3	CURA		
0634	243B	CF 04 63		STRA,R3	TMPA		
0635	243E	0F 04 60		LODA,R3	CUR2		
0636	2441	0D 04 62		LODA,R1	DUM2		
0637	2444	20		EOR2,R0			
0638	2445	CC 04 64		STRA,R0	TMP2		
0639	2448	CC 04 62		STRA,R0	DUM2		
0640	244F	0D 14 61	UP	LODA,R1	*DUMA,I		
0641	244F	CF E4 63		STRA,R3	*TMPA,I		
0642	2451	16		RETC,LT			
0643	2452	87 01		ADDI,R3	1		
0644	2454	3C 24 1A		ESTA,EQ	A1TA		
0645	2457	D9 72		BIRR,R1	UP		
0646	2459	3F 24 9D		BSTA,UN	A1DA		
0647	245C	1A 6D		BCTR,LT	UP		
0648	245E	17		RETC,UN			
0649	245F		*				
0650	245F	00	CURA	RES	1		
0651	2460	00	CUR2	RES	1		
0652	2461	00	DUMA	RES	1		
0653	2462	00	DUM2	RES	1		
0654	2463	00	TMPA	RES	1		
0655	2464	00	TMP2	RES	1		
0656	2465	00	BSA1	RES	1		
0657	2466	00	BSA2	RES	1		
0658	2467	00	CHGA	RES	1		
0659	2468	00	CHG2	RES	1		
0660	2469		*				
0661	2469	08 76	S1DA	LODR,R0	DUMA		
0662	246B	A4 01		SUBI,R0	1		
0663	246D	C8 72		STRR,R0	DUMA		
0664	246F	17		RETC,UN			
0665	2470		*				
0666	2470	08 70	SDCA	LOTR,R0	DUM2		
0667	2472	A8 6C		SUBR,R0	CUR2		
0668	2474	C8 70		STRR,R0	BSA2		
0669	2476	77 08		PFSL	WC		
0670	2478	08 67		IODR,R0	DUMA		
0671	247A	A8 63		SUBR,R0	CURA		
0672	247C	C8 67		STRR,R0	BSA1		
0673	247E	75 08		CFSL	WC		
0674	2480	04 01		LODI,R0	1		
0675	2482	06 06		LODI,R2	6		
0676	2484	1F 24 A9		PCTA,UN	ADDANY		
0677	2487		*				
0678	2487	08 56	MTDA	LOLF,R0	CURA	MOVE CURRENT ADDRESS TO DUMMY ADDRESS	
0679	2489	C8 56		STRR,R0	DUMA		
0680	248B	0C 04 60		LODA,R0	CUR2		
0681	248E	CC 04 62		STRA,R0	DUMA+1		
0682	2491	17		RETC,UN			
0683	2492		*				
0684	2492	08 4D	MTCA	LODR,R0	DUMA		
0685	2494	C8 49		STRR,R0	CURA		

LINE	ADDR	B2	B7	LABF	OPCODE	COND	AND
0696	2496	2C	04	62	LODA,R0	DUM2	
0697	2499	CC	04	60	STRA,R0	CUR2	
0698	249C	17			RETC,UN		
0699	249E			*			
0700	249F	04	01	A1DA	LODI,R0	01	
0701	249F	0C	04	61	ADDA,R0	DUMA	
0702	24A2	CC	04	61	STRA,R0	DUMA	
0703	24A5	EC	02	04	COMA,R0	TEST	
0704	24A8	17			RETC,UN		
0705	24A9			*			
0706	24A9	8F	64	60	ADDANY	ADDA,R2	CUR2,I
0707	24AC	CF	04	60	STRA,R2	CUR2,I	
0708	24AF	77	08		PPSL	WC	
0709	24F1	70			EORZ,R0		
0710	24F2	8F	64	5F	ADDA,R2	CURA,I	
0711	24B5	CF	64	5F	STRA,R2	CURA,I	
0712	24B8	75	08		CPSL	WC	
0713	24BA	17			RETC,UN		
0714	24BE			*			
0715	24BE	3F	25	33	LOADER	BSTA,UN	AOK WRITE THE OK MESSAGE
0716	24BE	3F	24	09	BSTA,UN	LOADA	LOAD THE TEXTBUFFER FROM TAPE
0717	24C1	9C	25	3C	BCFA,EQ	SCERR	IF CONDITION NOT 0, IT WAS A SUMCHECK ERROR
0718	24C4	1F	20	56	BCTA,UN	FBDN	OTHERWISE GET A NEW COMMAND
0719	24C7			*			
0710	24C7			*			
0711	24C7	17	F9		SUMK	ACON	17F9
0712	24C9			*			
0713	24C9			*			
0714	24C9	3F	24	87	LOADA	BSTA,UN	MTDA MOVE THE START ADDRESS TO DUMA
0715	24CC	20		WAIT	EORZ,R0		CLEAR R0
0716	24CD	08	F0		STRR,R0	*SUMK	CLEAR SUMCHECK
0717	24CF	3F	02	F9	BSTA,UN	SERI	GET CHARACTER FROM TAPE
0718	24D2	F7	3B		COMI,R3	;	COMPARE FOR START OF BLOCK CHAR
0719	24D4	98	76		BCFR,EQ	WAIT	IF NOT, WAIT
0720	24D6	05	FF		LODI,R1	FF	SETUP INDEX
0721	24D8	3F	02	10	NAML	BSTA,UN	SERI GET NEXT CHARACTER
0722	24DB	0D	F0	3C	LODA,R1	NAME,+	LOAD NEXT BYTE OF NAME TYPED IN
0723	24E1	10	03		ECTR,EQ	OVERSI	IF 0, STOP LOCKING
0724	24E2	E3			COMZ,R3		COMPARE THE CHARACTERS
0725	24E1	98	69		BCFR,EQ	WAIT	IF NOT EQUAL, GET ANOTHER BLOCK
0726	24E3	F5	07	OVERSI	COMI,R1	07	COMPARE FOR END OF NAME
0727	24E5	98	71		BCFR,EQ	NAML	IF NOT, DO NEXT CHARACTER
0728	24F7	3F	02	F9	BSTA,UN	SERI	GET SUMCHECK CHAR IN
0729	24FA	0C	84	07	LODA,R0	*SUMK	LOAD THE SUMCHECK
0730	24FD	1C			RETC,LT		IF NOT ZPRO, RETURN
0731	24FE	15			RETC,GT		
0732	24FF	0D	04	62	LODA,R1	DUM2	LOAD LOW BYTE OF POINTER INTO INDEX REGISTER
0733	24F2	CC	04	62	STRA,R0	DUM2	CLEAR LOW BYTE IN MEMORY
0734	24F5	CC	00	4C	STRA,R0	TMPS	CLEAR TMPS
0735	24F8	3F	F2	F9	ASCII	BSTA,UN	SERI GET NEXT TEXT CHARACTER
0736	24FB	03			LODZ,R3		LOAD IT INTO R0
0737	24FC	CF	F4	61	STRA,R1	*DUMA,I	STORE IT INTO MEMORY
0738	24FF	1A	2B		ECTR,LT	ENDING	IF LAST CHARACTER, END ROUTINE
0739	2501	D9	12		BIRR,R1	LL1	ADD 1 TO R1 AND CHECK FOR OVERFLOW
0740	2503	3F	24	0D	BSTA,UN	A1DA	ADD 1 TO HIGH BYTE (INCR PY 256)
0741	2506	1A	0D		ECTR,LT	LL1	IF STILL TEXT BUFFER, GO ON
0742	2508	3F	24	69	BSTA,UN	S1DA	RECOVER FROM LAST ADD

3	250B 05 FF FF	R1	FF	S	NE	DEX
0744	250D 04 83	LODI,R0	ERC			PREPARE TO STORE DUMMY END OF FILE CODE
0745	250F CD F4 61	STRA,R1	*DUMA,I			STORE IT
0746	2512 1F 25 C1	ECTA,UN	TME			TELL THE OPERATOR THAT HE TRIED TO LOAD TOO MUCH
0747	2515 0E 00 4C LL1	LODA,R2	TMPS			LOAD TMPS
0748	2518 86 01	ADDI,R2	1			ADD 1
0749	251A CE 00 4C	STRA,R2	TMPS			STORE IT
0750	251D 98 59	BCFR,EQ	ASCII			GO DO NEXT BLOCK
0751	251F					
0752	251F 3F 02 E9 ENDTF	BSTA,UN	SERI			GET SUMCHECK CHARACTER
0753	2522 CD 04 62	STRA,R1	DUM2			RESTORE THE LOW BYTE OF THE POINTER
0754	2525 0F 84 C7	LODA,R3	*SUMK			LOAD THE SUMCHECK CHARACTER
0755	2528 1C 24 CC	BC A,EQ	WAIT			IF EQUAL, NO ERRORS--BRANCH
0756	252B 17	RETC,UN				RETURN OTHERWISE
0757	252C					
0758	252C 3F 02 E9 ENDINC	BSTA,UN	SERI			GET SUMCHECK CHARACTER
0759	252F CC 84 C7	LODA,R0	*SUMK			LOAD THE SUMCHECK CHARACTER
0760	2532 17	RETC,UN				
0761	2533					
0762	2533 05 20 AOK	LODI,R1	OKMSG			GET THE ADDR OF FIRST BYTE OF MESSAGE 'OK'
0763	2535 3F 24 23	BSTA,UN	BLKW			WRITE THE LITERAL
0764	2538 3F 23 D6	BSTA,UN	ERAS1			ERASE THE CURSOR
0765	253B 17	RETC,UN				
0766	253C					
0767	253C 07 2D SCERR	LODI,R3	SCMSG			SETUP FOR ERROR ROUTINE
0768	253E 1F 25 94	BCTA,UN	ERRORE			WRITE ERROR MESSAGE
0769	2541					
0770	2541 3F 25 33 TAPEO	BSTA,UN	AOK			WRITE THE MESSAGE 'OK' ON THE SCREEN
0771	2544 0C 00 03	LODA,R0	RSTART			LOAD THE FIRST ADDR OF TXTBUF
0772	2547 CC 04 61	STRA,R0	DUMA			STORE INTO DUMA
0773	254A 20 TAPEOT	FORZ,R0				CLEAR R0
0774	254B CC 84 C7	STRA,R0	*SUMK			CLEAR SUMCKFCK
0775	254E CC 04 62	STRA,R0	DUM2			CLEAR LOW BYTE OF POINTER
0776	2551 07 3B	LODI,R3	;			BEGINNING OF TAPE BLOCK IS SEMICOLON
0777	2553 3F 02 4F	BSTA,UN	SERO			SEND IT OUT
0778	2556 05 FF	LODI,R1	FF			SETUP THE INDEX REGISTER
0779	2558 0D 20 3C NAMO	LODA,R1	NAME, +			GET THE NEXT CHARACTER OF THE FILE NAME
0780	255B C3	STRZ,R3				STORE INTO R3
0781	255C 3F 02 4F	BSTA,UN	SERO			SEND IT OUT
0782	255F EF 07	COMI,R1	07			SEE IF END OF NAME
0783	2561 98 75	BCFR,EQ	NAMO			IF NOT, DO NEXT CHARACTER
0784	2563 0F 84 C7	LODA,R3	*SUMK			LOAD THE SUMCHECK SO FAR
0785	2566 3F 02 4F	BSTA,UN	SERO			SEND IT OUT
0786	2569 05 00	LODI,R1	0			CLEAR R1
0787	256B CD 84 C7	STRA,R1	*SUMK			STORE INTO SUMCHECK--START AGAIN
0788	256E 0E E4 61 BYTEO	LODA,R1	*DUMA,I			GET NEXT BYTE OF TEXT
0789	2571 C3	STRZ,R3				STORE INTO R3
0790	2572 1A 14	BCTR,LT	ENIO			IF END, FINISH UP
0791	2574 3F 02 4F	BSTA,UN	SERO			SERIAL OUT IT
0792	2577 D9 75	BIRK,R1	BYTEO			INCR R1, CHECK FOR OVERFLOW
0793	2579 0F 84 C7	LODA,R3	*SUMK			LOAD THE SUMCHECK CHARACTER
0794	257C 3F 02 4F	BSTA,UN	SERO			SEND IT OUT
0795	257F 3F 24 9D	BSTA,UN	AIDA			INCREMENT THE ADDRESS BY 256
0796	2582 9E 20 5C	PCFA,LT	FBDN			IF STILL IN TEXT BUFFER, GO ON
0797	2585 1F 25 4A	BCTA,UN	TAPEOT			OTHERWISE QUIT
0798	2588					
0799	2588 3F 02 4F ENDO	BSTA,UN	SERO			SEND OUT THE CHARACTER (END OF BLOCK)

LINE	ADDR	R1	R2	R3	LABEL	OPCODE	OPERAND
0800	258E	0F	84	C7	ENDT	LODA,R3	*SUMK LOAD SUMCHECK BYTE
0801	258E	3F	02	4F		BSTA,UN	SERO SEND IT OUT
0802	2591	1F	20	56		BCTA,UN	FBDN GET A NEW COMMAND
0803	2594				*		
0804	2594	06	13		ERRORE	LODI,R2	13
0805	2596	05	C0			LODI,R1	C0
0806	2598	3F	21	45		BSTA,UN	SETCUR
0807	259B	03				LODZ,R3	
0808	259C	C1				STRZ,R1	
0809	259D	3F	24	23		BSTA,UN	BLKW
0810	25A0	3F	23	F4		BSTA,UN	ERAS2
0811	25A3	3F	01			BSTR,UN	PAUSE
0812	25A5	1F	20	56		BCTA,UN	FBDN
0813	25A8				*		
0814	25A9	3F	25	E2	GFTKE	BSTA,UN	PAUSE
0815	25AB	3F	21	E5		BSTA,UN	WRT
0816	25AE	08	01			LODR,R0	PAUSES
0817	25B0	17				RETC,UN	
0818	25B1				*		
0819	25B1	00			PAUSES	RES	1
0820	25B2				*		
0821	25B2	70			PAUSE	REDD,R0	
0822	25F3	F4	80			TMI,R0	80
0823	25F5	18	7B			BCTR,EQ	PAUSE
0824	25B7	C8	78			STRR,R0	PAUSES
0825	25B9	40			PL	REDD,R0	
0826	25BA	F4	80			TMI,R0	80
0827	25BC	98	7B			BCTR,EQ	PL
0828	25BE	08	71		PAUSES	LODR,R0	PAUSES
0829	25C0	17				RETC,UN	
0830	25C1	07	24		TME	LODI,R3	TMMSG
0831	25C3	1F	30	77		BCTA,UN	ERROR
0832	25C6				*		
0833	25C6	F4	0D		CKCTRL	COMI,R0	CRCD
0834	25C8	98	05			BCFR,EQ	CKLP12
0835	25CA	75	80			CPSL	80
0836	25CC	77	40			FPSL	40
0837	25CE	17				RETC,UN	
0838	25CF	24	FF		CKLP12	EORI,R0	FF
0839	25D1	77	10			PPSL	RS
0840	25D3	C1				STRZ,R1	
0841	25D4	24	FF			EORI,R0	FF
0842	25D6	F5	F0			TMI,R1	F0
0843	25D8	98	05			BCFR,EQ	NOCTCK
0844	25DA	77	80			FPSL	80
0845	25DC	75	50			CPSL	50
0846	25DF	17				RETC,UN	
0847	25DF	75	D0		NOCTCK	CPSL	D0
0848	25E1	17				RETC,UN	
0849	25F2				*		
0850	25F2	01			CHANGE	LODZ,R1	
0851	25F3	1C	20	59		BCTA,EQ	COMD
0852	25F6	3F	23	89		BSTA,UN	1BADD
0853	25F9	A5	01			SUBI,R1	1
0854	25FF	3F	21	F3		BSTA,UN	FWDX
0855	25FE	3F	24	92		BSTA,UN	MTCA
0856	25F1	3F	21	9F		BSTA,UN	ERASE

LINE	ADDR	E1	E2	E3	DABE1	OPCODE	OFFRAN1
0857	25F4	3F	21	F7		BSTA,UN	F1 ND
0858	25F7	0C	04	5F		LODA,R0	CUR1
0859	25FA	0C	04	67		STRA,R0	CHGA
0860	25FD	0C	04	60		LODA,R0	CUR2
0861	2600	CC	04	68		STRA,R0	CHG2
0862	2603	05	00			LODI,R1	00
0863	2605	3F	00	24	DISPL	BSTA,UN	LFGR
0864	2608	0C	81	43		LODA,R0	*MCUR
0865	260F	F4	0F			TMI,R0	F
0866	260D	3C	21	9F		BSTA,EQ	ERASE
0867	2610	0E	04	67		LODA,R2	CHGA
0868	2613	CF	04	65		STRA,R2	PSA1
0869	2616	0F	04	68		LODA,R3	CHG2
0870	2619	0C	84	67	DISPLP	LODA,R0	*CHGA
0871	261C	1E	27	19		BCTA,LT	ENDCHG
0872	261F	F4	01			COMI,R0	CRCD
0873	2621	18	12			BCTR,EQ	ELFND
0874	2623	3F	21	E5		BSTA,UN	WRT
0875	2626	04	01			LODI,R0	1
0876	2628	0E	08			LODI,R2	8
0877	262A	3F	24	A9		BSTA,UN	ADDANY
0878	262D	EC	00	04		COMA,R0	IBST
0879	2630	1A	67			BCTR,LT	DISPLP
0880	2632	1F	27	19		BCTA,UN	ENDCHG
0881	2635	CF	04	68	ELFND	STRA,R3	CHG2
0882	2638	0C	04	65		LODA,R0	BSA1
0883	263B	CC	04	67		STRA,R0	CHGA
0884	263E	3F	00	24		BSTA,UN	LFGR
0885	2641	3F	25	A8	CHGL	BSTA,UN	GETKB
0886	2644	E4	08			COMI,R0	PS
0887	2646	98	0E			BCFR,EQ	NOCHBS
0888	2648	3F	27	21		BSTA,UN	CHPACK
0889	264B	1B	74			BCTR,UN	CHGL
0890	264D	E4	15		NOCHBS	COMI,R0	CTRLU
0891	264F	98	0A			BCFR,EQ	NOCOPY
0892	2651	3F	26	CA		BSTA,UN	LOADD
0893	2654	18	6F			BCTR,EQ	CHGL
0894	2656	3F	26	E1		BSTA,UN	STRTMS
0895	2659	1B	66			BCTR,UN	CHGL
0896	265B	E4	10		NOCOPY	COMI,R0	CTPLP COPY TO END OF LINE
0897	265D	98	0A			BCFR,EQ	NOCEOL
0898	265F	3F	26	CA	COPYLP	BSTA,UN	LOADD
0899	2662	18	5D			BCTR,EQ	CHGL
0900	2664	3F	26	E1		BSTA,UN	STRTMS
0901	2667	1B	76			BCTR,UN	COPYLP
0902	2669	F4	0F		NOCEOL	COMI,R0	CTRLO
0903	266B	98	06			BCFR,EQ	NODISC
0904	266D	3F	26	CA		BSTA,UN	LOADD
0905	2670	1F	26	41		BCTA,UN	CHGL
0906	2673	03			NODISC	STRZ,R3	
0907	2674	F4	03			COMI,R0	ETX
0908	2676	18	26			BCTR,EQ	BYPASS
0909	2678	3F	25	06		BSTA,UN	CKCTRL
0910	267E	1E	26	41		BCTA,LT	CHGL
0911	267E	3F	26	E5	BYPASS	BSTA,UN	STRT2
0912	2681	03				LODZ,R3	
0913	2682	E4	0D			COMI,R0	CRCD

INSTR	ADDR	FI	FI	FI	FI	LABEL	OPCODE	OPERAND
0014	2684	18	0F				BCTR, EQ	ENDCHL
0015	2685	E4	03				COMI, EQ	ETX
0016	2688	9C	26	41			BCFA, EQ	CHGL
0017	269E	04	01				LODI, R0	1
0018	269D	06	02				LODI, R2	2
0019	269F	3F	24	03			BSTA, UN	SUBANY
001C	2692	1F	2C	A0			BCTA, UN	ENDCH
0071	2C95	3F	26	CA	ENDCHL		BSTA, UN	LOADD
0087	2698	96	7B				BCFR, EQ	ENDCHL
0023	269A	3F	26	DZ			BSTA, UN	AISC
0074	2C91	1F	26	05			BCTA, UN	DISPL
007F	26A2				*			
0026	26A0	0C	04	61	ENDCH		LODA, R0	DUMA
0027	26A3	0C	04	65			STRA, R0	BSA1
0028	26A6	0C	04	62			LODA, R0	DUM2
0029	26A9	0C	04	66			STRA, R0	BSA2
0030	26AC	0C	04	67			LODA, R0	CHGA
0031	26AF	0C	04	61			STRA, R0	DUMA
0032	26B2	0C	04	62			LODA, R0	CHG2
0033	26B5	0C	04	62			STRA, R0	DUM2
0034	26B8	3F	24	38			BSTA, UN	SHIF
0035	26BF	0C	04	65			LOLA, R0	BSA1
0036	26BF	0C	04	61			ST A, R0	DUMA
0037	26C1	0C	04	65			LODA, R0	BSA2
0038	26C4	0C	04	62			STRA, R0	DUM2
0039	26C7	1F	23	16			BCTA, UN	ENDI
0040	26CA				*			
0041	26CA	0F	04	67	LOADD		LODA, R3	*CHGA
0042	26CD	F7	0D				COMI, R3	CRCD
0043	26CF	14					RETC, EQ	
0044	26D0	04	01		AISC		LODI, R0	1
0045	26D2	06	02				LODI, R2	2
0046	26D4	3F	24	03			BSTA, UN	SUBANY
0047	26D7	04	01				LODI, R0	1
0048	26D9	06	08				LODI, R2	8
0049	26DF	3F	24	A9			BSTA, UN	ADDANY
0050	26E1	04	00				LODI, R0	00
0051	26E3	17					RETC, UN	
0052	26F1				*			
0053	26F1	03			STRTMS		LODZ, R3	
0054	26F2	3F	21	F5			BSTA, UN	WRT
0055	26F5	03			STRT2		LODZ, R3	
0056	26F6	0D	F4	63			STRA, R1	*TMPA, I
0057	26F9	04	01				LODI, R0	1
0058	26F9	06	02				LODI, R2	2
0059	26ED	3F	24	A9			BSTA, UN	ADDANY
0060	26F0	EC	00	04			COMA, R0	IBST
0061	26F3	1A	0E				BCTR, LT	AIR1
0062	26F5	3F	24	69			BSTA, UN	SIDA
0063	26F8	04	FF				LODI, R0	FE
0064	26FA	0C	04	62			STRA, R0	DUM2
0065	26FE	1F	27	19			BCTA, UN	ENDCHG
0066	2700	D9	0D		AIR1		FIRR, R1	RETCN
0067	2702	04	01				LODI, R0	1
0068	2704	8C	04	63			ADDA, R2	TMPA
0069	2707	FC	00	25			COMA, R0	ENDRAM
0070	270A	9A	04				BCFR, LT	ABRUFT

1	CC 04 63	RETCH	R0	PM	
0972	270F 17	RETCN	RETC,UN		
0973	2710 04 01	ABRUPT	LODI,R0	1	CL 04 63 STRIP, 20 7 11 11
0974	2712 06 02		LODI,R2	2	
0975	2714 3F 24 03		BSTA,UN	SUBANY	
0976	2717 05 FF		LODI,R1	FF	
0977	2719 04 03	ENDCHG	LODI,R0	ETX	
0978	271B CD E4 63		STRA,R1	*TMPA,1	
0979	271E 1F 26 A0		BCTA,UN	ENDCH	
0980	2721	*			
0981	2721 3F 23 A3	CHBACK	BSTA,UN	BACK1	
0982	2724 16		RETC,LT		
0983	2725 04 01		LODI,R0	1	
0984	2727 06 02		LODI,R2	2	
0985	2729 3F 24 03		BSTA,UN	SUBANY	
0986	272C 17		RETC,UN		
0987	272D	ON	EQU	0	
0988	272D	*	PRNT	ON	
0989	272D	*			
0990	272D	*	FLOATING POINT ROUTINE EQUATES		
0991	272D	*			
0992	272D	*			
0993	272D	IEN	EQU	4	LENGTH (IN BYTES) OF A FLOATING PT NUMBER
0994	272D	LEN2	EQU	LEN+LEN	2 X THE LENGTH
0995	272D	LEN4	EQU	LEN2+LEN2	4 X THE LENGTH
0996	272D	LEN8	EQU	LEN4+LEN4	8 X THE LENGTH
0997	272D	MLEN	EQU	LEN8-7	USED IN THE MULTIPLY ROUTINE
0998	272D	DLEN	EQU	LEN8-1	USED IN THE DIVIDE ROUTINE
0999	272D	*			
1000	272D	*			
1001	272D	*	MAKE THE INPT POINTER EQUAL TO THE CURA POINTER IN THE EDITOR		
1002	272D	*			
1003	272D	*			
1004	272D	INPT	EQU	CURA	
1005	272D	*			
1006	272D	*			
1007	272D	*	DIRCUR SETS UP THE CURSOR ADDRESS TO LINE 14 POS 4		
1008	272D	*			
1009	272D	*			
1010	272D	DIRCUR	EQU	10	
1011	272D	DIRCUA	EQU	4E	
1012	272D	*			
1013	272D	*			
1014	272D	*	GENERAL DEFINITIONS		
1015	272D	*			
1016	272D	*			
1017	272D	SDFLT	EQU	A	DEFAULT LENGTH OF STRING IF NOT DIMENSIONED
1018	272D	CR	EQU	0D	CARRIAGE RETURN
1019	272D 00 00 00	INTSTG	RES	4	
1020	2731 00 00 00	FECSTG	RES	4	
1021	2735 00	DATA		00	KEEP THIS IN FOR THE PRINT ROUTINE
1022	2736 00 00 00	NAMPUF	RES	F	
1023	2745 00 00	ADH	RES	2	
1024	2747 00	FLAG	RES	1	
1025	2748 00 00 00	OPA	RES	LEN	
1026	274C 00	SIGN	RES	1	
1027	274D 00 00 00	OPB	RES	LEN2	

LINE	ADDR	B1	B2	B3	LABEL	OPCODE	OPERAND
1028	2755	00	00	00	CPSTK	RFS	10
1029	2765	00	00	00	LIN	RFS	4
1030	2769	00	00	00	LINNUM	RES	4
1031	276D	00	00	00	INBUF	RES	14
1032	2781				*		
1033	2781				*		
1034	2781				*		
1035	2781	00	00	04	BASIC	LODA,R0	IBST GET START OF BASIC'S RAM
1036	2784	CC	15	24		STRA,R0	TABEND INITILIZE END OF VARIABLE TABLE
1037	2787	00	00	05		LODA,R0	ENDRAM GET THE END OF RAM LOCATION
1038	278A	CC	12	CF		STRA,R0	SP INITIALIZE GOSUB STACK POINTER
1039	278D	00	00	03		LODA,R0	BSTART START OF WHERE TO LOOK FOR DATA STATEMENTS
1040	2790	CC	00	5F		STRA,R0	DATPNT
1041	2793	20				EORZ,R0	CLEAR R0
1042	2794	CC	08	48		STRA,R0	PLINE NO LINE BREAKPOINT YET
1043	2797	CC	13	02		STRA,R0	PDATA NO DATA READY YET
1044	279A	CC	15	25		STRA,R0	TABEND+1 *----
1045	279D	CC	00	60		STRA,R0	DATPNT+1 * ZERO LOW BYTES OF POINTERS
1046	27A0	CC	12	D0		STRA,R0	SP+1 *----
1047	27A3	CC	1E	64		STRA,R0	RNDSTR
1048	27A6	CC	0E	24		STRA,R0	*TABEND
1049	27A9	3F	21	9F		BSTA,UN	FRASE FRASE THE SCREEN
1050	27AC				*		
1051	27AC	07	01		OPTION	LODI,R3	1 'OPTION'
1052	27AE	3F	30	9B		BS A,UN	DIRWRT WRITE IT ON DIRECTIVE LINE
1053	27B1	3F	75	A8	OPT1	BSTA,UN	GETKB GET KEY. WRITE ON SCREEN
1054	27B4	F4	1B			COMI,R0	FSC
1055	27B6	1C	20	4F		BCTA,EQ	EDITOR ESCAPE, DONE WITH BASIC
1056	27B9	F4	52			COMI,R0	'R'
1057	27BB	18	14			BCTR,FQ	NORMOP R IS FOR NORMAL EXECUTION
1058	27BD	F4	53			COMI,R0	'S'
1059	27BF	1C	28	04		BCTA,EQ	STEPR S IS STEP MOLE
1060	27C2	F4	4C			COMI,R0	'L'
1061	27C4	1C	28	29		BCTA,FQ	BLINE L IS TO SET BREAKPOINT LINE
1062	27C7	F4	49			COMI,R0	'I'
1063	27C9	1C	28	60		BCTA,FQ	INSVS I IS TO INSPECT VARIABLES
1064	27CC	3F	30	F6		BSTA,UN	RECCUR <i>return cursor</i>
1065	27CF	1B	5B			BCTR,UN	OPTION NO MATCH. TRY AGAIN
1066	27D1				*		
1067	27D1	07	06		NORMOP	LODI,R3	6
1068	27D3	3F	30	C7		BSTA,UN	WRM 'EXECUTING'
1069	27D6	3F	22	4E		BSTA,UN	BEGIN <i>begin of data</i>
1070	27D9	3F	30	F6		BSTA,UN	RECCUR
1071	27DC	0C	08	48	NORM1	LODA,R0	PLINE <i>no line breakpoint</i>
1072	27DF	18	11			BCTR,EQ	NORM6 NO LINE BREAKPOINT
1073	27E1	3F	33	EF		BSTA,UN	GETLIN GET LINE NUMBER (ASCII)
1074	27E4	0E	04			LODI,R1	4 DO 4 BYTE COMPARE
1075	27E6	0D	47	E5	NORM5	LODA,R1	LIN.- GET CHARACTER FROM STORED WORD
1076	27E9	ED	67	69		COMA,R1	LINNUM.I CHECK FOR MATCH
1077	27EC	00	04			PCFR,FQ	NORM6 NO MATCH. EXECUTE INSTRUCTION
1078	27EE	50	76			BRNE,R1	NORM5 CHECK FOR DONE
1079	27F2	1B	18			BCTR,UN	STEP DONE. SWITCH TO STEP MODE
1080	27F2	70			NORM6	REED,R0	READ KEYBOARD PORT
1081	27F3	F4	1F			COMI,F2	FSC TEST FOR ESCAPE KEY PRESSED
1082	27F5	00	06			PCFR,FQ	NORM7
1083	27F7	3F	25	F0		BSTA,UN	FL <i>clear breakpoint?</i>
1084	27FA	1F	27	AC		BCTA,UN	OPTION

