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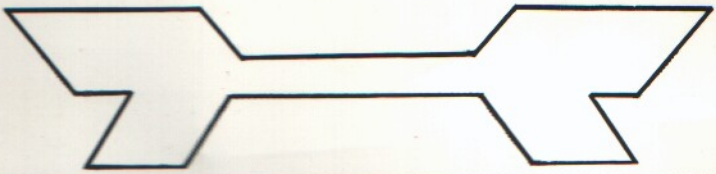
ZEN

EDITOR ASSEMBLER



FOR USE WITH Einstein COLOUR MICRO COMPUTER

KUMA

Introduction

Thank you for buying this copy of ZEN for the Tatung Einstein. If you have any questions about ZEN then please feel free to write to Avalon Software, every enquiry receives a reply. All high level languages have performance limitations, when you need the maximum in speed and flexibility the answer lies in Assembly Language programming. ZEN provides you with the tools to generate or analyse I88 Assembly Language programs.

Starting up

It is generally most convenient to work from DOS command level (not MOS command level) with drive 0 as the current drive. While these conditions are in no way obligatory all the examples in this manual assume them. The DOS command to load and execute ZEN from disk is:

ZEN(ENTER)

The DOS Monitor Module (DMM) will load ZEN into the Transient Program Area (TPA) and then transfer control.

Command level

Whenever the prompt ZEN> is displayed you are at command level, you may execute any of the following commands:

A ..... Assemble	O ..... Out
B ..... Bye	P ..... Print
C ..... Copy	Q ..... Query
D ..... Down	R ..... Read
E ..... Enter	S ..... Sort
F ..... Fill	T ..... Target
G ..... Goto	U ..... Up
H ..... Howbig	W ..... Write
I ..... In	X ..... Xamine
K ..... Kill	Z ..... Zap
L ..... Locate	d ..... disassemble
M ..... Modify	u ..... unscramble
N ..... New	

To select a given command type in the first letter of it's name, followed by a parameter if relevant, and then press the (ENTER) key. The (DEL) key can be used to backspace while (CTRL-A) will activate the Screen Dump function. The usage of command loop parameters is explained in greater detail in the next section, which examines each command in depth. If ZEN doesn't understand anything you've typed in it will display the error message HUH? The default command, just pressing (ENTER) on it's own, will clear the screen.

Assemble The function of the assembler is to read a series of assembly language statements and to produce the corresponding Z80 machine code and listing. The ZEN editing commands are used to create a text file in memory, usually called the source file, which is the input to the assembler. Output of the machine code file, usually called the object file, is controlled by the LOAD operator (see under PSEUDO-OPS). The listing output is specified by you in response to the OPTION> prompt from the assembler. You may specify V(ENTER), E(ENTER) or (ENTER) for video, external or null list output. The null output option is much the fastest mode (the assembler is peripheral-bound) and should be used until all syntax errors are corrected. The text file is read beginning at the start-of-file and stopping when the END operator is found.

Bye This command gives a warm return to the DOS. If you then want to return to ZEN without re-loading you can use the GO command. You can shuttle between ZEN and DOS whenever you like without affecting any files or data in memory. Note that a DOS warm start reloads the DMM just underneath the Operating System Module (OSM).

Copy This command moves a block of memory. You will be prompted for START>, STOP> and DESTINATION> parameters. Within ZEN's command structure a numeric parameter may be a decimal, hexadecimal or octal number. Hex numbers are 'H' postfixed and octal are 'O' postfixed. So if you wanted to move the block of memory from 200H to 2FFH up to 8000H you would type 200H(ENTER), 2FFH(ENTER) and 8000H(ENTER).

Down This command moves the editor current line down by the number of lines specified in the command parameter. For example D37(ENTER) moves down thirty-seven lines. The default command parameter is one so D(ENTER) moves down one line. The editor in ZEN is line orientated as in BASIC but does not use explicit line numbers, instead you use various commands to move around the text file until you reach the required position. You then use the ENTER or ZAP commands to insert or delete lines of text. If the DOWN command bumps into the end-of-file then the message EOF will be displayed.

Enter This command enters lines of text into the text file. ZEN will display the current line number, type in your line of text then press (ENTER). This process will repeat until you type a full stop as the first character on the line, this returns you to command level. Your text is placed in the file at the current line, the old current and following lines are moved downwards towards EOF. Note that although line numbers are often displayed by ZEN these are dynamically computed and not stored in the text file.

Fill This command fills a block of memory, from START> to STOP> inclusive with a DATA> value. You will be prompted for all three parameters.

Goto This command loads the Z80 registers with the User Image and transfers control to the address specified in the command parameter. For example G0(ENTER) would perform a DOS warm start. If no command parameter is supplied then control is transferred to the address in the User Program Counter. You will then be prompted for a breakpoint address. If you respond with a valid address parameter then a breakpoint is set at that address. If you default, by just pressing (ENTER), then no breakpoint is set. A breakpoint is a way of stopping a running program. A RST 30H instruction (0F7H) is inserted into the program and a vector back to the ZEN trap handler is placed at 0030H. The trap handler will save all the Z80 registers in the User Image area and restore the code under the breakpoint before returning to the ZEN command loop. You can thus examine the state of the Z80 at the time of the breakpoint. You can continue execution by using the G(ENTER) command as the Program Counter is saved as part of the trap process.

Howbig This command displays, in hexadecimal, the start and end addresses of the text file and the top of memory. ZEN will allow the text file to grow up to this top limit but no further. You can change this limit if required (see ZEN listing, the LIMIT constant). If LIMIT is zero then ZEN will take the DOS OSM minus one as it's upper bound.

In This command will display, in hexadecimal and binary, the data read from the I/O port specified by the command parameter. For example I83H(ENTER).

Kill This command erases the text file, as with the NEW statement in BASIC. It is possible to recover an accidentally KILLED file as ZEN just makes the EOF pointer equal to the SOF pointer, the actual text will still be in memory. Find the address of the last text character, this will be an ASCII Carriage Return code (0DH). Increase this by one and use the MODIFY command to restore the EOF pointer (see ZEN listing, EOFP).

Locate This command is used to search the text file for a particular string of characters. The character string forms the command parameter. For example LBIT 7,A(ENTER) would find the first occurrence of the string BIT 7,A in the text file. The text file is searched from the line after the current line. If the string is found then that line is made the current line. If the search fails you are at end-of-file. There are no restrictions on the contents of the parameter string.

Modify This command allows you to examine and alter memory contents. The start address is specified by the command parameter. For example M7000H(ENTER) would cause the command to start at 7000H. If you supply no address parameter then the command continues from where it last finished. The byte at the address is displayed in hex and ZEN prompts for a data parameter from you. If you supply a parameter then it is stored at that address, if you default ZEN just steps onto the next address. To return to command level type a full stop.

New This command lets you modify the current line of the text file. The line is displayed with the cursor at the rightmost position. Change the line and press (ENTER) to restore the new line to the text file.

Out This command will output a data value to the I/O port specified by the command parameter. You will be prompted for the data parameter.

Print This command displays a number of lines from the text file on the screen. The number of lines is specified by the command parameter, for example P9(ENTER) would display nine lines. The default command parameter is one. The display commences with the current line and the last line displayed becomes the new current line.

Query This command displays sixty-four bytes of memory in hex and ASCII. The command parameter specifies the start address, for example Q100H(ENTER) would display the start of ZEN. If you supply no address parameter then the display begins from where it last finished.

Read This command reads a file from a mass storage device into memory, the command parameter specifies the type of file.

RS(ENTER) will read a SRC (source) file and append it to the end of any text already existing in memory. You will be prompted for a filename. A filename may be from one to eight upper-case letters or digits optionally preceded by a drive identifier, if this is missing then the file is read from the current DOS drive. If the text file reaches ZEN's top of memory limit then reading terminates and the error message MEMORY is displayed.

RC(ENTER) will read a COM file into memory. You will be prompted for an address to LOAD> the file at. For example if you wanted to look at XBAS.COM then you would enter the following keystrokes: RC(ENTER) 3000H(ENTER) XBAS(ENTER). This will load BASIC into memory starting at 3000H.

RH(ENTER) will read an Intel HEX file into memory. Intel HEX files are standard file types on all CP/M systems as they are more flexible than COM files. As HEX files are composed entirely of ASCII characters they can also be examined by the DOS DISP command. You will be prompted for a LOAD> address, if you supply an address parameter then the HEX file will be loaded into memory commencing at that address. If you default, by just typing (ENTER), then the file is loaded at the address in the header of each record. The end-of-file record address is placed in the User Program Counter as this is assumed to be an execution address. If a checksum error is found during reading then reading terminates and the error message CHECKSUM is displayed. This command can cope with discontiguous HEX files.

Sort This command will sort and display the symbol table produced during the last assembly. You will be prompted for an output option. Your possible responses are the same as for the Assembler list output. The output of this command is generated a page at a time as with list output. You can restrict the sort process to symbols beginning with a particular letter by entering that letter as a command parameter. For example SB(ENTER) would only produce the symbols beginning with the letter 'B'. Note that symbols are only sorted on the first letter and not the whole name.

Target This command will move you to any line in the text file and make it the current line. The command parameter specifies the line number, for example T1435(ENTER) would move you to line one thousand four hundred and thirty-five. The default command parameter, T(ENTER), moves you to the start-of-file.

Up This command moves you up the text file by the number of lines specified in the command parameter. The default parameter is one.

Write This command writes an area of memory to a mass storage device, the command parameter specifies the type of file.

WS(ENTER) will write all the text in memory as a SRC file. You will be prompted for a filename as described in the READ command. ZEN source files are standard XtalDOS-CP/M text files with a CR,LF between lines and a CTRL-Z end-of-file mark.

WC(ENTER) will write an area of memory as a COM file. You will be prompted for START> and STOP> addresses inclusive. The actual file will usually be larger than this as ZEN will write a file which is a multiple of two hundred and fifty-six bytes in size, in line with DOS convention.

WH(ENTER) will write an area of memory as an Intel HEX file. You will be prompted for START> and STOP> addresses inclusive, these parameters will exactly define the size of the generated file. You will then be prompted for a LOAD> address. If you default then each record header address will be the actual address it was written from. If you supply a valid address parameter then ZEN will alter each record header address so that the file will load back in commencing at your specified address. You will then be prompted for an EXECUTION> address, this address is just placed in the end-of-file record for use in later reading.

Xamine This command displays the Z80 registers saved in the User Image. The top line shows the main registers and the lower line the Z80 alternate register set.

Zap This command removes a number of lines from the text file as specified by the command parameter. For example Z100(ENTER) would remove one hundred and eight lines, commencing with the current line. The default command parameter is one.

disassemble This command performs a symbolic disassembly on an area of memory and generates a text file or listing as output. You will be prompted for the START> and STOP> addresses inclusive of the area you wish to disassemble. You will then be asked the address which the program RUNS AT>. Sometimes you may have a program in memory at a different location to it's usual run-time location, the disassembler can relocate any addresses and labels in it's output to reflect this. If you default to the request for the run-time start address then ZEN assumes that the program is at it's normal run-time location. If you supply an actual address parameter then the output file will reflect this run-time address. You will then be asked, repeatedly, for the START> and STOP> addresses inclusive of any data areas within the disassembly region. These are areas which will not be decoded as instructions but as data bytes. To terminate this process type in a stop address of zero. There is a maximum of sixty-four separate data areas, if you exceed this number ZEN will generate the error message FULL. You will now be asked for an output OPTION>. You may specify V(ENTER) or E(ENTER) for listings to the video or external devices. If you default then ZEN will generate a text file and add it to the end of any text already in memory. If the text file grows up to the top of memory limit during disassembly then the error message MEMORY is issued and disassembly terminates. The only other error condition possible during disassembly is for the symbol table to fill up in which case the error message FULL is issued. Note that the disassembler uses the same symbol table as the assembler and so destroys any symbols there. This is only of relevance if you which to perform a later SORT operation. Any illegal opcodes encountered during disassembly are treated as data statements. Labels of the form Lnnnn (where nnnn is an address) will be generated at the appropriate positions if possible.

unscramble This command is a simplified version of the disassembler. It will disassemble eight Z80 instructions beginning at the address specified by the command parameter. For example u325H(ENTER) will disassemble the start of ZEN's mainloop. If you default on the address parameter then the command continues from where it last finished. Any illegal opcodes encountered are displayed as data bytes. ZEN will try to make an intelligent guess about how to display eight bit numeric operands. Numbers less than ten are displayed as single digit decimals. Numbers from from 41H to 5AH and 61H to 7AH are displayed as ASCII literal characters. Other numbers are displayed as hex values with a leading zero if necessary.

Further Information

List Output

The commands Assemble, Sort and disassemble can all generate large quantities of output to the video or external devices. With these commands the output will be generated a page at a time with a short pause between each page. Pressing any key will stop output at the end of the page, to restart press any key except 'Q'. This key will force the command to QUIT and return to the command loop.

The external device is assumed to be eighty characters wide by sixty-six lines long i.e a typical printer. If you have something different then you will need to modify ZEN. You can change the page length by modifying the PAGE procedure (see ZEN listing). You can change the various field widths by modifying the group of constants COMWIDTH/SYMWIDTH. The first byte of each of these constant pairs defines an external device field width, the second defines a video device field width. You may also change the number of symbols per line produced during a SORT, as there is a switch in the code specifically for this purpose.

The external device is presumed to respond to the ASCII control characters Formfeed (0CH), Carriage Return (0DH) and Linefeed (0AH). ZEN issues a Formfeed followed by sixty-two lines of text for each page, each line being terminated by Carriage Return, Linefeed. The external device driver is set up to output to the DOS List device, which is usually the Centronics port. The driver handles EPSON FX-80 type printers as it stands. If you have something unusual there is space in the driver to insert patches, to filter Linefeeds for example.

The video device is assumed to be forty characters wide but this can be changed, as for the external device, if an eighty character device becomes available. Note that line numbers are not generated on the video device for Assembler/disassembler listings because of this reduced width. The symbol, operand and comment fields of a Z80 statement may be of indefinite length. If necessary ZEN will truncate these fields to fit into the required format.

The Symbol Table

The symbol table is the area of memory used by ZEN to store symbols during Assembly/disassembly. It is situated between ZEN and the text file. If you wish to increase it's size it is only necessary to change the start-of-file pointer to the required new value, here's how: (1) KILL the text file (2) Use MODIFY to change SOFP (3) KILL the text file again to copy SOFP into EOFP and CURRENT (4) Perform an ASSEMBLE to shut down the symbol table (5) Use WC to write the new version to disk. Note that ZEN is a completely 'soft' program, any changes you make will be reflected in the new version.

Assembler Syntax

ZEN expects assembly language statements to be constructed according to the syntax defined in the ZILOG Z80 Assembly Language Programming Manual. ZEN deviates from the standard in one instance in that it expects EX AF,AF rather than EX AF,AF'. The section following this one contains an alphabetically sorted listing of the entire Z80 instruction set. Each assembly language statement may be divided into a maximum of four logical fields, they are:

(1) Label
(2) Operator
(3) Operands
(4) Comment

Label A label is a way of marking a statement so that other statements can refer to it. Line numbers serve the same purpose in BASIC, you would use GOTO 240 for example. Assembly Language allows you to use a symbolic name for a label. When you declare the label it must be postfixed with a colon ':' so that the assembler knows that it's a label. A label must begin with a letter but may contain letters or digits after that. ZEN allows labels of any length with all characters being significant. The register and condition-code names may not be used as symbols as these are reserved identifiers. Any attempt to do so will result in an error message.

Operator There are sixty-seven operators in the Z80 Assembly Language. In addition ZEN supports seven PSEUDO-OPS, they are:

END This pseudo-op terminates assembly, it MUST be used.

DS or DEFS Define Storage skips over the number of object locations specified by the operand.

DW or DEFW Define Word places the operand in the object file in reverse order as required by the Z80 word instructions.

DB or DEFB Define Byte(s) places the operand(s) in the object file at successive locations. Operands are delimited by commas, each operand may be an expression with value less than 256 or may be a literal string. Literal strings may be of any length but cannot form part of an expression.

EQU Equate assigns the value of the operand to a symbolic identifier. Any symbolic identifiers used in the operand expression must already be known to the assembler. This 'no forward reference' rule is designed to prevent circular referencing.

ORG Origin defines the start address of the object file. This pseudo-op can be used as often as needed to produce sections of code at different addresses. The 'no forward reference' rule applies to the operand.

LOAD Commences loading code into memory at the operand address. Use of a subsequent ORG pseudo-op will turn this process off, you are explicitly required to re-establish the loading process.

Operands The nuaber of operands in a statement depends upon the operator. There are niladic, monadic and dyadic operators in the Z80 instruction set. These take zero, one and two operands respectively. There are three classes of operand:

(1) Registers (A,B,C,D,E,H,L,I,R,HL,DE,BC,AF,IX,IY,SP)

(2) Condition-codes (NZ,Z,NC,C,PO,PE,P,M)

(3) Numeric expressions

A numeric expression is composed of one or more of the following elements delimited by the infix math operators:

(1) A decimal, hex or octal number. Decimal is the default base with hex numbers being 'H' postfixed and octal 'O' postfixed. Numbers must begin with a digit, a leading zero will be needed with some hex numbers.

(2) A literal character enclosed in single or double quotes.

(3) The $ character. This variable mimics the program counter of the run-time program.

(4) A symbolic name. The assembler will use the associated value in evaluating the expression.

The infix math operators are:

+ addition
- subtraction
* multiplication
/ division
& logical AND
. logical OR

Expressions are evaluated STRICTLY LEFT TO RIGHT with no precedence ordering. Arithmetic is sixteen bit unsigned integer and overflow will be ignored.

Comments Comments are ignored by the assembler. They begin with a semi-colon ';' and are terminated by the end-of-line.

Assembler Error Handling

If the assembler finds a syntax error the following will happen:

(1) Assembly terminates.

(2) An error message is displayed.

(3) The offending line is displayed and is made the editor current line.

(4) The command loop is re-entered.

You can now correct the error and re-assemble. It is impossible to make a syntax error which will damage ZEN or anything in memory. The error messages are:

UNDEFINED You have used an undeclared symbol.

SYMBOL You have declared a zero length symbol or have forgotten the symbol needed with an EQU pseudo-op.

RESERVED You have tried to use a reserved word for a symbol.

FULL The symbol table is full.

DOUBLE SYMBOL You have declared the same symbol more than once.

EOF You have forgotten END and have hit end-of-file.

ORG! You have forgotten ORG.

HUH? The assembler is completely baffled.

OPERAND You have done something wrong with an operand, this covers a multitude of sins! Most types of syntax error will come under this heading as well as errors of magnitude. These occur when you try to offset too far with a relative jump or indexing instruction.

```
                        ; *************************
                        ; *     Z80 Instruction   *
                        ; *         Set           *
                        ; *************************

                                ORG  0

                        INDEX:  EQU  5                  ; IX,IY Index
                        NUMBER: EQU  0584H              ; 16 BIT Operand
                        NUM:    EQU  20H                ; 8 BIT Operand

0000 8E                         ADC  A,(HL)
0001 DD8E05                     ADC  A,(IX+INDEX)
0004 FD8E05                     ADC  A,(IY+INDEX)
0007 8F                         ADC  A,A
0008 88                         ADC  A,B
0009 89                         ADC  A,C
000A 8A                         ADC  A,D
000B 8B                         ADC  A,E
000C 8C                         ADC  A,H
000D 8D                         ADC  A,L
000E CE20                       ADC  A,NUM
0010 ED4A                       ADC  HL,BC
0012 ED5A                       ADC  HL,DE
0014 ED6A                       ADC  HL,HL
0016 ED7A                       ADC  HL,SP
0018 86                         ADD  A,(HL)
0019 DD8605                     ADD  A,(IX+INDEX)
001C FD8605                     ADD  A,(IY+INDEX)
001F 87                         ADD  A,A
0020 80                         ADD  A,B
0021 81                         ADD  A,C
0022 82                         ADD  A,D
0023 83                         ADD  A,E
0024 84                         ADD  A,H
0025 85                         ADD  A,L
0026 C620                       ADD  A,NUM
0028 09                         ADD  HL,BC
0029 19                         ADD  HL,DE
002A 29                         ADD  HL,HL
002B 39                         ADD  HL,SP
002C DD09                       ADD  IX,BC
002E DD19                       ADD  IX,DE
0030 DD29                       ADD  IX,IX
0032 DD39                       ADD  IX,SP
0034 FD09                       ADD  IY,BC
0036 FD19                       ADD  IY,DE
0038 FD29                       ADD  IY,IY
003A FD39                       ADD  IY,SP
003C A6                         AND  (HL)
003D DDA605                     AND  (IX+INDEX)
0040 FDA605                     AND  (IY+INDEX)
0043 A7                         AND  A
0044 A0                         AND  B
0045 A1                         AND  C
0046 A2                         AND  D
0047 A3                         AND  E
0048 A4                         AND  H
0049 A5                         AND  L
004A E620                       AND  NUM
```

```
 61 004C CB46          BIT  0,(HL)
 62 004E DDCB0546      BIT  0,(IX+INDEX)
 63 0052 FDCB0546      BIT  0,(IY+INDEX)
 64 0056 CB47          BIT  0,A
 65 0058 CB40          BIT  0,B
 66 005A CB41          BIT  0,C
 67 005C CB42          BIT  0,D
 68 005E CB43          BIT  0,E
 69 0060 CB44          BIT  0,H
 70 0062 CB45          BIT  0,L
 71 0064 CB4E          BIT  1,(HL)
 72 0066 DDCB054E      BIT  1,(IX+INDEX)
 73 006A FDCB054E      BIT  1,(IY+INDEX)
 74 006E CB4F          BIT  1,A
 75 0070 CB48          BIT  1,B
 76 0072 CB49          BIT  1,C
 77 0074 CB4A          BIT  1,D
 78 0076 CB4B          BIT  1,E
 79 0078 CB4C          BIT  1,H
 80 007A CB4D          BIT  1,L
 81 007C CB56          BIT  2,(HL)
 82 007E DDCB0556      BIT  2,(IX+INDEX)
 83 0082 FDCB0556      BIT  2,(IY+INDEX)
 84 0086 CB57          BIT  2,A
 85 0088 CB50          BIT  2,B
 86 008A CB51          BIT  2,C
 87 008C CB52          BIT  2,D
 88 008E CB53          BIT  2,E
 89 0090 CB54          BIT  2,H
 90 0092 CB55          BIT  2,L
 91 0094 CB5E          BIT  3,(HL)
 92 0096 DDCB055E      BIT  3,(IX+INDEX)
 93 009A FDCB055E      BIT  3,(IY+INDEX)
 94 009E CB5F          BIT  3,A
 95 00A0 CB58          BIT  3,B
 96 00A2 CB59          BIT  3,C
 97 00A4 CB5A          BIT  3,D
 98 00A6 CB5B          BIT  3,E
 99 00A8 CB5C          BIT  3,H
100 00AA CB5D          BIT  3,L
101 00AC CB66          BIT  4,(HL)
102 00AE DDCB0566      BIT  4,(IX+INDEX)
103 00B2 FDCB0566      BIT  4,(IY+INDEX)
104 00B6 CB67          BIT  4,A
105 00B8 CB60          BIT  4,B
106 00BA CB61          BIT  4,C
107 00BC CB62          BIT  4,D
108 00BE CB63          BIT  4,E
109 00C0 CB64          BIT  4,H
110 00C2 CB65          BIT  4,L
111 00C4 CB6E          BIT  5,(HL)
112 00C6 DDCB056E      BIT  5,(IX+INDEX)
113 00CA FDCB056E      BIT  5,(IY+INDEX)
114 00CE CB6F          BIT  5,A
115 00D0 CB68          BIT  5,B
116 00D2 CB69          BIT  5,C
117 00D4 CB6A          BIT  5,D
118 00D6 CB6B          BIT  5,E
119 00D8 CB6C          BIT  5,H
120 00DA CB6D          BIT  5,L
```

```
121 00DC CB76          BIT  6,(HL)
122 00DE DDCB0576      BIT  6,(IX+INDEX)
123 00E2 FDCB0576      BIT  6,(IY+INDEX)
124 00E6 CB77          BIT  6,A
125 00E8 CB70          BIT  6,B
126 00EA CB71          BIT  6,C
127 00EC CB72          BIT  6,D
128 00EE CB73          BIT  6,E
129 00F0 CB74          BIT  6,H
130 00F2 CB75          BIT  6,L
131 00F4 CB7E          BIT  7,(HL)
132 00F6 DDCB057E      BIT  7,(IX+INDEX)
133 00FA FDCB057E      BIT  7,(IY+INDEX)
134 00FE CB7F          BIT  7,A
135 0100 CB78          BIT  7,B
136 0102 CB79          BIT  7,C
137 0104 CB7A          BIT  7,D
138 0106 CB7B          BIT  7,E
139 0108 CB7C          BIT  7,H
140 010A CB7D          BIT  7,L
141 010C DC8405        CALL C,NUMBER
142 010F FC8405        CALL M,NUMBER
143 0112 D48405        CALL NC,NUMBER
144 0115 CD8405        CALL NUMBER
145 0118 C48405        CALL NZ,NUMBER
146 011B F48405        CALL P,NUMBER
147 011E EC8405        CALL PE,NUMBER
148 0121 E48405        CALL PO,NUMBER
149 0124 CC8405        CALL Z,NUMBER
150 0127 3F            CCF
151 0128 BE            CP   (HL)
152 0129 DDBE05        CP   (IX+INDEX)
153 012C FDBE05        CP   (IY+INDEX)
154 012F BF            CP   A
155 0130 B8            CP   B
156 0131 B9            CP   C
157 0132 BA            CP   D
158 0133 BB            CP   E
159 0134 BC            CP   H
160 0135 BD            CP   L
161 0136 FE20          CP   NUM
162 0138 EDA9          CPD
163 013A EDB9          CPDR
164 013C EDA1          CPI
165 013E EDB1          CPIR
166 0140 2F            CPL
167 0141 27            DAA
168 0142 35            DEC  (HL)
169 0143 DD3505        DEC  (IX+INDEX)
170 0146 FD3505        DEC  (IY+INDEX)
171 0149 3D            DEC  A
172 014A 05            DEC  B
173 014B 0B            DEC  BC
174 014C 0D            DEC  C
175 014D 15            DEC  D
176 014E 1B            DEC  DE
177 014F 1D            DEC  E
178 0150 25            DEC  H
179 0151 2B            DEC  HL
180 0152 DD2B          DEC  IX
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```
181 0154 FD2B          DEC  IY
182 0156 2D            DEC  L
183 0157 3B            DEC  SP
184 0158 F3            DI
185 0159 10FE          DJNZ $
186 015B FB            EI
187 015C E3            EX   (SP),HL
188 015D DDE3          EX   (SP),IX
189 015F FDE3          EX   (SP),IY
190 0161 08            EX   AF,AF
191 0162 EB            EX   DE,HL
192 0163 D9            EXX
193 0164 76            HALT
194 0165 ED46          IM   0
195 0167 ED56          IM   1
196 0169 ED5E          IM   2
197 016B ED78          IN   A,(C)
198 016D DB20          IN   A,(NUM)
199 016F ED40          IN   B,(C)
200 0171 ED48          IN   C,(C)
201 0173 ED50          IN   D,(C)
202 0175 ED58          IN   E,(C)
203 0177 ED60          IN   H,(C)
204 0179 ED68          IN   L,(C)
205 017B 34            INC  (HL)
206 017C DD3405        INC  (IX+INDEX)
207 017F FD3405        INC  (IY+INDEX)
208 0182 3C            INC  A
209 0183 04            INC  B
210 0184 03            INC  BC
211 0185 0C            INC  C
212 0186 14            INC  D
213 0187 13            INC  DE
214 0188 1C            INC  E
215 0189 24            INC  H
216 018A 23            INC  HL
217 018B DD23          INC  IX
218 018D FD23          INC  IY
219 018F 2C            INC  L
220 0190 33            INC  SP
221 0191 EDAA          IND
222 0193 EDBA          INDR
223 0195 EDA2          INI
224 0197 EDB2          INIR
225 0199 E9            JP   (HL)
226 019A DDE9          JP   (IX)
227 019C FDE9          JP   (IY)
228 019E DA8405        JP   C,NUMBER
229 01A1 FA8405        JP   M,NUMBER
230 01A4 D28405        JP   NC,NUMBER
231 01A7 C38405        JP   NUMBER
232 01AA C28405        JP   NZ,NUMBER
233 01AD F28405        JP   P,NUMBER
234 01B0 EA8405        JP   PE,NUMBER
235 01B3 E28405        JP   PO,NUMBER
236 01B6 CA8405        JP   Z,NUMBER
237 01B9 38FE          JR   C,$
238 01BB 18FE          JR   $
239 01BD 30FE          JR   NC,$
240 01BF 20FE          JR   NZ,$
```

```
301 0241 0620      LD   B,NUM
302 0243 ED4B8405  LD   BC,(NUMBER)
303 0247 018405    LD   BC,NUMBER
304 024A 4E        LD   C,(HL)
305 024B DD4E05    LD   C,(IX+INDEX)
306 024E FD4E05    LD   C,(IY+INDEX)
307 0251 4F        LD   C,A
308 0252 48        LD   C,B
309 0253 49        LD   C,C
310 0254 4A        LD   C,D
311 0255 4B        LD   C,E
312 0256 4C        LD   C,H
313 0257 4D        LD   C,L
314 0258 0E20      LD   C,NUM
315 025A 56        LD   D,(HL)
316 025B DD5605    LD   D,(IX+INDEX)
317 025E FD5605    LD   D,(IY+INDEX)
318 0261 57        LD   D,A
319 0262 50        LD   D,B
320 0263 51        LD   D,C
321 0264 52        LD   D,D
322 0265 53        LD   D,E
323 0266 54        LD   D,H
324 0267 55        LD   D,L
325 0268 1620      LD   D,NUM
326 026A ED5B8405  LD   DE,(NUMBER)
327 026E 118405    LD   DE,NUMBER
328 0271 5E        LD   E,(HL)
329 0272 DD5E05    LD   E,(IX+INDEX)
330 0275 FD5E05    LD   E,(IY+INDEX)
331 0278 5F        LD   E,A
332 0279 58        LD   E,B
333 027A 59        LD   E,C
334 027B 5A        LD   E,D
335 027C 5B        LD   E,E
336 027D 5C        LD   E,H
337 027E 5D        LD   E,L
338 027F 1E20      LD   E,NUM
339 0281 66        LD   H,(HL)
340 0282 DD6605    LD   H,(IX+INDEX)
341 0285 FD6605    LD   H,(IY+INDEX)
342 0288 67        LD   H,A
343 0289 60        LD   H,B
344 028A 61        LD   H,C
345 028B 62        LD   H,D
346 028C 63        LD   H,E
347 028D 64        LD   H,H
348 028E 65        LD   H,L
349 028F 2620      LD   H,NUM
350 0291 2A8405    LD   HL,(NUMBER)
351 0294 218405    LD   HL,NUMBER
352 0297 ED47      LD   I,A
353 0299 DD2A8405  LD   IX,(NUMBER)
354 029D DD218405  LD   IX,NUMBER
355 02A1 FD2A8405  LD   IY,(NUMBER)
356 02A5 FD218405  LD   IY,NUMBER
357 02A9 6E        LD   L,(HL)
358 02AA DD6E05    LD   L,(IX+INDEX)
359 02AD FD6E05    LD   L,(IY+INDEX)
360 02B0 6F        LD   L,A
```

```
361 02B1 68          LD   L,B
362 02B2 69          LD   L,C
363 02B3 6A          LD   L,D
364 02B4 6B          LD   L,E
365 02B5 6C          LD   L,H
366 02B6 6D          LD   L,L
367 02B7 2E20        LD   L,NUM
368 02B9 ED4F        LD   R,A
369 02BB ED7B8405    LD   SP,(NUMBER)
370 02BF F9          LD   SP,HL
371 02C0 DDF9        LD   SP,IX
372 02C2 FDF9        LD   SP,IY
373 02C4 318405      LD   SP,NUMBER
374 02C7 EDA8        LDD
375 02C9 EDB8        LDDR
376 02CB EDA0        LDI
377 02CD EDB0        LDIR
378 02CF ED44        NEG
379 02D1 00          NOP
380 02D2 B6          OR   (HL)
381 02D3 DDB605      OR   (IX+INDEX)
382 02D6 FDB605      OR   (IY+INDEX)
383 02D9 B7          OR   A
384 02DA B0          OR   B
385 02DB B1          OR   C
386 02DC B2          OR   D
387 02DD B3          OR   E
388 02DE B4          OR   H
389 02DF B5          OR   L
390 02E0 F620        OR   NUM
391 02E2 EDBB        OTDR
392 02E4 EDB3        OTIR
393 02E6 ED79        OUT  (C),A
394 02E8 ED41        OUT  (C),B
395 02EA ED49        OUT  (C),C
396 02EC ED51        OUT  (C),D
397 02EE ED59        OUT  (C),E
398 02F0 ED61        OUT  (C),H
399 02F2 ED69        OUT  (C),L
400 02F4 D320        OUT  (NUM),A
401 02F6 EDAB        OUTD
402 02F8 EDA3        OUTI
403 02FA F1          POP  AF
404 02FB C1          POP  BC
405 02FC D1          POP  DE
406 02FD E1          POP  HL
407 02FE DDE1        POP  IX
408 0300 FDE1        POP  IY
409 0302 F5          PUSH AF
410 0303 C5          PUSH BC
411 0304 D5          PUSH DE
412 0305 E5          PUSH HL
413 0306 DDE5        PUSH IX
414 0308 FDE5        PUSH IY
415 030A CB86        RES  0,(HL)
416 030C DDCB0586    RES  0,(IX+INDEX)
417 0310 FDCB0586    RES  0,(IY+INDEX)
418 0314 CB87        RES  0,A
419 0316 CB80        RES  0,B
420 0318 CB81        RES  0,C
```

```
481 03AA CBB2          RES  6,D
482 03AC CBB3          RES  6,E
483 03AE CBB4          RES  6,H
484 03B0 CBB5          RES  6,L
485 03B2 CBBE          RES  7,(HL)
486 03B4 DDCB05BE      RES  7,(IX+INDEX)
487 03B8 FDCB05BE      RES  7,(IY+INDEX)
488 03BC CBBF          RES  7,A
489 03BE CBB8          RES  7,B
490 03C0 CBB9          RES  7,C
491 03C2 CBBA          RES  7,D
492 03C4 CBBB          RES  7,E
493 03C6 CBBC          RES  7,H
494 03C8 CBBD          RES  7,L
495 03CA C9            RET
496 03CB D8            RET  C
497 03CC F8            RET  M
498 03CD D0            RET  NC
499 03CE C0            RET  NZ
500 03CF F0            RET  P
501 03D0 E8            RET  PE
502 03D1 E0            RET  PO
503 03D2 C8            RET  Z
504 03D3 ED4D          RETI
505 03D5 ED45          RETN
506 03D7 CB16          RL   (HL)
507 03D9 DDCB0516      RL   (IX+INDEX)
508 03DD FDCB0516      RL   (IY+INDEX)
509 03E1 CB17          RL   A
510 03E3 CB10          RL   B
511 03E5 CB11          RL   C
512 03E7 CB12          RL   D
513 03E9 CB13          RL   E
514 03EB CB14          RL   H
515 03ED CB15          RL   L
516 03EF 17            RLA
517 03F0 CB06          RLC  (HL)
518 03F2 DDCB0506      RLC  (IX+INDEX)
519 03F6 FDCB0506      RLC  (IY+INDEX)
520 03FA CB07          RLC  A
521 03FC CB00          RLC  B
522 03FE CB01          RLC  C
523 0400 CB02          RLC  D
524 0402 CB03          RLC  E
525 0404 CB04          RLC  H
526 0406 CB05          RLC  L
527 0408 07            RLCA
528 0409 ED6F          RLD
529 040B CB1E          RR   (HL)
530 040D DDCB051E      RR   (IX+INDEX)
531 0411 FDCB051E      RR   (IY+INDEX)
532 0415 CB1F          RR   A
533 0417 CB18          RR   B
534 0419 CB19          RR   C
535 041B CB1A          RR   D
536 041D CB1B          RR   E
537 041F CB1C          RR   H
538 0421 CB1D          RR   L
539 0423 1F            RRA
540 0424 CB0E          RRC  (HL)
```

```
541 0426 DDCB050E          RRC  (IX+INDEX)
542 042A FDCB050E          RRC  (IY+INDEX)
543 042E CB0F              RRC  A
544 0430 CB08              RRC  B
545 0432 CB09              RRC  C
546 0434 CB0A              RRC  D
547 0436 CB0B              RRC  E
548 0438 CB0C              RRC  H
549 043A CB0D              RRC  L
550 043C 0F                RRCA
551 043D ED67              RRD
552 043F C7                RST  0
553 0440 D7                RST  10H
554 0441 DF                RST  18H
555 0442 E7                RST  20H
556 0443 EF                RST  28H
557 0444 F7                RST  30H
558 0445 FF                RST  38H
559 0446 CF                RST  8
560 0447 9E                SBC  A,(HL)
561 0448 DD9E05            SBC  A,(IX+INDEX)
562 044B FD9E05            SBC  A,(IY+INDEX)
563 044E 9F                SBC  A,A
564 044F 98                SBC  A,B
565 0450 99                SBC  A,C
566 0451 9A                SBC  A,D
567 0452 9B                SBC  A,E
568 0453 9C                SBC  A,H
569 0454 9D                SBC  A,L
570 0455 DE20              SBC  A,NUM
571 0457 ED42              SBC  HL,BC
572 0459 ED52              SBC  HL,DE
573 045B ED62              SBC  HL,HL
574 045D ED72              SBC  HL,SP
575 045F 37                SCF
576 0460 CBC6              SET  0,(HL)
577 0462 DDCB05C6          SET  0,(IX+INDEX)
578 0466 FDCB05C6          SET  0,(IY+INDEX)
579 046A CBC7              SET  0,A
580 046C CBC0              SET  0,B
581 046E CBC1              SET  0,C
582 0470 CBC2              SET  0,D
583 0472 CBC3              SET  0,E
584 0474 CBC4              SET  0,H
585 0476 CBC5              SET  0,L
586 0478 CBCE              SET  1,(HL)
587 047A DDCB05CE          SET  1,(IX+INDEX)
588 047E FDCB05CE          SET  1,(IY+INDEX)
589 0482 CBCF              SET  1,A
590 0484 CBC8              SET  1,B
591 0486 CBC9              SET  1,C
592 0488 CBCA              SET  1,D
593 048A CBCB              SET  1,E
594 048C CBCC              SET  1,H
595 048E CBCD              SET  1,L
596 0490 CBD6              SET  2,(HL)
597 0492 DDCB05D6          SET  2,(IX+INDEX)
598 0496 FDCB05D6          SET  2,(IY+INDEX)
599 049A CBD7              SET  2,A
600 049C CBD0              SET  2,B
```

```
601 049E CBD1          SET  2,C
602 04A0 CBD2          SET  2,D
603 04A2 CBD3          SET  2,E
604 04A4 CBD4          SET  2,H
605 04A6 CBD5          SET  2,L
606 04A8 CBDE          SET  3,(HL)
607 04AA DDCB05DE      SET  3,(IX+INDEX)
608 04AE FDCB05DE      SET  3,(IY+INDEX)
609 04B2 CBDF          SET  3,A
610 04B4 CBD8          SET  3,B
611 04B6 CBD9          SET  3,C
612 04B8 CBDA          SET  3,D
613 04BA CBDB          SET  3,E
614 04BC CBDC          SET  3,H
615 04BE CBDD          SET  3,L
616 04C0 CBE6          SET  4,(HL)
617 04C2 DDCB05E6      SET  4,(IX+INDEX)
618 04C6 FDCB05E6      SET  4,(IY+INDEX)
619 04CA CBE7          SET  4,A
620 04CC CBE0          SET  4,B
621 04CE CBE1          SET  4,C
622 04D0 CBE2          SET  4,D
623 04D2 CBE3          SET  4,E
624 04D4 CBE4          SET  4,H
625 04D6 CBE5          SET  4,L
626 04D8 CBEE          SET  5,(HL)
627 04DA DDCB05EE      SET  5,(IX+INDEX)
628 04DE FDCB05EE      SET  5,(IY+INDEX)
629 04E2 CBEF          SET  5,A
630 04E4 CBE8          SET  5,B
631 04E6 CBE9          SET  5,C
632 04E8 CBEA          SET  5,D
633 04EA CBEB          SET  5,E
634 04EC CBEC          SET  5,H
635 04EE CBED          SET  5,L
636 04F0 CBF6          SET  6,(HL)
637 04F2 DDCB05F6      SET  6,(IX+INDEX)
638 04F6 FDCB05F6      SET  6,(IY+INDEX)
639 04FA CBF7          SET  6,A
640 04FC CBF0          SET  6,B
641 04FE CBF1          SET  6,C
642 0500 CBF2          SET  6,D
643 0502 CBF3          SET  6,E
644 0504 CBF4          SET  6,H
645 0506 CBF5          SET  6,L
646 0508 CBFE          SET  7,(HL)
647 050A DDCB05FE      SET  7,(IX+INDEX)
648 050E FDCB05FE      SET  7,(IY+INDEX)
649 0512 CBFF          SET  7,A
650 0514 CBF8          SET  7,B
651 0516 CBF9          SET  7,C
652 0518 CBFA          SET  7,D
653 051A CBFB          SET  7,E
654 051C CBFC          SET  7,H
655 051E CBFD          SET  7,L
656 0520 CB26          SLA  (HL)
657 0522 DDCB0526      SLA  (IX+INDEX)
658 0526 FDCB0526      SLA  (IY+INDEX)
659 052A CB27          SLA  A
660 052C CB20          SLA  B
```

```
0661 052E CB21          SLA  C
0662 0530 CB22          SLA  D
0663 0532 CB23          SLA  E
0664 0534 CB24          SLA  H
0665 0536 CB25          SLA  L
0666 0538 CB2E          SRA  (HL)
0667 053A DDCB052E      SRA  (IX+INDEX)
0668 053E FDCB052E      SRA  (IY+INDEX)
0669 0542 CB2F          SRA  A
0670 0544 CB28          SRA  B
0671 0546 CB29          SRA  C
0672 0548 CB2A          SRA  D
0673 054A CB2B          SRA  E
0674 054C CB2C          SRA  H
0675 054E CB2D          SRA  L
0676 0550 CB3E          SRL  (HL)
0677 0552 DDCB053E      SRL  (IX+INDEX)
0678 0556 FDCB053E      SRL  (IY+INDEX)
0679 055A CB3F          SRL  A
0680 055C CB38          SRL  B
0681 055E CB39          SRL  C
0682 0560 CB3A          SRL  D
0683 0562 CB3B          SRL  E
0684 0564 CB3C          SRL  H
0685 0566 CB3D          SRL  L
0686 0568 96            SUB  (HL)
0687 0569 DD9605        SUB  (IX+INDEX)
0688 056C FD9605        SUB  (IY+INDEX)
0689 056F 97            SUB  A
0690 0570 90            SUB  B
0691 0571 91            SUB  C
0692 0572 92            SUB  D
0693 0573 93            SUB  E
0694 0574 94            SUB  H
0695 0575 95            SUB  L
0696 0576 D620          SUB  NUM
0697 0578 AE            XOR  (HL)
0698 0579 DDAE05        XOR  (IX+INDEX)
0699 057C FDAE05        XOR  (IY+INDEX)
0700 057F AF            XOR  A
0701 0580 A8            XOR  B
0702 0581 A9            XOR  C
0703 0582 AA            XOR  D
0704 0583 AB            XOR  E
0705 0584 AC            XOR  H
0706 0585 AD            XOR  L
0707 0586 EE20          XOR  NUM
0708
0709                    END
```

```
                        ; ********************************
                        ; **       TATUNG ZEN 1.0       **
                        ; **                            **
                        ; ** Written by John Hawthorne **
                        ; **                            **
                        ; **       Copyright 1984       **
                        ; **     AVALON  SOFTWARE       **
                        ; **    Cowley , Middlesex      **
                        ; ********************************

                                    ORG   100H

                        BS:         EQU   8
                        LF:         EQU   10
                        FF:         EQU   12
                        CR:         EQU   13
                        DEL:        EQU   25
                        BLANK:      EQU   32
                        S:          EQU   80H

                        ; Externals

                        BDOS:       EQU   5
                        FCB:        EQU   5CH
                        DMA:        EQU   80H

                        ; Flag displacements

                        F1:         EQU   0
                        F2:         EQU   1
                        F3:         EQU   2
                        F4:         EQU   3
                        F5:         EQU   4
                        F6:         EQU   5
                        F7:         EQU   6

                        ; Code starts here, skip text etc.

0100 C32503     ENTRY:      JP    ZEN
0103 C39808     REENTRY:    JP    TRAP
0106 5A454E3E   M1:         DB    'ZEN>',CR
010A 0D
010B 4855483F   M2:         DB    'HUH?',CR
010F 0D
0110 50414745   M4:         DB    'PAGE',CR
0114 0D
0115 454F460D   M5:         DB    'EOF',CR
0119 4C4F4144   M6:         DB    'LOAD>',CR
011D 3E0D
011F 4F505449   M7:         DB    'OPTION>',CR
0123 4F4E3E0D
0127 44415441   M9:         DB    'DATA AREAS:',CR
012B 20415245
012F 41533A0D
0133 52554E53   M11:        DB    'RUNS AT>',CR
0137 2041543E
013B 0D
013C 52455345   M12:        DB    'RESERVED',CR
0140 52564544
0144 0D
```

```
 50 0145 46554C4C M14:      DB   'FULL',CR
 50 0149 0D
 51 014A 444F5542 M13:      DB   'DOUBLE '
 51 014E 4C4520
 52 0151 53594D42 M15:      DB   'SYMBOL',CR
 52 0155 4F4C0D
 53 0158 4F504552 M16:      DB   'OPERAND',CR
 53 015C 414E440D
 54 0160 554E4445 M17:      DB   'UNDEFINED',CR
 54 0164 46494E45
 54 0168 440D
 55 016A 4F524721 M18:      DB   'ORG!',CR
 55 016E 0D
 56 016F 4D454D4F M20:      DB   'MEMORY',CR
 56 0173 52590D
 57 0176 4E414D45 M21:      DB   'NAME>',CR
 57 017A 3E0D
 58 017C 53544152 M22:      DB   'START>',CR
 58 0180 543E0D
 59 0183 53544F50 M23:      DB   'STOP>',CR
 59 0187 3E0D
 60 0189 424B5054 M24:      DB   'BKPT>',CR
 60 018D 3E0D
 61 018F 45584543 M25:      DB   'EXEC>',CR
 61 0193 3E0D
 62 0195 44455354 M27:      DB   'DEST>',CR
 62 0199 3E0D
 63 019B 44415441 M28:      DB   'DATA>',CR
 63 019F 3E0D
 64 01A1 20484C20 M29:      DB   ' HL   DE   '
 64 01A5 20204445
 64 01A9 202020
 65 01AC 42432020           DB   'BC   AF   RI',CR
 65 01B0 20414620
 65 01B4 20205249
 65 01B8 0D
 66 01B9 20495820 M30:      DB   ' IX   IY   '
 66 01BD 20204959
 66 01C1 202020
 67 01C4 53502020           DB   'SP   PC',CR
 67 01C8 2050430D
 68 01CC 44495220 M31:      DB   'DIR FULL',CR
 68 01D0 46554C4C
 68 01D4 0D
 69 01D5 4E4F5420 M32:      DB   'NOT FOUND',CR
 69 01D9 464F554E
 69 01DD 440D
 70 01DF 4449534B M33:      DB   'DISK FULL',CR
 70 01E3 2046554C
 70 01E7 4C0D
 71 01E9 43484543 M35:      DB   'CHECKSUM',CR
 71 01ED 4B53554D
 71 01F1 0D
 72 01F2 46494C45 M36:      DB   'FILE EXISTS',CR
 72 01F6 20455849
 72 01FA 5354530D
 73 01FE 484558    M40:     DB   'HEX'
 74 0201 535243    M41:     DB   'SRC'
 75 0204 434F4D    M42:     DB   'COM'
 76
```

```
0207 560000    FLAGS:      DB   'V',0,0
020A 00000000              DB   0,0,0,0

                           ; List field widths

020E 3C19      COMWIDTH:   DB   60,25
0210 0C07      SYMWIDTH:   DB   12,7
0212 0505                  DB   5,5
0214 120C                  DB   18,12
0216 1901                  DB   25,1

0218 0000      PAGENO:     DW   0                ; Page number
021A 0000      LCT:        DW   0                ; Line count
021C 0000      LIMIT:      DW   0
021E 0000      CURRENT:    DW   0                ; Current line
0220 0024      SOFP:       DW   AEND+1867
0222 0024      EOFP:       DW   AEND+1867
0224 0000      MDEF:       DW   0
0226 0000      QDEF:       DW   0
0228 0000      TEMP:       DW   0
022A 0000      FEP:        DW   0
022C 0000      STK:        DW   0
022E 0000      LBLP:       DW   0
0230 0000      PC:         DW   0
0232 0000      OBJ:        DW   0
0234 0000      BKPTADDR:   DW   0
0236 00        BKPTCODE:   DB   0
0237 C3        VECTOR:     DB   0C3H
0238 0301                  DW   REENTRY
023A 00        DMACTR:     DB   0
023B 00        FTYPE:      DB   0
023C 0000      DSTART:     DW   0
023E 0000      DSTOP:      DW   0
0240 0000      DIP:        DW   0
0242 0000      DRSTART:    DW   0
0244 0000      DRSTOP:     DW   0
0246 0000      DRIP:       DW   0
0248 0000      DEOAP:      DW   0
024A B71D      DSOSP:      DW   AEND+258
024C 0000      DEOSP:      DW   0

               USTK:       DS   40
0276 0000      IMAGE:      DW   0                ; HL
0278 0000                  DW   0                ; DE
027A 0000                  DW   0                ; BC
027C 0000                  DW   0                ; AF
027E FB00                  DW   00FBH            ; IR
0280 0000                  DW   0                ; HL'
0282 0000                  DW   0                ; DE'
0284 0000                  DW   0                ; BC'
0286 0000                  DW   0                ; AF'
0288 0000                  DW   0                ; IX
028A 0000                  DW   0                ; IY

028C 31        EXIT:       DB   31H
028D 7602      USP:        DW   IMAGE
028F FB                    EI
0290 C3                    DB   0C3H
0291 0000      UPC:        DW   0
```

```
                        LBUFF:      DS   6
                        TBUFF:      DS   140

                        ; ZEN Mainloop

0325 312503             ZEN:        LD   SP,ZEN
0328 FB                             EI
0329 DD210702                       LD   IX,FLAGS
032D CDBE03                         CALL TOP
0330 213003                         LD   HL,$
0333 E5                             PUSH HL
0334 ED732C02                       LD   (STK),SP
0338 DD360056                       LD   (IX+F1),'V'
033C DD360200                       LD   (IX+F3),0
0340 2E06                           LD   L,M1&255
0342 CD3108                         CALL CUE
0345 0D                             DEC  C
0346 CA7709                         JP   Z,CLEAR
0349 FE53                           CP   'S'
034B CA8705                         JP   Z,SORT
034E FE52                           CP   'R'
0350 CA1605                         JP   Z,READ
0353 FE57                           CP   'W'
0355 CA9004                         JP   Z,WRITE
0358 FE4C                           CP   'L'
035A 2824                           JR   Z,LOCATE
035C E5                             PUSH HL
035D C5                             PUSH BC
035E 0E01                           LD   C,1
0360 119902                         LD   DE,TBUFF
0363 212607                         LD   HL,COMTAB
0366 CD940E                         CALL SEARCH
0369 DA1709                         JP   C,E10
036C C1                             POP  BC
036D E3                             EX   (SP),HL
036E 41                             LD   B,C
036F 05                             DEC  B
0370 37                             SCF
0371 2809                           JR   Z,ZEN2
0373 13                             INC  DE
0374 CD1C09                         CALL CONVERT
0377 DA1709                         JP   C,E10
037A 44                             LD   B,H
037B 4D                             LD   C,L
037C 2A1E02             ZEN2:       LD   HL,(CURRENT)
037F C9                             RET

0380 0D                 LOCATE:     DEC  C
0381 CA1709                         JP   Z,E10
0384 2A1E02                         LD   HL,(CURRENT)
0387 C5                             PUSH BC
0388 CDA609                         CALL NEXT
038B C1                             POP  BC
038C 2B                             DEC  HL
038D E5                             PUSH HL
038E E1                 LC1:        POP  HL
038F 7E                 :           LD   A,(HL)
0390 23                             INC  HL
0391 FE0D                           CP   CR
0393 CCFF09                         CALL Z,UPDATE
```

```
197 03B6 CD6607                 CALL EOF
198 03B9 41                     LD   B,C
199 03BA 119A02                 LD   DE,TBUFF+1
200 03BD E5                     PUSH HL
201 03BE 1A             LC2:    LD   A,(DE)
202 03BF BE                     CP   (HL)
203 03C0 20EC                   JR   NZ,LC1
204 03C2 13                     INC  DE
205 03C3 23                     INC  HL
206 03C4 10F8                   DJNZ LC2
207 03C6 E1                     POP  HL
208 03C7 CD1C04                 CALL THIS
209 03CA 1832                   JR   LINE
210
211 03CC 78             UP:     LD   A,B
212 03CD B1                     OR   C
213 03CE 282E                   JR   Z,LINE
214 03D0 CD1204                 CALL LAST
215 03D3 3029                   JR   NC,LINE
216 03D5 0B                     DEC  BC
217 03D6 18F4                   JR   UP
218
219 03D8 2A2002         KILL:   LD   HL,(SOFP)
220 03DB 222202                 LD   (EOFP),HL
221
222 03DE 210100         TOP:    LD   HL,1
223 03E1 221A02                 LD   (LCT),HL
224 03E4 2A2002                 LD   HL,(SOFP)
225 03E7 221E02                 LD   (CURRENT),HL
226 03EA C9                     RET
227
228 03EB CDBE03         TARGET: CALL TOP
229 03EE 0B                     DEC  BC
230
231 03EF 78             DOWN:   LD   A,B
232 03F0 B1                     OR   C
233 03F1 280B                   JR   Z,LINE
234 03F3 C5                     PUSH BC
235 03F4 CDA609                 CALL NEXT
236 03F7 C1                     POP  BC
237 03F8 CDFF09                 CALL UPDATE
238 03FB 0B                     DEC  BC
239 03FC 18F1                   JR   DOWN
240 03FE CD6607         LINE:   CALL EOF
241 0401 CDB409                 CALL POSITION
242 0404 C37E07                 JP   PR3
243
244 0407 78             ZAP:    LD   A,B
245 0408 B1                     OR   C
246 0409 28F3                   JR   Z,LINE
247 040B E5                     PUSH HL
248 040C C5                     PUSH BC
249 040D CDD608                 CALL REMOVE
250 0410 C1                     POP  BC
251 0411 E1                     POP  HL
252 0412 0B                     DEC  BC
253 0413 18F2                   JR   ZAP
254
255 0415 2E51           E0:     LD   L,M15&255
256 0417 ED7B2C02       ER:     LD   SP,(STK)
```

```
 257 03FB CD7807                CALL ERR2
 258 03FE 2A2802                LD   HL,(TEMP)
 259 0401 010100                LD   BC,1
 260 0404 78        PRINT:      LD   A,B
 261 0405 B1                    OR   C
 262 0406 280A                  JR   Z,LAST
 263 0408 CDDE03                CALL LINE
 264 040B 23                    INC  HL
 265 040C CDFF09                CALL UPDATE
 266 040F 0B                    DEC  BC
 267 0410 18F2                  JR   PRINT
 268
 269 0412 E5        LAST:       PUSH HL
 270 0413 2A1A02                LD   HL,(LCT)
 271 0416 2B                    DEC  HL
 272 0417 221A02                LD   (LCT),HL
 273 041A E1                    POP  HL
 274 041B 2B                    DEC  HL
 275 041C CD7C09    THIS:       CALL SOF
 276 041F 309D                  JR   NC,TOP
 277 0421 2B                    DEC  HL
 278 0422 7E                    LD   A,(HL)
 279 0423 FE0D                  CP   CR
 280 0425 20F5                  JR   NZ,THIS
 281 0427 23                    INC  HL
 282 0428 221E02                LD   (CURRENT),HL
 283 042B 37                    SCF
 284 042C C9                    RET
 285
 286 042D CDB409    ENTER:      CALL POSITION
 287 0430 EB                    EX   DE,HL
 288 0431 CD3408                CALL USER
 289 0434 FE2E                  CP   '.'
 290 0436 C8                    RET  Z
 291 0437 2A2202                LD   HL,(EOFP)
 292 043A CD8709                CALL MEMCHECK
 293 043D CD7404                CALL INSERT
 294 0440 EB                    EX   DE,HL
 295 0441 CDFF09                CALL UPDATE
 296 0444 18E7                  JR   ENTER
 297
 298 0446 E5        NEW:        PUSH HL
 299 0447 CDA609                CALL NEXT
 300 044A 2A2202                LD   HL,(EOFP)
 301 044D ED42                  SBC  HL,BC
 302 044F E3                    EX   (SP),HL
 303 0450 E5                    PUSH HL
 304 0451 C5                    PUSH BC
 305 0452 119902                LD   DE,TBUFF
 306 0455 D5                    PUSH DE
 307 0456 EDB0                  LDIR
 308 0458 E1                    POP  HL
 309 0459 C1                    POP  BC
 310 045A 0B                    DEC  BC
 311 045B CDB409                CALL POSITION
 312 045E CD2708                CALL STR1
 313 0461 CD3E08                CALL US1
 314 0464 CD8107                CALL CRLF
 315 0467 E1                    POP  HL
 316 0468 E3                    EX   (SP),HL
```

```
317 0469 CD8709                  CALL MEMCHECK
318 046C E1                      POP  HL
319 046D E5                      PUSH HL
320 046E C5                      PUSH BC
321 046F CDD608                  CALL REMOVE
322 0472 C1                      POP  BC
323 0473 D1                      POP  DE
324
325 0474 D5          INSERT:     PUSH DE
326 0475 C5                      PUSH BC
327 0476 2A2202                  LD   HL,(EOFP)
328 0479 E5                      PUSH HL
329 047A 09                      ADD  HL,BC
330 047B 222202                  LD   (EOFP),HL
331 047E E3                      EX   (SP),HL
332 047F E5                      PUSH HL
333 0480 ED52                    SBC  HL,DE
334 0482 E3                      EX   (SP),HL
335 0483 C1                      POP  BC
336 0484 D1                      POP  DE
337 0485 03                      INC  BC
338 0486 EDB8                    LDDR
339 0488 C1                      POP  BC
340 0489 D1                      POP  DE
341 048A 219902                  LD   HL,TBUFF
342 048D EDB0                    LDIR
343 048F C9                      RET
344
345 0490 CDB00A      WRITE:      CALL CHECKTYPE
346 0493 FE43                    CP   'C'
347 0495 2866                    JR   Z,CWRITE
348 0497 FE48                    CP   'H'
349 0499 281C                    JR   Z,HWRITE
350
351 049B 2A2202      SWRITE:     LD   HL,(EOFP)
352 049E ED5B2002                LD   DE,(SOFP)
353 04A2 B7                      OR   A
354 04A3 ED52                    SBC  HL,DE
355 04A5 CA1709                  JP   Z,E10
356 04A8 CD0C0A                  CALL WNAME
357 04AB 1A          SW2:        LD   A,(DE)
358 04AC CD0F0B                  CALL WSCH
359 04AF 13                      INC  DE
360 04B0 2B                      DEC  HL
361 04B1 7C                      LD   A,H
362 04B2 B5                      OR   L
363 04B3 20F6                    JR   NZ,SW2
364 04B5 1832                    JR   HW32
365
366 04B7 CD0709      HWRITE:     CALL STARTSTOP
367 04BA E5                      PUSH HL
368 04BB 2E19                    LD   L,M6&255
369 04BD CDF208                  CALL PARAMETER
370 04C0 3002                    JR   NC,HW1
371 04C2 D5                      PUSH DE
372 04C3 E1                      POP  HL
373 04C4 E5          HW1:        PUSH HL
374 04C5 FDE1                    POP  IY
375 04C7 2E8F                    LD   L,M25&255
376 04C9 CDF208                  CALL PARAMETER
```

```
377 04CC E3                     EX   (SP),HL
378 04CD CD0C0A                 CALL WNAME
379 04D0 011000     HW2:        LD   BC,16
380 04D3 B7                     OR   A
381 04D4 ED42                   SBC  HL,BC
382 04D6 3003                   JR   NC,HW3
383 04D8 09                     ADD  HL,BC
384 04D9 4D                     LD   C,L
385 04DA 68                     LD   L,B
386 04DB CD1A0B     HW3:        CALL WIHREC
387 04DE 7C                     LD   A,H
388 04DF B5                     OR   L
389 04E0 20EE                   JR   NZ,HW2
390 04E2 0E00                   LD   C,0
391 04E4 FDE1                   POP  IY
392 04E6 CD1A0B                 CALL WIHREC
393 04E9 3E1A       HW32:       LD   A,1AH
394 04EB CD690B                 CALL WDMACH
395 04EE CDD60A     HW4:        CALL WSEQ
396 04F1 B7                     OR   A
397 04F2 C2FE0A                 JP   NZ,E33
398 04F5 CDCC0A                 CALL CLOSE
399 04F8 3C                     INC  A
400 04F9 CAFA0A                 JP   Z,E32
401 04FC C9                     RET
402
403 04FD CD0709     CWRITE:     CALL STARTSTOP
404 0500 CD0C0A                 CALL WNAME
405 0503 7D         CW2:        LD   A,L
406 0504 B7                     OR   A
407 0505 2803                   JR   Z,CW3
408 0507 2E00                   LD   L,0
409 0509 24                     INC  H
410 050A 1A         CW3:        LD   A,(DE)
411 050B CD690B                 CALL WDMACH
412 050E 13                     INC  DE
413 050F 2B                     DEC  HL
414 0510 7C                     LD   A,H
415 0511 B5                     OR   L
416 0512 20F6                   JR   NZ,CW3
417 0514 18D8                   JR   HW4
418
419 0516 CDB00A     READ:       CALL CHECKTYPE
420 0519 FE43                   CP   'C'
421 051B 2841                   JR   Z,CREAD
422 051D FE48                   CP   'H'
423 051F 2824                   JR   Z,HREAD
424
425 0521 CD1E0A     SREAD:      CALL RNAME
426 0524 ED5B2202               LD   DE,(EOFP)
427 0528 CD8B0B     SRD2:       CALL RSCH
428 052B FE1A                   CP   1AH
429 052D C8                     RET  Z
430 052E CD9809                 CALL MEMTOP
431 0531 B7                     OR   A
432 0532 ED52                   SBC  HL,DE
433 0534 2007                   JR   NZ,SRD3
434 0536 1B                     DEC  DE
435 0537 3E0D                   LD   A,CR
436 0539 12                     LD   (DE),A
```

```
437 053A C39309              JP   E20
438 053D 12       SRD3:      LD   (DE),A
439 053E 13                  INC  DE
440 053F ED532202            LD   (EOFP),DE
441 0543 18E3                JR   SRD2
442
443 0545 2E19     HREAD:     LD   L,M6&255
444 0547 CDF208              CALL PARAMETER
445 054A 3804                JR   C,HRD1
446 054C DDCB02C6            SET  0,(IX+F3)
447 0550 CD1E0A   HRD1:      CALL RNAME
448 0553 CD930B   HRD2:      CALL RIHREC
449 0556 B7                  OR   A
450 0557 20FA                JR   NZ,HRD2
451 0559 ED539102            LD   (UPC),DE
452 055D C9                  RET
453
454 055E 2E19     CREAD:     LD   L,M6&255
455 0560 CDF208              CALL PARAMETER
456 0563 CD1E0A              CALL RNAME
457 0566 CD000C   CRD2:      CALL RDMACH
458 0569 DDCB0256            BIT  2,(IX+F3)
459 056D C0                  RET  NZ
460 056E 77                  LD   (HL),A
461 056F 23                  INC  HL
462 0570 18F4                JR   CRD2
463
464 0572 2A2002   HOWBIG:    LD   HL,(SOFP)
465 0575 CDE109              CALL WORDSP
466 0578 2A2202              LD   HL,(EOFP)
467 057B CDE109              CALL WORDSP
468 057E CD9809              CALL MEMTOP
469 0581 CDE109              CALL WORDSP
470 0584 C38107              JP   CRLF
471
472 0587 218107   SORT:      LD   HL,CRLF
473 058A E5                  PUSH HL
474 058B 3A9A02              LD   A,(TBUFF+1)
475 058E F5                  PUSH AF
476 058F CD950C              CALL GETOPTION
477 0592 DD360201            LD   (IX+F3),1
478 0596 F1                  POP  AF
479 0597 4F                  LD   C,A
480 0598 FE0D                CP   CR
481 059A 200B                JR   NZ,SCAN
482 059C 0E41                LD   C,'A'
483 059E CDA705   SRT2:      CALL SCAN
484 05A1 0C                  INC  C
485 05A2 79                  LD   A,C
486 05A3 FE5A                CP   'Z'
487 05A5 20F7                JR   NZ,SRT2
488 05A7 21B41C   SCAN:      LD   HL,AEND-1
489 05AA 23       SCN1:      INC  HL
490 05AB 23       SCN2:      INC  HL
491 05AC 7E                  LD   A,(HL)
492 05AD 3C                  INC  A
493 05AE C8                  RET  Z
494 05AF CDAA0C              CALL HOLD
495 05B2 0600                LD   B,0
496 05B4 54                  LD   D,H
```

```
437 053A C39309              JP   E20
438 053D 12       SRD3:      LD   (DE),A
439 053E 13                  INC  DE
440 053F ED532202            LD   (EOFP),DE
441 0543 18E3                JR   SRD2
442
443 0545 2E19     HREAD:     LD   L,M6&255
444 0547 CDF208              CALL PARAMETER
445 054A 3804                JR   C,HRD1
446 054C DDCB02C6            SET  0,(IX+F3)
447 0550 CD1E0A   HRD1:      CALL RNAME
448 0553 CD930B   HRD2:      CALL RIHREC
449 0556 B7                  OR   A
450 0557 20FA                JR   NZ,HRD2
451 0559 ED539102            LD   (UPC),DE
452 055D C9                  RET
453
454 055E 2E19     CREAD:     LD   L,M6&255
455 0560 CDF208              CALL PARAMETER
456 0563 CD1E0A              CALL RNAME
457 0566 CD000C   CRD2:      CALL RDMACH
458 0569 DDCB0256            BIT  2,(IX+F3)
459 056D C0                  RET  NZ
460 056E 77                  LD   (HL),A
461 056F 23                  INC  HL
462 0570 18F4                JR   CRD2
463
464 0572 2A2002   HOWBIG:    LD   HL,(SOFP)
465 0575 CDE109              CALL WORDSP
466 0578 2A2202              LD   HL,(EOFP)
467 057B CDE109              CALL WORDSP
468 057E CD9809              CALL MEMTOP
469 0581 CDE109              CALL WORDSP
470 0584 C38107              JP   CRLF
471
472 0587 218107   SORT:      LD   HL,CRLF
473 058A E5                  PUSH HL
474 058B 3A9A02              LD   A,(TBUFF+1)
475 058E F5                  PUSH AF
476 058F CD950C              CALL GETOPTION
477 0592 DD360201            LD   (IX+F3),1
478 0596 F1                  POP  AF
479 0597 4F                  LD   C,A
480 0598 FE0D                CP   CR
481 059A 200B                JR   NZ,SCAN
482 059C 0E41                LD   C,'A'
483 059E CDA705   SRT2:      CALL SCAN
484 05A1 0C                  INC  C
485 05A2 79                  LD   A,C
486 05A3 FE5A                CP   'Z'
487 05A5 20F7                JR   NZ,SRT2
488 05A7 21B41C   SCAN:      LD   HL,AEND-1
489 05AA 23       SCN1:      INC  HL
490 05AB 23       SCN2:      INC  HL
491 05AC 7E                  LD   A,(HL)
492 05AD 3C                  INC  A
493 05AE C8                  RET  Z
494 05AF CDAA0C              CALL HOLD
495 05B2 0600                LD   B,0
496 05B4 54                  LD   D,H
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497 05B5 5D              LD   E,L
498 05B6 04    SCN3:     INC  B
499 05B7 CB7E            BIT  7,(HL)
500 05B9 23              INC  HL
501 05BA 28FA            JR   Z,SCN3
502 05BC 1A              LD   A,(DE)
503 05BD CBBF            RES  7,A
504 05BF B9              CP   C
505 05C0 20E8            JR   NZ,SCN1
506 05C2 DD3502          DEC  (IX+F3)
507 05C5 2015            JR   NZ,SCN4
508 05C7 CD8107          CALL CRLF
509 05CA DD360204        LD   (IX+F3),4
510 05CE DDCB004E        BIT  1,(IX+F1)
511 05D2 2803            JR   Z,SCN31
512 05D4 DD3502          DEC  (IX+F3)
513 05D7 D5    SCN31:    PUSH DE
514 05D8 CD6208          CALL PAGE
515 05DB D1              POP  DE
516 05DC EB    SCN4:     EX   DE,HL
517 05DD C5              PUSH BC
518 05DE D5              PUSH DE
519 05DF 50              LD   D,B
520 05E0 0E7F            LD   C,7FH
521 05E2 CD1E0E          CALL SYMFIELD
522 05E5 E1              POP  HL
523 05E6 C1              POP  BC
524 05E7 5E              LD   E,(HL)
525 05E8 23              INC  HL
526 05E9 56              LD   D,(HL)
527 05EA EB              EX   DE,HL
528 05EB CDE109          CALL WORDSP
529 05EE EB              EX   DE,HL
530 05EF 18BA            JR   SCN2
531
532 05F1 3804  GOTO:     JR   C,GOT2
533 05F3 ED439102        LD   (UPC),BC
534 05F7 2E89  GOT2:     LD   L,M24&255
535 05F9 CDF208          CALL PARAMETER
536 05FC 3814            JR   C,GOT3
537 05FE 223402          LD   (BKPTADDR),HL
538 0601 7E              LD   A,(HL)
539 0602 323602          LD   (BKPTCODE),A
540 0605 36F7            LD   (HL),0F7H
541 0607 213702          LD   HL,VECTOR
542 060A 113000          LD   DE,30H
543 060D 010300          LD   BC,3
544 0610 EDB0            LDIR
545 0612 F3    GOT3:     DI
546 0613 317602          LD   SP,IMAGE
547 0616 E1              POP  HL
548 0617 D1              POP  DE
549 0618 C1              POP  BC
550 0619 F1              POP  AF
551 061A 08              EX   AF,AF
552 061B D9              EXX
553 061C C1              POP  BC
554 061D 79              LD   A,C
555 061E ED47            LD   I,A
556 0620 78              LD   A,B
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557 0621 ED4F            LD   R,A
558 0623 E1              POP  HL
559 0624 D1              POP  DE
560 0625 C1              POP  BC
561 0626 F1              POP  AF
562 0627 D9              EXX
563 0628 08              EX   AF,AF
564 0629 DDE1            POP  IX
565 062B FDE1            POP  IY
566 062D C38C02          JP   EXIT
567
568 0630 CD0709  COPY:    CALL STARTSTOP
569 0633 E5              PUSH HL
570 0634 2E95            LD   L,M27 &255
571 0636 CDF208          CALL PARAMETER
572 0639 EB              EX   DE,HL
573 063A C1              POP  BC
574 063B EDB0            LDIR
575 063D C9              RET
576
577 063E CD0709  FILL:    CALL STARTSTOP
578 0641 E5              PUSH HL
579 0642 2E9B            LD   L,M28 &255
580 0644 CDF208          CALL PARAMETER
581 0647 EB              EX   DE,HL
582 0648 C1              POP  BC
583 0649 73    FIL2:     LD   (HL),E
584 064A 23              INC  HL
585 064B 0B              DEC  BC
586 064C 78              LD   A,B
587 064D B1              OR   C
588 064E 20F9            JR   NZ,FIL2
589 0650 C9              RET
590
591 0651 3804  MODIFY:    JR   C,MOD1
592 0653 ED432402        LD   (MDEF),BC
593 0657 2A2402  MOD1:    LD   HL,(MDEF)
594 065A CDE109  MOD2:    CALL WORDSP
595 065D 222402  MOD3:    LD   (MDEF),HL
596 0660 7E              LD   A,(HL)
597 0661 CDE609          CALL BYTESP
598 0664 EB              EX   DE,HL
599 0665 CD3808          CALL US0
600 0668 FE2E            CP   '.'
601 066A CA8107          JP   Z,CRLF
602 066D C5              PUSH BC
603 066E CDF508          CALL PARAM1
604 0671 C1              POP  BC
605 0672 EB              EX   DE,HL
606 0673 3810            JR   C,MOD5
607 0675 73              LD   (HL),E
608 0676 79              LD   A,C
609 0677 C602            ADD  A,2
610 0679 47              LD   B,A
611 067A 3E08  MOD4:      LD   A,BS
612 067C CD9007          CALL OUTPUT
613 067F 10F9            DJNZ MOD4
614 0681 7E              LD   A,(HL)
615 0682 CDE609          CALL BYTESP
616 0685 23    MOD5:     INC  HL
```