1085	27FD	04	27		LODI,R0	NO	
1086	27FF	05	DC		LODI,R1	NO	11
1087	2801	1F	28	98	BCTA,UN	EXEC	EXECUTE INSTRUCTION
1088	2804			*			
1089	2804	3F	30	B6	STEF	BSTA,UN	RFCCUR
1090	2807	3F	22	4E		BSTA,UN	BEGIN
1091	280A	07	09		STEF	LODI,R3	9
1092	280C	3F	30	9B		BSTA,UN	DIRWRT
1093	280F	3F	28	8F		BSTA,UN	SHINPT
1094	2812	06	FF			LODI,R2	FF
1095	2814	3F	28	65		BSTA,UN	SHLIN
1096	2817	3F	30	B6		BSTA,UN	RECCUR
1097	281A	3F	25	B2		BSTA,UN	PAUSE
1098	281D	F4	1B			COMI,R0	ESC
1099	281F	1C	27	AC		BCTA,EQ	OPTION
1100	2822	04	28			LODI,R0	STEF
1101	2824	05	0A			LODI,R1	STEF
1102	2826	1F	28	98		BCTA,UN	EXEC
1103	2829			*			
1104	2829	07	0A		BLINE	LODI,R3	0A
1105	282B	3F	30	A5		BSTA,UN	DIRWNL
1106	282E	04	27			LODI,R0	LIN
1107	2830	05	65			LODI,R1	LIN
1108	2832	06	04			LODI,R2	4
1109	2834	3F	22	59		BSTA,UN	ARROW
1110	2837	12	05			BCTR,EQ	BLINE1
1111	2839	20				EORZ,R0	
1112	283A	08	0C			STRR,R0	PLINE
1113	283C	1B	04			BCTR,UN	RECOPT
1114	283E	04	FF		PLINE1	LODI,R0	FF
1115	2840	08	0E			STRR,R0	PLINE
1116	2842	3F	30	B6	RECOPT	BSTA,UN	RECCUR
1117	2845	1F	27	AC		BCTA,UN	OPTION
1118	2848			*			
1119	2848			*			
1120	2848			*			
1121	2848	00			PLINE	RES	1
1122	2849			*			
1123	2849			*			
1124	2849			*			
1125	2849	07	0D		INSVAR	LODI,R3	0D
1126	284B	3F	30	9B		BSTA,UN	DIRWRT
1127	284F	3F	28	FC		BSTA,UN	AROWCR
1128	2851	04	28			LODI,R0	INSVRT
1129	2853	0C	08	9C		STRA,R0	RTNADR
1130	2856	04	5D			LODI,R0	INSVRT
1131	2858	08	3D			STRR,R0	RTNADR+1
1132	285A	1F	2E	7D		BCTA,UN	PRINT
1133	285D	3F	29	2F	INSVRT	BSTA,UN	RECBT
1134	2860	3F	30	B6	INSVS	BSTA,UN	RECCUR
1135	2863	1B	64			BCTR,UN	INSVAR
1136	2865			*			
1137	2865			*			
1138	2865			*			
1139	2865	05	50		SHLIN	LODI,R1	50
1140	2867	5A	05		SHLIN1	PRNR,P2	SHLIN3
1141	2869	04	5F			LODI,R0	

LINE	ADDR	P1	P2	P3	LABEL	OPCODE	OPERAND
1142	286B	3F	21	E5		BSTA,UN	WRT
1143	286E	A6	01		SHLIN3	SUBI,R2	1
1144	2870	08	97			LODR,R0	*SHPNT GET INPUT CHARACTER
1145	2872	E4	0D			COMI,R0	CR
1146	2874	14				RETC,EQ	
1147	2875	3F	21	E5		BSTA,UN	WRT PRINT CHARACTER
1148	2878	08	10			LODR,R0	SHPNT+1
1149	287A	04	01			ADDI,R0	1
1150	287C	08	0C			STRR,R0	SHPNT+1
1151	287E	98	06			BCFR,EQ	SHLIN2
1152	2880	08	07			LODR,R0	SHPNT
1153	2882	04	01			ADDI,R0	1
1154	2884	08	03			STRR,R0	SHPNT
1155	2886	F9	5F		SHLIN2	BDRR,R1	SHLIN1
1156	2888	17				RETC,UN	
1157	2889				*		
1158	2889				*		
1159	2889				*		
1160	2889	00	00		SHPNT	RES	2
1161	288B				*		
1162	288B				*		
1163	288B				*		
1164	288F	0C	04	5F	SHINPT	LODA,R0	INPT
1165	289E	08	79			STRR,R0	SHPNT SAVE INPUT POINTER FOR POSSIBLE ERROR
1166	2892	0C	04	60		LODA,R0	INPT+1
1167	2893	08	75			STRR,R0	SHPNT+1
1168	2895	17				RETC,UN	
1169	2896				*		
1170	2896				*		
1171	2896				*		
1172	2896	00	00		RTNADR	RES	2
1173	2898				*		
1174	2898				*		
1175	2898				*		
1176	2898	08	7C		EXEC	STRR,R0	RTNADR
1177	289A	09	7B			STRR,R1	RTNADR+1
1178	289C	0C	84	5F		LODA,R0	*INPT
1179	289F	F4	2A			COMI,R0	*
1180	28A1	1C	33	CC		BCTA,EQ	SKPLIN
1181	28A4	3E	65			BSTR,UN	SHINPT
1182	28A6	3F	33	EE		BSTA,UN	GETLIN
1183	28A9	04	29			LODI,R0	COMTRL
1184	28AB	05	3A			LODI,R1	COMTBL
1185	28AD	3E	08			BSTR,UN	TABUP
1186	28AF	9C	2D	47		BCFA,EQ	LET DO IMPLIED LET IF NO COMMAND
1187	28B2	1F	A8	FA		BCTA,UN	*DST
1188	28B5				*		
1189	28B5	00	00		TABSTG	RES	2
1190	28B7				*		
1191	28B7	08	7C		TABUP	STRR,R0	TABSTG
1192	28B9	09	7B			STRR,R1	TABSTG+1
1193	28BE	3F	31	DB	TABLOK	PSTA,UN	SKPDEC SKIP SPACES - set input pointer to next character
1194	28BE	3F	31	F3		BSTA,UN	SINPT INPUT POINTER NOW SET AT INPUT WORD - set input pointer to ITEM
1195	28C1	05	FF			LODI,R1	FF R1 IS INDEX FOR COMMAND TABLE
1196	28C3	3F	33	DE	GETC2	BSTA,UN	GETCHR GET NEXT CHARACTER
1197	28C6	0D	A8	B5		LODA,R1	*TABSTG,+ GET CHARACTER FROM COMMAND TABLE
1198	28C9	E4	2E			COMI,R0	CHECK FOR END OF WORD

1199	28CB	18	1E		BCTR, EQ	GET	F	MAT	
1200	28CD	E3			COMZ, R3			CHECK FOR INPUT TABLE MATCH	
1201	28CE	18	73		BCTR, EQ	GETC2			
1202	28D0	0D	A8	B5	GETC3	LODA, R1	*TABSTG, +	<i>new match</i>	<i>BCTR, E8 GETC3 end found, do match</i>
1203	28E3	F4	2E		CCMI, R0				
1204	28E5	98	79		PCFR, EQ	GETC3		SKIP TO END OF WORD	
1205	28D7	85	03		ADDI, R1	3			
1206	28E9	0D	E8	B5	LODA, R1	*TABSTG, I		GET POSSIBLE END OF TABLE	
1207	28DC	1A	07		BCTR, LT	GETC4		END OF TABLE. DO IMPLIED LET	
1208	28DE	A5	01		SUBI, R1	1		RESET COMMAND POINTER	
1209	28E0	3F	32	00	BSTA, UN	RINPT		RESET INPUT POINTER	<i>from START</i>
1210	28E3	1F	5E		BCTR, UN	GETC2			
1211	28E5	3F	32	00	GETC4	BSTA, UN	RINPT		
1212	28E8	04	01		LODI, R0	1		SET CC TO GT	<i>also implied let</i>
1213	28EA	17			RETC, UN				
1214	28FE	0D	A8	B5	GETC5	LODA, R1	*TABSTG, +	GET HI BYTE OF ROUTINE ADDRESS	
1215	28FE	C8	0A		STRR, R0	DST			
1216	28F0	0D	A8	B5	LODA, R1	*TABSTG, +		GET LOW BYTE OF ROUTINE ADDRESS	
1217	28F3	C8	06		STRR, R0	DST+1			
1218	28FE	3F	31	DE	BSTA, UN	DECPT			
1219	28F8	20			EORZ, R0			CLEAR CONDITION CODE BITS	
1220	28F9	17			RETC, UN				
1221	28FA			*					
1222	28FA			*					
1223	28FA			*					
1224	28FA	00	00		DST	RES	2		
1225	28FC			*					
1226	28FC			*					
1227	28FC			*					
1228	28FC	04	27		AROWCR	LODI, R0	INBUF		
1229	28FE	05	6D		LODI, R1	INBUF			
1230	2900	06	13		LODI, R2	13		GET 19 CHARACTERS MAXIMUM	
1231	2902	3F	22	59	BSTA, UN	ARROW			
1232	2905	9C	27	AC	BCFA, EQ	OPTION		GO TO OPTION IF ESCAPE PRESSED	
1233	2908	0F	14		LODI, R1	14		START ECL SEARCH AT LAST CHARACTERS	
1234	290A	0D	47	6D	ACR3	LODA, R1	INBUF, -	GET CHARACTER FROM INPUT	
1235	290D	58	04		BRNR, R0	ACR2		SEARCH FOR NON-ZERO ENTRY	
1236	290F	59	79		BRNR, R1	ACR3		CHECK FOR END OF BUFFER	
1237	2911	A5	01		SUBI, R1	1			
1238	2913	04	0D		ACR2	LODI, R0	CR		
1239	2915	CL	27	6D	STRA, R1	INBUF, +		STORE EOL AFTER VARIABLE	
1240	2918	0C	04	5F	LODA, R0	INPT		SAVE INPUT POINTER	
1241	291B	C8	10		STRR, R0	PTEMP			
1242	291D	0C	04	60	LODA, R0	INPT+1			
1243	2920	C8	0C		STRR, R0	PTEMP+1			
1244	2922	04	27		LODI, R0	INBUF		GET NEW INPUT	
1245	2924	CC	04	5F	STRA, R0	INPT			
1246	2927	04	6D		LODI, R0	INBUF			
1247	2929	CC	04	60	STRA, R0	INPT+1			
1248	292C	17			RETC, UN				
1249	292D			*					
1250	292E			*					
1251	292F			*					
1252	292D	00	00		BTEMP	RES	2		
1253	292F			*					
1254	292F			*					
1255	292F			*					

LINE	ADDR	IN	OP	CODE	OPCODE	OPERAND
1250	292F	08	7C	RECB1	LODR,R0	BTMP
1251	2931	3C	04	5F	STRA,R0	INPT RFCOVER SAVED INPUT POINTER
1252	2934	08	72		LODR,R0	BTMP+1
1253	2936	CC	04	62	STRA,R0	INPT+1
1254	2939	17			RETC.UN	
1255	293A				*	
1256	293A				*	
1257	293A				*	
1258	293A	4C	45	54	COMTR1	ALIT 'LET.'
1259	293F	2D	47		ACON	LET
1260	2940	50	52	49	ALIT	'PRINT.'
1261	2946	2E	7D		ACON	PRINT
1262	2948	49	46	2E	ALIT	'IF.'
1263	294F	2E	3A		ACON	IF
1264	294F	47	4F	54	ALIT	'GOTO.'
1265	2952	2B	49		ACON	GOTO
1266	2954	47	4F	53	ALIT	'GOSUB.'
1267	295A	2E	3E		ACON	GOSUB
1268	295C	52	45	54	ALIT	'RETURN.'
1269	2963	2E	F3		ACON	RETURN
1270	2965	4C	4F	52	ALIT	'FOR.'
1271	2969	2C	87		ACON	FOR
1272	296B	4E	45	58	ALIT	'NEXT.'
1273	2970	2D	AD		ACON	NEXT
1274	2972	49	4F	50	ALIT	'INPUT.'
1275	2976	2E	CC		ACON	INPUT
1276	297A	44	41	54	ALIT	'DATA.'
1277	297F	33	CC		ACON	SKPLIN
1278	2981	45	52	41	ALIT	'FRASE.'
1279	2987	29	F9		ACON	EPASFB
1280	2989	52	45	41	ALIT	'READ.'
1281	298F	2C	DF		ACON	READ
1282	2990	50	45	45	ALIT	'PEEK.'
1283	2995	2A	58		ACON	PEEK
1284	2997	50	4F	4B	ALIT	'POKE.'
1285	299C	2A	01		ACON	POKE
1286	299E	45	58	54	ALIT	'EXTIN.'
1287	29A4	2A	96		ACON	EXTIN
1288	29A6	45	58	54	ALIT	'EXTOUT.'
1289	29AD	2A	7F		ACON	EXTOUT
1290	29AF	44	49	4D	ALIT	'DIM.'
1291	29B3	2A	CA		ACON	DIM
1292	29B5	52	45	53	ALIT	'RESTORE.'
1293	29BE	2C	61		ACON	RESTOR
1294	29FF	43	41	4C	ALIT	'CALL.'
1295	29C4	29	EF		ACON	USER
1296	29C6	53	54	4F	ALIT	'STOP.'
1297	29CE	2A	99		ACON	STOP
1298	29CF	FF			DATA	FF
1299	29CF				*	
1300	29CF				*	
1301	29CF				*	
1302	29CF	44	41	54	COMTR2	ALIT 'DATA.'
1303	29D3	29	02		ACON	0
1304	29D5	54	4F	5F	ALIT	'TO.'
1305	29D8	22	21		ACON	1
1306	29DA	53	54	45	ALIT	'STEP.'

1313	29E0 02				2	
1314	29E1 53 54 4F	ALIT		STOP.		
1315	29E6 02 03	ACON		3		
1316	29E8 FF	DATA		FF		
1317	29E9					
1318	29E9					
1319	29E9					
1320	29E9					
1321	29E9					
1322	29E9					
1323	29E9					
1324	29E9 3F 21 9F	ERASEB	BSTA,UN	ERASE		
1325	29EC 1F 33 C0	BCTA,UN		NXTLIN		
1326	29EF					
1327	29EF					
1328	29EF					
1329	29EF					
1330	29EF					
1331	29EF					
1332	29EF					
1333	29EF 3F 2A 0F	USER	BSTA,UN	EVALNS	GET DESTINATION	
1334	29F2 3B 08	BSTR,UN		STRCT		
1335	29F4 3F A9 FA	BSTA,UN		*CTEMP	DO THE ASSEMBLY LANGUAGE SUBROUTINE	
1336	29F7 1F 33 C0	BCTA,UN		NXTLIN		
1337	29FA					
1338	29FA					
1339	29FA					
1340	29FA 00 00	CTEMP	RES	2		
1341	29FC					
1342	29FC					
1343	29FC					
1344	29FC 08 7C	STRCT	STRR,R0	CTEMP		
1345	29FE 08 7B		STRR,R1	CTEMP+1		
1346	2A00 17		RETC,UN			
1347	2A01					
1348	2A01					
1349	2A01					
1350	2A01					
1351	2A01					
1352	2A01					
1353	2A01					
1354	2A01 3F 0C	POKE	BSTR,UN	EVALNS	GET DESTINATION LOCATION	
1355	2A03 3B 77		BSTR,UN	STRCT		
1356	2A05 3F 33 E7		BSTA,UN	SKPCOM		
1357	2A08 3B 05		BSTR,UN	EVALNS	GET DATA	
1358	2A0A 09 EE		STRR,R1	*CTEMP	STORE VALUE	
1359	2A0C 1F 33 C0		BCTA,UN	NXTLIN		
1360	2A0F					
1361	2A0F					
1362	2A0F					
1363	2A0F 3F 35 4B	EVALNS	BSTA,UN	EVAL		
1364	2A12 3B 3F	ENS	BSTR,UN	NOSTR		
1365	2A14 3F 3C F5	ENS1	BSTA,UN	POPC1		
1366	2A17					
1367	2A17					
1368	2A17					
1369	2A17 0C 13 8F	DTORNL	LODA,R0	CBUF1+1		

LINE	ADDR	R1	R2	R3	LABEL	OPCODE	OFFHAND
1200	2A1A	18	2D			BCR.R3	DTOB3 BRANC IF NUMBER IS ZERO
1201	2A1C	0F	13	8D		LOPA,R3	CBUF1
1202	2A1F	00	18			BCFR,GT	DTOB3
1203	2A21	17	19			COMI,R3	10
1204	2A23	1D	32	6E		PCTA,GT	ERR15
1205	2A25	34	1A			LODI,R3	10
1206	2A28	AB				SUPZ,R3	
1207	2A29	03				STRZ,R3	
1208	2A2A	2E	13	98		LODA,R2	CBUF1+3
1209	2A2D	2D	13	8F		LODA,R1	CBUF1+2
1210	2A30	0C	13	8E		LODA,R2	CBUF1+1
1211	2A33	77	08			PPSL	WC
1212	2A35	02				RRL,R2	
1213	2A36	11				RRL,R1	
1214	2A37	10				RRL,R0	
1215	2A39	17	00		DTOB2	COMI,R3	0
1216	2A3A	08	03			BCFR,FC	DTOB1
1217	2A3C	75	78			CFSL	WC
1218	2A3E	17				RETC,UN	
1219	2A3F	27	01		DTOB1	PISL	CRY CLEAR BORROW
1220	2A41	A7	01			SUBI,R3	1
1221	2A43	75	01			CFSL	CRY
1222	2A45	52				RRR,R2	
1223	2A46	51				RRR,R1	
1224	2A47	1B	6F			PCTR,UN	DTOB2
1225	2A48	22			LTOB3	FORZ,R0	
1226	2A4A	01				STRZ,R1	
1227	2A4B	17				RETC,UN	
1228	2A4C				*		
1229	2A4C				*		
1230	2A4C				*		
1401	2A4C	3F	35	45	FNOSTR	PSTA,UN	EVAL
1402	2A4F	14			NOSTR	RETC,FC	FLOATING POINT
1403	2A52	1E	32	5C		BCTA,LT	ERR2 TYPE MISMATCH
1404	2A53	07	0C		ERR4	LODI,R3	0C
1405	2A55	17	30	77		BCTA,UN	ERROR
1406	2A56				*		
1407	2A5B				*		
1408	2A5B				*		
1409	2A5E				*	PEEK	<EXPR> , <EXPR> CR
1410	2A5E				*		
1411	2A5E				*		
1412	2A5E				*		
1413	2A5B	3F	2A	0F	PEEK	PSTA,UN	EVALNS GET SOURCE LOCATION
1414	2A5F	3F	29	FC		PSTA,UN	STRCT
1415	2A5F	0D	09	FA		LODA,R1	*CTEMP
1416	2A61	20			PEEK1	FORZ,R0	
1417	2A62	3F	2A	A1		PSTA,UN	ETODNL CONVERT IT TO DECIMAL
1418	2A65	3F	23	F7		PSTA,UN	SKPCOM
1419	2A68	3F	34	67		PSTA,UN	GCVAR GET DESTINATION VARIABLE
1420	2A6F	3F	62			PSTR,UN	NOSTR
1421	2A6D	3F	34	0D		PSTA,UN	STROP2
1422	2A70	24	33			LODI,R0	CBUF1
1423	2A72	25	8D			LODI,R1	CBUF1 GET SOURCE
1424	2A74	3F	34	14		BS A,UN	STROP1
1425	2A77	27	24			LODI,P3	LEN NO 4 BYTE TRANSFER
1426	2A79	3F	33	47		PSTA,UN	MOVEB1 TRANSFER SOURCE TO DESTINATION

27	2A7C	1E 33 C0	A,UN	NX	
1428	2A7F	1F 33 C0	BSTA,UN	NXTLIN	
1429	2A7F				
1430	2A7F				
1431	2A7F		EXTOUT	<EXPR>	<EXPR> CR
1432	2A7F				
1433	2A7F				
1434	2A7F				
1435	2A7F	3F 2A 0F	EXTOUT	BSTA,UN	EVALNS GET PORT ADDRESS
1436	2A82	CD 0A 8C	STRA,R1	WRTEP+1	STORE IT IN THE PORT ADDRESS
1437	2A85	3F 33 E7	FSTA,UN	SKPCOM	
1438	2A88	3F 2A 0F	BSTA,UN	EVALNS	GET DATA
1439	2A8E	D5 00	WRTEP	WRTE,R1	00 WRITE THE DATA IN THE CORRECT PCRT
1440	2A8D	1F 33 C0	BCTA,UN	NXTLIN	
1441	2A90				
1442	2A90				
1443	2A90				
1444	2A90		EXTIN	<EXPR>	<EXPR> CR
1445	2A90				
1446	2A90				
1447	2A90				
1448	2A90	3F 2A 0F	EXTIN	BSTA,UN	EVALNS GET PORT ADDRESS
1449	2A93	C9 01	STRR,R1	\$+3	PUT IN PORT REFERENCE
1450	2A95	55 00	REDE,R1	0	READ THE SELCTED PORT
1451	2A97	1B 48	BCTR,UN	PEFK1	
1452	2A99				
1453	2A99				
1454	2A99				
1455	2A99		STOP		CR
1456	2A99				
1457	2A99				
1458	2A99				
1459	2A99	07 0E	STOP	LODI,R3	0E 'STOPPED'
1460	2A9B	3F 30 C7	BSTA,UN	WPTM	
1461	2A9E	1F 27 AC	BCTA,UN	OPTION	
1462	2AA1				
1463	2AA1				
1464	2AA1				
1465	2AA1	77 28	BTODNL	PPSL	WC
1466	2AA3	75 01	CFSL		CRY
1467	2AA5	50	RRR,R0		
1468	2AA6	51	RRR,R1		
1469	2AA7	06 00	LODI,R2	0	
1470	2AA9	52	RRR,R2		
1471	2AAA	07 10	LODI,R3	10	
1472	2AAC	CF 07 4D	STRA,R3	OPB	
1473	2AAF	CC 07 4E	STRA,R0	OPB+1	
1474	2AB2	CF 07 4F	STRA,R1	OPB+2	
1475	2AB5	CF 07 50	STRA,R2	OPB+3	
1476	2AB8	3F 39 54	BSTA,UN	NORM	
1477	2AB8	04 02	LODI,R0	2	
1478	2ABD	03	IPSL		
1479	2ABF	07 04	LODI,R3	4	
1480	2AC0	2F 47 4D	BTOD2	LODA,R3	OPB,-
1481	2AC3	CF 73 8D	STRA,R3	CPUF1,I	
1482	2ACC	5B 78	BRNR,R3	BTOD2	
1483	2ACB	17	RETC,UN		

LINE	ADDR	FI	B2	B3	LABEL	OPCODE	OPERAND
1484	2AC9				*		
1485	2AC9				*		
1486	2AC9				*		
1487	2AC9	00			DIMSTG	RES	1
1488	2ACA				*		
1489	2ACA				*		
1490	2ACA				*		
1491	2ACA				*		
1492	2ACA				*		
1493	2ACA				*		
1494	2ACA				*		
1495	2ACA	3F	33	53	DIM	BSTA,UN	GETNAM
1496	2ACD	01	14	A5		STRA,R2	OPLTH
1497	2ATV	13				SPSL	
1498	2AD1	08	70			STRR,R0	DIMSTG
1499	2AP3	3F	33	E2		BSTA,UN	SKPSP
1500	2AP8	F7	29			COMI,R3	'('
1501	2A18	9C	33	C7		ECFA,EQ	FRR1
1502	2ADB	3F	3A	AA		BSTA,UN	GET3C
1503	2ATE	02				LODZ,R2	
1504	2APF	01				STZ,R1	
1505	2AF2	98	57			LODE,R0	DIMSTG
1506	2AK2	93				LPSL	
1507	2AK3	1D	30	6E		ECTA,GT	FRR11
1508	2AK6	1A	31			ECTR,LT	DIMST
1509	2AEG	20				EORZ,R0	
1510	2AF9	09	5E			STRR,R1	DIMSTG
1511	2AFE	77	08			PPSL	WC
1512	2AED	11				RRL,R1	
1513	2AEF	10				RRL,R0	
1514	2AEF	D1				RRL,R1	
1515	2AF0	10				RRL,R0	
1516	2AF1	45	FC			ANDI,R1	FC
1517	2A13	75	08			CPSL	WC
1518	2APE	03				STRZ,R3	
1519	2AF6	0F	14	A5		LODA,R2	OPLTH
1520	2A19	60	40			IORI,R2	40
1521	2A18	04	02			LODI,R0	2
1522	2AFD	3F	34	D2		BSTA,UN	GCSUB
1523	2P00	01	0A	09		LODA,R2	DIMSTG
1524	2R03	80	01			ADDI,R2	1
1525	2B05	05	04		DIM3	LODI,R1	4
1526	2B07	20			DIM2	EORZ,R0	
1527	2B08	3F	2B	2E		BSTA,UN	PUSOP2
1528	2B0B	F9	7A			EDRR,R1	DIM2
1529	2B0E	FA	76			EDRR,R2	DIM3
1530	2B0F	3F	33	E0	DIMDEL	BSTA,UN	SKPSP
1531	2B12	17	29			COMI,R3	'('
1532	2B14	9C	33	C7		ECFA,EQ	FRR1
1533	2B17	3F	33	E0		BSTA,UN	SKPSP
1534	2B1A	F7	2C			COMI,R3	
1535	2B1C	10	2A	CA		ECTA,EQ	DIM
1536	2B1F	3F	31	DE	DECNXT	BSTA,UN	DECP
1537	2B22	1F	33	C0		ECTA,UN	NXTLIN
1538	2B25	20			DIMST	EORZ,R0	
1539	2B28	0F	14	A5		LODA,R2	OPLTH
1540	2B29	3F	34	A7		BSTA,UN	GCSTRA