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617 0686 7D                     LD    A,L
618 0687 E607                   AND   7
619 0689 20D2                   JR    NZ,MOD3
620 068B CD8107                 CALL  CRLF
621 068E 18CA                   JR    MOD2
622
623 0690 3804           QUERY:  JR    C,QU2
624 0692 ED432602               LD    (QDEF),BC
625 0696 2A2602         QU2:    LD    HL,(QDEF)
626 0699 7D                     LD    A,L
627 069A E6F8                   AND   0F8H
628 069C 6F                     LD    L,A
629 069D 0E08                   LD    C,8
630 069F 0608           QU3:    LD    B,8
631 06A1 E5                     PUSH  HL
632 06A2 CDE109                 CALL  WORDSP
633 06A5 7E             QU4:    LD    A,(HL)
634 06A6 CDE609                 CALL  BYTESP
635 06A9 23                     INC   HL
636 06AA 10F9                   DJNZ  QU4
637 06AC E1                     POP   HL
638 06AD CD8E07                 CALL  SPACE
639 06B0 0608                   LD    B,8
640 06B2 7E             QU5:    LD    A,(HL)
641 06B3 FE20                   CP    20H
642 06B5 3002                   JR    NC,QU7
643 06B7 3E2E                   LD    A,'.'
644 06B9 CD9007         QU7:    CALL  OUTPUT
645 06BC 23                     INC   HL
646 06BD 10F3                   DJNZ  QU5
647 06BF CD8107                 CALL  CRLF
648 06C2 0D                     DEC   C
649 06C3 20DA                   JR    NZ,QU3
650 06C5 222602                 LD    (QDEF),HL
651 06C8 C9                     RET
652
653 06C9 218107         XAMINE: LD    HL,CRLF
654 06CC E5                     PUSH  HL
655 06CD 2EA1                   LD    L,M29&255
656 06CF CD7C07                 CALL  PR2
657 06D2 217602                 LD    HL,IMAGE
658 06D5 0605                   LD    B,5
659 06D7 CDF806                 CALL  PAIR
660 06DA CD8107                 CALL  CRLF
661 06DD 0604                   LD    B,4
662 06DF CDF806                 CALL  PAIR
663 06E2 CD8107                 CALL  CRLF
664 06E5 E5                     PUSH  HL
665 06E6 2EB9                   LD    L,M30&255
666 06E8 CD7C07                 CALL  PR2
667 06EB E1                     POP   HL
668 06EC 0602                   LD    B,2
669 06EE CDF806                 CALL  PAIR
670 06F1 23                     INC   HL
671 06F2 CDF706                 CALL  ONEPAIR
672 06F5 23                     INC   HL
673 06F6 23                     INC   HL
674 06F7 04             ONEPAIR: INC  B
675 06F8 5E             PAIR:   LD    E,(HL)
676 06F9 23                     INC   HL
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677 06FA 56                     LD    D,(HL)
678 06FB 23                     INC   HL
679 06FC EB                     EX    DE,HL
680 06FD CDE109                 CALL  WORDSP
681 0700 EB                     EX    DE,HL
682 0701 10F5                   DJNZ  PAIR
683 0703 C9                     RET
684
685 0704 C5             OUTPORT: PUSH BC
686 0705 2E9B                   LD    L,M28&255
687 0707 CDF208                 CALL  PARAMETER
688 070A C1                     POP   BC
689 070B ED69                   OUT   (C),L
690 070D C9                     RET
691
692 070E ED78           INPORT: IN    A,(C)
693 0710 F5                     PUSH  AF
694 0711 CDE609                 CALL  BYTESP
695 0714 F1                     POP   AF
696 0715 0608                   LD    B,8
697 0717 07             IN2:    RLCA
698 0718 F5                     PUSH  AF
699 0719 E601                   AND   1
700 071B C630                   ADD   A,'0'
701 071D CD9007                 CALL  OUTPUT
702 0720 F1                     POP   AF
703 0721 10F4                   DJNZ  IN2
704 0723 C38107                 JP    CRLF
705
706 0726 D5             COMTAB: DB    'U'.S
707 0727 AC03                   DW    UP
708 0729 C2                     DB    'B'.S
709 072A 0000                   DW    0
710 072C C9                     DB    'I'.S
711 072D 0E07                   DW    INPORT
712 072F CF                     DB    'O'.S
713 0730 0407                   DW    OUTPORT
714 0732 D1                     DB    'Q'.S
715 0733 9006                   DW    QUERY
716 0735 CD                     DB    'M'.S
717 0736 5106                   DW    MODIFY
718 0738 C6                     DB    'F'.S
719 0739 3E06                   DW    FILL
720 073B C3                     DB    'C'.S
721 073C 3006                   DW    COPY
722 073E C7                     DB    'G'.S
723 073F F105                   DW    GOTO
724 0741 D8                     DB    'X'.S
725 0742 C906                   DW    XAMINE
726 0744 C1                     DB    'A'.S
727 0745 310C                   DW    ASMB
728 0747 CB                     DB    'K'.S
729 0748 B803                   DW    KILL
730 074A C8                     DB    'H'.S
731 074B 7205                   DW    HOWBIG
732 074D C5                     DB    'E'.S
733 074E 2D04                   DW    ENTER
734 0750 D4                     DB    'T'.S
735 0751 CB03                   DW    TARGET
736 0753 CE                     DB    'N'.S
```

```
737 0754 4604                  DW   NEW
738 0756 C4                    DB   'D'.S
739 0757 CF03                  DW   DOWN
740 0759 DA                    DB   'Z'.S
741 075A E703                  DW   ZAP
742 075C D0                    DB   'P'.S
743 075D 0404                  DW   PRINT
744 075F E4                    DB   'd'.S
745 0760 8815                  DW   DASM
746 0762 F5                    DB   'u'.S
747 0763 2916                  DW   UNSCRAMBLE
748 0765 FF                    DB   0FFH
749
750 0766 D5          EOF:      PUSH DE
751 0767 EB                    EX   DE,HL
752 0768 2A2202                LD   HL,(EOFP)
753 076B 2B                    DEC  HL
754 076C B7                    OR   A
755 076D ED52                  SBC  HL,DE
756 076F EB                    EX   DE,HL
757 0770 D1                    POP  DE
758 0771 D0                    RET  NC
759 0772 2E15                  LD   L,M5&255
760 0774 ED7B2C02    ERR:      LD   SP,(STK)
761 0778 DD360056    ERR2:     LD   (IX+F1),'V'
762 077C 2601        PR2:      LD   H,M1/256
763 077E CD2708      PR3:      CALL STR1
764 0781 F5          CRLF:     PUSH AF
765 0782 3E0D                  LD   A,CR
766 0784 CD9007                CALL OUTPUT
767 0787 3E0A                  LD   A,LF
768 0789 CD9007                CALL OUTPUT
769 078C F1                    POP  AF
770 078D C9                    RET
771
772 078E 3E20        SPACE:    LD   A,BLANK
773 0790 DDCB004E    OUTPUT:   BIT  1,(IX+F1)
774 0794 283E                  JR   Z,EXTERN
775 0796 FE08        VIDEO:    CP   BS
776 0798 200A                  JR   NZ,VID2
777 079A CDA407                CALL VID2
778 079D 3E20                  LD   A,BLANK
779 079F CDA407                CALL VID2
780 07A2 3E08                  LD   A,BS
781 07A4 C5          VID2:     PUSH BC
782 07A5 D5                    PUSH DE
783 07A6 4F                    LD   C,A
784 07A7 110900                LD   DE,9
785 07AA CD1108                CALL BIOS
786 07AD D1                    POP  DE
787 07AE C1                    POP  BC
788 07AF C9                    RET
789
790 07B0 C5          KEYBOARD: PUSH BC
791 07B1 D5                    PUSH DE
792 07B2 110600                LD   DE,6
793 07B5 CD1108                CALL BIOS
794 07B8 D1                    POP  DE
795 07B9 C1                    POP  BC
796 07BA FE01                  CP   1
```