LINE	ADDR	DL	EX	FC	MODE	OP CODE	STANDARD
1541	2B2C	1B	61			BCAR,UN	DI,ED
1542	2B2E	1B	61	*		BCTR,UN	INDEL
1543	2B2E			*			
1544	2B2E			*			
1545	2B2E	CC	92	34	PUSOP2	STRA,R0	*OP2
1546	2B31	1F	32	36		BCTA,UN	INCOP2
1547	2B34			*			
1548	2B34			*			
1549	2B34			*			
1550	2B34	3F	32	D1	GPUSH	BSTA,UN	DFCSP
1551	2B37	CF	92	CF		STRA,R3	*SP
1552	2B3A	17				RETC,UN	
1553	2B3B			*			
1554	2B3B			*			
1555	2B3B			*			
1556	2B3B			*	GOSUB	<EXPR>	CR
1557	2B3B			*			
1558	2B3B			*			
1559	2B3B			*			
1560	2B3B	0F	04	60	GOSUB	LODA,R3	INFT+1
1561	2B31	3B	74			BSTR,UN	GPUSH
1562	2B40	0F	04	5F		LODA,R3	INPT
1563	2B43	3B	6F			BSTR,UN	GPUSH
1564	2B45	07	00			LODI,R3	0
1565	2B47	3B	6B			BSTR,UN	GPUSH
1566	2B49			*			
1567	2B49			*			
1568	2B49			*	LOCATION NOW SAVED. NOW DO TRANSFER OF CONTROL		
1569	2B49			*	GOTO		
1570	2B49			*			
1571	2B49			*			
1572	2B49			*			
1573	2B49			*	GOTO	<EXPR>	CR
1574	2B49			*			
1575	2B49			*			
1576	2B49	3F	02		GOTO	BSTR,UN	FNDLIN
1577	2B4B	1C	A8	96		BCTA,EQ	*RTNADR
1578	2B4E	07	0F		ERR6	LODI,R3	0F
1579	2B50	1F	30	77		BCTA,UN	ERROR
1580	2B53			*			
1581	2B53			*			
1582	2B53			*			
1583	2B53	3F	35	4B	FNDLIN	BSTA,UN	EVAL
1584	2B56	15				RETC,GT	
1585	2B57	3F	2A	12		BSTA,UN	FNS
1586	2B5A	3F	29	FC		BSTA,UN	STRCT
1587	2B5D	3F	32	0B		BSTA,UN	CSINPT
1588	2B60	3F	22	4E		BSTA,UN	BEGIN
1589	2B63	3F	31	F3	GOTO2	BSTA,UN	SINPT
1590	2B66	3F	33	EF		BSTA,UN	GETLIN
1591	2B69	05	FF			LODI,R1	FF
1592	2B6F	20				FORZ,R0	
1593	2B6C	C2				STRZ,R2	
1594	2B6D	C3				STRZ,R3	
1595	2B6F	0D	27	69	GOTC3	LODA,R1	IINNUM,+
1596	2B71	1C	2E	94		BCTA,EQ	GOTO5
1597	2B74	4C	2F			ANDI,R2	CF

LINE	ADDR	R1	R2	B3	LABEL	OPCODE	OPERAND
1000	2F76	75	01			CPSL	CRY
1001	2F7E	77	02			PPSL	WC
1002	2F7A	D3				RRL,R3	
1003	2F7B	D2				RRL,R2	
1004	2F7C	CA	25			STRR,R2	TEMPR2
1005	2F7E	CB	24			STRR,R3	TEMPR3
1006	2F7F	F3				RRL,R3	
1007	2F81	F2				RRL,R2	
1008	2F82	D3				RRL,R3	
1009	2F83	D2				RRL,R2	
1010	2F84	8B	1F			ADDR,R3	TEMPR3
1011	2F86	8A	1F			ADDR,R2	TEMPR2
1012	2B88	44	0F			ANDI,R0	F
1013	2B8A	83				ADDZ,R3	
1014	2B8E	03				STRZ,R3	
1015	2B9C	8C	70			ADDEI,R2	0
1016	2B9F	75	08			CPSL	WC
1017	2B9E	F5	03			COMI,R1	3
1018	2B92	98	1A			BCFR,EQ	GOTO3
1019	2B94	EE	09	FA	GOTO5	COMA,R2	CTEMP
1020	2B97	98	0C			BCFR,EQ	GOTO4
1021	2B9E	FF	05	FB		COMA,R3	CTEMP+1
1022	2B9C	98	07			BCFR,EQ	GOTO4
1023	2B9F	3F	32	0E		BSTA,UN	RINPT
1024	2BA1	20				EORZ,R0	
1025	2BA2	17				RETC,UN	
1026	2BA3				*		
1027	2BA3				*		
1028	2BA3				*		
1029	2BA3	07			TEMPR2	RES	1
1030	2BA4	00			TEMPR3	RES	1
1031	2BA5				*		
1032	2BA5				*		
1033	2BA5				*		
1034	2BA5				*		
1035	2BA5				*		
1036	2BA5				*		
1037	2BA5				*		
1038	2BA5				*		
1039	2BA5				*		
1040	2BA5				*		
1041	2BA5				*		
1042	2BA5				*		
1043	2BA5				*		
1044	2BA5				*		
1045	2BA5				*		
1046	2BA5				*		
1047	2BA5				*		
1048	2BA5				*		
1049	2BA5				*		
1050	2BA5				*		
1051	2BA5				*		
1052	2BA5				*		
1053	2BA5				*		
1054	2BA5				*		
1055	2BA5				*		
1056	2BA5				*		
1057	2BA5				*		
1058	2BA5				*		
1059	2BA5				*		
1060	2BA5				*		
1061	2BA5				*		
1062	2BA5				*		
1063	2BA5				*		
1064	2BA5				*		
1065	2BA5				*		
1066	2BA5				*		
1067	2BA5				*		
1068	2BA5				*		
1069	2BA5				*		
1070	2BA5				*		
1071	2BA5				*		
1072	2BA5				*		
1073	2BA5				*		
1074	2BA5				*		
1075	2BA5				*		
1076	2BA5				*		
1077	2BA5				*		
1078	2BA5				*		
1079	2BA5				*		
1080	2BA5				*		
1081	2BA5				*		
1082	2BA5				*		
1083	2BA5				*		
1084	2BA5				*		
1085	2BA5				*		
1086	2BA5				*		
1087	2BA5				*		
1088	2BA5				*		
1089	2BA5				*		
1090	2BA5				*		
1091	2BA5				*		
1092	2BA5				*		
1093	2BA5				*		
1094	2BA5				*		
1095	2BA5				*		
1096	2BA5				*		
1097	2BA5				*		
1098	2BA5				*		
1099	2BA5				*		
1100	2BA5				*		
1101	2BA5				*		
1102	2BA5				*		
1103	2BA5				*		
1104	2BA5				*		
1105	2BA5				*		
1106	2BA5				*		
1107	2BA5				*		
1108	2BA5				*		
1109	2BA5				*		
1110	2BA5				*		
1111	2BA5				*		
1112	2BA5				*		
1113	2BA5				*		
1114	2BA5				*		
1115	2BA5				*		
1116	2BA5				*		
1117	2BA5				*		
1118	2BA5				*		
1119	2BA5				*		
1120	2BA5				*		
1121	2BA5				*		
1122	2BA5				*		
1123	2BA5				*		
1124	2BA5				*		
1125	2BA5				*		
1126	2BA5				*		
1127	2BA5				*		
1128	2BA5				*		
1129	2BA5				*		
1130	2BA5				*		
1131	2BA5				*		
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1176	2BA5				*		
1177	2BA5				*		
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1186	2BA5				*		
1187	2BA5				*		
1188	2BA5				*		
1189	2BA5				*		
1190	2BA5				*		
1191	2BA5				*		
1192	2BA5				*		
1193	2BA5				*		
1194	2BA5				*		
1195	2BA5				*		
1196	2BA5				*		
1197	2BA5				*		
1198	2BA5				*		
1199	2BA5				*		
1200	2BA5				*		
1201	2BA5				*		
1202	2BA5				*		
1203	2BA5				*		
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1207	2BA5				*		
1208	2BA5				*		
1209	2BA5				*		
1210	2BA5				*		
1211	2BA5				*		
1212	2BA5				*		
1213	2BA5				*		
1214	2BA5				*		
1215	2BA5				*		
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1230	2BA5				*		
1231	2BA5				*		
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1233	2BA5				*		
1234	2BA5				*		
1235	2BA5				*		
1236	2BA5				*		
1237	2BA5				*		
1238	2BA5				*		
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1241	2BA5				*		
1242	2BA5				*		
1243	2BA5				*		
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1246	2BA5				*		
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1248	2BA5				*		
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1250	2BA5				*		
1251	2BA5				*		
1252	2BA5				*		
1253	2BA5				*		
1254	2BA5				*		
1255	2BA5				*		
1256	2BA5				*		
1257	2BA5				*		
1258	2BA5				*		
1259	2BA5				*		
126							

LINE	ADDR	B1	B2	B3	LABEL	OPCODE	OPERAND
1655	2BC6						
1656	2BC6	0F	92	CF	GPOP	LODA,R3	*SP
1657	2BC9	1F	32	9D		BCTA,UN	INCSP
1658	2BCC						
1659	2BCC						
1660	2BCC						
1661	2BCC					INPUT	((STRING)) <VAR> (<VAR...>) CR
1662	2BCC						
1663	2BCC						
1664	2BCC						
1665	2BCC	3F	02	24	INPUT	BSTA,UN	LFCR
1666	2BCF	3F	33	10		BSTA,UN	SKFSP SKIP THE SPACES
1667	2BF2	E7	0D			COMI,R3	CR
1668	2B54	98	05			PCFR,EQ	INPUT0
1669	2BD6	3F	31	DE		BSTA,UN	DECPT
1670	2BD9	1E	1F			BCTR,UN	INPUT3
1671	2BDB	E7	27		INPUT0	COMI,R3	
1672	2BDD	1C	2B	EA		BCTA,EQ	INPUT1
1673	2BE0	04	3F			LODI,R0	'?' <i>no more push '0'</i>
1674	2BE2	3F	21	E5		BSTA,UN	WRT <i>normal and finish</i>
1675	2BE5	3F	31	DE		BSTA,UN	DECPT
1676	2BE8	1B	03			BCTR,UN	INPUT2
1677	2BEA	3F	30	33	INPUT1	BSTA,UN	PRINTO <i>no for this string if no push, push if it is needed</i>
1678	2BED	04	28		INPUT2	LODI,P0	
1679	2BEF	3F	21	E5		BSTA,UN	WRT
1680	2BF2	3F	34	07		BSTA,UN	GCVAR
1681	2BF5	18	0D			PCTR,EQ	INFPT
1682	2BF7	1F	2C	25		BCTA,LT	INSTR <i>input string</i>
1683	2BFA	3F	25	B2	INPUT3	BSTA,UN	PAUSE WAIT FOR CR IF NO VARIABLE → <i>PUT CR is same and type variable</i>
1684	2BFD	F7	2D			COMI,R3	CR
1685	2BFF	98	79			PCFR,EQ	INPUT3
1686	2C01	1F	33	C0		BCTA,UN	NXTLIN
1687	2C04	3F	29	FC	INFPT	BSTA,UN	STRCT
1688	2C07	3F	28	FC		BSTA,UN	AROWCR
1689	2C0A	3F	35	4B		BSTA,UN	FVAL
1690	2C0D	18	0E			BCTR,EQ	INFPT1 NORMAL
1691	2C0F	3F	29	2F		BSTA,UN	RECPT RECOVER INPUT POINTER
1692	2C12	3F	33	E0	INDEL	BSTA,UN	SKPSP SKIP SPACES
1693	2C15	E7	2C			COMI,R3	SEE IF COMMA (DELIMITER)
1694	2C17	1C	2B	ED		BCTA,EQ	INPUT2
1695	2C1A	1F	2B	1F		BCTA,UN	DFCNXT
1696	2C1D	3F	29	2F	INFPT1	BSTA,UN	RFCBT RECOVER INPUT POINTER
1697	2C20	3F	2C	D2		BSTA,UN	POPCT
1698	2C23	1B	6E			BCTR,UN	INDEL
1699	2C25	3F	34	0D	INSTR	BSTA,UN	STROPZ <i>3F 3F 3F BCTA UN STROPZ</i>
1700	2C28	04	27			LODI,R0	INBUF
1701	2C2A	05	6D			LODI,R1	INBUF
1702	2C2C	06	13			LODI,P2	13 <i>no more push input</i>
1703	2C2E	3F	22	59		BSTA,UN	ARROW <i>no more push non keyboard</i>
1704	2C31	9C	27	AC		BCTA,EQ	OPTION
1705	2C34	05	14			LODI,R1	14
1706	2C36	0D	47	6D	INSTR1	LODA,R1	INBUF
1707	2C39	58	94			BRNE,R0	INSTR2
1708	2C3B	59	79			PRNP,R1	INSTR1
1709	2C3E	05	29			LODI,R1	SDFLT-1
1710	2C3F	05	01		INSTR2	ADDI,R1	1
1711	2C41	0C	14	9F		LODA,R0	CR1ATD

LINE	ADDR	R1	R2	R3	IAFPI	OPCODE	OPERAND
1712	2044	18	0C			PCDE,PC	INSTR3
1717	2046	3F	24	A7		PSTA,UN	GCSTRA
1718	2049	4F	14	A6		LODA,R3	GCSSSTG
1719	204C	0F	14	A5		STRA,R3	QILTH
171E	204F	3F	24	0B		PSTA,UN	STRCP2
171F	2050	24	27		INSTR3	LODI,R2	INRUP
1722	2054	05	0D			LODI,R1	INRUF
1726	205E	3F	34	14		PSTA,UN	STNCF1
1727	2060	3F	33	43		PSTA,UN	MOVFB
1731	206C	1F	2C	17		PCTA,UN	INDEL
1732	206F				*		
1733	206F				*		
1734	206F				*		
1735	2069	0F	23		DATPNT	RTS	2
1736	2061				*		
1737	2061				*		
1738	2061				*		
1739	2061				*	RESTORE	<EXPR> CR
173E	2061				*		
173F	2061				*		
1743	2081	3F	2F	53	RESTOR	PSTA,UN	FNDLIN
1744	2084	10	17			PCTR,GT	RESTR1
1745	2086	1F	2B	4E		PCTA,IT	FRG6
1746	2089	2D	24	5F		LODA,R1	INPT
1747	209C	0F	71			STRF,R1	DATPNT
1749	209F	2E	04	60		LODA,R1	INPT-1
1749	209F	09	0D			STRF,R1	DATPNT+1
1749	20A3	3F	32	18		PSTA,UN	CRINPT
1741	2078	2C			RESTR2	FORZ,R2	
1742	2077	0C	13	22		STPA,R2	PIATA
1743	207A	1F	33	02		PCTA,UN	XXLIN
1744	207D	22			RESTR1	FORZ,R2	
1745	207E	08	60			STRF,R2	DATPNT+1
1746	2082	0C	00	03		LODA,R2	BSTART
1747	2083	08	5A			STRF,R2	DATPNT
1748	2085	18	0F			PCTE,UN	RESTR2
1749	2087				*		
1749	2087				*		
1751	2087				*		
1752	2087				*	FOR <VAR>	<EXPR> TO <EXPR> [STFP <EXPR>]
1753	2087				*		
1754	2087				*		
1755	2087				*		
1756	2087	3F	34	67	FOR	PSTA,UN	GCVAR
1757	208A	3F	2A	4F		PSTA,UN	NOSTR
1758	208D	3F	28	FC		PSTA,UN	STRCT
1759	208E	0E				STRZ,R2	
1762	2091	21				LODZ,R1	
1761	2085	0A				STRZ,R3	
1761	20A3	3F	2B	24		PSTA,UN	GPUSH
1763	20A6	02				IOEZ,R2	
1764	20A7	03				STRZ,R3	
1765	209F	3F	2B	34		PSTA,UN	GPUSH
1766	20A8	3F	33	10		PSTA,UN	SKESH
1767	20AF	17	3D			COM1,R3	
1768	20AF	9C	33	07		PCVF,LO	FRD1

?

1770	2CA6	3F 2C D2	BSTA,UN	NO	POPC1
1771	2CA9	24 29	LODI,R0	COMTB2	
1772	2CAB	05 CE	LODI,R1	COMTB2	
1773	2CAD	3F 28 B7	BSTA,UN	TABUP	
1774	2CB2	9C 33 C7	BCFA,EQ	ERR1	
1775	2CB3	2C 28 FB	LODA,R0	DST+1	
1776	2CB8	14 01	COMI,R0	1	
1777	2CB9	9C 33 C7	PCFA,EQ	ERR1	
1778	2CB8	3F 21 DE	BSTA,UN	SKPDEC	
1779	2CB8	0F 24 60	LODA,R3	INPT+1	
1780	2CC1	3F 2E 34	BSTA,UN	GPUSH	
1781	2CC4	0F 24 5F	LODA,R3	INPT	
1782	2CC7	3F 2B 34	BSTA,UN	GPUSH	
1783	2CCA	07 FF	LODI,R3	FF	
1784	2CCC	3F 2B 34	BSTA,UN	GPUSH	
1785	2CCF	1F 33 CC	BCTA,UN	SKPLIN	
1786	2CD2				
1787	2CD2				
1788	2CD2				
1789	2CD2	2C 09 FA	PCPCT	LODA,R0	CTEMP
1790	2CD5	0D 29 FB	LODA,R1	CTEMP+1	
1791	2CD8	1F 32 45	BCTA,UN	POP	
1792	2CDE				
1793	2CDE				
1794	2CDE				
1795	2CDE				
1796	2CDE				
1797	2CDP				
1798	2CDB				
1799	2CDE	3F 34 C7	READ	BSTA,UN	GCVAR GET DESTINATION
1800	2CDE	1A 1F	BCTA,UN	RDSTR	
1801	2CE0	1L 2A E3	BCTA,GT	FRF4	NO DESTINATION
1802	2CF3	3F 29 FC	BSTA,UN	STRCT	
1803	2CF6	3F 32 E3	BSTA,UN	GETDAT	GET NEXT DATA
1804	2CF9	3F 2A 4F	BSTA,UN	NOSTR	
1805	2CEC	3B 64	BSTR,UN	POPCT	DESTINATION <-- DATA
1806	2CF4	3F 33 E2	BSTA,UN	SKPSP	
1807	2CF1	E7 2C	COMI,R3	,	CHECK FOR COMMA
1808	2CF3	1B 6E	BCTR,EG	READ	IF SO, GET MORE DATA
1809	2CF5	3F 31 DE	BSTA,UN	DECPT	NO BACK UP AND RETURN
1810	2CF8	1F 33 C0	BCTA,UN	NXTLIN	
1811	2CFB				
1812	2CFB	3F 34 0D	RDSTR	BSTA,UN	STROP2
1813	2CFE	2C 14 9F	LODA,R0	CREATD	
1814	2D01	99 03	PCFR,FQ	RDSTR2	
1815	2D03	CE 14 AF	STRA,R2	OPLTH	SAVE LENGTH
1816	2D06	3F 32 F3	RDSTR2	BSTA,UN	GETDAT GET NEXT DATA
1817	2D09	2F 2D 40	BSTA,UN	NOFPT	
1818	2D0C	0C 12 23	LODA,R0	OF1	
1819	2D0F	0B 12 24	LODA,P1	OF1+1	
1820	2D12	3F 29 FC	BSTA,UN	STRCT	
1821	2D15	2F 14 9F	LODA,R3	CREATD	
1822	2D18	1B 1A	BCTR,FQ	RDSTR3	
1823	2D1A	02	LODZ,R2		
1824	2D1B	01	STF7,F1		
1825	2D1C	3F 34 A7	BSTA,UN	GOSTRA	

LINE	ADDR	R1	R2	R3	LABEL	OPCODE	OPERAND
1000	2D1F	3F	34	0D		ESTA,UN	STROP2
1001	2D20	3C	30	FA		LODA,R2	CTEMP
1002	2D25	0D	09	FB		LODA,R1	CTEMP+1
1003	2D28	3F	34	14		ESTA,UN	STROP1
1004	2D2B	0F	14	A0		LODA,R3	GCSSTG
1005	2D2E	3F	33	47		ESTA,UN	MOVER1
1006	2D31	1F	2C	FE		PCTA,UN	REDEL
1007	2D34	FF	14	A0	R1STR3	COMA,R2	OPLTH NO LFTHS MUST MATCH
1008	2D37	0C	30	5A		BCFA,EQ	ERR3 NO MATCH. LENGTH MISMATCH
1009	2D3A	3F	33	43		ESTA,UN	MOVER1 DESTINATION --- DATA
1010	2D3E	1F	2C	FE		PCTA,UN	REDEL
1011	2D43						
1012	2D46						
1013	2D49						
1014	2D4C						
1015	2D4F						
1016	2D52	1C	30	50	NOVPT	PCTA,EQ	ERR2
1017	2D55	1D	2A	53		PCTA,GT	ERR4
1018	2D58	17				RETC,UN	
1019	2D5B						
1020	2D5E						
1021	2D61						
1022	2D64						
1023	2D67						
1024	2D6A						
1025	2D6D						
1026	2D70						
1027	2D73	3F	34	C7	LET	ESTA,UN	GCVAR GET DESTINATION LOCATION
1028	2D76	1A	17			PCTR,LT	LETSTR STRING
1029	2D79	1D	2A	53		PCTA,GT	ERR4 MISSING DESTINATION
1030	2D7C	3F	29	FC		ESTA,UN	STRCT
1031	2D7F	3F	33	40		ESTA,UN	SKPSF
1032	2D82	17	3D			COMI,R3	MUST BE
1033	2D85	0C	33	C7		BCFA,EQ	ERR1 SYNTAX ERROR
1034	2D88	3F	2A	4C		ESTA,UN	ENOSTR GET SOURCE VALUE
1035	2D8B	3F	2C	D2		ESTA,UN	POPCT POP SOURCE TO DESTINATION
1036	2D8E	1F	33	C0		PCTA,UN	NXTLIN
1037	2D91						
1038	2D94	3F	34	0D	LETSTR	ESTA,UN	STROP2
1039	2D97	0C	14	0F		LODA,R0	CREATD
1040	2D9A	0C	03			BCFR,EQ	LETST2
1041	2D9D	0F	14	A5		STRA,R2	OPLTH FOUND SAVE LENGTH
1042	2D9F	3F	23	10	LETST2	ESTA,UN	SKPSF
1043	2DA2	F7	3F			COMI,R3	MUST BE
1044	2DA5	0C	33	C7		BCFA,EQ	ERR1 BAD SYNTAX
1045	2DA8	3F	35	4B		ESTA,UN	EVAL GET SOURCE VALUE
1046	2DAF	3F	2L	40		ESTA,UN	NOFIT
1047	2DB2	3F	34	14		ESTA,UN	STROP1
1048	2DB5	0F	14	0F		LODA,R3	CREATD
1049	2DB8	18	1D			PCTR,EQ	LETST3
1050	2DBB	3F	29	FC		ESTA,UN	STRCT
1051	2DBE	27				LOF2,R2	
1052	2DBF	01				STR2,R1	
1053	2DC2	3F	34	A7		ESTA,UN	GCSTRA
1054	2DC5	3F	34	0D		ESTA,UN	STROP2
1055	2DC8	0C	0D	FA		LODA,R2	CTEMP
1056	2DCB	0D	09	FB		LODA,R1	CTEMP+1
1057	2DCD	3F	34	14		ESTA,UN	STROP1
1058	2DCE	0F	14	A0		LODA,R3	GCSSTG
1059	2DD1	3F	33	47		ESTA,UN	MOVER1

LINE	DATA	EQ	DATA	OPCODE	OFFNAME
1883	2DA1	1F	33 C0	BCTA,UN	NXTLIN
1884	2DA1	FF	14 AS	IETST3	COMA,R2
1885	2DA4	9C	32 5A	BCFA,EQ	ERR3
1886	2DA7	3F	33 43	BSTA,UN	MOVEB
1887	2DAA	1F	33 C0	BCTA,UN	NXTLIN
1888	2DAD		*		
1889	2DAD		*		
1890	2DAI		*		
1891	2DAD		*	NEXT (VAR) CR	
1892	2DAD		*		
1893	2DAD		*		
1894	2DAD		*		
1895	2DAD	3F	2B C6	NEXT	BSTA,UN
1896	2DE0	E7	FF		GPOP
1897	2DE2	9C	32 5E	BCFA,EQ	ERR7
1898	2DE5	05	FF	LODI,R1	FF
1899	2DE7	3F	2B C8	NEXT1	BSTA,UN
1900	2DEA	03			GPOP
1901	2DEB	0D	2D EC	STRA,R1	NTEMP1,+
1902	2DF1	1F	03	COMI,R1	3
1903	2DC0	98	75	BCFR,EQ	NEXT1
1904	2DC2	3F	34 67	BSTA,UN	OCVAR
1905	2DC5	3F	2A 4F	BSTA,UN	NOSTR
1906	2DC7	E8	34	COMR,R0	NTEMP3
1907	2DCA	9C	30 5E	BCFA,EQ	ER 7
1908	2DCD	ED	0D FF	COMA,R1	NTEMP4
1909	2DE0	9C	30 5E	BCFA,EQ	ERR7
1910	2DD3	3F	32 0E	BSTA,UN	CSINPT
1911	2DD6	08	25	LODR,R0	NTEMP2
1912	2DE8	CC	04 60	STRA,R0	INPT+1
1913	2DD8	28	1F	LODR,R0	NTEMP1
1914	2DDD	3C	04 5F	STRA,R0	INPT
1915	2DE0	3F	2A 4C	BSTA,UN	ENOSTR
1916	2DF3	3F	3C FC	BSTA,UN	POFC1
1917	2DE0	04	29	LODI,R0	COMTB2
1918	2DE8	25	CE	LODI,R1	COMTB2
1919	2DEA	3F	28 F7	BSTA,UN	TABUF
1920	2DFE	0E	11	BCFR,EQ	NEXT2
1921	2DF7	2C	08 FB	IODA,R0	DST+1
1922	2DF2	E4	07	COMI,R0	2
1923	2DF4	9C	33 C7	BCFA,EQ	ERR1
1924	2DF7	3F	2A 4C	BSTA,UN	ENOSTR
1925	2DFA	1B	07	BCTR,UN	NEXT3
1926	2DFC		*		
1927	2DFC	07		NTEMP1	RES
1928	2DFD	00		NTEMP2	RES
1929	2DFE	00		NTEMP3	RES
1930	2DFE	00		NTEMP4	RES
1931	2E00		*		
1932	2E00	3F	3A 7A	NEXT2	BSTA,UN
1933	2E03	28	79	NEXT3	LODR,R0
1934	2E05	09	78		LODR,R1
1935	2E07	3F	32 7D	BSTA,UN	PUSH
1936	2E0A	3F	37 EF	BSTA,UN	FPADD
1937	2E0D	3F	3D 03	BSTA,UN	POFC2
1938	2E10	05	04	LODI,R1	4
1939	2E12	0D	53 91	NEXT5	IODA,R1
					CRUF2.-

LINE	ADDR	F1	F2	F3	LABEL	OPCODE	OPFRA	
1040	2F15	CD	ED	FF		STRA,R1	*NTEMP3.1	
1041	2F16	59	98			BRNF,R1	NEXT3	
1042	2F1A	3F	33	98		BSTA,UN	COMNUM	
1043	2F1D	57	22			COMI,R3	LT	
1044	2F1F	1A	13			BCTR,R3	NEXT4	
1045	2F21	05	04			LOFI,R1	4	
1046	2F23	01	41	FC	NEXT6	LOFA,R1	NTEMP1.-	
1047	2F26	03				STRZ,R3		
1048	2F27	3F	3B	34		BSTA,UN	GPUSH	
1049	2F2A	1C	27			ERNR,R1	NEXT6	
1050	2F2C	27	FF			LOFI,R3	FF	
1051	2F2E	3F	2B	34		BSTA,UN	GPUSH	
1052	2F31	1F	33	00		BCTA,UN	NATLIN	
1053	2F34	3F	3B	10	NEXT4	BSTA,UN	CONTINP	
1054	2F37	1F	33	00		BCTA,UN	NATLIN	
1055	2F3A							
1056	2F3A				*			
1057	2F3A				*			
1058	2F3A				*	IF <EXPR>	<LOGICAL OPERATOR>	<EXPR> <STATEMENT> CR
1059	2F3A				*			
1060	2F3A				*			
1061	2F3A				*			
1062	2F3A	3F	35	4B	IF	BSTA,UN	EVAL	GET FIRST ARGUMENT
1063	2F3D	1A	21			BCTR,LT	IFSTR	
1064	2F3F	1D	2A	53		BCTA,GT	ERR4	
1065	2F42	3F	34	1F		BSTA,UN	GETLOP	
1066	2F45	3F	2A	4C		BSTA,UN	ENOSTR	
1067	2F48	3F	31	23		BSTA,UN	POPC2	GET SECOND ARGUMENT FROM STACK
1068	2F4B	3F	3C	FS		BSTA,UN	POIC1	GET FIRST ARGUMENT FROM STACK
1069	2F4E	3F	33	98		BSTA,UN	COMNUM	DO FLOATING POINT COMPARE
1070	2F51				*			
1071	2F51	FF	14	19	IFLOC	COMA,R3	LOP1	
1072	2F54	1C	A8	98		BCTA,EQ	*RTNADR	
1073	2F57	1F	14	1C		COMA,R3	LOP2	CHECK FOR SECOND MATCH
1074	2F5A	1C	A8	98		BCTA,EQ	*RTNADR	
1075	2F5D	1F	33	00		BCTA,UN	SKPLIN	NO MATCH, SKIP STATEMENT
1076	2F62				*			
1077	2F62	CF	14	A5	IFSTR	STRA,R2	OPLTH	SAVE LENGTH OF STRING
1078	2F63	3F	34	14		BSTA,UN	STROP1	
1079	2F66	3F	34	1D		BSTA,UN	GETLOP	
1080	2F69	3F	35	4B		BSTA,UN	FVAL	GET SECOND ARGUMENT
1081	2F6C	3F	2D	40		BSTA,UN	NOFPT	
1082	2F6F	1F	14	A5		COMA,R2	OPLTH	
1083	2F72	9C	30	5A		BCTA,EQ	ERR3	LENGTHS NOT SAME - LENGTH MISMATCH ERROR
1084	2F75	3F	34	0D		BSTA,UN	STROP2	
1085	2F78	3F	34	49		BSTA,UN	COMOP	DO COMPARE
1086	2F7B	1B	51			BCTR,UN	IFLOC	CHECK THEM
1087	2F7D				*			
1088	2F7E				*			
1089	2F7D				*			
1090	2F7D				*	PRINT (FORMAT)	(<EXPR>,<EXPR>,...)	CR
1091	2F7E				*			
1092	2F7E				*	FORMATS-	# PRINT INTEGER	# <EXPR>
1093	2F7D				*		% = PRINT TAB	% CHAR
1094	2F7D				*		@ = SET SCREEN LOCATION	@ LINE,CHAR
1095	2F7E				*		& = PRINT HEX	& <EXPR>
1096	2F7E				*		/ = SUPPRESS LINEFEED	/

Address	Disassembly	Comment
1998	217D	*
1999	217D	*
2000	217D	EXPRESSIONS: QUOTED STRING
2001	217D	DIMENSIONED OR NORMAL VARIABLE
2002	217D	STRING VARIABLE
2003	217D	*
2004	217D	*
2005	217D 3F 33 E0 PRINT	BSTA,UN SKPSP
2006	2180 E7 46	COMI,R3 'Q'
2007	2182 19 0D	PCTR,FQ PRINT2
2008	2184 E7 2F	COMI,R3 '/'
2009	2186 18 06	BCTR,FQ PRINT1
2010	2188 3F 31 DE	BSTA,UN DECPT
2011	218P 3F 03 24	PSTA,UN LFCR
2012	218E 3F 33 E0 PRINT1	BSTA,UN SKPSP
2013	2191 E7 0D	PRINT2 COMI,R3 CR
2014	2193 1C A2 96	BCTA,EC *RTNADR
2015	2195 E7 27	COMI,R3 QUOTED STRING
2016	219B 1C 2F AB	BCTA,EC PRNTQ
2017	219E E7 40	COMI,R3 AT LOCATION SET
2018	21A0 1C 2F D1	BCTA,EC PRNTA
2019	21A2 E7 23	COMI,R3 PRINT INTEGER
2020	21A4 1C 2F 0C	BCTA,EC PRNTI
2021	21A6 E7 26	COMI,R3 PRINT HEX
2022	21A7 1C 2F 3D	PCTA,EC PRNTH
2023	21AA E7 25	COMI,R3 PRINT TAB
2024	21AC 1C 2F 04	BCTA,EC PRNTT
2025	21AF 2F 31 DE	BSTA,UN DECPT
2026	21B2 3F 35 48	BSTA,UN EVAL
2027	21B5 1C 2F 58	BCTA,EC PRNTE
2028	21B8 1A 03	PCTR,LT PRNTS
2029	21BA 1F 33 C7	BCTA,UN ERR1 SYNTAX ERROR
2030	21BD	*
2031	21BD 3F 34 14 PRNTS	BSTA,UN STROP1
2032	21C0 02	PRNTS1 IOLZ,R2 CHECK FOR DONE
2033	21C1 1C 2F AF	PCTA,EC PRNTD
2034	21C4 0C 02 23	IOWA,R0 *OP1 GET CHARACTER
2035	21C7 3F 21 E5	BSTA,UN WRT
2036	21CA 3F 32 25	BSTA,UN INCOPI INCREMENT POINTERS
2037	21CD A6 01	SUPI,R2 1
2038	21CF 1B 6F	BCTR,UN PRNTS1
2039	21E1	*
2040	21E1 3F 2A 0F PRNTA	BSTA,UN EVALNS
2041	21E4 A5 01	SUBI,R1 1
2042	21E6 CD CF 57	STRA,R1 PNTTMP
2043	21E9 3F 33 E7	BSTA,UN SKPCCM
2044	21EC 3F 2A 0F PRNTA1	BSTA,UN EVALNS
2045	21EE A5 01	SUBI,R1 1
2046	21F1 07 08	IFSL WC
2047	21F3 11	RRL ,R1
2048	21F4 F2	RRL ,R0
2049	21F5 D1	RRL ,R1
2050	21F6 D0	RRL ,R0
2051	21F7 D1	RRL ,R1
2052	21F8 10	RRL ,R0
2053	21F9 D1	RRL ,R1

LINE	ADDR	R1	B2	R3	LABEL	OPCODE	OPERAND
1004	21FA	P2				RRL,R2	
1005	21FF	75	00			CTL	00
1006	21FD	44	07			ANDI,R2	07
1007	21EF	54	12			IORI,R0	10 MAKE 1 IN THE DISPLAY PAGE
1008	21F1	02				STRZ,R2	
1009	21F2	00	0F	57		LODA,R0	PNTTMP
1010	21F5	44	0F			ANDI,R0	0F
1011	21F7	45	FD			ANDI,R1	FD
1012	21F9	01				IORZ,R1	
1013	21FA	01				STRZ,R1	
1014	21FB	3F	21	45		PSTA,UN	SETCUR
1015	21FF	7F	00	04		PSTA,UN	WRTCUR
1016	21C1	1F	2F	AF		PCTA,UN	PRNTD
1017	21F4				*		
1018	21F4	00	81	43	PRNTT	LODA,R0	*MCUR
1019	21C7	00	0F	57		STRA,R0	PNTTMP
1020	21C8A	1F	50			ECTR,UN	PRNTA1
1021	21F0				*		
1022	21C0	3F	2A	4C	PRNTI	PSTA,UN	FNOSTR
1023	21F0F	3F	30	2F		PSTA,UN	MNTSGN
1024	2112	00	13	0D		LODA,R0	CRUF1
1025	2115	10	08			ECTR,CT	PRNT13
1026	2117	04	32			LODI,R0	0
1027	2119	3F	21	75		PSTA,UN	WRT
1028	2110	1F	0F	AE		PCTA,UN	PRNTD
1029	211F	00	1B	05	PRNT13	LODA,R0	INTEXP
1030	2122	E4	27			COMI,R0	7
1031	2124	1A	11			PCTR,LT	PRNT11
1032	2126	00	15	12		LODA,R0	EXPSON
1033	2128	1A	00			ECTR,LT	PRNT11
1034	212B	05	06			LODI,R1	6
1035	2121	24	2A		PRNT12	LODI,R0	*
1036	212F	24	21	E5		PSTA,UN	WRT <i>1036 212F 24 21 E5</i>
1037	2132	19	79			EDRR,R1	PRNT12
1038	2134	1F	2F	AF		PCTA,UN	PRNTD
1039	2137	3F	2F	EA	PRNT11	PSTA,UN	MNTINT
1040	213A	1F	2F	AF		PCTA,UN	PRNTD
1041	213D				*		
1042	2131	3F	2A	4C	PRNTH	PSTA,UN	FNOSTR
1043	2140	3F	30	F5		PSTA,UN	POPC1
1044	2143	07	02			LODI,R3	0
1045	2145	17	04		PRNTH1	COMI,R3	LEN
1046	2147	10	2F	AE		PCTA,EO	PRNTD
1047	214F	0B	0F			STHR,R3	PNTTMP
1048	2140	0F	73	8D		LODA,R3	CRUF1.I
1049	214F	02				STRZ,R2	
1050	2150	3F	20	6A		PSTA,UN	HXOT
1051	21B3	0B	02			LODR,R3	PNTTMP
1052	2155	1B	0E			PIRE,R3	PRNTH1
1053	2117				*		
1054	2157				*		
1055	2157				*		
1056	2157	00			PNTTMP RES		1
1057	2158				*		
1058	2152				*		
1059	2158				*		
1060	2150	3F	30	20	PRNTF	PSTA,UN	MNTSGN

LINE	ADDR	FL	EQ	EQ	LABEL	OPCODE	OPERAND
2111	2F58	04	30			LODI,R0	'0'
2112	2F5D	3F	21	E5		BSTA,UN	WRT
2113	2F60	04	31			IOEI,R0	' '
2114	2F62	3F	21	F5		BSTA,UN	WRT
2115	2F65	3F	2F	EA		BSTA,UN	MNTINT
2116	2F68	27	07			LODI,R3	'7'
2117	2F6A	AF	0F	F9		SUBA,R3	DIGCTR
2118	2F6D	03				LOEZ,R3	
2119	2F6E	C2				STRZ,R2	
2120	2F6F	53				RRR,R3	
2121	2F70	47	03			ANDI,R3	3
2122	2F72	05	FF			LODI,R1	FF
2123	2F74	0D	27	31	PRNTF2	LODA,R1	FRCSTG,+
2124	2F77	F7	00			COMI,R3	0
2125	2F79	18	0C			ECTR,EQ	PRNTF3
2126	2F7B	77	10			PPSL	RS
2127	2F7D	C2				STRZ,R2	
2128	2F7F	3F	00	6A		BSTA,UN	HXOT
2129	2F81	75	10			CPSL	RS
2130	2F83	A7	01			SUBI,R3	1
2131	2F85	1B	0D			ECTR,UN	PRNTF2
2132	2F87	F6	01		PRNTF3	TMI,R2	1
2133	2F89	98	0A			PCFR,EQ	PRNTF4
2134	2F8B	0D	27	31		LODA,R1	FRCSTG,+
2135	2F8E	57				RRR,R0	
2136	2F8F	50				RRR,R0	
2137	2F90	50				RRR,R0	
2138	2F91	0C				RRR,R0	
2139	2F92	3F	30	4F		BSTA,UN	DOUT
2140	2F95	3F	21	E3	PRNTF4	BSTA,UN	WRBL
2141	2F98	04	45			LODI,R0	'E'
2142	2F9A	3F	21	F5		BSTA,UN	WRT
2143	2F9D	0C	1E	12		LODA,R0	EXPSGN
2144	2FA0	3F	30	29		BSTA,UN	ANYSGN
2145	2FA3	0F	1B	B5		LODA,R3	INTEXP
2146	2FA6	3F	21	09		BSTA,UN	BTODOT
2147	2FA9	1B	03			ECTR,UN	PRNTD
2148	2FAB				*		
2149	2FAB	3F	32	33	PRNTQ	BSTA,UN	PRINTQ
2150	2FAE	3F	33	E0	PRNTD	BSTA,UN	SKFSP
2151	2FB1	F7	2C			COMI,R3	' '
2152	2FB3	10	07			ECTR,EQ	PRNTD1
2153	2FB5	F7	3E			COMI,R3	' '
2154	2FB7	10	0F			ECTR,EQ	PRNTD3
2155	2FB9	1F	2E	91		ECTR,UN	PRINT2
2156	2FBC	05	08		PRNTE1	LODI,R1	8
2157	2FBE	04	20		PRNTE2	LODI,R0	' '
2158	2FC0	3F	21	E5		BSTA,UN	WRT
2159	2FC3	F9	70			PDRR,R1	PRNTD2
2160	2FC5	1F	2E	8E		ECTR,UN	PRINT1
2161	2FC8	0F	01	41	PRNTD3	LODA,R2	*MCU1
2162	2FCB	F6	04			TMI,R2	4
2163	2FCD	1C	2E	8E		ECTR,EQ	PRINT1-3
2164	2FCE	0E	01			ADDI,R2	1
2165	2FD2	0D	01	43		LODA,R1	*MCUR
2166	2FD5	F5	40			COMI,R1	40
2167	2FD7	0A	02			BCFR,LT	PRNTD4

2169	2FEE	45 0F	PRNTD4	SUL1,R2	1	
2170	2FDD	65 40		ANDI,R1	0F	
2171	2FLF	3F 21 45		IORI,R1	40	MOVE OVER 4 SPACES
2172	2FE2	3F 00 64		BSTA,UN	SETCUR	
2173	2FE5	1F 2E 8E		BSTA,UN	WRTCUR	
2174	2FF0		*	BCTA,UN	PRINT1	
2175	2FF8		*			
2176	2FF8		*			
2177	2FF8	00	MNTSTG	RES	1	
2178	2FE9	00	DIGCTR	RES	1	
2179	2FFA		*			
2180	2FEA		*			
2181	2FEA		*			
2182	2FEA	05 04	MNTINT	LODI,R1	4	
2183	2FEC	20		EORZ,R0		
2184	2FED	08 7A		STRR,R0	DIGCTR	
2185	2FEF	0D 47 2D	MNTI2	LODA,R1	IN STG.-	
2186	2FI2	F5 FF		COMI,R1	FF	
2187	2FF4	14		RETC,EQ		
2188	2FF5	00		LODZ,P0		
2189	2FF6	18 77		BCTR,EQ	MNTI2	
2190	2FF8	02		STRZ,R2		
2191	2FF9	0T 0F E8		STRA,R1	MNTSTG	
2192	2FFC	44 F0		ANDI,R0	F0	
2193	2FFE	98 14		BCFR,EQ	MNTI4	
2194	3000	02		LODZ,R2		
2195	3001	3F 32 4F		BSTA,UN	ROUT	
2196	3004	0C 0F E9		LODA,R0	DIGCTR	
2197	3007	84 01		ADDI,R0	1	
2198	3009	08 5E	MNTI5	STRR,R0	DIGCTR	
2199	300F	0D 47 2D		LODA,R1	INTSTG -	
2200	300E	F5 FF		COMI,R1	FF	
2201	3010	14		RETC,EQ		
2202	3011	02		STRZ,R2		
2203	3012	09 54		STRR,R1	MNTSTG	
2204	3014	3F 00 6A	MNTI4	BSTA,UN	HXOT	
2205	3017	08 4F		LODR,R1	MNTSTG	
2206	3019	2C 0F E9		LODA,R0	DIGCTR	
2207	301C	84 02		ADDI,R0	2	
2208	301F	1B 69		BCTR,UN	MNTI5	
2209	3020		*			
2210	3020		*			
2211	3020		*			
2212	3020	3F 3C F5	MNTSGN	RSTA,UN	POPC1	
2213	3023	3F 3B 1F		RSTA,UN	FIXNL	
2214	3026	0C 1B 13		LODA,R0	INTSGN	
2215	3029	F4 80	ANYSGN	TMI,R0	80	
2216	302P	9C 21 E3		BCFA,EQ	WREI	
2217	302E	04 2F		LODI,R0		
2218	3030	1F 21 E5		BCTA,UN	WRT	
2219	3033		*			
2220	3033		*			
2221	3033		*	PRINTQ PRINTS CHARACTERS STARTING AT INPT. UNTIL A QUOTE IS		
2222	3033		*	REACHED. INPT IS LEFT POINTING TO THE CHARACTER AFTER THE		
2223	3033		*	QUOTE. A DOUBLE QUOTE IS PRINTED AS A QUOTE AND THE PRINT IS		
2224	3033		*	CONTINUED.		

2225	3033		*			
2226	3033		*			
2227	3033	3F 33	DS PRINTQ	BSTA,UN	GETCHR	
2228	3036	F7 0D		COM1,R3	CP	
2229	3038	10 33 C7		BCTA,R0	ERR1	
2230	303F	F7 27		COM1,R3		CHECK FOR QUOTE
2231	303D	19 06		BCTR,R0	IRINQ1	
2232	303F	03	FRNTQ2	LOD7,R3		
2233	3040	3F 21 E5		BSTA,UN	WRT	
2234	3042	1B 0E		BCTR,UN	PRINTQ	
2235	3045	3F 33	LS PRINQ1	BSTA,UN	GETCHR	GET POSSIBLE SECOND QUOTE
2236	3048	F7 27		COM1,R3		
2237	304A	9C 31 DE		BCTA,R0	DECP	NO. BACKUP AND RETURN
2238	304D	1F 72		BCTR,UN	FRNTQ2	
2239	304F		*			
2240	304F		*			
2241	304F	44 0F	DOUT	ANDI,R0	0F	
2242	3051	64 30		IORI,R0	00	
2243	3053	1F 21 F5		BCTA,UN	WRT	
2244	3056		*			
2245	3056		*			
2246	3058		*			
2247	3058	07 10	ERR2	LODI,R3	10	TYPE MISMATCH
2248	3058	1F 1D		PCTR,UN	ERROR	
2249	305A	07 03	ERR3	LODI,R3	3	LENGTH MISMATCH
2250	305C	1F 19		BCTR,UN	ERROR	
2251	305E	07 02	ERR7	LODI,R3	02	NEST ERROR
2252	3060	1F 1F		PCTR,UN	ERROR	
2253	3062	07 02	ERR8	LODI,R3	2	STACK OVERFLOW
2254	3064	1F 11		PCTR,UN	ERROR	
2255	3066	07 15	ERR11	LODI,R3	15	IMPROPER VARIABLE NAME
2256	3068	1B 0D		BCTR,UN	ERROR	
2257	306A	07 04	ERR12	LODI,R3	04	LINE NUMBER TOO LONG
2258	306C	1B 09		BCTR,UN	ERROR	
2259	306E	07 14	ERR15	LODI,R3	14	OVERFLOW
2260	3070	1B 05		BCTR,UN	ERROR	
2261	3072	07 13	ERR16	LODI,R3	13	DIVIDE BY ZERO
2262	3074	1B 01		BCTR,UN	ERROR	
2263	3076		*			
2264	3076	00	ETEMP	RES	1	
2265	3077		*			
2266	3077		*			
2267	3077		*			
2268	3077	04 02	ERROR	LODI,R0	2	
2269	3079	03		LPSL		RESET THE PSL IF FROM ARITH. ROUTINE
2270	307A	0B 7A		STRR,R3	ETEMP	SAVE ERROR MESSAGE CODE
2271	307C	07 05		LODI,R3	5	
2272	307E	3B 1B		BSTR,UN	DIRWRT	***
2273	3080	0B 74		LODR,R3	ETEMP	
2274	3082	3F 30 C7		BSTA,UN	WRTM	DISPLAY ERROR TYPE
2275	3085	07 07		LODI,R3	7	
2276	3087	3F 30 C7		BSTA,UN	WRTM	ERROR ***
2277	308A	0F 24 60		LODA,R2	INIT+1	
2278	308D	AF 08 8A		SCEA,R2	SHPT+1	
2279	3090	3F 28 65		BSTA,UN	SHLIN	SHOW CURRENT (FAULTY) LINE
2280	3093	3F 25 B2		BSTA,UN	PAUSE	
2281	3096	1F 27 AC		BCTA,UN	OPTION	LET THEM CHANGE SOMETHING

LINE	ADDR	P1	P2	P3	LABEL	OPCODE	OPERAND
2242	3009				*		
2243	3009	02	02		DTEMP	R25	2
2244	3009				*		
2245	3009				*		
2246	3009				*		
2247	3009	00	01	21	TIPWRT	LODA,R0	*PCU1
2248	3009	00	70		STAR,R0	DTEMP	SAVE
2249	3009	00	70		STAR,R0	DTEMP	RESET CURSOR POSITION
2250	3009	00	71	43	LODA,R2	*MCUR	
2251	3009	00	71		STAR,R0	DTEMP+1	
2252	3009	00	13		LODI,R2	DIRCUR	
2253	3009	00	4F		LODI,R1	DIRCUA	
2254	3009	00	21	45	ESTA,UN	SETCUR	
2255	3009	00			LODZ,R3		
2256	3009	00			STAR,R1		
2257	3009	00	00	3A	ESTA,UN	ERASEL	
2258	3009	00			LODZ,R1		
2259	3009	00			STAR,R3		
2260	3009	00	30	C7	BCTA,UN	WRTM	WRITE THE MESSAGE, RETURN
2261	3009				*		
2262	3009				*		
2263	3009	0A	61		RECCUR	LODR,R2	DTEMP
2264	3009	09	60		LODR,R1	DTEMP+1	
2265	3009	0A	21	45	BCTA,UN	SETCUR	
2266	3009				*		
2267	3009				*		
2268	3009				*		
2269	3009	03			CKNUM0	LODZ,R3	
2270	3009	F4	30		CKNUM	COMI,R0	'0'
2271	3009	10			RETC,LT		
2272	3009	F4	39		CCMI,R0	'9'	
2273	3009	15			RETC,GT		
2274	3009	75	00		CPSL	C0	CLEAR CONDITION CODE BITS
2275	3009	17			RETC,UN		
2276	3009				*		
2277	3009				*		
2278	3009				*		
2279	3009	06	00		WRTM	LODI,R2	0
2280	3009	05	FF		LODI,R1	FF	
2281	3009	02			WRTM2	LODZ,R2	
2282	3009	03			COMZ,R3		
2283	3009	18	0E		PCTR,FQ	WRTM1	
2284	3009	0D	30	ED	WRTM3	LODA,R1	MSG0,+
2285	3009	E4	2F		COMI,R0		
2286	3009	98	79		BCFR,FQ	WRTM3	
2287	3009	06	01		ADDI,R2	1	
2288	3009	18	71		BCTR,UN	WRTM2	
2289	3009	0D	30	ED	WRTM1	LODA,R1	MSG0,+
2290	3009	14	2E		COMI,R0		CHECK FOR END OF MESSAGE
2291	3009	14			RETC,FQ		
2292	3009	54	01		COMI,R0	CP	
2293	3009	90	04		BCFR,FQ	WRTM5	
2294	3009	1E	24		ZPSR	LFGR	
2295	3009	1E	72		BCTR,UN	WRTM1	
2296	3009	2F	21	E5	WRTM5	ESTA,UN	WRT
2297	3009	1E	0D		PCTR,UN	WRTM1	AFTER INCREMENTING HIH BYTE, DO NEXT CHAR
2298	3009				*		

LINE	ADDR	E1	E2	E3	LABEL	OPCODE	OFFEND
2339	30ED					*	
2340	30ED					*	
2341	30ED	4E	45	53	MSG0	ALIT	'NEST.'
2342	30F2	4F	50	54	MSG1	ALIT	'OPTION.'
2343	30FC	53	54	4B	MSG2	ALIT	'STR OVF.'
2344	3104	4C	45	4F	MSG3	ALIT	'LEN MISMATCH.'
2345	3111	4C	4F	20	MSG4	ALIT	'LN #.'
2346	3116	20	2A	2A	MSG5	ALIT	'***'
2347	311C	20	45	58	MSG6	ALIT	'EXECUTING.'
2348	3127	20	45	52	MSG7	ALIT	'ERROR ***'
2349	3131	0D				DATA	CR
2350	3132	2E				DATA	
2351	3133	4F	4F	20	MSG8	ALIT	'NO STOP STMT.'
2352	3140	F3	54	45	MSG9	ALIT	'STEP MODE'
2353	3149	0D				DATA	CR
2354	314A	2E				DATA	
2355	314B	0D			MSGA	DATA	CR
2356	314C	42	4E	50		ALIT	'BKPT AT LINE #'
2357	315C	4F	55	54	MSGB	ALIT	'OUT OF DATA.'
2358	3168	41	52	47	MSGC	ALIT	'ARC.'
2359	316C	49	4E	53	MSGD	ALIT	'INSPECT VAR.'
2360	3178	0D			MSGE	DATA	CR
2361	317A	53	54	4F		ALIT	'STOPPED.'
2362	3182	4C	49	4E	MSGF	ALIT	'LINE NOT FND.'
2363	318F	54	59	F0	MSG10	ALIT	'TYPE MISMATCH.'
2364	3190	53	59	4E	MSG11	ALIT	'SYNTAX.'
2365	31A4	54	4F	4F	MSG12	ALIT	'TOO MANY OPS.'
2366	31B1	44	56	44	MSG13	ALIT	'DVE BY ZERO.'
2367	31BD	4F	56	4C	MSG14	ALIT	'OVF.'
2368	31C1	56	41	52	MSG15	ALIT	'VAR NM.'
2369	31C8					*	
2370	31C8					*	
2371	31C8					*	
2372	31C8	0C	04	60	INCPTR	LODA,R0	INPT+1 INCREMENT LOW BYTE OF INPUT POINTER
2373	31CE	04	01			ADDI,R0	1
2374	31CD	CC	04	60		STRA,R0	INPT+1
2375	31D0	16				RETC,LT	
2376	31E1	15				RETC,GT	RETURN IF NO OVERFLOW
2377	31E2	0C	04	5F		LODA,R0	INPT
2378	31D5	04	01			ADDI,R0	1
2379	31D7	CC	04	5F		STRA,R0	INPT
2380	31DA	17				RETC,UN	
2381	31LB					*	
2382	31DB					*	
2383	31DB					*	
2384	31EB	3F	33	10	SKPDEC	PETA,UN	SKPSF
2385	31EF	0C	04	60	DECPT	LODA,R0	INPT+1 DECREMENT LOW BYTE OF INPUT POINTER
2386	31F1	A4	01			SUBI,R0	1
2387	31F3	CC	04	60		STRA,R0	INPT+1
2388	31EC	77	08			PPSL	WC
2389	31E8	0C	04	5F		LODA,R0	INPT INCREMENT HIGH BYTE OF INPUT POINTER
2390	31EB	A4	00			SUBI,R0	0 SUBTRACT ANY CARRY
2391	31F1	CC	04	5F		STRA,R0	INPT
2392	31F0	7F	08			CPSL	WC
2393	31F2	17				RETC,UN	
2394	31F3					*	
2395	31F3	CC	04	5F	SINPT	LODA,R0	INPT SAVE INPUT POINTER IN STMP

LINE	ADDR	B1	B2	B3	LABEL	OPCODE	OFFRAND
1400	319C	08	7C			STRR,R0	STEMP
1401	319D	13	24	07		LOPR,R0	INPT+1
1402	319E	08	7C			STRR,R0	STEMP+1
1403	319F	17				RETC,UN	
1404	31FE				*		
1405	31FF	00	00		STEMP	RES	2
1406	3200				*		
1407	3200	78	7C		INIT	LOPR,R0	STEMP
1408	3202	00	24	5F		STRA,R0	INPT
1409	3205	08	78			LODR,R0	STEMP+1
1410	3207	00	24	07		STRA,R0	INIT+1
1411	320A	17				RETC,UN	
1412	320B				*		
1413	320C	78	74	5F	GINPT	LODA,R0	INPT
1414	320E	08	7C			STRR,R0	CINPT
1415	3210	00	24	80		LODA,R0	INPT+1
1416	3213	08	22			STRR,R0	CINPT+1
1417	3215	17				RETC,UN	
1418	3216				*		
1419	3218	08	00		CINPT	RES	2
1420	3218				*		
1421	3218	28	7C		CRINPT	LODR,R0	CINPT
1422	321A	00	24	5F		STRA,R0	INPT
1423	321D	08	78			LODP,R0	CINPT+1
1424	321F	00	24	60		STRA,R0	INPT+1
1425	3222	17				RETC,UN	
1426	3223				*		
1427	3223	00	00		OP1	RES	2
1428	3223				*		
1429	3225	08	7C		INCCP1	LODR,R0	OP1+1
1430	3227	84	21			ADDI,R0	1
1431	3229	08	78			STRR,R0	OP1+1
1432	322B	15				RETC,GT	
1433	322C	1C				RETC,LT	
1434	322D	28	74			LODR,R0	OP1
1435	322F	84	21			ADDI,R0	1
1436	3231	08	7C			STRR,R0	OP1
1437	3233	17				RETC,UN	
1438	3234				*		
1439	3234	00	00		OP2	RES	2
1440	3236				*		
1441	323C	08	7C		INCCP2	LODR,R0	OP2+1
1442	323E	84	21			ADDI,R0	1
1443	323A	08	78			STRR,R0	OP2+1
1444	323C	1C				RETC,LT	
1445	323E	15				RETC,GT	
1446	323F	08	74			LODR,R0	OP2
1447	3240	84	21			ADDI,R0	1
1448	3242	08	7C			STRR,R0	OP2
1449	3244	17				RETC,UN	
1450	3245				*		
1451	3245	08	34		LOP	STRR,R0	UTEMP
1452	3247	08	32			STRR,R1	UTEMP+1
1453	3249	3F	32	84	POPNI	BSTA,UN	UTOP
1454	324C	04	03			LODI,R2	3
1455	324E	5E	1A			BSTF,UN	AFT
1456	3250	05	04			LODI,R1	4