```
797 07BC 2005                  JR   NZ,KB1
798 07BE CDA407                CALL VID2
799 07C1 18ED                  JR   KEYBOARD
800 07C3 FE19        KB1:      CP   DEL
801 07C5 2002                  JR   NZ,KB2
802 07C7 3E08                  LD   A,BS
803 07C9 FE08        KB2:      CP   BS
804 07CB C8                    RET  Z
805 07CC FE0D                  CP   CR
806 07CE C8                    RET  Z
807 07CF FE20                  CP   BLANK
808 07D1 38DD                  JR   C,KEYBOARD
809 07D3 C9                    RET
810
811 07D4 00000000    EXTERN:   DB   0,0,0,0
812 07D8 00000000              DB   0,0,0,0
813 07DC 00000000              DB   0,0,0,0
814 07E0 00000000              DB   0,0,0,0
815 07E4 00000000              DB   0,0,0,0
816 07E8 00000000              DB   0,0,0,0
817 07EC 00000000              DB   0,0,0,0
818 07F0 00000000              DB   0,0,0,0
819 07F4 00000000              DB   0,0,0,0
820 07F8 00000000              DB   0,0,0,0
821 07FC C5                    PUSH BC
822 07FD D5                    PUSH DE
823 07FE 4F                    LD   C,A
824 07FF 110C00                LD   DE,0CH
825 0802 CD1108                CALL BIOS
826 0805 D1                    POP  DE
827 0806 C1                    POP  BC
828 0807 C9                    RET
829
830 0808 C5          CONSTAT:  PUSH BC
831 0809 D5                    PUSH DE
832 080A 1EFF                  LD   E,0FFH
833 080C 0E06                  LD   C,6
834 080E C3DD0A                JP   TBD2
835
836 0811 E5          BIOS:     PUSH HL
837 0812 DDE5                  PUSH IX
838 0814 FDE5                  PUSH IY
839 0816 211F08                LD   HL,BIO2
840 0819 E5                    PUSH HL
841 081A 2A0100                LD   HL,(1)
842 081D 19                    ADD  HL,DE
843 081E E9                    JP   (HL)
844 081F FDE1        BIO2:     POP  IY
845 0821 DDE1                  POP  IX
846 0823 E1                    POP  HL
847 0824 C9                    RET
848
849 0825 2601        STRING:   LD   H,M1/256
850 0827 7E          STR1:     LD   A,(HL)
851 0828 FE0D                  CP   CR
852 082A C8                    RET  Z
853 082B CD9007                CALL OUTPUT
854 082E 23                    INC  HL
855 082F 18F6                  JR   STR1
856
```

```
 857 0831 CD2508   CUE:      CALL STRING
 858 0834 218107   USER:     LD   HL,CRLF
 859 0837 E5               PUSH HL
 860 0838 219902   US0:      LD   HL,TBUFF
 861 083B 010000           LD   BC,0
 862 083E CDB007   US1:      CALL KEYBOARD
 863 0841 77               LD   (HL),A
 864 0842 FE08             CP   BS
 865 0844 2007             JR   NZ,US2
 866 0846 0D               DEC  C
 867 0847 FA3808           JP   M,US0
 868 084A 2B               DEC  HL
 869 084B 1810             JR   US4
 870 084D 0C       US2:    INC  C
 871 084E FE0D             CP   CR
 872 0850 3A9902           LD   A,(TBUFF)
 873 0853 C8               RET  Z
 874 0854 0D               DEC  C
 875 0855 79               LD   A,C
 876 0856 FE22             CP   34
 877 0858 28E4             JR   Z,US1
 878 085A 7E               LD   A,(HL)
 879 085B 0C               INC  C
 880 085C 23               INC  HL
 881 085D CD9007   US4:     CALL OUTPUT
 882 0860 18DC             JR   US1
 883
 884 0862 DD3504   PAGE:     DEC  (IX+F5)
 885 0865 C0               RET  NZ
 886 0866 3E3C             LD   A,60
 887 0868 DDCB004E         BIT  1,(IX+F1)
 888 086C 2802             JR   Z,PG2
 889 086E 3E15             LD   A,21
 890 0870 DD7704   PG2:    LD   (IX+F5),A
 891 0873 CD5C09           CALL DELAY
 892 0876 E5               PUSH HL
 893 0877 2E10             LD   L,M4&255
 894 0879 CD2508           CALL STRING
 895 087C 2A1A02           LD   HL,(LCT)
 896 087F E5               PUSH HL
 897 0880 2A1802           LD   HL,(PAGENO)
 898 0883 23               INC  HL
 899 0884 221802           LD   (PAGENO),HL
 900 0887 221A02           LD   (LCT),HL
 901 088A CDB409           CALL POSITION
 902 088D E1               POP  HL
 903 088E 221A02           LD   (LCT),HL
 904 0891 E1               POP  HL
 905 0892 CD8107           CALL CRLF
 906 0895 C38107           JP   CRLF
 907
 908 0898 F3       TRAP:   DI
 909 0899 E3               EX   (SP),HL
 910 089A 2B               DEC  HL
 911 089B 229102           LD   (UPC),HL
 912 089E E1               POP  HL
 913 089F ED738D02         LD   (USP),SP
 914 08A3 318C02           LD   SP,EXIT
 915 08A6 FDE5             PUSH IY
 916 08A8 DDE5             PUSH IX
```



```
 917 08AA 08               EX   AF,AF
 918 08AB D9               EXX
 919 08AC F5               PUSH AF
 920 08AD C5               PUSH BC
 921 08AE D5               PUSH DE
 922 08AF E5               PUSH HL
 923 08B0 ED5F             LD   A,R
 924 08B2 47               LD   B,A
 925 08B3 ED57             LD   A,I
 926 08B5 4F               LD   C,A
 927 08B6 C5               PUSH BC
 928 08B7 D9               EXX
 929 08B8 08               EX   AF,AF
 930 08B9 F5               PUSH AF
 931 08BA C5               PUSH BC
 932 08BB D5               PUSH DE
 933 08BC E5               PUSH HL
 934 08BD 2A3402           LD   HL,(BKPTADDR)
 935 08C0 ED5B9102         LD   DE,(UPC)
 936 08C4 B7               OR   A
 937 08C5 ED52             SBC  HL,DE
 938 08C7 2005             JR   NZ,TRAP2
 939 08C9 3A3602           LD   A,(BKPTCODE)
 940 08CC 12               LD   (DE),A
 941 08CD 1B               DEC  DE
 942 08CE 13       TRAP2:  INC  DE
 943 08CF ED539102         LD   (UPC),DE
 944 08D3 C32503           JP   ZEN
 945
 946 08D6 E5       REMOVE: PUSH HL
 947 08D7 CDA609           CALL NEXT
 948 08DA E5               PUSH HL
 949 08DB 2A2202           LD   HL,(EOFP)
 950 08DE E5               PUSH HL
 951 08DF B7               OR   A
 952 08E0 ED42             SBC  HL,BC
 953 08E2 222202           LD   (EOFP),HL
 954 08E5 E1               POP  HL
 955 08E6 D1               POP  DE
 956 08E7 D5               PUSH DE
 957 08E8 B7               OR   A
 958 08E9 ED52             SBC  HL,DE
 959 08EB E3               EX   (SP),HL
 960 08EC C1               POP  BC
 961 08ED D1               POP  DE
 962 08EE C8               RET  Z
 963 08EF EDB0             LDIR
 964 08F1 C9               RET
 965
 966 08F2 CD3108   PARAMETER: CALL CUE
 967 08F5 41       PARAM1: LD   B,C
 968 08F6 05               DEC  B
 969 08F7 37               SCF
 970 08F8 C8               RET  Z
 971 08F9 D5               PUSH DE
 972 08FA 119902           LD   DE,TBUFF
 973 08FD CD1C09           CALL CONVERT
 974 0900 D1               POP  DE
 975 0901 D0               RET  NC
 976 0902 CD8107           CALL CRLF
```

```
 977 0905 1810              JR   E10
 978
 979 0907 2E7C    STARTSTOP: LD   L,M22&255
 980 0909 CDF208             CALL PARAMETER
 981 090C EB                 EX   DE,HL
 982 090D 2E83               LD   L,M23&255
 983 090F CDF208             CALL PARAMETER
 984 0912 B7                 OR   A
 985 0913 ED52               SBC  HL,DE
 986 0915 23                 INC  HL
 987 0916 D0                 RET  NC
 988 0917 2E0B    E10:       LD   L,M2&255
 989 0919 C37407             JP   ERR
 990
 991 091C 2B      CONVERT:   DEC  HL
 992 091D 7E                 LD   A,(HL)
 993 091E 0E10               LD   C,16
 994 0920 FE48               CP   'H'
 995 0922 2809               JR   Z,CV0
 996 0924 0E08               LD   C,8
 997 0926 FE4F               CP   'O'
 998 0928 2803               JR   Z,CV0
 999 092A 0E0A               LD   C,10
1000 092C 04                 INC  B
1001 092D 05      CV0:       DEC  B
1002 092E 210000             LD   HL,0
1003 0931 1A      CV1:       LD   A,(DE)
1004 0932 D630               SUB  48
1005 0934 FE0A               CP   10
1006 0936 3805               JR   C,CV2
1007 0938 D607               SUB  7
1008 093A FE0A               CP   10
1009 093C D8                 RET  C
1010 093D B9      CV2:       CP   C
1011 093E 3F                 CCF
1012 093F D8                 RET  C
1013 0940 D5                 PUSH DE
1014 0941 5D                 LD   E,L
1015 0942 54                 LD   D,H
1016 0943 CB49               BIT  1,C
1017 0945 2008               JR   NZ,CV3
1018 0947 110000             LD   DE,0
1019 094A CB59               BIT  3,C
1020 094C 2001               JR   NZ,CV3
1021 094E 29                 ADD  HL,HL
1022 094F 29      CV3:       ADD  HL,HL
1023 0950 29                 ADD  HL,HL
1024 0951 19                 ADD  HL,DE
1025 0952 29                 ADD  HL,HL
1026 0953 5F                 LD   E,A
1027 0954 1600               LD   D,0
1028 0956 19                 ADD  HL,DE
1029 0957 D1                 POP  DE
1030 0958 13                 INC  DE
1031 0959 10D6               DJNZ CV1
1032 095B C9                 RET
1033 ;
1034 095C 11B80B  DELAY:     LD   DE,3000
1035 095F CDAA0C  DEL1:      CALL HOLD
1036 0962 1B                 DEC  DE
```



```
1037 0963 7A                 LD   A,D
1038 0964 B3                 OR   E
1039 0965 20F8               JR   NZ,DEL1
1040 0967 DDCB005E           BIT  3,(IX+F1)
1041 096B CCB007             CALL Z,KEYBOARD
1042 096E FE51               CP   'Q'
1043 0970 CA2503             JP   Z,ZEN
1044 0973 DDCB00DE           SET  3,(IX+F1)
1045 0977 3E0C    CLEAR:     LD   A,FF
1046 0979 C39007             JP   OUTPUT
1047
1048 097C D5      SOF:       PUSH DE
1049 097D EB                 EX   DE,HL
1050 097E 2A2002             LD   HL,(SOFP)
1051 0981 B7                 OR   A
1052 0982 ED52               SBC  HL,DE
1053 0984 EB                 EX   DE,HL
1054 0985 D1                 POP  DE
1055 0986 C9                 RET
1056
1057 0987 D5      MEMCHECK:  PUSH DE
1058 0988 09                 ADD  HL,BC
1059 0989 EB                 EX   DE,HL
1060 098A CD9809             CALL MEMTOP
1061 098D B7                 OR   A
1062 098E ED52               SBC  HL,DE
1063 0990 EB                 EX   DE,HL
1064 0991 D1                 POP  DE
1065 0992 D0                 RET  NC
1066 0993 2E6F    E20:       LD   L,M20&255
1067 0995 C37407             JP   ERR
1068
1069 0998 F5      MEMTOP:    PUSH AF
1070 0999 2A1C02             LD   HL,(LIMIT)
1071 099C 7C                 LD   A,H
1072 099D B5                 OR   L
1073 099E 2004               JR   NZ,MMT2
1074 09A0 2A0600             LD   HL,(6)
1075 09A3 2B                 DEC  HL
1076 09A4 F1      MMT2:      POP  AF
1077 09A5 C9                 RET
1078
1079 09A6 CD6607  NEXT:      CALL EOF
1080 09A9 010000  NX0:       LD   BC,0
1081 09AC 7E      NX1:       LD   A,(HL)
1082 09AD 23                 INC  HL
1083 09AE 03                 INC  BC
1084 09AF FE0D               CP   CR
1085 09B1 20F9               JR   NZ,NX1
1086 09B3 C9                 RET
1087
1088 09B4 E5      POSITION:  PUSH HL
1089 09B5 C5                 PUSH BC
1090 09B6 219302             LD   HL,LBUFF
1091 09B9 E5                 PUSH HL
1092 09BA 0605               LD   B,5
1093 09BC 3620    POS1:      LD   (HL),BLANK
1094 09BE 23                 INC  HL
1095 09BF 10FB               DJNZ POS1
1096 09C1 360D               LD   (HL),CR
```

```
1097 09C3 EB              EX   DE,HL
1098 09C4 1B              DEC  DE
1099 09C5 010A00          LD   BC,10
1100 09C8 2A1A02          LD   HL,(LCT)
1101 09CB 1B        POS2: DEC  DE
1102 09CC D5              PUSH DE
1103 09CD EB              EX   DE,HL
1104 09CE CDC00F          CALL MA50
1105 09D1 7B              LD   A,E
1106 09D2 D1              POP  DE
1107 09D3 C630            ADD  A,'0'
1108 09D5 12              LD   (DE),A
1109 09D6 7D              LD   A,L
1110 09D7 B4              OR   H
1111 09D8 20F1            JR   NZ,POS2
1112 09DA E1              POP  HL
1113 09DB CD2708          CALL STR1
1114 09DE C1              POP  BC
1115 09DF E1              POP  HL
1116 09E0 C9              RET
1117
1118 09E1 7C        WORDSP: LD   A,H
1119 09E2 CDEB09          CALL BYTE
1120 09E5 7D              LD   A,L
1121 09E6 E5        BYTESP: PUSH HL
1122 09E7 218E07          LD   HL,SPACE
1123 09EA E3              EX   (SP),HL
1124 09EB F5        BYTE:   PUSH AF
1125 09EC 0F              RRCA
1126 09ED 0F              RRCA
1127 09EE 0F              RRCA
1128 09EF 0F              RRCA
1129 09F0 CDF409          CALL NYB
1130 09F3 F1              POP  AF
1131 09F4 E60F      NYB:  AND  0FH
1132 09F6 C690            ADD  A,90H
1133 09F8 27              DAA
1134 09F9 CE40            ADC  A,40H
1135 09FB 27              DAA
1136 09FC C39007          JP   OUTPUT
1137
1138 09FF 221E02    UPDATE: LD   (CURRENT),HL
1139 0A02 E5        LINC:   PUSH HL
1140 0A03 2A1A02            LD   HL,(LCT)
1141 0A06 23                INC  HL
1142 0A07 221A02            LD   (LCT),HL
1143 0A0A E1                POP  HL
1144 0A0B C9                RET
1145
1146 0A0C CD290A    WNAME:  CALL GETNAME
1147 0A0F CDC20A            CALL OPEN
1148 0A12 3C                INC  A
1149 0A13 C20A0B            JP   NZ,E36
1150 0A16 CDC70A            CALL MAKE
1151 0A19 3C                INC  A
1152 0A1A CAF60A            JP   Z,E31
1153 0A1D C9                RET
1154
1155 0A1E CD290A    RNAME:  CALL GETNAME
1156 0A21 CDC20A            CALL OPEN
```



```
1157 0A24 3C                INC  A
1158 0A25 CAFA0A            JP   Z,E32
1159 0A28 C9                RET
1160
1161 0A29 C5        GETNAME: PUSH BC
1162 0A2A D5                 PUSH DE
1163 0A2B E5                 PUSH HL
1164 0A2C AF                 XOR  A
1165 0A2D 323A02             LD   (DMACTR),A
1166 0A30 CDED0A             CALL SETDMA
1167 0A33 115C00             LD   DE,FCB
1168 0A36 D5                 PUSH DE
1169 0A37 AF                 XOR  A
1170 0A38 12                 LD   (DE),A
1171 0A39 13                 INC  DE
1172 0A3A 0608               LD   B,8
1173 0A3C 3E20               LD   A,BLANK
1174 0A3E 12        GN2:     LD   (DE),A
1175 0A3F 13                 INC  DE
1176 0A40 10FC               DJNZ GN2
1177 0A42 3A3B02             LD   A,(FTYPE)
1178 0A45 21FE01             LD   HL,M40
1179 0A48 FE48               CP   'H'
1180 0A4A 280A               JR   Z,GN3
1181 0A4C 210102             LD   HL,M41
1182 0A4F FE53               CP   'S'
1183 0A51 2803               JR   Z,GN3
1184 0A53 210402             LD   HL,M42
1185 0A56 010300    GN3:     LD   BC,3
1186 0A59 EDB0               LDIR
1187 0A5B 0618               LD   B,24
1188 0A5D AF                 XOR  A
1189 0A5E 12        GN4:     LD   (DE),A
1190 0A5F 13                 INC  DE
1191 0A60 10FC               DJNZ GN4
1192 0A62 2E76               LD   L,M21&255
1193 0A64 CD3108             CALL CUE
1194 0A67 0D                 DEC  C
1195 0A68 CA1709             JP   Z,E10
1196 0A6B D1                 POP  DE
1197 0A6C 219A02             LD   HL,TBUFF+1
1198 0A6F 7E                 LD   A,(HL)
1199 0A70 2B                 DEC  HL
1200 0A71 FE3A               CP   ':'
1201 0A73 2014               JR   NZ,GN5
1202 0A75 0D                 DEC  C
1203 0A76 0D                 DEC  C
1204 0A77 CA1709             JP   Z,E10
1205 0A7A 7E                 LD   A,(HL)
1206 0A7B D630               SUB  '0'
1207 0A7D DA1709             JP   C,E10
1208 0A80 FE0A               CP   '9'-'0'+1
1209 0A82 D21709             JP   NC,E10
1210 0A85 3C                 INC  A
1211 0A86 12                 LD   (DE),A
1212 0A87 23                 INC  HL
1213 0A88 23                 INC  HL
1214 0A89 13        GN5:     INC  DE
1215 0A8A 79                 LD   A,C
1216 0A8B FE09               CP   9
```