2453	3252	3F 2B C6 POP1	BSTA, UN		
2454	3253	08 A2	STRR, R0		
2455	3254	08 21	LODR, R2	PTMP+1	
2456	3255	01	SUBI, R0	1	
2457	3256	08 1D	STRR, R0	PTMP+1	
2458	325D	77 08	PSSL	WC	
2459	325F	08 18	LODR, R2	PTMP	
2460	3261	A4 00	SUBI, R0	0	
2461	3263	08 14	STRR, R0	PTMP	
2462	3265	75 08	CPSL	WC	
2463	3267	F8 09	BDRR, R1	POP1	
2464	3269	17	RETC, UN		
2465	326A				
2466	326A	*			
2467	326A	*			
2468	326A	88 0E APT	ADDP, R0	PTMP+1	
2469	326C	08 0C	STRR, R0	PTMP+1	
2470	326F	77 08	PSSL	WC	
2471	3270	08 07	LODR, R0	PTMP	
2472	3272	84 00	ADDI, R0	0	
2473	3274	08 03	STRR, R0	PTMP	
2474	3276	75 08	CPSL	WC	
2475	3278	17	RETC, UN		
2476	3279				
2477	3279	00 00	PTMP RES	2	
2478	327B	00 00	UTMP RES	2	
2479	327D				
2480	327D	08 7C	PUSH STRR, R0	UTMP	
2481	327F	08 7B	STRR, R1	UTMP+1	
2482	3281	05 04	PUSHNL LODI, P1	4	
2483	3283	3E 0F	BSTR, UN	UTOP	
2484	3285	0E F2	PUSH1 LOIR, R3	*PTMP	
2485	3287	3E 32 D1	BSTA, UN	DECSP	
2486	328A	0F 92 CF	STRA, R3	*SF	
2487	328D	04 01	LODI, R0	1	
2488	328F	3E 59	BSTR, UN	APT	
2489	3291	F8 72	BDRR, R1	PUSH1	
2490	3293	17	RETC, UN		
2491	3294				
2492	3294	05 65	UTOP	LODR, R0	UTMP
2493	3296	08 61	STRR, R0	PTMP	
2494	3298	08 62	LOIR, R0	UTMP+1	
2495	329A	08 5F	STRR, R0	PTMP+1	
2496	329C	17	RETC, UN		
2497	329D				
2498	329D	08 31	INCSP	LODP, R0	SP+1
2499	329F	84 01	ADDI, R0	1	
2500	32A1	08 2D	STRR, R0	SP+1	
2501	32A3	98 06	PCFR, F0	INCSP1	
2502	32A5	08 28	LODR, R0	SP	
2503	32A7	84 01	ADDI, R0	1	
2504	32A9	08 24	STRR, R0	SP	
2505	32AB	08 22	INCSP1	LODP, R0	SP
2506	32AD	10 00 05	COMA, R0	ENDRAM	
2507	32B0	1D 30 02	BCTA, CT	FRR8	
2508	32B3	1A 0A	BCTR, LT	INCSP2	
2509	32B5	08 19	LODR, R0	SP+1	

LINE	ADDR	EX	ES	LABD	OPCODE	OPERAND
2511	3217	EC	00	06	COMA,R0	ENDRAM+1
2511	321A	1E	30	82	BCTA,LT	ERR8
2512	321D	08	12		LOPS,R0	SP
2513	321F	ED	15	24	INCEP2	TABEND
2514	3202	15			RETC,CT	
2515	3203	1E	30	62	BCTA,LT	ERR8
2516	3206	09	08		LOLR,R0	SP+1
2517	320E	EC	17	2F	COMA,R0	TABEND+1
2518	320F	1E	30	62	BCTA,LT	ERR8
2519	320E	17			RETC,UN	
2520	320F					
2521	320F	00	00		RES	2
2522	32D1					
2523	3211	08	7D		DECSF	LODR,R0
2524	3213	84	01		SUPI,R0	1
2525	3215	08	79		SIRB,R0	SP+1
2526	3217	77	09		PESL	WC
2527	3219	0F	74		LODR,R0	SP
2528	321E	A4	02		SUBI,R0	0
2529	321D	08	7D		STRR,R0	SP
2530	321F	75	28		CPSL	WC
2531	3211	1E	42		ECTR,UN	INCSP1
2532	3213					
2533	321E					
2534	3213					
2535	3213	3F	32	0A	GETDAT	BSTA,UN
2536	3216	0C	2C	5F		CSINPT
2537	3219	0C	24	5F	STRA,R0	DATPNT
2538	321E	0C	2C	62	LODA,R0	INPT
2539	321F	0C	24	62	LODA,R0	DATPNT+1
2540	321E	09	0E		LOLR,R0	INPT+1
2541	3214	1E	28		BCTR,EQ	PDATA
2542	3216	3F	33	E0	BSTA,UN	GETD2
2543	3219	17	2C		COMI,R0	SKPSP
2544	321E	18	26		BCTR,IQ	
2545	321D	3F	31	FE	BSTA,UN	GETD3
2546	3300	1E	30		BCTR,UN	DECP1
2547	3302					GETD4
2548	3302					
2549	3302					
2550	3302	00			PDATA	RFS
2551	3303					1
2552	3303					
2553	3303					
2554	3303	3F	35	4B	GETD3	BSTA,UN
2555	3306	3F	34	14	BSTA,UN	EVAL
2556	3309	13			SPSL	STROP1
2557	330A	C3			STRZ,R0	
2558	330B	C4	FF		LODI,R0	FF
2559	332B	05	73		STRR,R0	PDATA
2560	332F	0C	04	5F	LODA,R0	INPT
2561	3312	0C	2C	5F	ST A,R0	DATPNT
2562	3315	0C	24	62	LODA,R0	INPT+1
2563	3312	0C	2C	62	STRA,R0	DATPNT+1
2564	331F	3F	32	18	BSTA,UN	CRINPT
2565	331E	03			LODZ,R0	
2566	331F	03			LPPL	

2567	3317			RETC,UN	
2568	3321	3F 33	EE GETD2	BSTA,UN	GETLIN SKIP OVER POSSIBLE LINE NUMBER
2569	3324	04 29		LODI,R0	COMTR2
2570	3316	05 0E		LODI,R1	COMTB2
2571	3328	3F 28	E7	BSTA,UN	TAPUP
2572	3325	08 05		PCFR,EQ	GETD4
2573	3320	0C 28	FE	LODA,R0	DST+1
2574	3330	18 51		PCTR,EQ	GETD3
2575	3332	3F 33	DE GETD4	BSTA,UN	GETCHR
2576	3335	F7 0D		COMI,R3	CR
2577	3337	08 79		PCFR,EQ	GETD4
2578	3339	0C 84	FF	LODA,R0	*INPT
2579	3330	0A 63		PCFR,LT	GETD2
2580	3331	07 0B		LODI,R3	0B
2581	3340	1F 30	77	BCTA,UN	ERROR
2582	3343		*		
2583	3343		*		
2584	3343		*		
2585	3343	0F 14	A5 MOVEB	LODA,R3	OPLTH
2586	3346	14		RETC,FO	
2587	3347	0C 92	23 MOVEB1	LODA,R0	*OP1
2588	334A	3F 2E	2E	BSTA,UN	PUSOP2
2589	334D	3F 32	25	BSTA,UN	INCOF1
2590	3350	FF 75		BRRR,R3	MOVEB1
2591	3352	17		RETC,UN	
2592	3353		*		
2593	3353		*		
2594	3353		*		RETURNS NAME OF VARIABLE IN NAMEP. VARIABLE NAME IS FROM
2595	3353		*		1-16 CHARACTERS. LENGTH RETURNED IN R2.
2596	3353		*		CC = FC IF FLOATING POINT
2597	3353		*		LT IF STRING, '\$' NOT INCLUDED IN NAME
2598	3353		*		GT IF NO NAME FOUND
2599	3353		*		
2600	3353		*		
2601	3353	0C FF	GETNAM	ICPI,R2	FF
2602	3355	3F 33	E0	BSTA,UN	SKIPF
2603	3358	F7 24	GETNM5	COMI,R3	'\$'
2604	335A	18 1A		BCTR,EQ	GETNM3
2605	335C	3E 2E		BCTR,UN	CKALPH
2606	335F	08 13		PCFR,EQ	GETNM6
2607	3360	03	GETNM1	LODZ,R3	
2608	3361	16 0F		COMI,R2	F
2609	3363	1C 30	66	BCTA,FO	ERR11 NAME TCC ICNG
2610	3366	0F 27	36	STRA,R2	NAMEP.F.
2611	3369	3F 33	D5	BSTA,UN	GETCHR
2612	336C	3F 30	ED	BSTA,UN	CKNUM0
2613	336F	1E 6F		BCIP,EQ	GETNM1
2614	3371	1E 65		BCTR,UN	GETNM5
2615	3373	3F 31	DE GETNM6	BSTA,UN	DECP
2616	3376	0C 01	GETNM3	ADDI,R2	1
2617	3378	18 07		BCTR,EQ	GETNM7
2618	337A	F7 24		COMI,R3	'\$'
2619	337C	1C 37	75	BCTA,FO	RETNL7
2620	337F	22		FOR7,R0	
2621	3380	17		RETC,UN	
2622	3381	04 01	GETNM7	LODI,R0	1
2623	3383	17		RETC,UN	

CLEAR CC

SET GT INTO CC

LINE ADDR R1 R2 R3 LABEL OPCODE OPERAND

2624	3384			*		
2625	3384			*		
2626	3384			*		
2627	3384	E7 41		CKALPH	COMI,R3	A
2628	3386	1C			RETC,LT	
2629	3387	E7 5A			COMI,R3	Z
2630	3389	15			RETC,GT	
2631	338A	75 C0			CPSL	C0
2632	3390	17			RETC,UN	
2633	338D			*		
2634	338D			*		
2635	338D			*		
2636	338D	00 00 00		CBUF1	RFS	4
2637	3391	00 00 00		CBUF2	RFS	4
2638	3395			*		
2639	3395			*		
2640	3395			*		
2641	3395			*		
2642	3395			*		
2643	3395	08 77		COMNUM	LODR,R0	CBUF1+1
2644	3397	28 79			FORB,R0	CBUF2+1
2645	3399	9A 07			BCFR,LT	COMN1
2646	339B	08 71			LODR,R0	CBUF1+1
2647	339D	9A 0D			BCFR,LT	COMGT
2648	339F			*		
2649	339F	07 02		COMLT	LODI,R3	LT
2650	33A1	17			RETC,UN	LESS THAN CONDITION
2651	33A2			*		
2652	33A2	08 69		COMN1	LODR,R0	CBUF1
2653	33A4	28 6B			EORR,R0	CBUF2
2654	33A6	9A 07			BCFR,LT	COMN3
2655	33A8	09 63			LODR,R0	CBUF1
2656	33AA	1A 73			PCTR,LT	COMLT
2657	33AC			*		
2658	33AC	07 01		COMGT	LODI,R3	GT
2659	33AE	17			RETC,UN	GREATER THAN CONDITION
2660	33AF			*		
2661	33AF	0C FF		COMN3	LODI,R2	FF
2662	33B1	07 04			LODI,R3	4
2663	33B3	0E 33 8D		COMN4	LODA,R2	CBUF1
2664	33B6	FF 73 91			COMA,R2	CBUF2.I
2665	33B8	1A 64			BCTR,LT	COMLT
2666	33BF	19 0F			BCTR,GT	COMGT
2667	33BD	FB 74			BDRR,R3	COMN4
2668	33BF	17			RETC,UN	
2669	33C0			*		
2670	33C0			*		
2671	33C0			*		
2672	33C0	3B 1F		LXTLIN	RSTR,UN	SKPSP
2673	33C2	F7 01			COMI,R3	CR
2674	33C4	1C A8 96			PCTA,EO	*RTNADR
2675	33C7	07 11		ERR1	LODI,R3	11
2676	33C9	1F 30 77			BCTA,UN	ERROR
2677	33CC			*		
2678	33CC			*		
2679	33CC			*		
2680	33CC	3B 07		SKPLIN	PSTR,UN	GFTCHR

check of algorithm → ab < +141' << LT, ab > +15A' << GT as check, cc=0

CC RF DI R3 FA, EG SEFEC

20 107

LINE	ADDR	F1	F2	F3	LABEL	OPCODE	OPERAND
2681	330F	17	0D		COMI,R3	CP	
2682	330F	1C	A8	96	BCTA,EC	*RTNADR	
2683	330F	1E	77		BCTR,UN	SKPLIN	
2684	330F						
2685	330F						
2686	330F						
2687	3315	0F	84	5F	GETCHR LODA,R3	*INPT GET CHARACTER	
2688	3318	9F	31	08	BCFA,LT	INCPT IF NCT, UPDATE INPT AND RETURN	
2689	33DB	07	08		ERR10 LODI,R3	8	
2690	33DD	1F	37	77	BCTA,UN	ERROR	<i>what are these errors</i>
2691	33E0						
2692	33E0						
2693	33E0						
2694	33E2	3B	73		SKPSP BSTR,UN	GETCHR	<i>skip space</i>
2695	33E2	17	20		COMI,R3		
2696	33E4	18	7A		BCTR,FO	SKPSP	
2697	33E6	17			RETC,UN		
2698	33E7						
2699	33E7						
2700	33E7						
2701	33E7	3F	77		SKPCOM BSTR,UN	SKPSP	
2702	33E9	F7	2C		COMI,R3		
2703	33EB	98	5A		BCTR,FO	ERR1	
2704	33ED	17			RETC,UN		
2705	33EE						
2706	33EE						<i>get line number as 4096 and not 4095</i>
2707	33EE						
2708	33EE	3B	70		GETLIN BSTR,UN	SKPSP SKIP THE SPACES	
2709	33F0	20			FORZ,R0		
2710	33F1	0E	04		LODI,R1	4	
2711	33F3	CD	47	69	GETLI1 STRA,R1	LINNUM.- ZERO LINNUM	
2712	33F6	59	7B		ERNR,R1	GETLI1	
2713	33F8	05	FF		LODI,R1	FF	
2714	33FA	3F	30	BD	GETLI2 BSTA,UN	CKNUM0	<i>check if line number is 4096</i>
2715	33FD	9C	31	FF	BCFA,FO	RECPT	<i>20 min, begin 4096 for line number</i>
2716	3402	15	04		COMI,R1	4	
2717	3402	1C	30	6A	BCTA,FO	ERR12 LINE NUMBER TOO LONG	
2718	3405	CD	27	69	STRA,R1	LINNUM,+ STORE THE NUMBER IN THE BUFFER	
2719	3408	3F	33	D5	BSTA,UN	GETCHR	<i>get next character</i>
2720	340B	1B	6D		BCTR,UN	GETLI2	
2721	340D						
2722	340D						
2723	340D						
2724	340D	CC	12	34	STROP2 STRA,R0	OP2	
2725	3410	CD	12	35	STRA,R1	OP2+1	
2726	3413	17			RETC,UN		
2727	3414						
2728	3414						
2729	3414						
2730	3414	CC	12	23	STROP1 STRA,R0	OP1	
2731	3417	CD	12	24	STRA,R1	OP1+1	
2732	341A	17			RETC,UN		
2733	341B						
2734	341B						
2735	341B						
2736	341B	02			LOP1 RES	1	
2737	341C	02			LOP2 RES	1	

LINE	ADDR	R1	B2	B3	LABEL	OPCODE	OPERAND
2779	341E				*		
2780	341F				*		
2781	341D				*	GETS THE NEXT LOGICAL OPERATOR(S):	=, >, <, >=, <=
2782	341E				*		
2783	341F	FE	FF		GETLOP	LODI,R1	FP
2784	341F	CE	7F		STRR,R1	LOP2	
2785	3421	3F	33	FE	GETLO	BSTA,UN	SRPSP
2786	3424	EF	3D		COMI,R3	"	
2787	3426	18	2E		BCTR,EQ	GETL1	
2788	3428	EF	3C		COMI,R3	<	
2789	342A	18	2D		BCTR,EQ	GETL2	
2790	342C	EF	3F		COMI,R3	>	
2791	342F	9C	34	42	PCPA,EO	GETL7	
2792	3431	24	21		LODI,R0	GT	
2793	3433	1F	06		BCTR,UN	GETL4	
2794	3435	24	20		GETL1	LODI,R0	EQ
2795	3437	1B	32		BCTR,UN	GETL4	
2796	3439	24	22		GETL2	LODI,R0	LT
2797	343F	31	34	1E	GETL4	STRA,R1	LOP1,+ STORE IT
2798	343F	21			LODZ,R1		CHECK R1 FOR FIRST CHAR
2799	343F	15			RETC,GT		
2800	3440	1B	5F		BCTR,UN	GETL6	
2801	3442	01			GETL7	LODZ,R1	
2802	3443	1E	33	C7	PCTA,LT	ERR1	SYNTAX ERROR
2803	3445	1F	31	DE	BCTA,UN	DEOPT	
2804	3449				*		
2805	3449				*		
2806	3449				*		
2807	3449	27	00		COMOP	LODI,R3	0 INITIALIZE RETURN STATUS
2808	344F	CF	14	A5	LODA,R2	OPLTH	GET LENGTH OF COMPARE
2809	344F	14			RETC,EQ		
2810	344F	FC	92	23	COMOP1	LODA,R0	*OP1
2811	3452	FC	92	34	COMA,R0		*OP2
2812	3455	1F	33	9F	BCTA,LT	COMLT	
2813	3458	1E	33	AC	BCTA,GT	COMGT	
2814	345B	3F	32	25	BSTA,UN	INCOF1	
2815	345E	3F	32	30	BSTA,UN	INCOF2	
2816	3461	FA	6C		BDRR,R2	COMOP1	
2817	3463	22			EORZ,R0		
2818	3464	17			RETC,UN		
2819	3465				*		
2820	3465				*		
2821	3465				*		
2822	3465	24			GCS1	RFS	1
2823	3466	02			GCS2	RFS	1
2824	3467				*		
2825	3467				*		
2826	3467				GCVAR	EORZ,R2	
2827	3468	08	35		STRR,R0	CREATD	
2828	346A	3F	3C	DA	BSTA,UN	LOKVAR	
2829	346B	14			RETC,EQ		
2830	346E	16			RETC,LT		
2831	346F	3F	33	53	GCVAR2	BSTA,UN	GETNAM
2832	3472	15			RETC,GT		
2833	3473	CA	70		STRR,R2	OPLTH	

2795	3475 1E 34 A0	BCTA,LT	GC	GCSTR
2796	3476 3F 33 E0	BSTA,UN	SKFSP	
2797	347B E7 28	COMI,R3	'1'	CHECK THE DIMENSIONED VAR
2798	347D 1C 33 AC	PCTA,EQ	COMGT	
2799	3480 3F 31 DE	BSTA,UN	DECP	Default value
2800	3483 04 02	LODI,R0	2	
2801	3485 05 04	LODI,R1	LEN	
2802	3487 0A 1C	LODR,R2	OPLTH	
2803	3489 07 00	LODI,R3	0	
2804	348E 3F 34 D0	BSTA,UN	GCSUE	
2805	348E 05 05	LODI,R1	5	CLEAR THE VARIABLE AND NEXT BYTE
2806	3492 2E	GCEPT1	EORZ,R0	
2807	3491 3F 2E 2E	BSTA,UN	PUSOP2	
2808	3494 F9 7A	BERR,R1	GCEPT1	
2809	3496 0C 03 FA GETDST	LODA,R0	DST	
2810	3499 2D 23 FB	LODA,R1	DST+1	
2811	349C 75 00	CPSL	C0	
2812	349E 17	RETC,UN		
2813	349F	*		
2814	349F 00	CREATD RES	1	
2815	34A0	*		
2816	34A2 04 FF	GCSTR	LODI,R0	FF
2817	34A2 09 7E		STRR,R0	CREATD
2818	34A4 17		RETC,UN	
2819	34A5	*		
2820	34A5 00	OPLTH RES	1	
2821	34A6 00	GCSSTG RES	1	
2822	34A7	*		
2823	34A7 09 7D	GCSTRA	STRR,R1	GCSSTG
2824	34A9 0A 7A		LODR,R2	OPLTH
2825	34AB 0C 00		LODI,R2	00 MAKE IT A STRING
2826	34AD 04 03		LODI,R0	3
2827	34AF 07 00		LODI,R3	0
2828	34B1 3F 34 D0	BSTA,UN	GCSUB	
2829	34B4 08 70		LODR,R0	GCSSTG
2830	34B6 C1	GCSTR1	STRZ,R1	
2831	34B7 3F 2E 2E	BSTA,UN	PUSOP2	
2832	34BA 04 20	GCSTR3	LODI,R2	
2833	34BC 3F 2E 2E	BSTA,UN	PUSOP2	
2834	34BF F9 79	BERR,R1	GCSTR3	
2835	34C1 20		EORZ,R0	
2836	34C2 3F 2E 2E	BSTA,UN	PUSOP2	
2837	34C5 08 0A		LODI,R2	SDFLT
2838	34C7 3F 34 96	BSTA,UN	GETDST	
2839	34CA 07 FF		LODI,R3	FF SET LT CONDITION
2840	34CC 17	RETC,UN		
2841	34CD 00	GCVT1	RES	1
2842	34CF 00	GCVT2	RES	1
2843	34CF 00	GCVT3	RES	1
2844	34D0	*		
2845	34D2 08 7B	GCSUE	STRR,R0	GCVT1 2 OR 3
2846	34D2 09 7A		STRR,R1	GCVT2 LENGTH OF VARIABLE
2847	34D4 0E 95 24		STRA,R2	*TABEND LENGTH OF NAME
2848	34D7 0E 76		STRR,R3	GCVT3 HIGH BYTE OF LEN OF VAR
2849	34D9 0C 15 24		LODA,R0	TABEND
2850	34DC 0C 12 34		STRA,R0	OF2
2851	34DE 0C 13 2F		LODA,R0	TABEND+1

LINE	ADDR	R1	R2	R3	LABEL	OPCODE	OPERAND
2012	34F2	00	12	35		STRA,R3	OP2+1
2013	34F3	04	27			LODI,R0	NAMBUF
2014	34F7	00	12	23		STRA,R0	CF1
2015	34FA	04	36			LODI,R0	NAMBUF
2016	34FC	00	12	24		STRA,R0	OP1+1
2017	34FE	3F	32	30		PSTA,UN	INCOF2
2018	34FF	01	14	A5		LODA,R1	OP1+1
2019	34FF	01	17	35		ADDA,R1	OP2+1
2020	34FF	77	78			PFSL	UC
2021	34FA	00	12	34		LODA,R0	OP2
2022	34FD	04	22			ADDI,R0	0
2023	34FF	75	41			CISL	CRY
2024	3501	02	4A			ADDA,R1	GCVT1
2025	3501	04	47			ADDI,R0	0
2026	3505	00	22	1A		STRA,R0	DST
2027	3508	00	28	1B		STRA,R1	DST+1
2028	350B	75	01			CPSL	CRY
2029	350D	0E	14	CE		ADDA,R1	GCVT2
2030	3512	8C	14	CF		ADDA,R0	GCVT3
2031	3513	75	28			CPSL	UC
2032	3515	08	0E			STRR,R0	TABEND
2033	3517	08	0C			STRR,R1	TABEND+1
2034	3519	3F	23	2E		PSTA,UN	PUSOP2
2035	351C	01				LOPZ,R1	
2036	351E	3F	2P	21		PSTA,UN	PUSOP2
2037	3520	3F	33	43		PSTA,UN	MOVEB
2038	3523	17				RETC,UN	
2039	3524				*		
2040	3524				*		
2041	3524				*		
2042	3524	00	00			TABEND RES	2
2043	3525				*		
2044	352C	02				PUSOP LODZ,R3	
2045	3527	09	2F			LODR,R1	OPSP
2046	3529	00	07	55		STRA,R1	OPSTK,I
2047	352C	85	01			ADDI,R1	1
2048	352F	00	02			STRR,R1	OPSP
2049	3532	00	10			COMI,R1	10
2050	3532	10				RETC,LT	
2051	3533	07	12		ERR5	LODI,R3	12
2052	3535	1F	30	77		BCTA,UN	ERROR
2053	3538				*		
2054	3538	0E				OPSP RES	1
2055	3539				*		
2056	3539	09	7D		PGPCP	LODR,R1	OPSP
2057	353F	A5	21			SUBI,P1	1
2058	353D	1A	74			BCTR,LT	ERR5
2059	353F	01	07	55		LODA,R1	OPSTK,I
2060	3542	03				STRZ,R3	
2061	3543	09	73			STRR,R1	OPSP
2062	3545	17				RETC,UN	
2063	3546				*		
2064	3546				*		
2065	3546				*		
2066	3546	00				GOE RES	1
2067	3547				*		
2068	3547				*		

LINE	AL	R1	R2	CC	ED	CODE	STANDARD
2910	3547	20				SFTGOT	FORZ,R0
2911	3548	02	7C				STRR,R0 GOT
2912	354A	17					RETC,UN
2913	354B				*		
2914	354B				*		
2915	354B				*	FVAL.RETURNS CC = EQ IF NORMAL, VALUE ON STACK	
2916	354B				*	LT IF STRING, R0, R1 = ADDRESS. R2 = LENGTH	
2917	354B				*	GT IF NOT FOUND	
2918	354B				*		
2919	354B				*		
2920	354B	04	01			EVAL	LODI,R0 1
2921	354D	08	77				STRR,R0 GOT
2922	354F	20					FORZ,R0 INITIALIZE OPERATOR STACK POINTER
2923	3550	08	66				STRR,R0 OPSP
2924	3552	07	07			EVALNL	LODI,R3 7 THIS INDICATED BEGINNING
2925	3554	3B	50			BSTR,UN	PUSHOP INITILIZE OPERATOR STACK
2926	3556	3F	3C 47			BSTA,UN	CKNFG
2927	3559	3F	36	DA		EVAL2	BSTA,UN LOKVAR TRY TO READ A VARIABLE
2928	355C	1B				RETC,LT	
2929	355D	08	07			BCFR,EQ	EVAL15
2930	355F	3F	32 7D			BSTA,UN	PUSH
2931	3562	3B	63			BSTR,UN	SETCOT
2932	3564	1B	26			ECTR,UN	EVAL1
2933	3566	3F	39 C5			EVAL15	BSTA,UN ECONST TRY TO READ A CONSTANT
2934	3568	7C	35 47			BSTA,FO	SETGOT
2935	356C	3F	33 E2			EVAL1	BSTA,UN SKPSP
2936	356F	03				LODZ,R3	
2937	3572	05	75			LODI,R1	5 NUMBER OF OPERATORS
2938	3572	11	56 F4			EVAL3	COMA,R1 OPTBL,-
2939	3575	1C	35 A9			BCTA,EQ	FCP OPERATOR MATCH
2940	3578	59	78			EPNR,R1	EVAL3
2941	357A	F7	29			COMI,R3	')
2942	357C	1C	35 E2			BCTA,EQ	EDEL1
2943	357F	F7	29			COMI,R3	' (
2944	3581	1C	35 F5			BCTA,EQ	EDEL
2945	3584	3F	31 DE			BSTA,UN	DEOPT
2946	3587	24	36			LODI,R0	FCNTAB
2947	3589	0F	68			LODI,R1	FCNTAB
2948	358B	3F	28 B7			BSTA,UN	TARUP
2949	358E	1C	36 2C			BCTA,EQ	EPON
2950	3591	3F	25 39			EVAL7	BSTA,UN POPOP
2951	3594	F7	27			COMI,F3	7
2952	3596	08	04			ECFR,EQ	EVAL8
2953	3598	0C	15 46			LODA,R0	GOT
2954	359B	17				RETC,UN	
2955	359C	03				EVAL8	LODZ,R3
2956	359D	44	07			ANDI,R0	7
2957	359F	F4	23			COMI,R0	3
2958	35A1	1D	33 C7			ECTA,GT	EPF1 SYNTAX ERROR
2959	35A4	3F	35 F8			BSTA,UN	DOOP
2960	35A7	1B	08			ECTR,UN	EVAL7
2961	35A9				*		
2962	35AB	0D	76 59			LODA,R1	OPCOD.I GET OPERATOR CODE
2963	35AC	01				RRL,R1	
2964	35AD	11				RRL,R1	
2965	35AE	11				RRL,R1	

LINE	ADDR	R1	R2	R3	INSTR	OPCODE	OPERAND
2006	317F	01				LODZ,R1	
2007	3180	02	1B			STPR,R2	TEMPOP SAVE OPERATOR
2008	3181	03	35	39	10P1	ESTA,UN	PCPCP GET OPERATOR FROM STACK
2009	3182	03				LODZ,R3	
2010	3183	01				STRZ,R1	
2011	3184	47	07			ANDI,R3	7
2012	3185	03	17			LOLF,R0	TEMPOP
2013	3186	44	07			ANDI,R2	7
2014	3187	03				COMZ,R3	
2015	3188	8A	2E			PCFR,IP	LOPZ IF INPUT = STACK, DC OPERATION ON STACK
2016	3189	01				LODZ,R1	
2017	3190	03				STRZ,R3	
2018	3191	31	35	26		ESTA,UN	PUSHOP
2019	3192	44	0E			LOLF,R3	TEMPOP GET INPUT OPERATOR
2020	3193	31	35	26		ESTA,UN	PUSHOP PUSH IT ONTO STACK
2021	3194	1F	35	50		BCTA,UN	EVAL2
2022	3195				*		
2023	3196				*		
2024	3197				*		
2025	3198	0V				TEMPOP RES	1
2026	3199				*		
2027	3101	01			LOP2	LODZ,R1	
2028	3102	03				STRZ,R3	
2029	3103	3F	35	FB		ESTA,UN	DOOP
2030	3104	1F	31			PCFR,UN	POP1
2031	3105				*		
2032	3106	07	FB		EDFL	LODI,R3	5
2033	3107	3F	35	20		ESTA,UN	PUSHOP
2034	3108	7F	36	47		ESTA,UN	CKNEG
2035	3109	1F	35	59		BCTA,UN	EVAL2
2036	3110				*		
2037	3111	7F	3F	39	FIELD1	ESTA,UN	PCPCP
2038	3112	03				LODZ,R3	
2039	3113	44	07			ANDI,R2	7
2040	3114	14	07			COMI,R0	7
2041	3115	10	37	07		BCTA,RQ	ERR1
2042	3116	14	0E			COMI,R0	5
2043	3117	10	35	80		BCTA,RQ	EVAL1
2044	3118	14	0E			COMI,R0	6
2045	3119	16	31			BCTR,RQ	EFCNEX
2046	3120	2F	02			BSTR,UN	DOOP
2047	3121	1B	02			BCTR,UN	EDFL1
2048	3122				*		
2049	3123	77	23		DOOP	COMI,R3	3
2050	3124	00	06			PCFR,RQ	DOOP1
2051	3125	3F	3D	11		ESTA,UN	POP0PB
2052	3126	1F	3C	19		BCTA,UN	FPABS1
2053	3127	53			LOOP1	RRR,R3	
2054	3128	53				RRR,R3	
2055	3129	47	0E			ANDI,R3	0E
2056	3130	2F	70	5E		LODA,R3	OPJUMP,I
2057	3131	00	00	FA		STRA,R0	DST
2058	3132	0F	36	5E		LODA,R3	OPJUMP,+
2059	3133	00	00	FB		STRA,R0	DST+1
2060	3134	1F	48	FA		BCTA,UN	*DST
2061	3135				*		
2062	3136	53			EFCNEX	RRR,R3	

3023	3616	53		R00,R3			
3024	3617	53		R00,R3			
3025	3618	47 1F		ANDI,R3	1F		
3026	361A	01 7C R0		LOFA,R3	FCNJMP,I		
3027	361D	00 09 FA		STRA,R0	DST		
3028	3622	0F 36 P0		LODA,R3	FCNJMP,+		
3029	3623	00 70 FB		STRA,R0	DST+1		
3030	3625	3F A8 FA		BSTA,UN	*DST		
3031	3629	1F 35 6C		BCTA,UN	EVAL1		
3032	362C		*				
3033	362C	3F 33 E0 EFCN		BSTA,UN	SKPSP		
3034	362F	F7 28		COMI,R3	'('		
3035	3031	9C 33 C7		PCFA,E0	ERR1	SYNTAX ERROR	
3036	3634	0B 08 7B		LODA,R1	DST+1		
3037	3637	D1		RRL,R1			
3038	3638	L1		RRL,R1			
3039	3639	D1		RRL,R1			
3040	363A	05 06		IORI,R1	6	FUNCTION CODE	
3041	363C	01		LODZ,R1			
3042	363D	03		ST Z,R3			
3043	363E	3F 35 26		BSTA,UN	PUSHOP	PUSH CODE AND FUNCTION ONTO OPSIK	
3044	3641	3F 36 47		PSTA,UN	CKNEG		
3045	3644	1F 35 59		BCTA,UN	EVAL2		
3046	3647		*				
3047	3647	2F 3E F7 CKNEG		BSTA,UN	SKPSP		
3048	364A	E7 2D		COMI,R3	-		
3049	364C	9C 31 DE		BCFA,F0	DECP		
3050	364F	07 23		LODI,R3	3		
3051	3651	1F 35 26		BCTA,UN	PUSHOP		
3052	3654		*				
3053	3654	1F 2A 2F OPTPL		ALIT	'**/+'		
3054	3659	02	JPCOD	DATA	0		
3055	365A	01		DATA	1	*	
3056	365E	01		DATA	1	/	
3057	365C	02		DATA	2		
3058	365D	02		DATA	2		
3059	365F		*				
3060	365F	3F 97	CPJUMP	ACON	FFFXF		
3061	3662	38 91		ACON	FFMULT		
3062	3662	38 94		ACON	FFPIV		
3063	3664	37 EF		ACON	FFADD		
3064	3666	37 FD		ACON	FFSUP		
3065	3668		*				
3066	3669		*				
3067	3668	45 58 5A FCNTAB		ALIT	'EXP.'		
3068	366C	00 00		ACON	0		
3069	366F	43 4F 53		ALIT	'COS.'		
3070	3672	00 02		ACON	2		
3071	3674	03 49 4E		ALIT	'SIN.'		
3072	3675	00 04		ACON	4		
3073	367A	04 41 4F		ALIT	'TAN.'		
3074	367E	07 06		ACON	6		
3075	3680	41 42 53		ALIT	'ARS.'		
3076	3684	00 08		ACON	8		
3077	368C	13 47 4E		ALIT	'SGN.'		
3078	369A	00 0A		ACON	A		
3079	368C	52 4E 44		ALIT	'RND.'		