```
1217 0A8D D21709                JP   NC,E10
1218 0A90 7E          GN6:      LD   A,(HL)
1219 0A91 CD9E0A                CALL CHKCHAR
1220 0A94 12                    LD   (DE),A
1221 0A95 23                    INC  HL
1222 0A96 13                    INC  DE
1223 0A97 0D                    DEC  C
1224 0A98 20F6                  JR   NZ,GN6
1225 0A9A E1                    POP  HL
1226 0A9B D1                    POP  DE
1227 0A9C C1                    POP  BC
1228 0A9D C9                    RET
1229
1230 0A9E FE30        CHKCHAR:  CP   '0'
1231 0AA0 3805                  JR   C,CKC2
1232 0AA2 FE3A                  CP   '9'+1
1233 0AA4 D8                    RET  C
1234 0AA5 FE41                  CP   'A'
1235 0AA7 DA1709      CKC2:     JP   C,E10
1236 0AAA FE5B                  CP   'Z'+1
1237 0AAC D21709                JP   NC,E10
1238 0AAF C9                    RET
1239
1240 0AB0 3A9A02      CHECKTYPE: LD  A,(TBUFF+1)
1241 0AB3 323B02                LD   (FTYPE),A
1242 0AB6 FE53                  CP   'S'
1243 0AB8 C8                    RET  Z
1244 0AB9 FE48                  CP   'H'
1245 0ABB C8                    RET  Z
1246 0ABC FE43                  CP   'C'
1247 0ABE C21709                JP   NZ,E10
1248 0AC1 C9                    RET
1249
1250 0AC2 C5          OPEN:     PUSH BC
1251 0AC3 0E0F                  LD   C,0FH
1252 0AC5 1812                  JR   TBDOS
1253 0AC7 C5          MAKE:     PUSH BC
1254 0AC8 0E16                  LD   C,16H
1255 0ACA 180D                  JR   TBDOS
1256 0ACC C5          CLOSE:    PUSH BC
1257 0ACD 0E10                  LD   C,10H
1258 0ACF 1808                  JR   TBDOS
1259 0AD1 C5          RSEQ:     PUSH BC
1260 0AD2 0E14                  LD   C,14H
1261 0AD4 1803                  JR   TBDOS
1262 0AD6 C5          WSEQ:     PUSH BC
1263 0AD7 0E15                  LD   C,15H
1264 0AD9 D5          TBDOS:    PUSH DE
1265 0ADA 115C00                LD   DE,FCB
1266 0ADD E5          TBD2:     PUSH HL
1267 0ADE DDE5                  PUSH IX
1268 0AE0 FDE5                  PUSH IY
1269 0AE2 CD0500                CALL BDOS
1270 0AE5 FDE1                  POP  IY
1271 0AE7 DDE1                  POP  IX
1272 0AE9 E1                    POP  HL
1273 0AEA D1                    POP  DE
1274 0AEB C1                    POP  BC
1275 0AEC C9                    RET
1276
```



```
1277 0AED C5          SETDMA:   PUSH BC
1278 0AEE 0E1A                  LD   C,1AH
1279 0AF0 D5                    PUSH DE
1280 0AF1 110000                LD   DE,DMA
1281 0AF4 18E7                  JR   TBD2
1282
1283 0AF6 2ECC        E31:      LD   L,M31&255
1284 0AF8 1812                  JR   DERR
1285 0AFA 2ED5        E32:      LD   L,M32&255
1286 0AFC 180E                  JR   DERR
1287 0AFE 2EDF        E33:      LD   L,M33&255
1288 0B00 180A                  JR   DERR
1289 0B02 2E15        E34:      LD   L,M5&255
1290 0B04 1806                  JR   DERR
1291 0B06 2EE9        E35:      LD   L,M35&255
1292 0B08 1802                  JR   DERR
1293 0B0A 2EF2        E36:      LD   L,M36&255
1294 0B0C C37407      DERR:     JP   ERR
1295
1296 0B0F FE0D        WSCH:     CP   CR
1297 0B11 2056                  JR   NZ,WDMACH
1298 0B13 CD690B                CALL WDMACH
1299 0B16 3E0A                  LD   A,LF
1300 0B18 184F                  JR   WDMACH
1301
1302 0B1A 3E3A        WIHREC:   LD   A,':'
1303 0B1C CD690B                CALL WDMACH
1304 0B1F 0600                  LD   B,0
1305 0B21 79                    LD   A,C
1306 0B22 CD500B                CALL WIHCH
1307 0B25 FDE5                  PUSH IY
1308 0B27 E3                    EX   (SP),HL
1309 0B28 7C                    LD   A,H
1310 0B29 CD500B                CALL WIHCH
1311 0B2C 7D                    LD   A,L
1312 0B2D CD500B                CALL WIHCH
1313 0B30 E1                    POP  HL
1314 0B31 AF                    XOR  A
1315 0B32 CD500B                CALL WIHCH
1316 0B35 0C                    INC  C
1317 0B36 0D          WIHR2:    DEC  C
1318 0B37 2809                  JR   Z,WIHR3
1319 0B39 1A                    LD   A,(DE)
1320 0B3A CD500B                CALL WIHCH
1321 0B3D 13                    INC  DE
1322 0B3E FD23                  INC  IY
1323 0B40 18F4                  JR   WIHR2
1324 0B42 AF          WIHR3:    XOR  A
1325 0B43 90                    SUB  B
1326 0B44 CD500B                CALL WIHCH
1327 0B47 3E0D                  LD   A,CR
1328 0B49 CD690B                CALL WDMACH
1329 0B4C 3E0A                  LD   A,LF
1330 0B4E 1819                  JR   WDMACH
1331
1332 0B50 F5          WIHCH:    PUSH AF
1333 0B51 0F                    RRCA
1334 0B52 0F                    RRCA
1335 0B53 0F                    RRCA
1336 0B54 0F                    RRCA
```

```
1337 0B55 CD610B          CALL WIHD
1338 0B58 F1              POP  AF
1339 0B59 F5              PUSH AF
1340 0B5A CD610B          CALL WIHD
1341 0B5D F1              POP  AF
1342 0B5E 80              ADD  A,B
1343 0B5F 47              LD   B,A
1344 0B60 C9              RET
1345
1346 0B61 E60F    WIHD:   AND  0FH
1347 0B63 C690            ADD  A,90H
1348 0B65 27              DAA
1349 0B66 CE40            ADC  A,40H
1350 0B68 27              DAA
1351 0B69 C5      WDMACH: PUSH BC
1352 0B6A E5              PUSH HL
1353 0B6B 47              LD   B,A
1354 0B6C 3A3A02          LD   A,(DMACTR)
1355 0B6F FE80            CP   128
1356 0B71 2008            JR   NZ,WDC2
1357 0B73 CDD60A          CALL WSEQ
1358 0B76 B7              OR   A
1359 0B77 C2FE0A          JP   NZ,E33
1360 0B7A AF              XOR  A
1361 0B7B 4F      WDC2:   LD   C,A
1362 0B7C 3C              INC  A
1363 0B7D 323A02          LD   (DMACTR),A
1364 0B80 78              LD   A,B
1365 0B81 0600            LD   B,0
1366 0B83 218000          LD   HL,DMA
1367 0B86 09              ADD  HL,BC
1368 0B87 77              LD   (HL),A
1369 0B88 E1              POP  HL
1370 0B89 C1              POP  BC
1371 0B8A C9              RET
1372
1373 0B8B CD000C  RSCH:   CALL RDMACH
1374 0B8E FE0A            CP   LF
1375 0B90 28F9            JR   Z,RSCH
1376 0B92 C9              RET
1377
1378 0B93 CD000C  RIHREC: CALL RDMACH
1379 0B96 FE1A            CP   1AH
1380 0B98 CA020B          JP   Z,E34
1381 0B9B FE3A            CP   ':'
1382 0B9D 20F4            JR   NZ,RIHREC
1383 0B9F 0600            LD   B,0
1384 0BA1 CDE20B          CALL RIHCH
1385 0BA4 4F              LD   C,A
1386 0BA5 F5              PUSH AF
1387 0BA6 CDE20B          CALL RIHCH
1388 0BA9 57              LD   D,A
1389 0BAA CDE20B          CALL RIHCH
1390 0BAD 5F              LD   E,A
1391 0BAE DDCB024E        BIT  1,(IX+F3)
1392 0BB2 DDCB02CE        SET  1,(IX+F3)
1393 0BB6 200C            JR   NZ,RIHR1
1394 0BB8 B7              OR   A
1395 0BB9 ED52            SBC  HL,DE
1396 0BBB DDCB0246        BIT  0,(IX+F3)
```



```
1397 0BBF 2003            JR   NZ,RIHR1
1398 0BC1 210000          LD   HL,0
1399 0BC4 E5      RIHR1:  PUSH HL
1400 0BC5 19              ADD  HL,DE
1401 0BC6 E3              EX   (SP),HL
1402 0BC7 FDE1            POP  IY
1403 0BC9 CDE20B          CALL RIHCH
1404 0BCC 0C              INC  C
1405 0BCD 0D      RIHR2:  DEC  C
1406 0BCE 280A            JR   Z,RIHR3
1407 0BD0 CDE20B          CALL RIHCH
1408 0BD3 FD7700          LD   (IY+0),A
1409 0BD6 FD23            INC  IY
1410 0BD8 18F3            JR   RIHR2
1411 0BDA CDE20B  RIHR3:  CALL RIHCH
1412 0BDD C2060B          JP   NZ,E35
1413 0BE0 F1              POP  AF
1414 0BE1 C9              RET
1415
1416 0BE2 CDF50B  RIHCH:  CALL RIHD
1417 0BE5 07              RLCA
1418 0BE6 07              RLCA
1419 0BE7 07              RLCA
1420 0BE8 07              RLCA
1421 0BE9 D5              PUSH DE
1422 0BEA 57              LD   D,A
1423 0BEB CDF50B          CALL RIHD
1424 0BEE B2              OR   D
1425 0BEF 57              LD   D,A
1426 0BF0 80              ADD  A,B
1427 0BF1 47              LD   B,A
1428 0BF2 7A              LD   A,D
1429 0BF3 D1              POP  DE
1430 0BF4 C9              RET
1431
1432 0BF5 CD000C  RIHD:   CALL RDMACH
1433 0BF8 D630            SUB  '0'
1434 0BFA FE0A            CP   10
1435 0BFC D8              RET  C
1436 0BFD D607            SUB  7
1437 0BFF C9              RET
1438
1439 0C00 C5      RDMACH: PUSH BC
1440 0C01 E5              PUSH HL
1441 0C02 3A3A02          LD   A,(DMACTR)
1442 0C05 B7              OR   A
1443 0C06 2016            JR   NZ,RDC2
1444 0C08 CDD10A          CALL RSEQ
1445 0C0B B7              OR   A
1446 0C0C 280E            JR   Z,RDC1
1447 0C0E 3A3B02          LD   A,(FTYPE)
1448 0C11 FE43            CP   'C'
1449 0C13 C2020B          JP   NZ,E34
1450 0C16 DDCB02D6        SET  2,(IX+F3)
1451 0C1A 1812            JR   RDC3
1452 0C1C 3E80    RDC1:   LD   A,128
1453 0C1E 3D      RDC2:   DEC  A
1454 0C1F 323A02          LD   (DMACTR),A
1455 0C22 4F              LD   C,A
1456 0C23 3E7F            LD   A,127
```

```
0C25 91              SUB  C
0C26 4F              LD   C,A
0C27 0600            LD   B,0
0C29 218000          LD   HL,DMA
0C2C 09              ADD  HL,BC
0C2D 7E              LD   A,(HL)
0C2E E1        RDC3: POP  HL
0C2F C1              POP  BC
0C30 C9              RET

               ; Table lengths

               JL:   EQU  3
               CL:   EQU  1
               TL:   EQU  16
               LL:   EQU  21
               AL:   EQU  2
               SBL:  EQU  2
               ADL:  EQU  4
               INL:  EQU  3
               OL:   EQU  3
               XL:   EQU  4

               ; Register pair IDs

               IBC:  EQU  0
               IDE:  EQU  2
               IHL:  EQU  4
               IAF:  EQU  0EH
               ISP:  EQU  6

               ; Tiny register IDs

               IB:   EQU  0
               IC:   EQU  1
               ID:   EQU  2
               IE:   EQU  3
               IH:   EQU  4
               IL:   EQU  5
               IA:   EQU  7

               IIX:  EQU  0DDH
               IIY:  EQU  0FDH

               IREF: EQU  8
               IINT: EQU  0

               ; Condition code IDs

               ICY:  EQU  18H
               INCY: EQU  10H
               IZ:   EQU  8
               INZ:  EQU  0
               IPO:  EQU  20H
               IPE:  EQU  28H
               IMIN: EQU  38H
               IPOS: EQU  30H

               ; Parser primary IDs
```



```
               TR:   EQU  0
               TRI:  EQU  4
               RP:   EQU  1
               RPI:  EQU  5
               XY:   EQU  2
               XYI:  EQU  6
               NO:   EQU  3
               NOI:  EQU  7
               RE:   EQU  8
               CC:   EQU  9
               XYD:  EQU  10
               EOL:  EQU  11
               TNO:  EQU  12
               TNOI: EQU  13

               ; Parser intermediate IDs

               TALPHA: EQU  30H
               TLAB:   EQU  31H
               TOPD:   EQU  32H
               TCOM:   EQU  33H
               TIND:   EQU  34H
               TADD:   EQU  40H
               TSUB:   EQU  0C0H
               TMUL:   EQU  80H
               TDIV:   EQU  81H
               TAND:   EQU  82H
               TOR:    EQU  83H
               TDEF:   EQU  35H
               TLIT:   EQU  36H

               ; Assembler

0C31 CD950C    ASMB:  CALL GETOPTION
0C34 21B61C           LD   HL,AEND+1
0C37 36FF             LD   (HL),0FFH
0C39 222A02           LD   (FEP),HL
0C3C CD430C           CALL PASS
0C3F DDCB00AE         RES  5,(IX+F1)
0C43 CDBE03    PASS:  CALL TOP
0C46 CDAA0C    PS1:   CALL HOLD
0C49 2A1E02           LD   HL,(CURRENT)
0C4C 222802           LD   (TEMP),HL
0C4F 2A3002           LD   HL,(PC)
0C52 E5               PUSH HL
0C53 210000           LD   HL,0
0C56 220802           LD   (FLAGS+F2),HL
0C59 220C02           LD   (FLAGS+F6),HL
0C5C CD8410           CALL CLASS
0C5F FE31             CP   TLAB
0C61 CCBB0C           CALL Z,SYMBOL
0C64 FE0B             CP   EOL
0C66 2819             JR   Z,PS2
0C68 FE30             CP   TALPHA
0C6A 2024             JR   NZ,E1
0C6C CD750E           CALL OPTSCH
0C6F 381F             JR   C,E1
0C71 DD7105           LD   (IX+F6),C
0C74 CD0F0D           CALL JUMP
0C77 C2CA0E           JP   NZ,E6
```

```
1577 0C7A CD150F                CALL PARSER
1578 0C7D FE0B                  CP   EOL
1579 0C7F 200F                  JR   NZ,E1
1580 0C81 E1            PS2:    POP  HL
1581 0C82 DDCB006E              BIT  5,(IX+F1)
1582 0C86 CC890D                CALL Z,LIST
1583 0C89 CD020A                CALL LINC
1584 0C8C 04                    INC  B
1585 0C8D 20B7                  JR   NZ,PS1
1586 0C8F C9                    RET
1587
1588 0C90 2E0B          E1:     LD   L,M2&255
1589 0C92 C3F703                JP   ER
1590
1591 0C95 2E1F          GETOPTION: LD  L,M7&255
1592 0C97 CD3108                CALL CUE
1593 0C9A F6B8                  OR   0B8H
1594 0C9C DD7700                LD   (IX+F1),A
1595 0C9F DD360401              LD   (IX+F5),1
1596 0CA3 210000                LD   HL,0
1597 0CA6 221802                LD   (PAGENO),HL
1598 0CA9 C9                    RET
1599
1600 0CAA CD0808        HOLD:   CALL CONSTAT
1601 0CAD B7                    OR   A
1602 0CAE C8                    RET  Z
1603 0CAF DDCB0076              BIT  6,(IX+F1)
1604 0CB3 CA2503                JP   Z,ZEN
1605 0CB6 DDCB009E              RES  3,(IX+F1)
1606 0CBA C9                    RET
1607
1608 0CBB DDCB01CE SYMBOL:      SET  1,(IX+F2)
1609 0CBF 0C                    INC  C
1610 0CC0 DD7106                LD   (IX+F7),C
1611 0CC3 0D                    DEC  C
1612 0CC4 CAF503                JP   Z,E0
1613 0CC7 CD620E                CALL SYMSCH
1614 0CCA FD222E02              LD   (LBLP),IY
1615 0CCE DDCB006E              BIT  5,(IX+F1)
1616 0CD2 2838                  JR   Z,SY2
1617 0CD4 2E4A                  LD   L,M13&255
1618 0CD6 D2F703                JP   NC,ER
1619 0CD9 CD670E                CALL OPDSCH
1620 0CDC 2E3C                  LD   L,M12&255
1621 0CDE D2F703                JP   NC,ER
1622 0CE1 2A2A02                LD   HL,(FEP)
1623 0CE4 E5                    PUSH HL
1624 0CE5 0600                  LD   B,0
1625 0CE7 09                    ADD  HL,BC
1626 0CE8 23                    INC  HL
1627 0CE9 23                    INC  HL
1628 0CEA 23                    INC  HL
1629 0CEB CD7C09                CALL SOF
1630 0CEE 2E45                  LD   L,M14&255
1631 0CF0 DAF703                JP   C,ER
1632 0CF3 E1                    POP  HL
1633 0CF4 EB                    EX   DE,HL
1634 0CF5 EDB0                  LDIR
1635 0CF7 EB                    EX   DE,HL
1636 0CF8 2B                    DEC  HL
```