LINE	ADDR	OP	RS	TABLE	CODE	OPERAND
2000	3000 00 00				ACON	C
2001	3001 00 01				SCF.	
2002	3002 00 02				ACON	F
2003	3003 00 03				ALIT	INT.
2004	3004 00 04				ACON	10
2005	3005 00 05				ALIT	PRE.
2006	3006 00 06				ACON	12
2007	3007 00 07				ALIT	IN.
2008	3008 00 08				ACON	14
2009	3009 00 09				ALIT	LOG.
2010	3010 00 10				ACON	16
2011	3011 00 11				DATA	FF
2012	3012					
2013	3013					
2014	3014					
2015	3015					
2016	3016					
2017	3017					
2018	3018					
2019	3019					
2020	3020					
2021	3021					
2022	3022					
2023	3023					
2024	3024					
2025	3025					
2026	3026					
2027	3027					
2028	3028					
2029	3029					
2030	3030					
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2037	3037					
2038	3038					
2039	3039					
2040	3040					
2041	3041					
2042	3042					
2043	3043					
2044	3044					
2045	3045					
2046	3046					
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2097	3097					
2098	3098					
2099	3099					

modified table

table

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table

137	E7 3D 4E	FR,1			
3138	36F9 28 DC	LODR,R0	*LTEMP	GET HIGH BYTE OF FORWARD REFERENCE	
3139	36FB C8 2E	STRA,R0	FREF	SAVE IT	
3140	36FD 3E 4E	BSTR,UN	INCL		
3141	36FF 28 16	LODR,R2	*LTEMP	GET LOW BYTE OF FORWARD REFERENCE	
3142	3721 C8 29	STRA,R0	FREF+1	SAVE IT	
3143	3723 3B 43	BSTR,UN	INCL		
3144	3725 3F 33 D5	BSTA,UN	GETCHR	GET CHARACTER FROM INPUT	
3145	3728 1B CD	COMI,R3	*LTEMP	CHECK FOR MATCH	
3146	372A 98 2F	BCFR,E0	LOKV3	NO MATCH, SKIP VARIABLE	
3147	372C F9 75	BDRR,R1	LOKV2	SEE IF END	
3148	372E 3F 33 F5	BSTA,UN	GETCHR	GET NEXT CHARACTER	
3149	3711 3F 30 BD	BSTA,UN	CKNUM0		
3150	3714 18 25	BCTR,E0	LOKV3	NOT A MATCH IF STILL A NUMBER LEFT	
3151	3716 3F 33 84	BSTA,UN	CKALPH		
3152	3719 98 12	BCFR,E0	LOKV5		
3153	371B 3F 32 00	BSTA,UN	PINPT		
3154	371E 08 2B	LODR,R0	FREF		
3155	3720 29 2A	LODR,R1	FREF+1	GET THE FORWARD REFERENCE	
3156	3722 CC 18 D7	STRA,R0	LTEMP		
3157	3725 CD 16 D8	STRA,R1	LTEMP+1	RESET TABLE POINTER	
3158	3728 1F 36 ED	BCTA,UN	LOKV1A		
3159	372B	*			
3160	372B 20 20	FREF	RES	2	
3161	372D	*			
3162	372E 3F 36 C8	LOKV5	BSTA,UN	INCL	POINT TO FIRST BYTE OF VARIABLE
3163	3732 F7 24	COMI,R3			
3164	3732 98 29	BCFR,E0	LOKV5		
3165	3734 3F 31 C8	BSTA,UN	INCPT		
3166	3737 0F 96 E7	LODA,R2	*LTEMP	GET LENGTH OF STRING	
3167	373A 3F 36 C8	BSTA,UN	INCL		
3168	373D 3F 31 D1	LOKV8	BSTA,UN	DECPT	
3169	3740 0C 16 E7	LODA,R0	LTEMP		
3170	3743 2D 16 D8	LODA,R1	LTEMP+1	GET THE POINTERS	
3171	3746 F7 24	COMI,R3			
3172	3748 98 27	BCFR,E0	LOKV6	NOT A STRING	
3173	374A 0F 16 D9	LODA,R3	LTEMP+2		
3174	374D 0E 37 1E	BCFA,LT	LOKV3		
3175	3752 17	RETC,UN			
3176	3751	*			
3177	3751 0F 16 D9	LOKV6	LODA,R3	LTEMP+2	GET DATA BYTE
3178	3754 47 C0	ANDI,R3	C0		
3179	3756 19 22	BCTR,GT	LOKV7	BRANCH IF DIMENSIONED	
3180	3758 17	RETC,UN			
3181	3759	*			
3182	375C 06 00	LOKV9	LODI,R2	0	
3183	375E 3F 31 C8	BSTA,UN	INCPT		
3184	375E 3F 33 D5	LOKV10	BSTA,UN	GETCHR	
3185	3761 E7 27	COMI,R3			
3186	3763 18 24	BCTR,E0	LOKV11		
3187	3765 86 71	APDI,R2	1		
3188	3767 1B 75	BCTR,UN	LOKV10		
3189	3769 0C 11	FE	LOKV11	STEMP	
3190	376C 27 11	FE	LODA,R1	STEMP+1	
3191	376F 65 21	ADDI,R1	1		
3192	3771 98 22	BCFR,E0	RETNLT		
3193	3773 84 21	ADDI,R0	1		

LINE	ADDR	D1	D2	D3	LABEL	OPCODE	OPERAND
3194	3775	07	FF		RETNLT	ICDI,R3	FF SET LT CONDITION
3195	3777	17				RETC,UN	<i>R0, R1 is address 18 bits only, CC & LT</i>
3196	3778				*		
3197	3778				*		
3198	3778				*		
3199	3778	00	00		LVT2	RES	2
3200	377A				*		
3201	377A				*		
3202	377A				*		
3203	377A	08	7C		LOCKV7	STRR,R0	LVT2
3204	377C	CD	17	79		STRA,R1	LVT2+1
3205	377F	3F	33	E2		BSTA,UN	SKPSP
3206	3782	F7	28			COMI,R3	'(' <i>square error</i>
3207	3784	6C	33	C7		BCFA,E0	ERR1
3208	3787	3F	36	DA		BSTA,UN	LOKVAR
3209	378A	3F	32	7D		BSTA,UN	PUSH
3210	378D	3F	31	C8		BSTA,UN	INCPT
3211	3790	3F	3C	F5		BSTA,UN	PO C1
3212	3793	3F	2A	17		BSTA,UN	DTOBNI
3213	3796	20				FORZ,E0	
3214	3797	A5	01			SUBI,R1	1
3215	3799	77	08			PPSL	WC
3216	379B	75	01			CPSL	CRY
3217	379D	D1				RRL,R1	
3218	379E	D2				RRL,R0	
3219	379F	D1				RRL,R1	
3220	37A0	D2				RRL,R0	
3221	37A1	8D	17	79		ADDA,R1	LVT2+1
3222	37A4	9C	17	78		ADDA,R0	LVT2
3223	37A7	95	08			CPSL	C0+WC
3224	37A9	17				RETC,UN	
3225	37AA				*		
3226	37AA				*****		
3227	37AA				*		
3228	37AA				*	TRANSFER ROUTINE	
3229	37AA				*		
3230	37AA				*	THIS ROUTINE TRANSFERS THE OPERANDS FROM THE STACK TO OPB AND OPA	
3231	37AA				*		
3232	37AA	04	27		TRAN	LODI,R0	OPB
3233	37AC	05	41			LODI,R1	OPB
3234	37AF	3F	32	45		BSTA,UN	POP PCP SECOND OPERAND OFF STACK
3235	37B1	24	27			LODI,R0	OPA
3236	37B3	05	48			LODI,R1	OPA
3237	37F5	3F	32	45		BSTA,UN	POP POP FIRST OFFRANND OFF STACK
3238	37F8	07	00			LODI,R3	00
3239	37BA	77	08			PPSL	WC
3240	37BC	17				RETC,UN	
3241	37BD				*		
3242	37BD				*****		
3243	37BD				*		
3244	37BD				*	SUBTRACTION ROUTINE	
3245	37BD				*		
3246	37BD				*	THIS ROUTINE SUBTRACTS TWO PINARY FLOATING POINT NUMBERS	
3247	37BD				*		
3248	37BD	3F	6B		FPSUP	PSTR,UN	TRAN TRANSFER OPERANDS
3249	37F1	3F	38	4F		BSTA,UN	TCOM PERFORM TWO'S COMPLEMENT
3250	3702	1B	27			PCTR,UN	ADDJ

3251	3784	06	27	ADDC	LODI,R2	OPB	
3252	3785	07	4E		LODI,R3	CPB	
3253	3786	1B	07		BCTR,UN	ADDE	
3254	378A			*			
3255	378A	06	27	ADDE	LODI,R2	OPA	
3256	378B	07	48		LODI,R3	OPA	
3257	378C	0E	27	4D	LODA,R1	OPB	FETCH EXP OF OPERAND 1 IN R1
3258	378D	0E	27	45	ADDE	STRA,R2	ADR
3259	378E	0F	27	46		STRA,R3	ADR+1
3260	378F	07	01	ADDF	LODI,R3	1	SFT BYTE COUNTER
3261	3790	77	01		FPST	CRY	SET CARRY
3262	3791	0F	E7	4E	LODA,R3	*ADR,I	FETCH MS BYTE OF MATISSA
3263	3792	1A	02		BCTR,LT	ADDE	IF BYTE IS NEGATIVE, BRANCH
3264	3793	75	01		CPST	CRY	
3265	3794	06	04	ADDE	LODI,R2	LEN	SET END OF BYTE COUNTER
3266	3795	3F	38	33	BSTA,UN	RRIN	ROTATE RIGHT MANTISSA AND INCR EXPONENT
3267	3796	0C	87	45	LODA,R0	*ADR	TEST TWO EXPONENTS
3268	3797	E1			COMZ,R1		
3269	3798	08	6A		BCTR,EQ	ADDF	IF NOT EQUAL, CONTINUE
3270	3799	1B	16		BCTR,UN	ADDF	IF EQUAL, ALIGN READY, GO BACK
3271	379A			*			
3272	379B			*****			
3273	379C			*			
3274	379D			*			
3275	379E			*			
3276	379F			*			
3277	37A0			*			
3278	37A1			*			
3279	37A2	3F	37	AA	FPADD	BSTA,UN	TRAN
3280	37A3	7E	02	ADDF	CPST	COM	COM
3281	37A4	20			EORZ,R0		
3282	37A5	0C	07	4C	STRA,R0	OPA+LEN	
3283	37A6	0C	07	51	STRA,R0	OPB+LEN	
3284	37A7	0D	07	48	LODA,R1	OPA	COMPARE EXPONENTS OF THE TWO OPERANDS
3285	37A8	ED	07	4D	COMA,R1	OPB	
3286	37A9	19	41		BCTR,GT	ADDC	ALIGN OPERAND 2 OPA>OPB
3287	37AA	1A	45		BCTR,LT	ADDE	ALIGN OPERAND 1 OPB>OPA
3288	37AB	75	01	ADDF	CPST	CRY	
3289	37AC	07	04		LODI,R3	LEN	SET BYTE COUNTER
3290	37AD	0F	07	4D	ADDC	LODA,R3	OPB,I
3291	37AE	0F	07	48	ADDA,R3	OPA,I	
3292	37AF	0F	07	4D	STRA,R3	OPB,I	
3293	37B0	FB	75		BDRR,R3	ADDC	DECR BYTE COUNTER AND BRANCH IF NOT DONE
3294	37B1	04	27	ROOF	LODI,R0	OPB	
3295	37B2	05	4D		LODI,R1	CPB	
3296	37B3	3F	38	26	BSTA,UN	OVFL	
3297	37B4	3F	39	94	BSTA,UN	NORM	NORMALIZE RESULT
3298	37B5	24	02	PUSHRS	LODI,R0	2	
3299	37B6	03			LPSL		
3300	37B7	04	27		LODI,R0	OPB	
3301	37B8	05	4D		LODI,R1	CPB	
3302	37B9	1F	32	7D	BCTA,UN	PUSH	
3303	37BA			*			
3304	37BB			*****			
3305	37BC			*			
3306	37BD			*			
3307	37BE			*			
3308	37BF			*			
3309	37C0			*			
3310	37C1			*			
3311	37C2			*			
3312	37C3			*			
3313	37C4			*			
3314	37C5			*			
3315	37C6			*			
3316	37C7			*			
3317	37C8			*			
3318	37C9			*			
3319	37CA			*			
3320	37CB			*			
3321	37CC			*			
3322	37CD			*			
3323	37CE			*			
3324	37CF			*			
3325	37D0			*			
3326	37D1			*			
3327	37D2			*			
3328	37D3			*			
3329	37D4			*			
3330	37D5			*			
3331	37D6			*			
3332	37D7			*			
3333	37D8			*			
3334	37D9			*			
3335	37DA			*			
3336	37DB			*			
3337	37DC			*			
3338	37DD			*			
3339	37DE			*			
3340	37DF			*			
3341	37E0			*			
3342	37E1			*			
3343	37E2			*			
3344	37E3			*			
3345	37E4			*			
3346	37E5			*			
3347	37E6			*			
3348	37E7			*			
3349	37E8			*			
3350	37E9			*			
3351	37EA			*			
3352	37EB			*			
3353	37EC			*			
3354	37ED			*			
3355	37EE			*			
3356	37EF			*			
3357	37F0			*			
3358	37F1			*			
3359	37F2			*			
3360	37F3			*			
3361	37F4			*			
3362	37F5			*			
3363	37F6			*			
3364	37F7			*			
3365	37F8			*			
3366	37F9			*			
3367	37FA			*			
3368	37FB			*			
3369	37FC			*			
3370	37FD			*			
3371	37FE			*			
3372	37FF			*			
3373	3800			*			
3374	3801			*			
3375	3802			*			
3376	3803			*			
3377	3804			*			
3378	3805			*			
3379	3806			*			
3380	3807			*			
3381	3808			*			
3382	3809			*			
3383	380A			*			
3384	380B			*			
3385	380C			*			
3386	380D			*			
3387	380E			*			
3388	380F			*			
3389	3810			*			
3390	3811			*			
3391	3812			*			
3392	3813			*			
3393	3814			*			
3394	3815			*			
3395	3816			*			
3396	3817			*			
3397	3818			*			
3398	3819			*			
3399	381A			*			
3400	381B			*			
3401	381C			*			
3402	381D			*			
3403	381E			*			
3404	381F			*			
3405	3820			*			
3406	3821			*			
3407	3822			*			
3408	3823			*			
3409	3824			*			
3410	3825			*			
3411	3826			*			
3412	3827			*			
3413	3828			*			
3414	3829			*			
3415	382A			*			
3416	382B			*			
3417	382C			*			
3418	382D			*			
3419	382E			*			
3420	382F			*			
3421	3830			*			
3422	3831			*			
3423	3832			*			
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3425	3834			*			
3426	3835			*			
3427	3836			*			
3428	3837			*			
3429	3838			*			
3430	3839			*			
3431	383A			*			
3432	383B			*			
3433	383C			*			
3434	383D			*			
3435	383E			*			
3436	383F			*			
3437	3840			*			
3438	3841			*			
3439	3842			*			
3440	3843			*			
3441	3844			*			
3442	3845			*			
3443	3846			*			
3444	3847			*			
3445	3848			*			
3446	3849			*			
3447	384A			*			
3448	384B			*			
3449	384C			*			
3450	384D			*			
3451	384E			*			
3452	384F			*			
3453	3850			*			
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3460	3857			*			
3461	3858			*			
3462	3859			*			
3463	385A			*			
3464	385B			*			
3465	385C			*			
3466	385D			*			
3467	385E			*			
3468	385F			*			
3469	3860			*			
3470	3861			*			
3471	3862			*			
3472	3863			*			
3473	3864			*			
3474	3865			*			
3475	3866			*			
3476	3867			*			
3477	3868			*			
3478	3869			*			
3479	386A			*			
3480	386B			*			
3481	386C			*			
3482	386D			*			
3483	386E			*			
3484	386F			*			
3485	3870			*			
3486	3871			*			
3487	3872			*			
3488	3873			*			
3489	3874			*			
3490	3875			*			
3491	3876			*			
3492	3877			*			

LINE ADDR 11 B2 B3 LABEL OPCODE OPERAND

3300 3810 * THIS ROUTINE INCREMENTS THE EXPONENT AND ROTATES THE MANTISSA
 3301 3810 * RIGHT IF THE OVF FLAG IS 1.

3311 3808 C0 07 45 OVFL STRA,R0 ADR
 3312 3810 01 07 45 STRA,R1 ADR+1
 3313 3810 00 24 OVFF LODI,R0 LEN
 3314 3807 00 04 OV45 TPSL OVF
 3315 3807 10 RETC,LT NO OVERFLOW
 3316 3803 07 00 RRIN LODI,R3 0
 3317 3805 07 07 45 LODA,R3 *ADR,I
 3318 3803 04 7F COMI,R0 7F
 3319 380A 10 30 5E ECTA,E0 ERR15
 3320 380D 10 00 BIRR,R0 \$+2
 3321 380F 07 07 45 LIA STRA,R3 *ADR,I
 3322 3842 02 LODZ,R2
 3323 3843 03 CCMZ,R3
 3324 3844 14 RETC,E0
 3325 3840 07 A7 45 LODA,R3 *ADR,I
 3326 3848 00 BRR,R2
 3327 3840 1E 04 BCTR,UN LPA

3328 3840 *****

3329 3840 *
 3330 3840 *
 3331 3840 * TWO'S COMPLEMENT ROUTINE
 3332 3840 *

3333 3840 * THIS ROUTINE PERFORMS A TWO'S COMPLEMENT OF THE BINARY
 3334 3840 * FLOATING POINT NUMBER ADDRESSED BY ADR.

3335 3840 *
 3336 3840 07 03 TCOM LODI,R3 LEN-1
 3337 384D 00 27 TWCA LODI,R2 OIB
 3338 384F 04 41 LODI,R0 CPB
 3339 3851 00 27 45 TWOB STRA,R2 ADR
 3340 3854 00 07 46 STRA,R0 ADR+1
 3341 3857 03 TWOC LODZ,R3
 3342 3858 02 STRZ,R2
 3343 3850 07 01 FPSL CRY
 3344 385B 00 LPB FORZ,R0
 3345 385C AF 07 45 SUBA,R3 *ADR,I
 3346 385F 0F 07 45 STRA,R3 *ADR,I
 3347 3862 FE 77 BERR,R3 LPB
 3348 3864 1B 4A BCTR,UN OV45

3349 3860 *****

3351 3850 *
 3352 3860 00 07 47 MDIE LODA,R2 FLAG
 3353 3865 00 30 72 ECFA,E0 ERR16 DIVIDE BY ZERO ERROR
 3354 386C 20 MDIC FORZ,R0
 3355 386F 0F 27 4D MDIN STEA,R3 OPE,+
 3356 3872 07 03 COMI,R3 LEN-1
 3357 3872 00 79 BCTR,E0 MDIN
 3358 3874 04 00 LODI,R0 00
 3359 3870 01 07 4D STRA,R0 CPB
 3360 3870 10 30 1E ECTA,UN PUSHR5

3361 3870 *
 3362 3870 00 27 MDIA LODI,R2 OPA
 3363 3870 04 45 LODI,R0 OPA
 3364 3870 07 03 LODI,R3 LEN-1

3385	3884	3B	4D		BSTR,UN	TWO
3386	3884	21			LODZ,R1	
3387	3885	19	07		BCTR,CT	MDIL
3388	3887	27			EORZ,R0	
3389	3888	00	37 4C		STRA,R0	SIGN
3390	388F	3F	38 47	MDID	PSTA,UN	TCOM
3391	388F	26		MDIL	FORZ,R0	
3392	388F	1E	24		BCTR,UN	MDIF
3393	3891			*		
3394	3891			*****		
3395	3891			*		
3396	3891			*	MULTIPLICATION ROUTINE	
3397	3891			*		
3398	3891			*	THIS ROUTINE MULTIPLIES TWO BINARY FLOATING POINT NUMBERS	
3399	3891			*		
339A	3891	28		PPMULT	EORZ,R0	
339B	3892	1B	22		BCTR,UN	MDIA
339C	3894			*		
339D	3894			*****		
339E	3894			*		
339F	3894			*	DIVISION ROUTINE	
33A0	3894			*		
33A1	3894			*	THIS ROUTINE DIVIDES TWO BINARY FLOATING POINT NUMBERS	
33A2	3894			*		
33A3	3894	24	FF	FFDIV	LODI,R0	FF
33A4	3895	CC	27 47	MDIA	STRA,R0	FLAG
33A5	3899	3F	37 AA		PSTA,UN	TPAN
33A6	389C	0D	27 4E		LODA,R1	OPB+1
33A7	389F	18	45		BCTR,FQ	MDIB
33A8	38A1	04	FF		LGDI,R0	FF
33A9	38A3	CC	27 4C		STRA,R0	SIGN
33AA	38A6	2E	27 49		LODA,R2	OPA+1
33AB	38A9	10	38 6C		ECTA,EC	MDIC
33AC	38AC	1A	4E		BCTR,LT	MDIF
33AD	38AE	01			LODZ,R1	
33AE	38AF	1A	5A		BCTR,LT	MDID
33AF	38F1	28			FORZ,R0	
33B0	38E2	CC	27 4C		STRA,R0	SIGN
33B1	38E5	07	04	MDIF	LODI,R3	LEN
33B2	38B7	CF	47 51	MDIG	STRA,R3	OPB+LEN,-
33B3	38BA	FB	7B		ERNR,P3	MDIC
33B4	38BC	2C	07 47		LODA,R0	FLAG
33B5	38BF	9C	39 1F		ECFA,EQ	DIV
33B6	38C2	28	19	MUL	LODI,R2	MLFN
33B7	38C4	75	01	MULA	CPSL	CRY
33B8	38C6	27	26		LODI,R3	IFN2-2
33B9	38C8	0F	67 4D	MULB	LODA,R3	OPB,I
33BA	38CB	10			RRL,R0	
33BB	38CC	CF	67 4D		STRA,R3	OPB,I
33BC	38CF	F5	77		PDRR,R3	MULB
33BD	38F1	F5	01		TPSI	CRY
33BE	38F3	95	1B		BCFR,EQ	MULB
33BF	38D5	07	23		LODI,R3	LEN-1
33C0	38D7	75	01		CPSL	CRY
33C1	3813	2F	47 51	MULC	LODA,R3	OPB+LEN,-
33C2	38DC	8F	67 49		ADPA,R3	OPA+1,I
33C3	381F	CF	67 51		STRA,R3	OPB+LEN,I

LINE	ADDR	E1	E2	E3	LABEL	OPCODE	OPERAND
3410	30F2	5B	75			FMUL,R3	MULC
3411	30F3	07	27			LEN,I	LEN-1
3412	30F4	0F	67	4B	UNL	LODA,R3	OPB,I
3413	30F5	04	47			ADDI,R3	2
3414	30F6	03	27	4B		STRA,R3	OPB,I
3415	30F7	1B	75			MULT,R3	MULP
3416	30F8	FA	52		ANLE	MPRR,I2	MULA
3417	30F9	25	21			CPST	CRY
3418	30FA	21	27	4B		LODA,R1	OPA
3419	30FB	8D	27	4B		ADDA,R1	OPR
3420	30FC	3B	24			TISL	OVF
3421	30FD	2C	35	82		ECFA,R0	MDIH
3422	30FE	07				FORZ,R2	
3423	30FF	1B	21			TPSL	CRY
3424	3000	9C	39	64		ECFA,R0	MDIH
3425	3001	1P	32	0F	ERRG	ECTA,UN	ERR16 ARITHMETIC ERROR
3426	3002				*		
3427	3003	F7	23		BITA	COMI,R3	LEN-1
3428	3004	5B	17			PCFR,R0	DIVD
3429	3005	27	21		ITVE	IPSL	CRY CLEAR FORKOW
3430	3006	07	23			LODI,R3	LEN-1
3431	3007	0F	67	4B	DIVC	LODA,R3	OPA,I
3432	3008	AF	67	4B		SUBA,R3	OPB,I
3433	3009	0F	67	4B		STRA,R3	OPA,I
3434	300A	F5	75			BDPR,R3	DIVC
3435	300B	77	21			IFSL	CRY
3436	300C	1F	17			ECTR,UN	DIVE
3437	300D				*		
3438	300E	4C	1F		DIV	IODI,R2	DLEN
3439	300F	27	22			PP L	COM LOGICAL COMPARE
3440	3010	0F	67	4B	DIVE	LODA,R3	OPA,+
3441	3011	0F	67	4B		COMA,R2	OPB,I
3442	3012	12	5D			ECTR,R0	DIVA
3443	3013	12	5F			PCTR,CT	DIVB
3444	3014	75	21			CPSL	CRY
3445	3015	07	24		DIVE	IODI,R3	LEN
3446	3016	0F	47	51	DIVE	LODA,R3	OPB+LEN,-
3447	3017	12				FRL,R0	
3448	3018	0F	67	51		STRA,R3	OPB+LEN,I
3449	3019	5F	77			BRNP,R3	DIVE
3450	301A	07	23			LODI,R3	LEN-1
3451	301B	AF	67	4B	DIVE	LODA,R3	OPA,I
3452	301C	17				RRL,R0	
3453	301D	0F	67	4B		STRA,R3	OPA,I
3454	301E	F5	77			IDPR,R3	DIVC
3455	301F	FA	5C			BDPR,R2	DIVD
3456	3020	0F	67	52	DIVE	LODA,R3	OPB+LEN-1,+
3457	3021	0F	67	4B		STRA,R3	OPB,I
3458	3022	F7	24			COMI,R3	LEN
3459	3023	0F	75			ECPR,R0	DIVE
3460	3024	77	21			IFSL	CRY
3461	3025	0F	67	4B		LODA,R1	OPA
3462	3026	AD	27	4B		SUBA,R1	OPR
3463	3027	24	21			LODI,R0	1
3464	3028	F5	24			TP L	OVF
3465	3029	9C	1A			PCFR,R0	MDIK
3466	302A	55	01			TPSL	CRY