```
1637 0CF9 CBFE                  SET  7,(HL)
1638 0CFB C1                    POP  BC
1639 0CFC D1                    POP  DE
1640 0CFD D5                    PUSH DE
1641 0CFE C5                    PUSH BC
1642 0CFF 23                    INC  HL
1643 0D00 73                    LD   (HL),E
1644 0D01 23                    INC  HL
1645 0D02 72                    LD   (HL),D
1646 0D03 222E02                LD   (LBLP),HL
1647 0D06 23                    INC  HL
1648 0D07 36FF                  LD   (HL),0FFH
1649 0D09 222A02                LD   (FEP),HL
1650 0D0C C38410        SY2:    JP   CLASS
1651
1652 0D0F 44            JUMP:   LD   B,H
1653 0D10 CB7D                  BIT  7,L
1654 0D12 2004                  JR   NZ,JP2
1655 0D14 DDCB01DE              SET  3,(IX+F2)
1656 0D18 CBBD          JP2:    RES  7,L
1657 0D1A 5D                    LD   E,L
1658 0D1B 1600                  LD   D,0
1659 0D1D 7D                    LD   A,L
1660 0D1E 21510D                LD   HL,JPTAB
1661 0D21 19                    ADD  HL,DE
1662 0D22 5E                    LD   E,(HL)
1663 0D23 23                    INC  HL
1664 0D24 56                    LD   D,(HL)
1665 0D25 D5                    PUSH DE
1666 0D26 FE05                  CP   5
1667 0D28 D8                    RET  C
1668 0D29 FE25                  CP   37
1669 0D2B DA150F                JP   C,PARSER
1670 0D2E CD150F                CALL PARSER
1671 0D31 E5                    PUSH HL
1672 0D32 F5                    PUSH AF
1673 0D33 CD150F                CALL PARSER
1674 0D36 4F                    LD   C,A
1675 0D37 F1                    POP  AF
1676 0D38 EB                    EX   DE,HL
1677 0D39 E1                    POP  HL
1678 0D3A 07                    RLCA
1679 0D3B 07                    RLCA
1680 0D3C 07                    RLCA
1681 0D3D 07                    RLCA
1682 0D3E B1                    OR   C
1683 0D3F 4F                    LD   C,A
1684 0D40 FDE1                  POP  IY
1685 0D42 CD3510                CALL FIND
1686 0D45 47                    LD   B,A
1687 0D46 2801                  JR   Z,JP3
1688 0D48 EB                    EX   DE,HL
1689 0D49 7D            JP3:    LD   A,L
1690 0D4A 07                    RLCA
1691 0D4B 07                    RLCA
1692 0D4C 07                    RLCA
1693 0D4D 07                    RLCA
1694 0D4E B3                    OR   E
1695 0D4F FDE9                  JP   (IY)
1696
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```
1697 0D51 E60E     JPTAB:     DW   MOFB
1698 0D53 DC11                DW   L30
1699 0D55 8511                DW   ENDH
1700 0D57 4812                DW   RSTH
1701 0D59 5512                DW   RETH
1702 0D5B 8A12                DW   PPH
1703 0D5D F710                DW   JRH
1704 0D5F 0511                DW   DJH
1705 0D61 B612                DW   INCH
1706 0D63 1513                DW   ML1
1707 0D65 4C13                DW   SRH
1708 0D67 3A13                DW   BITH
1709 0D69 2411                DW   DWH
1710 0D6B 2A11                DW   DBH
1711 0D6D 4711                DW   DSH
1712 0D6F 7811                DW   EQUH
1713 0D71 6711                DW   ORGH
1714 0D73 A212                DW   IMH
1715 0D75 5B11                DW   LOADH
1716 0D77 8711                DW   LTAB
1717 0D79 7412                DW   CALTAB
1718 0D7B 5F12                DW   JMPTAB
1719 0D7D 8A13                DW   XTAB
1720 0D7F 6513                DW   INTAB
1721 0D81 DE12                DW   ADDTAB
1722 0D83 D012                DW   ADCTAB
1723 0D85 D712                DW   SBCTAB
1724 0D87 6F13                DW   OUTAB
1725
1726 0D89 DDCB0076 LIST:      BIT  6,(IX+F1)
1727 0D8D C8                  RET  Z
1728 0D8E C5                  PUSH BC
1729 0D8F DD4E02              LD   C,(IX+F3)
1730 0D92 ED5B0C02            LD   DE,(FLAGS+F6)
1731 0D96 FD219902            LD   IY,TBUFF
1732 0D9A D5          LS1:    PUSH DE
1733 0D9B DDCB0176            BIT  6,(IX+F2)
1734 0D9F CC6208              CALL Z,PAGE
1735 0DA2 DDCB004E            BIT  1,(IX+F1)
1736 0DA6 2007                JR   NZ,LS12
1737 0DA8 DDCB017E            BIT  7,(IX+F2)
1738 0DAC CCB409              CALL Z,POSITION
1739 0DAF D1          LS12:   POP  DE
1740 0DB0 060E                LD   B,14
1741 0DB2 0C                  INC  C
1742 0DB3 0D                  DEC  C
1743 0DB4 2817                JR   Z,LS4
1744 0DB6 CDE109              CALL WORDSP
1745 0DB9 0604                LD   B,4
1746 0DBB FD7E00      LS2:    LD   A,(IY+0)
1747 0DBE CDEB09              CALL BYTE
1748 0DC1 FD23                INC  IY
1749 0DC3 23                  INC  HL
1750 0DC4 0D                  DEC  C
1751 0DC5 2803                JR   Z,LS3
1752 0DC7 10F2                DJNZ LS2
1753 0DC9 04                  INC  B
1754 0DCA CB20        LS3:    SLA  B
1755 0DCC 05                  DEC  B
1756 0DCD CD8E07      LS4:    CALL SPACE
```



```
1757 0DD0 10FB                DJNZ LS4
1758 0DD2 C5                  PUSH BC
1759 0DD3 E5                  PUSH HL
1760 0DD4 FDE5                PUSH IY
1761 0DD6 FD210E02            LD   IY,COMWIDTH
1762 0DDA 2A2802              LD   HL,(TEMP)
1763 0DDD 0EFF                LD   C,0FFH
1764 0DDF DDCB0146            BIT  0,(IX+F2)
1765 0DE3 281A                JR   Z,LS7
1766 0DE5 CD1E0E              CALL SYMFIELD
1767 0DE8 53                  LD   D,E
1768 0DE9 CD220E              CALL FIELD
1769 0DEC 5A                  LD   E,D
1770 0DED E5                  PUSH HL
1771 0DEE 7E          LS5:    LD   A,(HL)
1772 0DEF FE0D                CP   CR
1773 0DF1 2808                JR   Z,LS6
1774 0DF3 FE3B                CP   3BH
1775 0DF5 2804                JR   Z,LS6
1776 0DF7 14                  INC  D
1777 0DF8 23                  INC  HL
1778 0DF9 18F3                JR   LS5
1779 0DFB E1          LS6:    POP  HL
1780 0DFC CD220E              CALL FIELD
1781 0DFF E5          LS7:    PUSH HL
1782 0E00 7E          LS8:    LD   A,(HL)
1783 0E01 FE0D                CP   CR
1784 0E03 2804                JR   Z,LS9
1785 0E05 14                  INC  D
1786 0E06 23                  INC  HL
1787 0E07 18F7                JR   LS8
1788 0E09 E1          LS9:    POP  HL
1789 0E0A CD220E              CALL FIELD
1790 0E0D 222802              LD   (TEMP),HL
1791 0E10 FDE1                POP  IY
1792 0E12 E1                  POP  HL
1793 0E13 C1                  POP  BC
1794 0E14 CD8107              CALL CRLF
1795 0E17 0C                  INC  C
1796 0E18 0D                  DEC  C
1797 0E19 C29A0D              JP   NZ,LS1
1798 0E1C C1                  POP  BC
1799 0E1D C9                  RET
1800
1801 0E1E FD211002 SYMFIELD:  LD   IY,SYMWIDTH
1802 0E22 FD4600   FIELD:     LD   B,(IY+0)
1803 0E25 DDCB004E            BIT  1,(IX+F1)
1804 0E29 2803                JR   Z,FD1
1805 0E2B FD4601              LD   B,(IY+1)
1806 0E2E FD23     FD1:       INC  IY
1807 0E30 FD23                INC  IY
1808 0E32 7A                  LD   A,D
1809 0E33 B8                  CP   B
1810 0E34 3801                JR   C,FD2
1811 0E36 78                  LD   A,B
1812 0E37 3C       FD2:       INC  A
1813 0E38 3D       FD3:       DEC  A
1814 0E39 280A                JR   Z,FD4
1815 0E3B F5                  PUSH AF
1816 0E3C 7E                  LD   A,(HL)
```

```
1817 0E3D A1              AND  C
1818 0E3E CD9007          CALL OUTPUT
1819 0E41 F1              POP  AF
1820 0E42 23              INC  HL
1821 0E43 18F3            JR   FD3
1822 0E45 78        FD4:  LD   A,B
1823 0E46 92              SUB  D
1824 0E47 3004            JR   NC,FD6
1825 0E49 23        FD5:  INC  HL
1826 0E4A 3C              INC  A
1827 0E4B 20FC            JR   NZ,FD5
1828 0E4D 7A        FD6:  LD   A,D
1829 0E4E 90              SUB  B
1830 0E4F 1600            LD   D,0
1831 0E51 3008            JR   NC,FD8
1832 0E53 F5        FD7:  PUSH AF
1833 0E54 CD8E07          CALL SPACE
1834 0E57 F1              POP  AF
1835 0E58 3C              INC  A
1836 0E59 20F8            JR   NZ,FD7
1837 0E5B 7E        FD8:  LD   A,(HL)
1838 0E5C FE20            CP   BLANK
1839 0E5E C0              RET  NZ
1840 0E5F 23              INC  HL
1841 0E60 18F9            JR   FD8
1842
1843 0E62 21B61C    SYMSCH: LD   HL,AEND+1
1844 0E65 182D              JR   SEARCH
1845
1846 0E67 213415    OPDSCH: LD   HL,CCODES
1847 0E6A DDCB015E          BIT  3,(IX+F2)
1848 0E6E 2824              JR   Z,SEARCH
1849 0E70 215015            LD   HL,TREGS
1850 0E73 181F              JR   SEARCH
1851
1852 0E75 79        OPTSCH: LD   A,C
1853 0E76 3D                DEC  A
1854 0E77 37                SCF
1855 0E78 C8                RET  Z
1856 0E79 1A                LD   A,(DE)
1857 0E7A D641              SUB  'A'
1858 0E7C D8                RET  C
1859 0E7D FE1A              CP   'Z'-'A'+1
1860 0E7F 3F                CCF
1861 0E80 D8                RET  C
1862 0E81 CD6518            CALL KEYADDR
1863 0E84 13                INC  DE
1864 0E85 0B                DEC  BC
1865 0E86 CD940E            CALL SEARCH
1866 0E89 03                INC  BC
1867 0E8A 1B                DEC  DE
1868 0E8B C9                RET
1869
1870 0E8C CB7E      BAD:    BIT  7,(HL)
1871 0E8E 23                INC  HL
1872 0E8F 28FB              JR   Z,BAD
1873 0E91 23                INC  HL
1874 0E92 23                INC  HL
1875 0E93 D1                POP  DE
1876 0E94 7E        SEARCH: LD   A,(HL)
```



```
1877 0E95 3C                INC  A
1878 0E96 37                SCF
1879 0E97 C8                RET  Z
1880 0E98 D5                PUSH DE
1881 0E99 41                LD   B,C
1882 0E9A 1A        SC2:    LD   A,(DE)
1883 0E9B 1002              DJNZ SC3
1884 0E9D CBFF              SET  7,A
1885 0E9F 04        SC3:    INC  B
1886 0EA0 BE                CP   (HL)
1887 0EA1 20E9              JR   NZ,BAD
1888 0EA3 13                INC  DE
1889 0EA4 23                INC  HL
1890 0EA5 10F3              DJNZ SC2
1891 0EA7 5E                LD   E,(HL)
1892 0EA8 23                INC  HL
1893 0EA9 56                LD   D,(HL)
1894 0EAA E3                EX   (SP),HL
1895 0EAB EB                EX   DE,HL
1896 0EAC FDE1              POP  IY
1897 0EAE C9                RET
1898
1899 0EAF FE03      RESOLV: CP   NO
1900 0EB1 2017              JR   NZ,E6
1901 0EB3 DD7E01            LD   A,(IX+F2)
1902 0EB6 CB67              BIT  4,A
1903 0EB8 C22010            JP   NZ,E7
1904 0EBB CB4F              BIT  1,A
1905 0EBD C9                RET
1906
1907 0EBE FE03      LITLE:  CP   NO
1908 0EC0 2008              JR   NZ,E6
1909 0EC2 DDCB006E  LITLE2: BIT  5,(IX+F1)
1910 0EC6 C0                RET  NZ
1911 0EC7 7C                LD   A,H
1912 0EC8 B7                OR   A
1913 0EC9 C8                RET  Z
1914 0ECA 2E58      E6:     LD   L,M16&255
1915 0ECC C3F703            JP   ER
1916
1917 0ECF 5D        MOFMIX: LD   E,L
1918 0ED0 CB5B      MOFMX2: BIT  3,E
1919 0ED2 20F6              JR   NZ,E6
1920 0ED4 7B                LD   A,E
1921 0ED5 07                RLCA
1922 0ED6 07                RLCA
1923 0ED7 07                RLCA
1924 0ED8 B0                OR   B
1925 0ED9 180C              JR   MOF
1926 0EDB 3EED      MOFPRE: LD   A,0EDH
1927 0EDD 1808              JR   MOF
1928 0EDF 7D        MOFLH:  LD   A,L
1929 0EE0 CDE70E            CALL MOF
1930 0EE3 7C        MOFH:   LD   A,H
1931 0EE4 1801              JR   MOF
1932 0EE6 78        MOFB:   LD   A,B
1933 0EE7 E5        MOF:    PUSH HL
1934 0EE8 C5                PUSH BC
1935 0EE9 CD9410            CALL CL2
1936 0EEC 23                INC  HL
```

```
1937 0EED 223002                LD   (PC),HL
1938 0EF0 DDCB006E              BIT  5,(IX+F1)
1939 0EF4 2018                  JR   NZ,MOF5
1940 0EF6 DDCB0066              BIT  4,(IX+F1)
1941 0EFA 2008                  JR   NZ,MOF2
1942 0EFC 2A3202                LD   HL,(OBJ)
1943 0EFF 77                    LD   (HL),A
1944 0F00 23                    INC  HL
1945 0F01 223202                LD   (OBJ),HL
1946 0F04 0600          MOF2:   LD   B,0
1947 0F06 DD4E02                LD   C,(IX+F3)
1948 0F09 219902                LD   HL,TBUFF
1949 0F0C 09                    ADD  HL,BC
1950 0F0D 77                    LD   (HL),A
1951 0F0E DD3402        MOF5:   INC  (IX+F3)
1952 0F11 C1                    POP  BC
1953 0F12 E1                    POP  HL
1954 0F13 AF                    XOR  A
1955 0F14 C9                    RET
1956
1957 0F15 DDCB0146 PARSER:      BIT  0,(IX+F2)
1958 0F19 3E0B                  LD   A,EOL
1959 0F1B C0                    RET  NZ
1960 0F1C C5                    PUSH BC
1961 0F1D CD220F                CALL PA1
1962 0F20 C1                    POP  BC
1963 0F21 C9                    RET
1964
1965 0F22 CDEF0F        PA1:    CALL TERM
1966 0F25 D8                    RET  C
1967 0F26 FE34                  CP   TIND
1968 0F28 0600                  LD   B,0
1969 0F2A 2005                  JR   NZ,PA2
1970 0F2C CDEF0F                CALL TERM
1971 0F2F 0604                  LD   B,4
1972 0F31 FE32          PA2:    CP   TOPD
1973 0F33 2031                  JR   NZ,PA7
1974 0F35 7C                    LD   A,H
1975 0F36 B0                    OR   B
1976 0F37 57                    LD   D,A
1977 0F38 E5                    PUSH HL
1978 0F39 CDEF0F                CALL TERM
1979 0F3C E1                    POP  HL
1980 0F3D 4F                    LD   C,A
1981 0F3E 7A                    LD   A,D
1982 0F3F D8                    RET  C
1983 0F40 FE06                  CP   XYI
1984 0F42 202F                  JR   NZ,PER
1985 0F44 CB71                  BIT  6,C
1986 0F46 282B                  JR   Z,PER
1987 0F48 45                    LD   B,L
1988 0F49 C5                    PUSH BC
1989 0F4A CDEF0F                CALL TERM
1990 0F4D CD760F                CALL PA4
1991 0F50 C1                    POP  BC
1992 0F51 CDC20E                CALL LITLE2
1993 0F54 200C                  JR   NZ,PA3
1994 0F56 7D                    LD   A,L
1995 0F57 CB79                  BIT  7,C
1996 0F59 2803                  JR   Z,PA31
```



```
1997 0F5B ED44                  NEG
1998 0F5D 6F                    LD   L,A
1999 0F5E A9            PA31:   XOR  C
2000 0F5F FACA0E                JP   M,E6
2001 0F62 60            PA3:    LD   H,B
2002 0F63 3E0A                  LD   A,XYD
2003 0F65 C9                    RET
2004 0F66 FE36          PA7:    CP   TLIT
2005 0F68 200C                  JR   NZ,PA4
2006 0F6A B0                    OR   B
2007 0F6B 6F                    LD   L,A
2008 0F6C E5                    PUSH HL
2009 0F6D CDEF0F                CALL TERM
2010 0F70 E1                    POP  HL
2011 0F71 7D                    LD   A,L
2012 0F72 D8                    RET  C
2013 0F73 C3CA0E        PER:    JP   E6
2014 0F76 FE03          PA4:    CP   NO
2015 0F78 20F9                  JR   NZ,PER
2016 0F7A B0                    OR   B
2017 0F7B F5                    PUSH AF
2018 0F7C E5            PA5:    PUSH HL
2019 0F7D CDEF0F                CALL TERM
2020 0F80 E1                    POP  HL
2021 0F81 3811                  JR   C,PA6
2022 0F83 F5                    PUSH AF
2023 0F84 E5                    PUSH HL
2024 0F85 CDEF0F                CALL TERM
2025 0F88 EB                    EX   DE,HL
2026 0F89 E1                    POP  HL
2027 0F8A FE03                  CP   NO
2028 0F8C 20E5                  JR   NZ,PER
2029 0F8E F1                    POP  AF
2030 0F8F CD960F                CALL MATH
2031 0F92 18E8                  JR   PA5
2032 0F94 F1            PA6:    POP  AF
2033 0F95 C9                    RET
2034
2035 0F96 FE40          MATH:   CP   TADD
2036 0F98 2002                  JR   NZ,MA2
2037 0F9A 19                    ADD  HL,DE
2038 0F9B C9                    RET
2039 0F9C FEC0          MA2:    CP   TSUB
2040 0F9E 2003                  JR   NZ,MA3
2041 0FA0 ED52                  SBC  HL,DE
2042 0FA2 C9                    RET
2043 0FA3 FE82          MA3:    CP   TAND
2044 0FA5 2007                  JR   NZ,MA4
2045 0FA7 7B                    LD   A,E
2046 0FA8 A5                    AND  L
2047 0FA9 6F                    LD   L,A
2048 0FAA 7A                    LD   A,D
2049 0FAB A4                    AND  H
2050 0FAC 67                    LD   H,A
2051 0FAD C9                    RET
2052 0FAE FE83          MA4:    CP   TOR
2053 0FB0 2007                  JR   NZ,MA5
2054 0FB2 7B                    LD   A,E
2055 0FB3 B5                    OR   L
2056 0FB4 6F                    LD   L,A
```