3480	3964	00 07 4D MDII	BCFA, R0	OPB	
3481	3967	3B 2B	BSTR, UN	NORM	
3482	3969	75 01	CPSL	CRY	
3483	396E	0C 07 4D	LODA, R0	OPB	
3484	396F	01	ADDZ, R1		
3485	396F	0C 07 4D	STRA, R0	OPB	
3486	3972	B5 04	TPSL	OVF	
3487	3974	12 11	BCTR, EQ	MDIJ	
3488	3976	1F 30 8E	BCTA, UN	ERR15	
3489	3978	75 01 MDIK	CPSL	CRY	
3490	3978	01	ADDZ, R1		
3491	397C	01	STRZ, R1		
3492	397D	22	FORZ, R0		
3493	397E	B5 04	TPSL	OVF	
3494	3980	18 02	BCTR, EQ	MDII	
3495	3982	01 07 4D MDIH	STRA, R1	OPB	
3496	3985	3F 0D	BSTR, UN	NORM	
3497	3987	07 04 MDIJ	LODI, R3	LFN	
3498	3989	0C 07 4C	LODA, R0	SIGN	
3499	398C	BC 38 4D	BSFA, EQ	TWOA	
3500	398F	75 04	CPSL	OVF	
3501	3991	1F 38 14	BCTA, UN	ROOF	ROUND RESULT
3502	3994	*			
3503	3994	*****			
3504	3994	*			
3505	3994	*	NORMALIZE ROUTINE		
3506	3994	*			
3507	3994	*	THIS ROUTINE NORMALIZES THE RESULT		
3508	3994	*			
3509	3994	75 04 02 NORM	LODI, R2	LEN	
3510	3995	75 02 NORA	CPSL	COM	
3511	3998	02 NOR1	LODZ, R2		
3512	3999	03	STRZ, R3		
3513	399A	0C 07 4E	LODA, R0	OPB+1	
3514	399D	E4 C0	COMI, R0	C0	
3515	399F	16	RETC, LT		
3516	39A0	E4 3F	COMI, R0	3F	
3517	39A2	15	RETC, GT		
3518	39A3	0C 07 4D	LODA, R0	OPB	
3519	39A6	E4 80	COMI, R0	80	
3520	39A9	18 12	BCTR, EQ	LPE	
3521	39AA	F8 00	BDRR, R0	\$+2	
3522	39AC	0C 07 4D	STRA, R0	OPB	
3523	39AF	75 01	CPSL	CRY	
3524	39B1	0F 67 4D LPD	LODA, R3	OPB, I	
3525	39B4	D0	RRL, R0		
3526	39B5	0F 67 4D	STRA, R3	OPB, I	
3527	39B8	FB 77	BDRR, R3	LPD	
3528	39BA	1B 5C	BCTR, UN	NOR1	
3529	39BC	0F 67 4D LPE	LODA, R3	OPB, I	
3530	39BF	9C 30 6E	BCTA, EQ	ERR15	
3531	39C2	FB 78	BDRR, R3	LPE	
3532	39C4	17	RETC, UN		
3533	39C5	3F 33 E0 ECONST	BSFA, UN	SKPSE	
3534	39C8	70	FORZ, R0		
3535	39C9	08 2D	STRR, R0	ECONSS	

LINE	ADDR	B1	B2	B3	LABEL	OPCODE	OPERAND
3536	39CF	F7	2B			COMI,R3	'+'
3537	39CD	18	0D			BCTR,EQ	ECONS0
3538	39CF	F7	2D			COMI,R3	'-'
3539	39D1	08	06			BCFR,EQ	ECONS4
3540	39D3	04	FF			LODI,R0	FF
3541	39D5	08	21			STRR,R0	ECONSS
3542	39D7	1F	03			BCTR,UN	ECONS0
3543	39D9	3F	31	DE	ECONS4	BSTA,UN	DECPT
3544	39DC	3F	3A	CA	ECONS0	BSTA,UN	EASCII CHANGE ASCII STRING OF NUMBERS TO FPT
3545	39DF	3F	33	D5		BSTA,UN	GETCHR GET NEXT CHARACTER
3546	39E2	F7	2E			COMI,R3	'.'
3547	39E4	18	1C			BCTR,EQ	ECONS1 EVALUATE THE FRACTIONAL PART NOW
3548	39E6	E6	00			COMI,R2	00
3549	39E8	18	0F			BCTR,EQ	ECONS9
3550	39EA	F7	4E			COMI,R3	'E'
3551	39EC	1C	3A	26		BCTR,EQ	ECONS5 EXPONENT NOTATION FOLLOWING
3552	39EF	3F	31	DE		BSTA,UN	DECPT EVALUATE THE EXPONENT NOW
3553	39F2	3F	3A	61		BSTA,UN	NEGATE
3554	39F5	20				FORZ,R0	
3555	39F8	17				RETC,UN	
3556	39F7	00			ECSTR	RES	1
3557	39F8	00			ECONSS	RES	1
3558	39F9				*		
3559	39F9	3F	3D	11	ECONS9	BSTA,UN	POPOPE
3560	39FC	3F	31	DE		BSTA,UN	DECPT
3561	39FF	04	01			LODI,R0	1
3562	3A01	17				RETC,UN	
3563	3A02	3F	3A	CA	ECONS1	BSTA,UN	FASCII GET THE FRACTIONAL PART OF THE NUMBER
3564	3A05	CA	70		ECONS2	STRR,R2	ECSTR STORE THE NUMBER OF CHARACTERS GOTTEN IN
3565	3A07	02				LODZ,R2	
3566	3A28	18	0A			BCTR,EQ	ECONS3 FINISHED WITH THE FRAC PART
3567	3A0A	3F	3A	08		BSTA,UN	PUSH10 PUSH A FPT 10 ONTO THE STACK
3568	3A0D	3F	38	94		BSTA,UN	FPDIV DIVIDE THE FRACTIONAL PART BY 10
3569	3A10	0A	65			LODR,R2	ECSTR
3570	3A12	FA	71			BDRR,R2	ECONS2
3571	3A14	3F	37	FF	ECONS3	BSTA,UN	FPADD ADD INTEGER AND FRACTIONAL PARTS
3572	3A17	3F	3A	61		BSTA,UN	NEGATE
3573	3A1A	3F	33	ED		BSTA,UN	SKPSP GET NEXT CHARACTER FROM LINE
3574	3A1D	F7	45			COMI,R3	'E'
3575	3A1F	18	0F			BCTR,EQ	ECONS5 EXPONENT TO FOLLOW
3576	3A21	3F	31	DE		BSTA,UN	DECPT RESTORE THE INPUT POINTER
3577	3A24	20				FORZ,R0	
3578	3A25	17				RETC,UN	RETURN WITH THE NUMBER
3579	3A26	20			ECONS5	FORZ,R0	
3580	3A27	C8	4F			STRR,R0	FCONSS
3581	3A29	3F	33	ED		BSTA,UN	SKPSP
3582	3A2C	F7	2B			COMI,R3	'1'
3583	3A2E	18	0D			BCTR,EQ	ECONS7
3584	3A30	F7	2D			COMI,R3	'-'
3585	3A32	08	06			BCFR,EQ	ECONS8
3586	3A34	04	FF			LODI,R0	FF
3587	3A36	C8	40			STRR,R0	ECONSS
3588	3A38	1B	03			BCTR,UN	ECONS7
3589	3A3A	3F	31	DE	FCONS8	BSTA,UN	DECPT
3590	3A3D	3F	3A	AA	FCONS7	BSTA,UN	GET3C CONVERT UP TO 3 ASCII CHARS TO NUMBER IN R2
3591	3A40	02				LODZ,R2	
3592	3A41	14				FF C.FG	

LINE	ADDR	FI	BE	BO	LABEL	OPCODE	OPERAND
3593	3A42	3F	3A	7A		ESTA, UN	PUSH1 PUSH A 1 ONTO THE STACK
3594	3A45	0E	19	F7	ECONSS	STRA, R2	ECSTR
3595	3A48	3F	3A	88		BSTA, UN	PUSH10 PUSH A 10 ONTO THE STACK
3596	3A4B	3F	38	91		BSTA, UN	FPMULT MULTIPLY THE RUNNING EXPONENT BY 10
3597	3A4E	0E	19	F7		LODA, R2	ECSTR
3598	3A51	FA	72			BDRR, R2	ECONSS
3599	3A53	0C	19	F8		LODA, R0	ECONSS
3600	3A56	3C	38	91		BSTA, EQ	FPMULT
3601	3A59	0C	19	F8		LODA, R0	ECONSS
3602	3A5C	3E	38	94		BSTA, LT	FPDIV
3603	3A5F	20				EORZ, R0	
3604	3A60	17				RETC, UN	
3605	3A61				*		
3606	3A61				*		
3607	3A61				*		
3608	3A61	0C	19	F8	NEGATE	LODA, R0	ECONSS
3609	3A64	14				RETC, EQ	
3610	3A65	3F	3D	11		BSTA, UN	POPOPB
3611	3A68	77	08			PPSL	WC
3612	3A6A	3F	38	4B		BSTA, UN	TCOM
3613	3A6D	75	08			CPSL	WC
3614	3A6F	3F	3D	18		BSTA, UN	PUSOPB
3615	3A72	17				RETC, UN	
3616	3A73				*		
3617	3A73	04	3A		PUSH0	LODI, R0	FP0
3618	3A75	05	96			LODI, R1	FP0
3619	3A77	1F	32	7D		BCTA, UN	PUSH
3620	3A7A	04	3A		PPUSH1	LODI, R0	FP1
3621	3A7C	05	9A			LODI, R1	FP1
3622	3A7E	1F	32	7D		BCTA, UN	PUSH
3623	3A81	04	3A		PPUSH2	LODI, R0	FP2
3624	3A83	05	9E			LODI, R1	FP2
3625	3A85	1F	32	7D		BCTA, UN	PUSH
3626	3A88	04	3A		PUSH10	LODI, R0	FP10
3627	3A8A	05	A2			LODI, R1	FP10
3628	3A8C	1F	32	7D		BCTA, UN	PUSH
3629	3A8F	04	3A		PPUSM1	LODI, R0	FPM1
3630	3A91	05	A6			LODI, R1	FPM1
3631	3A93	1F	32	7D		BCTA, UN	PUSH
3632	3A96				*		
3633	3A96				*		
3634	3A96				*		
3635	3A96	80			FP0	DATA	80
3636	3A97	00				DATA	00
3637	3A98	00	00			ACON	0000
3638	3A9A	01	40		FP1	ACON	0140
3639	3A9C	00	00			ACON	0000
3640	3A9E	02	40		FP2	ACON	0240
3641	3AA0	00	00			ACON	0000
3642	3AA2	04	50		FP10	ACON	0450
3643	3AA4	00	00			ACON	0000
3644	3AA6	01	C0		YPM1	ACON	01C0
3645	3AA8	00	00			ACON	0000
3646	3AAA				*		
3647	3AAA	20			GET3C	EORZ, R0	
3648	3AAB	CC	19	F7	GET3C3	STRA, R0	ECSTR
3649	3AAE	3F	33	D5		BSTA, UN	GETCHR

X 2nd 307 code (5.15) was in B-mem in BL
(12)

LINE	ADDR	B1	B2	B3	LABEL	OPCODE	OPERAND
3650	3AB1	3F	30	BD		BSTA,UN	CKNUM0
3651	3AB4	9E	0E			BCFR,EQ	GET3C1
3652	3AB6	0C	19	F7		LODA,R0	ECSTR
3653	3AB9	06	09			LODI,R2	9
3654	3ABB	C1				STRZ,R1	
3655	3ABE	81			GET3C2	ADDZ,R1	
3656	3ABD	FA	7D			-BD R,R2	GET3C2
3657	3ABF	47	0F			ANDI,R3	F
3658	3AC1	83				ADDZ,R3	
3659	3AC2	1B	57			BCTR,UN	GET3C3
3660	3AC4	0E	19	F7	GET3C1	LODA,R2	ECSTR
3661	3AC7	1F	31	DE		BCTA,UN	DEUPT
3662	3ACA				*		
3663	3ACA	3F	31	DB	EASCI1	BSTA,UN	SKPDEC
3664	3ACD	3F	3A	73		BSTA,UN	PUSH0 INITIALIZE THE NUMBER
3665	3AD0	20				EORZ,R0	
3666	3AD1	C8	3E		EASCI1	STRR,R0	FASTG
3667	3AD3	C2				STRZ,R2	
3668	3AD4	0F	84	5F		LODA,R3	*INPT
3669	3AD7	3F	30	BD		BSTA,UN	CKNUM0
3670	3ADA	1F				RETC,GT	
3671	3ADB	16				RETC,LT	
3672	3ADC	3F	3A	88		BSTA,UN	PUSH10
3673	3ADF	3F	32	91		BSTA,UN	FPMULT
3674	3AE2	3F	33	D5		BSTA,UN	GETCHR
3675	3AE5	47	0F			ANDI,R3	0F MAKE IT DECIMAL
3676	3AE7	18	24			ECTR,EQ	EASCI2
3677	3AE9	D3				RRL,R3	
3678	3AEA	D3				RRL,R3	
3679	3AEB	D3				RRL,R3	SET IT UP TO BE THE FIRST BYTE OF MANTISSA
3680	3AEC	CF	07	4E		STRA,R3	CPB+1
3681	3AEF	04	04			LODI,R0	4
3682	3AF1	CC	07	4D		STRA,R0	OPB
3683	3AF4	20				EORZ,R0	
3684	3AF5	CC	07	4F		STRA,R0	OPB+2
3685	3AF8	CC	07	50		STRA,R0	OPB+3
3686	3AFB	77	08			PPSL	WC
3687	3AFD	3F	39	94		BSTA,UN	NORM NORMALIZE THE DIGIT
3688	3B00	04	02			LODI,R0	2
3689	3B02	93				LPSL	
3690	3B03	04	27			LODI,R0	OPB
3691	3B05	05	4D			LODI,R1	OPB
3692	3B07	3F	32	7D		BSTA,UN	PUSH PUSH THE DIGIT
3693	3B0A	3F	37	EF		BSTA,UN	FPADD ADD THIS DIGIT TO ALL THE REST
3694	3B0D	08	02		EASCI2	LODR,R0	EASTG
3695	3B0F	D8	40			BIRR,R0	EASCI1
3696	3B11				*		
3697	3B11				*		
3698	3B11				*		
3699	3B11	00			EASTG	RFS	1
3700	3B12	00			EXPSGN	RFS	1
3701	3B13	00			INTSGN	RFS	1
3702	3B14	00			PYTON	RFS	1
3703	3B15				*		
3704	3B15				*		
3705	3B15				*		
3706	3B15	05	08		FIXNL	LODI,R1	8

07	7 20	FC12,R0		
3708	3B18 CD 47 2D	FIXNL1 STRA,R1	INTSTG,-	
3709	3B1B 59 7B	BRNR,R1	FIXNL1	
3710	3B1D CC 1B B5	STRA,R0	INTEXP	
3711	3B20 C8 70	STRR,R0	EXPSGN	
3712	3B22 C8 6F	STRR,R0	INTSGN	
3713	3B24 0C 13 8E	LODA,R0	CBUF1+1	
3714	3B27 F4 80	TMI,R0	80	
3715	3B29 98 20	BCFR,EQ	FIXNL2	
3716	3B2B 05 04	LODI,R1	4	
3717	3B2D 0D 53 8D	FIXNL3 LODA,R1	CBUF1,-	
3718	3B30 CL 67 4D	STRA,R1	OPB,I	
3719	3B33 59 78	BRNR,R1	FIXNL3	
3720	3B35 77 08	PPSL	WC	
3721	3B37 3F 38 4B	BSTA,UN	TCOM	
3722	3B3A 75 08	CPSL	WC	
3723	3B3C 05 04	LODI,R1	4	
3724	3B3E 0D 47 4D	FIXNL4 LODA,R1	OPB,-	
3725	3B41 CL 73 8D	STRA,R1	CBUF1,I	
3726	3B44 59 78	BRNR,R1	FIXNL4	
3727	3B46 04 FF	LODI,R0	FF	
3728	3B48 CC 1B 13	STRA,R0	INTSGN	
3729	3B4B 0C 13 8D	FIXNI2 LODA,R0	CPUF1 EXPONENT	
3730	3B4E 91 3B C0	BCFA,GT	FIXN16	
3731	3B51 04 01	LODI,R0	1	
3732	3B53 CC 1F 14	STRA,R0	BYTON	
3733	3B56 C2	STRZ,R2		
3734	3B57 07 40	LODI,R3	40	
3735	3B59 3F 3C 5B	FIXNL6 BSTA,UN	INTX2	
3736	3B5C 0D 1B 14	LODA,R1	BYTON	
3737	3B5F 0D 73 8D	LODA,R1	CBUF1,I	
3738	3B62 43	ANDZ,R3		
3739	3B63 E3	COMZ,R3		
3740	3B64 98 03	BCFR,EQ	FIXNL7	
3741	3B66 3F 3C 47	BSTA,UN	INTAD	
3742	3B69 86 01	FIXNL7 ADDI,R2	1	
3743	3B6B FF 13 8D	COMA,R2	CBUF1	
3744	3B6E 19 30	BCTR,GT	FIXNL8	
3745	3B70 53	RRR,R3		
3746	3B71 F7 80	TMI,R3	80	
3747	3B73 98 64	BCFR,EQ	FIXNL6	
3748	3B75 0C 1F 14	LODA,R0	BYTON	
3749	3B78 84 01	ADDI,R0	1	
3750	3B7A CC 1F 14	STRA,R0	BYTON	
3751	3B7D E4 04	COMI,R0	4	
3752	3B7F 9C 3B 59	BCFA,EQ	FIXNL6	
3753	3B82	*		
3754	3B82 07 00	LODI,R3	0	
3755	3B84 3F 3C 5B	FIXN11 BSTA,UN	INTX2	
3756	3B87 0C 07 30	LODA,R0	INTSTG+3	
3757	3B8A 44 F0	ANDI,R0	F0	
3758	3B8C 18 09	BC R,EQ	FIXN13	
3759	3B8E 87 01	ADDI,R3	1	
3760	3B90 05 04	LODI,R1	4 ROTATE 4 BITS	
3761	3B92 3F 3C B2	ROTL11 PSTA,UN	INTROT	
3762	3B95 F9 7B	BDRR,R1	ROTL11	
3763	3B97 86 01	FIXN13 ADDI,R2	1	

LINE	ADDR	R1	P2	B3	LABEL	OPCODE	OPFRAND
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3764	3B99	FF	13	8D		COMA,R2	CBUF1
3765	3B9C	99	66			BCFR,GT	FIXN11
3766	3B9E	CB	15		FIXN10	ST R,R3	INTEXP
3767	3BA0	05	04		FIXN18	LODI,R1	4
3768	3BA2	0D	47	2D	FIXN60	LODA,R1	INTSTG,-
3769	3BA5	FE	FF			COMI,R1	FF
3770	3BA7	18	17			BCTR,EQ	FIXN16
3771	3BA9	C2				STRZ,R2	
3772	3BAA	44	F0			ANDI,R0	F0
3773	3BAC	98	09			BCFR,EQ	FIXN15
3774	3BAF	46	0F			ANDI,R2	0F
3775	3BB0	18	70			BCTR,EQ	FIXN60
3776	3BB2	D1				RRL,R1	
3777	3BB3	1B	05			BCTR,UN	FIXN17
3778	3BB5				*		
3779	3BB5				*		
3780	3BB5				*		
3781	3BB5	00			INTEXP	RES	1
3782	3BB6	00			BITON	RES	1
3783	3BB7				*		
3784	3BB7				*		
3785	3BB7				*		
3786	3BB7	D1			FIXN15	RRL,R1	
3787	3BB8	85	01			ADDI,R1	1
3788	3BBA	89	79		FIXN17	ADDR,R1	INTEXP
3789	3BBC	85	01			ADDI,R1	1
3790	3BBE	C9	75			STRR,R1	INTEXP
3791	3BC0	0E	13	8D	FIXN16	LODA,R2	CBUF1
3792	3BC3	75	02			CPSL	COM
3793	3BC5	F6	16			COMI,R2	16
3794	3BC7	77	02			PPSL	COM
3795	3BC9	15				RETC,GT	
3796	3BCA	0C	13	8E		LODA,R0	CBUF1+1
3797	3BCD	14				RETC,EQ	
3798	3BCE	04	17			LODI,R0	17
3799	3BD0	A2				SUEZ,R2	
3800	3BD1	CC	1C	46		STRA,R0	FIXT2
3801	3BD4	04	03			LODI,R0	3
3802	3BD6	CC	1B	14		STRA,R0	BYTON
3803	3BD9	06	01			LODI,R2	1
3804	3BDB	CA	59			STRR,R2	BITON
3805	3BDD	0D	1B	14	FIXN18	LODA,R1	BYTON
3806	3BE0	0D	73	8D		LODA,R1	CBUF1,I
3807	3BE3	07	00			LODI,R3	0
3808	3BE5	42				ANDZ,R2	
3809	3BE6	E2				COMZ,R2	
3810	3BE7	98	02			BCFR,EQ	FIXN20
3811	3BE9	07	50			LODI,R3	50
3812	3BEB	3F	3C	7A	FIXN20	BSTA,UN	FRCD2
3813	3BEF	08	46			LODR,R0	BITON
3814	3BF0	84	01			ADDI,R0	1
3815	3BF2	C8	42			STRR,R0	BITON
3816	3BF4	FC	1C	46		COMA,R0	FIXT2
3817	3BF7	1F				RETC,GT	
3818	3BF8	D2				RRL,R2	
3819	3BF9	F6	01			TMI,R2	1
3820	3BFB	9C	3F	DD		BCFA,EQ	FIXN10

321	FE 0C 1B 14	LODA,R0	PY
3822	3C01 A4 01	SUBI,R0	1
3823	3C03 CC 1B 14	STRA,R0	BYTON
3824	3C06 9C 3B DD	BCFA,EQ	FIXN18
3825	3C09 07 00	FIXN22 LODI,R3	0
3826	3C0B 3F 3C 7A	BSTA,UN	FRC02
3827	3C0E 0C 1B B6	LODA,R0	BITON
3828	3C11 84 01	ADDI,R0	1
3829	3C13 CC 1B B6	STRA,R0	BITON
3830	3C16 E8 2E	COMR,R0	FIXT2
3831	3C18 15	RETC,GT	
3832	3C19 0F 07 31	LODA,R2	FRCSTG
3833	3C1C 02	LODZ,R2	
3834	3C1D 44 F0	ANDI,R0	F0
3835	3C1F 98 68	PCFR,EQ	FIXN22
3836	3C21 0C 1B B5	LODA,R0	INTEXP
3837	3C24 84 01	ADDI,R0	1
3838	3C26 CC 1B B5	STRA,R0	INTEXP
3839	3C29 04 FF	LODI,R0	FF
3840	3C2B CC 1B 12	STRA,R0	EXPSGN
3841	3C2E 77 18	PPSL	RS+WC
3842	3C30 06 04	LODI,R2	04
3843	3C32 75 01	FIXN23 CPSL	CRY
3844	3C34 05 04	LODI,R1	04
3845	3C36 0D 47 31	FIXN24 LODA,R1	FRCSTG,-
3846	3C39 D0	RRL,R0	
3847	3C3A CD 67 31	STRA,R1	FRCSTG,I
3848	3C3D 59 77	BRNF,R1	FIXN24
3849	3C3F FA 71	BDRR,R2	FIXN23
3850	3C41 75 1E	CPSL	WC+RS
3851	3C43 1F 3C 09	BCTA,UN	FIXN22
3852	3C46	*	
3853	3C46	*	
3854	3C46	*	
3855	3C46 00	FIXT2 RES	1
3856	3C47	*	
3857	3C47	*	
3858	3C47	*	
3859	3C47 05 FF	INTAD LODI,R1	FF
3860	3C49 77 09	PPSL	WC+CRY
3861	3C4B 0D 27 2D	INTAD1 LODA,R1	INTSTG,+
3862	3C4E 84 66	ADDI,R0	66
3863	3C50 94	DA,R0	
3864	3C51 CD 67 2D	STRA,R1	INTSTG,I
3865	3C54 F5 03	COMI,R1	3
3866	3C56 98 73	BCFR,EQ	INTAD1
3867	3C58 75 08	CPSL	WC
3868	3C5A 17	RETC,UN	
3869	3C5B	*	
3870	3C5B	*	
3871	3C5B	*	
3872	3C5B 77 18	INTX2 PPSL	WC+RS
3873	3C5D 05 FF	LODI,R1	FF
3874	3C5F 75 01	CPSL	CRY
3875	3C61 0D 27 2D	INTX2A LODA,R1	INISTG,+
3876	3C64 C2	STRZ,R2	
3877	3C65 13	SPSL	

LINE	ADDR	B1	B2	B3	LABEL	OPCODE	OPERAND
3878	3C66	75	01			CPSL	CRY
3879	3C68	86	66			ADDI,R2	66
3880	3C6A	93				LPSL	
3881	3C6B	02				LODZ,R2	
3882	3C6C	8D	67	2D		ADDA,R1	INTSTG,I
3883	3C6F	94				DAR,R0	
3884	3C70	CD	67	2D		STRA,R1	INTSTG,I
3885	3C73	E5	03			COMI,R1	3
3886	3C75	98	6A			BCFR,EQ	INTX2A
3887	3C77	75	18			CPSL	WC+RS
3888	3C79	17				RETC,UN	
3889	3C7A				*		
3890	3C7A				*		
3891	3C7A				*		
3892	3C7A	05	FF		FRCD2	LODI,R1	FF
3893	3C7C	0D	27	31	FRCD2A	LODA,R1	FRCDSTG,+
3894	3C7F	F4	20		FRCD2C	COMI,R0	20
3895	3C81	1A	06			BCTR,LT	FRCD2B
3896	3C83	A4	20			SUBI,R0	20
3897	3C85	87	10			ADDI,R3	10
3898	3C87	1B	76			BCTR,UN	FRCD2C
3899	3C89	F4	10		FRCD2B	TMI,R0	10
3900	3C8B	98	04			BCFR,EQ	FRCD2D
3901	3C8E	87	05			ADDI,R3	5
3902	3C8F	44	0F			ANDI,R0	0F
3903	3C91	E4	02		FRCD2D	COMI,R0	2
3904	3C93	1A	06			BCTR,LT	FRCD2E
3905	3C95	A4	02			SUBI,R0	2
3906	3C97	87	01			ADDI,R3	1
3907	3C99	1B	76			BCTR,UN	FRCD2D
3908	3C9B	F4	01		FRCD2E	TMI,R0	1
3909	3C9D	98	04			BCFR,EQ	FRCD2F
3910	3C9F	04	50			LODI,R0	50
3911	3CA1	1B	01			BCTR,UN	FRCD2G
3912	3CA3	20			FRCD2F	EORZ,R0	
3913	3CA4	C8	0B		FRCD2G	STRR,R0	FIXTMP
3914	3CA6	03				LODZ,R3	
3915	3CA7	CD	67	31		ST A,R1	FRCDSTG,I
3916	3CAA	0B	05			LODR,R3	FIXTMP
3917	3CAC	F5	03			COMI,R1	3
3918	3CAE	98	4C			BCFR,EQ	FRCD2A
3919	3CB0	17				RETC,UN	
3920	3CB1				*		
3921	3CB1				*		
3922	3CB1				*		
3923	3CB1	00			FIXTMP	RES	1
3924	3CB2				*		
3925	3CB2				*		
3926	3CB2				*		
3927	3CB2	77	18		INTROT	PSSL	RS+WC
3928	3CB4	75	01			CPSL	CRY
3929	3CB6	05	04			LODI,R1	4
3930	3CB8	0D	47	2D	INTR1	LODA,R1	INTSTG,-
3931	3CBB	50				RRR,R0	
3932	3CBC	CD	67	2D		STRA,R1	INTSTG,I
3933	3CFF	F9	77			PRNR,R1	INTR1
3934	3C01	75	18			CPSL	WC+RS

	335	3CC3 17		RE TC,UN	
	3936	3CC4	*		
	3937	3CC4	*		
	3938	3CC4	*		
	3939	3CC4 3F 3C F5	FPSCN	BSTA,UN	POPC1
	3940	3CC7 0C 13 8E		LODA,R0	CBUF1+1
	3941	3CCA 9F 3A 7A		BCFA,LT	PPUSH1
	3942	3CCD 1F 3A 8F		BCTA,UN	PPUSM1
	3943	3CD0	*		
	3944	3CD0	*		
	3945	3CD0	*		
	3946	3CD0 3F 3D 11	FPABS	BSTA,UN	POPOPBB
	3947	3CD3 0C 07 4E		LODA,R0	OPB+1
	3948	3CD6 9E 3D 18		BCFA,LT	PUSOPB
	3949	3CD9 3B 03	FPABS1	BSTR,UN	INVOPB
	3950	3CDB 1F 3D 18		BCTA,UN	PUSOPB
	3951	3CDE	*		
	3952	3CDE	*		
	3953	3CDE	*		
	3954	3CDE 77 08	INVOFB	FPSL	WC
	3955	3CE0 3F 38 4B		BSTA,UN	TCOM
	3956	3CE3 75 08		CPSL	WC
	3957	3CE5 17		RETC,UN	
	3958	3CE6	*		
	3959	3CE6	*		
	3960	3CE6	*		
	3961	3CE6 3F 3C F5	FPINT	BSTA,UN	POPC1
127	3962	3CE9 3F 3C FC		BSTA,UN	PUSHC1
	3963	3CEC 3F 3C FC		BSTA,UN	PUSHC1
	3964	3CEF 3F 3D 20		BSTA,UN	FPFRC
	3965	3CF2 1F 37 BD		BCTA,UN	FPSUB
	3966	3CF5	*		
	3967	3CF5	*		
	3968	3CF5 04 33	POPC1	LODI,R0	CBUF1
	3969	3CF7 05 8D		LODI,R1	CBUF1
	3970	3CF9 1F 32 45		BCTA,UN	POP
	3971	3CFC 04 33	PUSHC1	LODI,R0	CBUF1
	3972	3CFE 05 8D		LODI,R1	CBUF1
	3973	3D00 1F 32 7D		BCTA,UN	PUSH
	3974	3D03 04 33	POPC2	LODI,R0	CPUF2
	3975	3D05 05 91		LODI,R1	CBUF2
	3976	3D07 1F 32 45		BCTA,UN	POP
	3977	3D0A 04 33	PUSHC2	LODI,R0	CBUF2
	3978	3D0C 05 91		LODI,R1	CBUF2
	3979	3D0E 1F 32 7D		BCTA,UN	PUSH
	3980	3D11 04 27	POPCPB	LODI,R0	OPB
	3981	3D13 05 4D		LODI,R1	OPB
	3982	3D15 1F 32 45		BCTA,UN	POP
	3983	3D18 04 27	PUSOPB	LODI,R0	OPB
	3984	3D1A 05 4D		LODI,R1	OPB
	3985	3D1C 1F 32 7D		BCTA,UN	PUSH
	3986	3D1F	*		
	3987	3D1F	*		
	3988	3D1F	*		
	3989	3D1F 00	INVERT RES		1
	3990	3D20	*		
	3991	3D20	*		

LINE ADDR B1 R2 R3 LABEL OPCODE OPERAND

3992	3D20			*		
3993	3D20	3E	6F	FPFRC	BSTR,UN	POPOPB
3994	3D22	20			EORZ,R0	
3995	3D23	C8	7A		STRR,R0	INVERT
3996	3D25	0C	07	4E	LODA,R0	OPB+1
3997	3D28	9A	07		BCFR,LT	FPFRC1
3998	3D2A	04	FF		-LODI,R0	FF
3999	3D2C	C8	71		STRR,R0	INVERT
4000	3D2F	3F	3C	DE	BSTA,UN	INVOPB
4001	3D31	0C	07	4D	FPFRC1	LODA,R0
4002	3D34	99	29		BCFR,GT	FRC4
4003	3D36	F4	17		COMI,R0	17
4004	3D38	9E	3A	73	BCFA,LT	PUSH0
4005	3D3B	00			LODZ,R0	
4006	3D3C	C2			STRZ,R2	
4007	3D3E	05	00		LODI,R1	0
4008	3D3F	07	40		LODI,R3	40
4009	3D41	20			FRCV	EORZ,R0
4010	3D42	E6	00		FRC1	COMI,R2
4011	3D44	18	06		BCTR,EQ	FRC3
4012	3D46	A6	01		SUBI,R2	1
4013	3D48	63			IORZ,R3	
4014	3D49	F3			RRR,R3	
4015	3D4A	9A	76		BCFR,LT	FRC1
4016	3D4C	24	FF		FRC3	EORI,R0
4017	3D4E	41	27	4D		ANDA,R1
4018	3D51	CD	67	4D		STRA,R1
4019	3D54	02				LODZ,R2
4020	3D55	98	6A			BCFR,EQ
4021	3D57	77	08			PPSL
4022	3D59	3F	39	94		BSTA,UN
4023	3D5C	04	02			LODI,R0
4024	3D5E	93				LPSL
4025	3D5F	0C	1D	1F	FRC4	LODA,R0
4026	3D62	3E	3C	DE		BSTA,LT
4027	3D65	1F	3D	18		BCTA,UN
4028	3D68			*		
4029	3D68			*		
4030	3D68			*		
4031	3D68	3F	3E	E2	FPSIN	BSTA,UN
4032	3D6B	3F	3C	F5		BSTA,UN
4033	3D6E	06	04			LODI,R2
4034	3D70	3F	3C	FC	FPSIN1	BSTA,UN
4035	3D73	FA	7B			BDRR,R2
4036	3D75	3F	38	91		BSTA,UN
4037	3D78	3F	38	91		BSTA,UN
4038	3D7B	3F	3E	03		BSTA,UN
4039	3D7E	04	3D			LODI,R0
4040	3D80	05	A6			LODI,R1
4041	3D82	06	FF			LODI,R2
4042	3D84	1F	3E	0P		BCTA,UN
4043	3D87			*		
4044	3D87			*		
4045	3D87			*		
4046	3D87	3F	3E	E2	FPCOS	BSTA,UN
4047	3D8A	3F	3C	F5		BSTA,UN
4048	3D8D	3F	3A	7A		BSTA,UN

$$\sin x = \pi \cos(\frac{x}{\pi}) = x'$$

$$\sin x = x - \frac{1}{3}x^3 + \frac{1}{5}x^5$$

$$\cos x = 1 - \frac{1}{2}x^2 + \frac{1}{24}x^4$$

49	00	I.R		
4050	3D92 3F 3C FC	FPCOS1	BSTA, UN	PUSHC1
4051	3D95 FA 7B		BDRR, R2	FPCOS1
4052	3D97 3F 38 91		BSTA, UN	FPMULT
4053	3D9A 3F 3D 03		BSTA, UN	POPC2
4054	3D9D 04 3D		LODI, R0	COSFAC
4055	3D9F 05 BE		LODI, R1	COSFAC
4056	3DA1 06 FF		LODI, R2	FF
4057	3DA3 1F 3E 0B		BC A, UN	SERIES
4058	3DA6	*		
4059	3DA6	*		
4060	3DA6	*		
4061	3DA6 FE	SINFAC	DATA	FE
4062	3DA7 AA		DATA	AA
4063	3DA8 AA		DATA	AA
4064	3DA9 AB		DATA	AB
4065	3DAA FA		DATA	FA
4066	3DAB 44		DATA	44
4067	3DAC 44		DATA	44
4068	3DAD 44		DATA	44
4069	3DAE F4		DATA	F4
4070	3DAF 97		DATA	97
4071	3DE0 F9		DATA	F9
4072	3DE1 80		DATA	80
4073	3DE2 EE		DATA	EE
4074	3DE3 5C		DATA	5C
4075	3DE4 77		DATA	77
4076	3DE5 8E		DATA	8E
4077	3DE6 E7		DATA	E7
4078	3DE7 94		DATA	94
4079	3DE8 66		DATA	66
4080	3DE9 EB		DATA	EB
4081	3DEA E0		DATA	E0
4082	3DEB 58		DATA	58
4083	3DEC 49		DATA	49
4084	3DED 1A		DATA	1A
4085	3DEE	*		
4086	3DEE	*		
4087	3DEE	*		
4088	3DEE 00	COSFAC	DATA	00
4089	3DEF C0		DATA	C0
4090	3DC0 00		DATA	00
4091	3DC1 00		DATA	00
4092	3DC2 FC		DATA	FC
4093	3DC3 55		DATA	55
4094	3DC4 55		DATA	55
4095	3DC5 55		DATA	55
4096	3DC6 F7		DATA	F7
4097	3DC7 A4		DATA	A4
4098	3DC8 FA		DATA	FA
4099	3DC9 50		DATA	50
4100	3DCA F1		DATA	F1
4101	3DCB 68		DATA	68
4102	3DCC 06		DATA	06
4103	3DCE 80		DATA	80
4104	3DCE FF		DATA	FF
4105	3DCF B6		DATA	B6

NIL GEOMETRIC

TALOR CONTINUUM

= 2.332986

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LINE	ADDR	B1	B2	B3	LABFL	OPCODE	OPEPAND
4106	3D10	06				DATA	06
4107	3D11	02				DATA	02
4108	3D12	E4				DATA	E4
4109	3D13	47				DATA	47
4110	3D14	FB				DATA	FB
4111	3D15	61				DATA	61
4112	3DD6			*			
4113	3DD6			*			
4114	3DD6			*			
4115	3DD6	3F	3E	68	FPTAN	BSTA,UN	FPSIN
4116	3DD9	3F	3C	FC		BSTA,UN	PUSHC1
4117	3DDC	3F	3D	87		BSTA,UN	FPCOS
4118	3DDF	1F	38	94		BCTA,UN	FPDIV
4119	3DE2			*			
4120	3DE2			*			
4121	3DE2			*			
4122	3DE2	3F	3C	F5	QUAD	BSTA,UN	POPC1
4123	3DE5	3F	3C	FC		BSTA,UN	PUSHC1
4124	3DE8	3F	3C	FC		BSTA,UN	PUSHC1
4125	3DEB	3F	0F			BSTR,UN	PUSHQU
4126	3DED	3F	38	94		BSTA,UN	FPDIV
4127	3DF0	3F	3C	E6		BSTA,UN	FPINT
4128	3DF3	3B	07			BSTR,UN	PUSHQU
4129	3DF5	3F	38	91		BSTA,UN	FPMULT
4130	3DF8	3F	37	BD		BSTA,UN	FPSUB
4131	3DFB	17				BCTA,UN	
4132	3DFC			*			
4133	3DFC			*			
4134	3DFC			*			
4135	3DFC	04	3E		PUSHQU	LODI,R0	QUADC
4136	3DFE	05	03			LODI,R1	QUADC
4137	3E00	1F	32	7D		BC A,UN	PUSH
4138	3E03			*			
4139	3E03			*			
4140	3E03			*			
4141	3E03	02	64		QUADC	ACON	0264
4142	3E05	87				DATA	87
4143	3E06	EE				DATA	EE
4144	3E07	00	00	00	SRTEMP	RES	4
4145	3E0B			*			
4146	3E0B			*			
4147	3E0B			*			
4148	3E0B	C8	7A		SERIES	STRR,R0	SRTEMP
4149	3E0D	C9	79			STRR,R1	SRTEMP+1
4150	3E0F	CA	79			STRR,R2	SRTEMP+3
4151	3E11	20				FORZ,R0	
4152	3E12	C8	75			STRR,R0	SRTEMP+2
4153	3E14	3F	3D	0A	SERIEZ	BSTA,UN	PUSHC2
4154	3E17	08	6E			LODR,R0	SRTEMP
4155	3E19	09	6D			LODR,R1	SRTEMP+1
4156	3E1B	3F	32	7D		BSTA,UN	PUSH
4157	3E1F	3F	38	91		BSTA,UN	FPMULT
4158	3E21	3F	37	EF		BSTA,UN	FPADD
4159	3E24	3F	3D	0A		BSTA,UN	PUSHC2
4160	3E27	3F	3C	FC		BSTA,UN	PUSHC1
4161	3E2A	08	FE			LODR,R0	SRTEMP+3
4162	3E2C	18	06			ROTR,R0	SERIEZ

$$DC - \pi \text{INT} \left(\frac{x}{\pi} \right)$$

(def $N \times 2\pi$ of $\sin \phi$ def)

$$03 \quad 64 \quad \} = 2\pi !$$

$$\frac{03}{2} = \pi$$

$$87 \quad ED$$

MSB table
LSB table
FF/...

intermediate integral factor
def 5 weeks ago

33	F 3F 3C FC	BSTA, UN	I		
4164	3E31 3F 3E 91	BSTA, UN	FPMULT		
4165	3E34 3F 38 91	SERIE3 BSTA, UN	FPMULT		BSTA, UN 7ASHG1
4166	3E37 3F 3D 03	BSTA, UN	POPC2		
4167	3E3A 0C 13 91	LODA, R0	CBUF2		
4168	3E3D 7F 02	CPSL	COM		
4169	3E3F E4 F9	COMI, R0	E9	-17	
4170	3E41 77 02	PPSL	COM		
4171	3E43 1E	RETC, LT			
4172	3E44 08 43	LODR, R0	SRTEMP+2		
4173	3E46 84 01	ADDI, R0	1		
4174	3E48 E4 06	COMI, R0	6		6 factor in parent?
4175	3E4A 14	RETC, EQ			
4176	3E4B CC 1E 09	STRA, R0	SRTEMP+2		store in factor
4177	3E4E 0C 1E 08	LODA, R0	SRTEMP+1		
4178	3E51 84 04	ADDI, R0	4		
4179	3E53 CC 1E 08	STRA, R0	SRTEMP+1		
4180	3E56 9C 3E 14	BCFA, EQ	SERIE2		total add + 4 (no quad for)
4181	3E59 0C 1E 07	LODA, R0	SRTEMP		
4182	3E5C 84 01	ADDI, R0	1		
4183	3E5E CC 1E 07	STRA, R0	SRTEMP		
4184	3E61 1F 3F 14	BCTA, UN	SERIE2		
4185	3E64	*			
4186	3E64	*			
4187	3E64	*			
4188	3E64 00 00 00	RNDSTR RES	4		
4189	3E68	*			
4190	3E68	*			
4191	3E68	*			
131 4192	3E68 08 7B	FPRND LODR, R0	RNDSTR+1		
4193	3E6A 3E 1C	BSTR, UN	RANDOM		
4194	3E6C 44 7F	ANDI, R0	7F		
4195	3E6E C8 75	STRR, R0	RNDSTR+1		
4196	3E70 07 02	LODI, R3	2		
4197	3E72 06 01	LODI, R2	1		
4198	3E74 0F 3F 64	FPRND1 LODA, R2	RNDSTR, +		
4199	3E77 3B 0F	BSTR, UN	RANDOM		
4200	3E79 CF 7F 64	STRA, R2	RNDSTR, I		
4201	3E7C FB 76	BDRR, R3	FPRND1		
4202	3E7E 04 3F	LODI, R0	RNDSTR		
4203	3E80 05 64	LODI, R1	RNDSTR		
4204	3E82 3F 32 7D	BSTA, UN	PUSH		
4205	3E85 1F 38 91	BCTA, UN	FPMULT		
4206	3E88	*			
4207	3E88	*			
4208	3E88	*			
4209	3E88 00	RANDOM LODZ, R0			
4210	3E89 98 02	BCFR, EQ	RAND1	3E89 00 00	RANDOM LODZ, R0
4211	3E8B E4 01	ADDI, R0	1	3E89 98 02	BCFR, EQ RAND1
4212	3E8D C1	RAND1 STRZ, R1		3E8B 04 01	ADDI, R0 1
4213	3E8E 45 8E	ANDI, R1	8E	3E8D C1	STRZ, R1
4214	3E90 77 08	PPSL	WC	3E8E 01	RRL, R1
4215	3E92 18 0F	BCTR, EQ	RAND3	3E8F 01	RRL, R1
4216	3E94 D1	RRL, R1		3E90 45 FC	ANDI, R1 FC
4217	3E95 45 FE	ANDI, R1	FE	3E92 81	ADDZ, R1
4218	3E97 B5 01	TPSL	CRY	3E93 01	RRL, R1
4219	3E99 98 79	BCFR, EQ	RAND2	3E94 45 FB	ANDI, R1 FB
				3E96 01	ADDZ, R1
				3E97 17	RETC, UN

LINE	ADDR	B1	B2	B3	LABFL	OPCODE	OPERAND
4220	3E9B	45	FF			ANDI,R1	FF
4221	3E9D	13	06			BCTR,EQ	RAND4
4222	3E9F	D0			RAND3	RRL,R0	
4223	3EA0	44	FF			ANDI,R0	FE
4224	3EA2	75	08			CPSL	WC
4225	3EA4	17				RETC,UN	
4226	3EA5	D0			RAND4	RRL,R0	
4227	3EA6	44	FE			ANDI,R0	FE
4228	3EA8	84	01			ADDI,R0	1
4229	3EAA	75	08			CP,L	WC
4230	3EAC	17				RETC,UN	
4231	3EAD				*		
4232	3EAD				*		
4233	3EAD				*		
4234	3EAD	3F	3C	F5	FPLN	BSTA,UN	POPC1
4235	3EB0	04	07			LODI,R0	7
4236	3EB2	CC	07	4D		STRA,R0	OPB
4237	3EB5	0C	13	0D		LODA,R0	CBUF1
4238	3EB8	9A	04			BCFR,LT	FPLN1
4239	3EBA	24	FF			EORI,R0	FF
4240	3EBC	84	01			ADDI,R0	1
4241	3EBF	CC	07	4E	FPLN1	STRA,R0	OPB+1
4242	3EC1	20				EORZ,R0	
4243	3EC2	CC	07	4F		STRA,R0	OPB+2
4244	3EC5	CC	07	50		STRA,R0	OPB+3
4245	3EC8	0C	13	0E		LODA,R0	CBUF1+1
4246	3ECB	0D	30	6E		BCFA,GT	ERR15 OVERFLOW--LN OF 0 OR NEG NUMBER
4247	3ECE	77	08			PPSL	WC
4248	3E10	3F	39	94		BSTA,UN	NORM
4249	3ED3	04	02			LODI,R0	2
4250	3ED5	93				LPSL	
4251	3ED6	0C	13	8D		LODA,R0	CBUF1
4252	3ED9	3E	3C	DE		BSTA,LT	INVOPB
4253	3E1C	20				EORZ,R0	
4254	3EDD	CC	13	8D		STRA,R0	CBUF1
4255	3EE0	04	3F			LODI,R0	FPLN2
4256	3EE2	05	12			LODI,R1	FPLN2
4257	3EE4	3F	32	7E		BSTA,UN	PUSH
4258	3EE7	3F	3D	18		BSTA,UN	PUSOPB
4259	3EEA	3F	38	91		BSTA,UN	FPMULT
4260	3EED	3F	3C	FC		BSTA,UN	PUSHC1
4261	3EF0	3F	3A	7A		BSTA,UN	PPUSH1
4262	3EF3	3F	37	BD		BSTA,UN	FPSUB
4263	3EF6	3F	3C	F5		BSTA,UN	POPC1
4264	3EF9	06	03			LODI,R2	3
4265	3EFB	3F	3C	FC	FPLN4	BSTA,UN	PUSHC1
4266	3FFE	FA	7F			BDRR,R2	FPLN4
4267	3F00	3F	38	91		BSTA,UN	FPMULT
4268	3F03	3F	3D	03		BSTA,UN	POPC2
4269	3F06	3F	37	FF		BSTA,UN	FPADD
4270	3F09	04	3F			LODI,R0	LNFAC
4271	3F0B	05	16			LODI,R1	LNFAC
4272	3F0D	06	00			LODI,R2	0
4273	3F0F	1F	3F	0B		ECTA,UN	SERIES
4274	3F12				*		
4275	3F12				*		
4276	3F12				*		

4277	3F12 00 58	EDLN2	ACON	0050
4278	3F14 09		DATA	
4279	3F15 09		DATA	09
4280	3F16	*		
4281	3F16	*		
4282	3F16	*		
4283	3F16 00	LNFA	DATA	00
4284	3F17 00		DATA	00
4285	3F18 00		DATA	00
4286	3F19 00		DATA	00
4287	3F1A FF		DATA	FF
4288	3F1B 55		DATA	55
4289	3F1C 55		DATA	55
4290	3F1D 55		DATA	55
4291	3F1E FF		DATA	FF
4292	3F1F FF		DATA	FF
4293	3F20 FF		DATA	FF
4294	3F21 FC		DATA	FC
4295	3F22 FE		DATA	FE
4296	3F23 66		DATA	66
4297	3F24 66		DATA	66
4298	3F25 66		DATA	66
4299	3F26 FE		DATA	FE
4300	3F27 AA		DATA	AA
4301	3F28 AA		DATA	AA
4302	3F29 AA		DATA	AA
4303	3F2A FE		DATA	FE
4304	3F2B 49		DATA	49
4305	3F2C 24		DATA	24
4306	3F2D 96		DATA	96
4307	3F2E	*		
4308	3F2E	*		
4309	3F2E	*		
4310	3F2F 00	FPFSTG RES		1
4311	3F2F	*		
4312	3F2F	*		
4313	3F2F	*		
4314	3F2F 3F 3C F5	FPFEXP2	BSTA,UN	POP01
4315	3F32 3F 3C FC	FPFEXP3	BSTA,UN	PUSHC1
4316	3F35 3F 2A 17		BSTA,UN	DT0BNL
4317	3F38 01		LODZ,R1	
4318	3F39 02		STRZ,R2	
4319	3F3A 3F 3A 7A		BSTA,UN	PFUSH1
4320	3F3D 02		LODZ,R2	
4321	3F3E 18 10		ECTR,FQ	FPEXPD
4322	3F40 0A 60	FPEXPA	STRR,R2	FPESTG
4323	3F42 04 3F		LODI,P0	FPE
4324	3F44 05 7B		LODI,R1	FPE
4325	3F46 3F 32 7D		BSTA,UN	FUSH
4326	3F49 3F 38 91		BSTA,UN	FPMULT
4327	3F4C 0A 60		LODR,R2	FPESTG
4328	3F4E FA 70		BDRR,R2	FPEXPA
4329	3F50 3F 3D 03	FPEXPD	BSTA,UN	POP02
4330	3F53 3F 3D 20		BSTA,UN	FPPRC
4331	3F56 3F 3C F5		BSTA,UN	POP01
4332	3F59 3F 3D 0A		BSTA,UN	PUSHC2
4333	3F5C 3F 3A 7A		BSTA,UN	PFUSH1

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FPFEXP2 BSTA,UN FPEXPA 1F 1F 96

LINE ADDR B1 B2 B3 LABEL OPCODE OPERAND

4334	3F5F	06	03		LODI, R2	3	
4335	3F61	3F	3C	FC	FPEXPB	BSTA, UN	PUSHC1
4336	3F64	FA	7B		BDRR, R2	FPEXPB	
4337	3F66	3F	38	91		BSTA, UN	FPMULT
4338	3F69	3F	3D	03		BSTA, UN	POPC2
4339	3F6C	3F	37	EF		BSTA, UN	FPADD
4340	3F6F	04	3F		LODI, R0	EXPFAC	
4341	3F71	0E	7F		LODI, R1	EXPFAC	
4342	3F73	06	00		LODI, R2	00	
4343	3F75	3F	3E	0B		BSTA, UN	SERIES
4344	3F78	1F	38	91		BSTA, UN	FPMULT
4345	3F7B						
4346	3F7B						
4347	3F7B						
4348	3F7B	02			FPE	DATA	02
4349	3F7C	56				DATA	56
4350	3F7D	FC				DATA	FC
4351	3F7E	29				DATA	29
4352	3F7F						
4353	3F7F						
4354	3F7F						
4355	3F7F	00			EXPFAC	DATA	00
4356	3F80	40				DATA	40
4357	3F81	00				DATA	00
4358	3F82	00				DATA	00
4359	3F83	FE				DATA	FE
4360	3F84	55				DATA	55
4361	3F85	55				DATA	55
4362	3F86	55				DATA	55
4363	3F87	FC				DATA	FC
4364	3F88	55				DATA	55
4365	3F89	55				DATA	55
4366	3F8A	55				DATA	55
4367	3F8B	FA				DATA	FA
4368	3F8C	44				DATA	44
4369	3F8D	44				DATA	44
4370	3F8E	48				DATA	48
4371	3F8F	F7				DATA	F7
4372	3F90	5B				DATA	5B
4373	3F91	05				DATA	05
4374	3F92	B0				DATA	B0
4375	3F93	F4				DATA	F4
4376	3F94	68				DATA	68
4377	3F95	06				DATA	06
4378	3F96	86				DATA	86
4379	3F97						
4380	3F97						
4381	3F97						
4382	3F97	3F	3C	F5	FPEXP	BSTA, UN	POPC1
4383	3F9A	3F	3D	03		BSTA, UN	POPC2
4384	3F9D	3F	3C	FC		BSTA, UN	PUSHC1
4385	3FA0	3F	3D	0A		BSTA, UN	PUSHC2
4386	3FA3	3F	3F	AD		BSTA, UN	FPLN
4387	3FA6	3F	38	91		BSTA, UN	FPMULT
4388	3FA9	1F	3F	2F		BSTA, UN	FPEXP2
4389	3FAC						
4390	3FAC						

IF IF R2 BCTA, UN MLTEXT

1/5 .5
1/6 .16666666

1/24 .04166666

1/120 .00833333

1/720 .00138888

1/5040 .00019841

4392	3FAC 3F 3E AD FPLOG	BSTA,UN	FPLN
4393	3FAF 04 3F	LODI,R0	LOGCON
4394	3FB1 05 B9	LODI,R1	LOGCON
4395	3FB3 3F 32 7D	BSTA,UN	PUSH
4396	3FB6 1F 38 91	BCTA,UN	FPMULT
4397	3FB9	*	
4398	3FB9	*	
4399	3FB9	*	
4400	3FB9 FF	LOGCON DATA	FF
4401	3FBA 6F	DATA	6F
4402	3FBE 2D	DATA	2D
4403	3FBC EB	DATA	EB
4404	3FBD	*	
4405	3FBD	*	
4406	3FBE	*	
4407	3FBD 00 40	FP.5 ACON	0040
4408	3FBF 00 00	ACON	0000
4409	3FC1	*	
4410	3FC1	*	
4411	3FC1	*	
4412	3FC1 3F 3E AD FPSORT	BSTA,UN	FPLN
4413	3FC4 04 3F	LODI,R0	FP.5
4414	3FC6 05 B1	LODI,R1	FP.5
4415	3FC8 3F 32 7D	BSTA,UN	PUSH
4416	3FCB 3F 38 91	BSTA,UN	FPMULT
4417	3FCE 1F 3F 2F	BCTA,UN	FPEXP2

3FD1 13	SETCC	SPSL	
3FD2 E6 00	COHT,R2	00	
3FD4 1B 03	BCTA,Z	A	
3FD6 93	LTSL		
3FD7 1B 06	BCTA,UN	B	
3FD8 93	A LTSL		
3FD9 1H 09	BCTA,V	C	
3FDC 0C 13 8E	LODA,R0	CBUF1+1	
3FDE 1E 33 9F	BCTA,N	COHLT	
3FE2 1F 33 AC	BCTA,UN	CCMG	
3FE5 1C 13 8E	C LODA,R0	CBUF1+1	
3FE8 1E 33 AC	BCTA,N	CCMG	
3FEB 1F 33 9F	BCTA,UN	COHLT	

CC is LT in return.
CC is GT in return.

3FEE CE 14 4F	STAR2	SEAB,R2	CPLTH
1F 34 0D	BCTA,UN	STROP2	

*

Central Data Corporation
PO Box 2484, Station A
Champaign, IL 61820
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Dear BASIC Customer:

The following following changes have been made to
the 8K BASIC program. These changes are in
versions 1.3 and higher.

→ x 33B9	9C 3F D1 C0
→ x 3FD1	13 E6 00 18 03 93 1B 06 93 1A 09 0C 13 8E
	1E 33 9F 1F 33 AC 0C 13 8E 1E 33 AC 1F 33
	9F
→ x 3995	03
x 25B9	1F 3E 98
x 3E88	00 98 02 84 01 C1 D1 D1 45 FC 81 D1 45 F8
	81 17 70 F4 80 1C 25 BE 0C 1E 65 84 01 44
	7F CC 1E 65 1F 3E 98
x 1780	33 8E 3F 38 91 0C 17 AF 14 15 3F 3D 03 3F
	3A 7A 3F 3D 0A 1F 38 94 3F 3C F5 0C 97 80
	CC 17 AF 3F 3C FC 3F 3C D0 3F 3C F5 1F 3F
	32 1F
3F2F — x 2F2F	1F 17 96
x 3F78	1F 17 82
x 2C25	3F 3F EE
x 3FEE	CE 14 A5 1F 34 0D

CEX 1A 2 1 1 1 1
CEXC 3F
CEX 1A 2 1 1 1 1