```
2057 0FB5 7A              LD   A,D
2058 0FB6 B4              OR   H
2059 0FB7 67              LD   H,A
2060 0FB8 C9              RET
2061 0FB9 4B    MA5:      LD   C,E
2062 0FBA 42              LD   B,D
2063 0FBB EB              EX   DE,HL
2064 0FBC FE81            CP   TDIV
2065 0FBE 2018            JR   NZ,MA6
2066 0FC0 210000  MA50:   LD   HL,0
2067 0FC3 3E11            LD   A,17
2068 0FC5 B7              OR   A
2069 0FC6 ED6A    MA51:   ADC  HL,HL
2070 0FC8 ED42            SBC  HL,BC
2071 0FCA 3002            JR   NC,MA52
2072 0FCC 09              ADD  HL,BC
2073 0FCD 37              SCF
2074 0FCE 3F    MA52:     CCF
2075 0FCF CB13            RL   E
2076 0FD1 CB12            RL   D
2077 0FD3 3D              DEC  A
2078 0FD4 20F0            JR   NZ,MA51
2079 0FD6 EB              EX   DE,HL
2080 0FD7 C9              RET
2081 0FD8 FE80    MA6:    CP   TMUL
2082 0FDA 2097            JR   NZ,PER
2083 0FDC 210000          LD   HL,0
2084 0FDF 3E10            LD   A,16
2085 0FE1 CB38    MA61:   SRL  B
2086 0FE3 CB19            RR   C
2087 0FE5 3001            JR   NC,MA62
2088 0FE7 19              ADD  HL,DE
2089 0FE8 EB      MA62:   EX   DE,HL
2090 0FE9 29              ADD  HL,HL
2091 0FEA EB              EX   DE,HL
2092 0FEB 3D              DEC  A
2093 0FEC 20F3            JR   NZ,MA61
2094 0FEE C9              RET
2095
2096 0FEF CD8410  TERM:   CALL CLASS
2097 0FF2 FE31            CP   TLAB
2098 0FF4 CACA0E          JP   Z,E6
2099 0FF7 FE0B    TE2:    CP   EOL
2100 0FF9 2006            JR   NZ,TE3
2101 0FFB DDCB01C6        SET  0,(IX+F2)
2102 0FFF 37              SCF
2103 1000 C9              RET
2104 1001 FE33    TE3:    CP   TCOM
2105 1003 37              SCF
2106 1004 C8              RET  Z
2107 1005 FE30            CP   TALPHA
2108 1007 37              SCF
2109 1008 3F              CCF
2110 1009 C0              RET  NZ
2111 100A CD670E          CALL OPDSCH
2112 100D 3E32            LD   A,TOPD
2113 100F D0              RET  NC
2114 1010 CD620E          CALL SYMSCH
2115 1013 3E03            LD   A,NO
2116 1015 D0              RET  NC
```



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2117 1016 3F              CCF
2118 1017 DDCB01E6        SET  4,(IX+F2)
2119 101B DDCB006E        BIT  5,(IX+F1)
2120 101F C0              RET  NZ
2121 1020 2E60    E7:     LD   L,M17&255
2122 1022 C3F703          JP   ER
2123
2124 1025 2A1E02  TYPE:   LD   HL,(CURRENT)
2125 1028 CD6607          CALL EOF
2126 102B 23              INC  HL
2127 102C 221E02          LD   (CURRENT),HL
2128 102F 2B              DEC  HL
2129 1030 7E              LD   A,(HL)
2130 1031 FD215310        LD   IY,TYPTAB
2131 1035 D5      FIND:   PUSH DE
2132 1036 FDE5            PUSH IY
2133 1038 E3              EX   (SP),HL
2134 1039 5E              LD   E,(HL)
2135 103A 53              LD   D,E
2136 103B 23      FIN1:   INC  HL
2137 103C BE              CP   (HL)
2138 103D 2803            JR   Z,FIN2
2139 103F 15              DEC  D
2140 1040 20F9            JR   NZ,FIN1
2141 1042 1600    FIN2:   LD   D,0
2142 1044 19              ADD  HL,DE
2143 1045 7E              LD   A,(HL)
2144 1046 19              ADD  HL,DE
2145 1047 5F              LD   E,A
2146 1048 7E              LD   A,(HL)
2147 1049 CB7B            BIT  7,E
2148 104B CBBB            RES  7,E
2149 104D 19              ADD  HL,DE
2150 104E E3              EX   (SP),HL
2151 104F FDE1            POP  IY
2152 1051 D1              POP  DE
2153 1052 C9              RET
2154
2155 1053 100D27  TYPTAB: DB   TL,CR,"'"
2156 1056 242A2F2B        DB   '$*/+-&.()'
2156 105A 2D262E28
2156 105E 29
2157 105F 3B3A222C        DB   3BH,':",'
2158 1063 00              DB   0
2159 1064 1F              DB   CL3-$-TL
2160 1065 2C              DB   CL4-$-TL
2161 1066 1E              DB   CL2-$-TL
2162 1067 1C              DB   CL3-$-TL
2163 1068 1B              DB   CL3-$-TL
2164 1069 1A              DB   CL3-$-TL
2165 106A 19              DB   CL3-$-TL
2166 106B 18              DB   CL3-$-TL
2167 106C 17              DB   CL3-$-TL
2168 106D 16              DB   CL3-$-TL
2169 106E 06              DB   CLASS-$-TL
2170 106F 0D              DB   CL1-$-TL
2171 1070 13              DB   CL3-$-TL
2172 1071 20              DB   CL4-$-TL
2173 1072 11              DB   CL3-$-TL
2174 1073 3B              DB   CL5-$-TL
```

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2175 1074 0B000380              DB    EOL,0,NO,TMUL,TDIV
2175 1078 81
2176 1079 40C08283              DB    TADD,TSUB,TAND,TOR
2177 107D 34000031              DB    TIND,0,0,TLAB
2178 1081 003335                DB    0,TCOM,TDEF
2179
2180 1084 CD2510    CLASS:      CALL  TYPE
2181 1087 010021                LD    BC,2100H
2182 108A FDE9                  JP    (IY)
2183 108C CD2510    CL1:        CALL  TYPE
2184 108F FE0B                  CP    EOL
2185 1091 20F9                  JR    NZ,CL1
2186 1093 C9        CL3:        RET
2187 1094 2A3002    CL2:        LD    HL,(PC)
2188 1097 DDCB007E              BIT   7,(IX+F1)
2189 109B C8                    RET   Z
2190 109C 2E6A      E11:        LD    L,M18&255
2191 109E C3F703                JP    ER
2192 10A1 E5        CL4:        PUSH  HL
2193 10A2 46                    LD    B,(HL)
2194 10A3 5E        CL41:       LD    E,(HL)
2195 10A4 0C                    INC   C
2196 10A5 CD2510                CALL  TYPE
2197 10A8 FE0B                  CP    EOL
2198 10AA 282C                  JR    Z,CLER
2199 10AC 7E                    LD    A,(HL)
2200 10AD B8                    CP    B
2201 10AE 20F3                  JR    NZ,CL41
2202 10B0 EB                    EX    DE,HL
2203 10B1 D1                    POP   DE
2204 10B2 0D                    DEC   C
2205 10B3 2823                  JR    Z,CLER
2206 10B5 61                    LD    H,C
2207 10B6 3E03                  LD    A,NO
2208 10B8 25                    DEC   H
2209 10B9 C8                    RET   Z
2210 10BA 24                    INC   H
2211 10BB 3E36                  LD    A,TLIT
2212 10BD C9                    RET
2213 10BE 7E        CL5:        LD    A,(HL)
2214 10BF B8                    CP    B
2215 10C0 38C2                  JR    C,CLASS
2216 10C2 FE30                  CP    30H
2217 10C4 3815                  JR    C,CL7
2218 10C6 FE3A                  CP    3AH
2219 10C8 3011                  JR    NC,CL7
2220 10CA CDDB10    CL6:        CALL  CL7
2221 10CD FE31                  CP    TLAB
2222 10CF 2807                  JR    Z,CLER
2223 10D1 41                    LD    B,C
2224 10D2 CD1C09                CALL  CONVERT
2225 10D5 3E03                  LD    A,NO
2226 10D7 D0                    RET   NC
2227 10D8 C3CA0E    CLER:       JP    E6
2228 10DB E5        CL7:        PUSH  HL
2229 10DC D1                    POP   DE
2230 10DD CB7E      GL71:       BIT   7,(HL)
2231 10DF C2900C                JP    NZ,E1
2232 10E2 0C                    INC   C
2233 10E3 CD2510                CALL  TYPE
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2234 10E6 FE31                  CP    TLAB
2235 10E8 C8                    RET   Z
2236 10E9 FE35                  CP    TDEF
2237 10EB 2004                  JR    NZ,CL72
2238 10ED 7E                    LD    A,(HL)
2239 10EE B8                    CP    B
2240 10EF 30EC                  JR    NC,CL71
2241 10F1 221E02    CL72:       LD    (CURRENT),HL
2242 10F4 3E30                  LD    A,TALPHA
2243 10F6 C9                    RET
2244
2245 10F7 FE09      JRH:        CP    CC
2246 10F9 200A                  JR    NZ,DJH
2247 10FB 7D                    LD    A,L
2248 10FC E6E7                  AND   0E7H
2249 10FE C0                    RET   NZ
2250 10FF 45                    LD    B,L
2251 1100 CBE8                  SET   5,B
2252 1102 CD150F                CALL  PARSER
2253
2254 1105 FE03      DJH:        CP    NO
2255 1107 C0                    RET   NZ
2256 1108 CDE60E                CALL  MOFB
2257 110B DDCB006E              BIT   5,(IX+F1)
2258 110F 200F                  JR    NZ,DJ2
2259 1111 ED5B3002              LD    DE,(PC)
2260 1115 37                    SCF
2261 1116 ED52                  SBC   HL,DE
2262 1118 7C                    LD    A,H
2263 1119 24                    INC   H
2264 111A 2802                  JR    Z,DJ1
2265 111C 25                    DEC   H
2266 111D C0                    RET   NZ
2267 111E AD        DJ1:        XOR   L
2268 111F F8                    RET   M
2269 1120 7D        DJ2:        LD    A,L
2270 1121 C3E70E                JP    MOF
2271
2272 1124 FE03      DWH:        CP    NO
2273 1126 C0                    RET   NZ
2274 1127 C3DF0E                JP    MOFLH
2275
2276 112A FE36      DBH:        CP    TLIT
2277 112C 200A                  JR    NZ,DBH3
2278 112E 13        DBH1:       INC   DE
2279 112F 1A                    LD    A,(DE)
2280 1130 CDE70E                CALL  MOF
2281 1133 25                    DEC   H
2282 1134 20F8                  JR    NZ,DBH1
2283 1136 1807                  JR    DBH4
2284
2285 1138 CDBE0E    DBH3:       CALL  LITLE
2286 113B 7D                    LD    A,L
2287 113C CDE70E                CALL  MOF
2288 113F CD150F    DBH4:       CALL  PARSER
2289 1142 FE0B                  CP    EOL
2290 1144 20E4                  JR    NZ,DBH
2291 1146 C9                    RET
2292
2293 1147 CDAF0E    DSH:        CALL  RESOLV
```

```
2294 114A EB              EX   DE,HL
2295 114B 2A3002          LD   HL,(PC)
2296 114E 19              ADD  HL,DE
2297 114F 223002          LD   (PC),HL
2298 1152 2A3202          LD   HL,(OBJ)
2299 1155 19              ADD  HL,DE
2300 1156 223202          LD   (OBJ),HL
2301 1159 AF              XOR  A
2302 115A C9              RET
2303
2304 115B CDAF0E   LOADH: CALL RESOLV
2305 115E 223202          LD   (OBJ),HL
2306 1161 DDCB00A6        RES  4,(IX+F1)
2307 1165 AF              XOR  A
2308 1166 C9              RET
2309
2310 1167 CDAF0E   ORGH:  CALL RESOLV
2311 116A 223002          LD   (PC),HL
2312 116D DDCB00E6        SET  4,(IX+F1)
2313 1171 DDCB00BE        RES  7,(IX+F1)
2314 1175 2007            JR   NZ,EQ2
2315 1177 C9              RET
2316
2317 1178 CDAF0E   EQUH:  CALL RESOLV
2318 117B CAF503          JP   Z,E0
2319 117E EB       EQ2:   EX   DE,HL
2320 117F 2A2E02          LD   HL,(LBLP)
2321 1182 72              LD   (HL),D
2322 1183 2B              DEC  HL
2323 1184 73              LD   (HL),E
2324 1185 AF       ENDH:  XOR  A
2325 1186 C9              RET
2326
2327 1187 15       LTAB:  DB   LL
2328 1188 53              DB   RPI*16.NO
2329 1189 03              DB   TR*16.NO
2330 118A 80              DB   RE*16.TR
2331 118B 08              DB   TR*16.RE
2332 118C 00              DB   TR*16.TR
2333 118D 11              DB   RP*16.RP
2334 118E 72              DB   NOI*16.XY
2335 118F 27              DB   XY*16.NOI
2336 1190 23              DB   XY*16.NO
2337 1191 70              DB   NOI*16.TR
2338 1192 07              DB   TR*16.NOI
2339 1193 71              DB   NOI*16.RP
2340 1194 17              DB   RP*16.NOI
2341 1195 12              DB   RP*16.XY
2342 1196 A3              DB   XYD*16.NO
2343 1197 13              DB   RP*16.NO
2344 1198 A0              DB   XYD*16.TR
2345 1199 0A              DB   TR*16.XYD
2346 119A 50              DB   RPI*16.TR
2347 119B 05              DB   TR*16.RPI
2348 119C 00              DB   0
2349 119D 95              DB   L1-$-LL.S
2350 119E 98              DB   L2-$-LL.S
2351 119F 21              DB   L3-$-LL
2352 11A0 A0              DB   L3-$-LL.S
2353 11A1 AC              DB   L4-$-LL.S
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2354 11A2 31              DB   L5-$-LL
2355 11A3 35              DB   L6-$-LL
2356 11A4 B4              DB   L6-$-LL.S
2357 11A5 B3              DB   L6-$-LL.S
2358 11A6 3C              DB   L7-$-LL
2359 11A7 BB              DB   L7-$-LL.S
2360 11A8 42              DB   L8-$-LL
2361 11A9 C1              DB   L8-$-LL.S
2362 11AA D2              DB   L9-$-LL.S
2363 11AB D8              DB   LA-$-LL.S
2364 11AC DF              DB   LB-$-LL.S
2365 11AD 63              DB   LC-$-LL
2366 11AE E2              DB   LC-$-LL.S
2367 11AF 6A              DB   LE-$-LL
2368 11B0 E9              DB   LE-$-LL.S
2369 11B1 36              DB   LER-$-LL
2370 11B2 16064757        DB   16H,6,47H,57H,40H
2370 11B6 40
2371 11B7 F9222A21        DB   0F9H,22H,2AH,21H
2372 11BB 32              DB   32H
2373 11BC 3A222AF9        DB   3AH,22H,2AH,0F9H
2374 11C0 36              DB   36H
2375 11C1 01020A02        DB   1,2,0AH,2,0AH,0
2375 11C5 0A00
2376
2377 11C7 7B       L1:    LD   A,E
2378 11C8 FE04            CP   IHL
2379 11CA C0              RET  NZ
2380 11CB CDC20E   L2:    CALL LITLE2
2381 11CE CDD00E          CALL MOFMX2
2382 11D1 7D              LD   A,L
2383 11D2 C3E70E   L21:   JP   MOF
2384 11D5 7B       L3:    LD   A,E
2385 11D6 FE07            CP   IA
2386 11D8 C0              RET  NZ
2387 11D9 7D              LD   A,L
2388 11DA B0              OR   B
2389 11DB 47              LD   B,A
2390 11DC CDDB0E   L30:   CALL MOFPRE
2391 11DF C3E60E   L31:   JP   MOFB
2392 11E2 7D       L4:    LD   A,L
2393 11E3 B0              OR   B
2394 11E4 47              LD   B,A
2395 11E5 C3D00E          JP   MOFMX2
2396 11E8 FE64     L5:    CP   ISP*16.IHL
2397 11EA C0              RET  NZ
2398 11EB 18F2            JR   L31
2399 11ED 7B       L6:    LD   A,E
2400 11EE CDE70E   L61:   CALL MOF
2401 11F1 CDE60E   L62:   CALL MOFB
2402 11F4 C3DF0E   L63:   JP   MOFLH
2403 11F7 7B       L7:    LD   A,E
2404 11F8 FE07            CP   IA
2405 11FA 28F5            JR   Z,L62
2406 11FC C3CA0E   LER:   JP   E6
2407 11FF 7B       L8:    LD   A,E
2408 1200 FE04            CP   IHL
2409 1202 28ED            JR   Z,L62
2410 1204 CDDB0E          CALL MOFPRE
2411 1207 78              LD   A,B
```

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2412 1208 EE61          XOR  61H
2413 120A 47            LD   B,A
2414 120B CDD00E        CALL MOFMX2
2415 120E C3DF0E        JP   MOFLH
2416 1211 7B      L9:   LD   A,E
2417 1212 FE06          CP   ISP
2418 1214 C0            RET  NZ
2419 1215 60            LD   H,B
2420 1216 18DC          JR   L63
2421 1218 CDC20E  LA:   CALL LITLE2
2422 121B 7A            LD   A,D
2423 121C 65            LD   H,L
2424 121D 6B            LD   L,E
2425 121E 18CE          JR   L61
2426 1220 CDD00E  LB:   CALL MOFMX2
2427 1223 18CF          JR   L63
2428 1225 CDE30E  LC:   CALL MOFH
2429 1228 CD3C12        CALL LE1
2430 122B 7D            LD   A,L
2431 122C 18A4          JR   L21
2432 122E FE07    LE:   CP   IBC*16.IA
2433 1230 28AD          JR   Z,L31
2434 1232 CBE0          SET  4,B
2435 1234 FE27          CP   IDE*16.IA
2436 1236 28A7          JR   Z,L31
2437 1238 7D            LD   A,L
2438 1239 FE04          CP   IHL
2439 123B C0            RET  NZ
2440 123C CB58    LE1:  BIT  3,B
2441 123E 0646          LD   B,46H
2442 1240 C2D00E        JP   NZ,MOFMX2
2443 1243 7B            LD   A,E
2444 1244 F670          OR   70H
2445 1246 188A          JR   L21
2446
2447 1248 CDBE0E  RSTH: CALL LITLE
2448 124B 2003          JR   NZ,RST2
2449 124D 7D            LD   A,L
2450 124E A0            AND  B
2451 124F C0            RET  NZ
2452 1250 78      RST2: LD   A,B
2453 1251 B5            OR   L
2454 1252 C3E70E        JP   MOF
2455
2456 1255 FE09    RETH: CP   CC
2457 1257 28F7          JR   Z,RST2
2458 1259 06C9          LD   B,0C9H
2459 125B FE0B          CP   EOL
2460 125D 1811          JR   JMP21
2461
2462 125F 03      JMPTAB: DB   JL
2463 1260 6B            DB   XYI*16.EOL
2464 1261 5B            DB   RPI*16.EOL
2465 1262 00            DB   0
2466 1263 03            DB   JMP1-$-JL
2467 1264 06            DB   JMP2-$-JL
2468 1265 10            DB   JMP3-$-JL
2469 1266 E9E9C3        DB   0E9H,0E9H,0C3H
2470
2471 1269 60      JMP1: LD   H,B
```



```
2472 126A C3DF0E        JP   MOFLH
2473 126D 7D      JMP2: LD   A,L
2474 126E FE04          CP   IHL
2475 1270 C0      JMP21: RET  NZ
2476 1271 C3E60E        JP   MOFB
2477
2478 1274 01      CALTAB: DB   CL
2479 1275 00            DB   0
2480 1276 01            DB   JMP3-$-CL
2481 1277 CD            DB   0CDH
2482
2483 1278 79      JMP3: LD   A,C
2484 1279 FE3B          CP   NO*16.EOL
2485 127B CAF111        JP   Z,L62
2486 127E FE93          CP   CC*16.NO
2487 1280 C0            RET  NZ
2488 1281 78            LD   A,B
2489 1282 E6C6          AND  0C6H
2490 1284 B5            OR   L
2491 1285 47            LD   B,A
2492 1286 EB            EX   DE,HL
2493 1287 C3F111        JP   L62
2494
2495 128A FE01    PPH:  CP   RP
2496 128C 200B          JR   NZ,PP2
2497 128E 7D            LD   A,L
2498 128F FE06          CP   ISP
2499 1291 CACA0E        JP   Z,E6
2500 1294 CB9D          RES  3,L
2501 1296 C3CF0E        JP   MOFMIX
2502 1299 FE02    PP2:  CP   XY
2503 129B C0            RET  NZ
2504 129C CBE8    PP21: SET  5,B
2505 129E 60            LD   H,B
2506 129F C3DF0E        JP   MOFLH
2507
2508 12A2 CDBE0E  IMH:  CALL LITLE
2509 12A5 2004          JR   NZ,IM2
2510 12A7 3E02          LD   A,2
2511 12A9 95            SUB  L
2512 12AA D8            RET  C
2513 12AB 11B312  IM2:  LD   DE,IMTAB
2514 12AE 19            ADD  HL,DE
2515 12AF 46            LD   B,(HL)
2516 12B0 C3DC11        JP   L30
2517
2518 12B3 46565E  IMTAB: DB   46H,56H,5EH
2519
2520 12B6 FE02    INCH: CP   XY
2521 12B8 28E2          JR   Z,PP21
2522 12BA FE01          CP   RP
2523 12BC CACF0E        JP   Z,MOFMIX
2524 12BF CB58          BIT  3,B
2525 12C1 0634          LD   B,34H
2526 12C3 2801          JR   Z,INC2
2527 12C5 04            INC  B
2528 12C6 B7      INC2: OR   A
2529 12C7 205A          JR   NZ,ML2
2530 12C9 78            LD   A,B
2531 12CA E6C7          AND  0C7H
```

```
2532 12CC 47             LD   B,A
2533 12CD C3CF0E         JP   MOFMIX
2534
2535 12D0 02    ADCTAB:  DB   AL
2536 12D1 11             DB   RP*16.RP
2537 12D2 00             DB   0
2538 12D3 16             DB   DL1-$-AL
2539 12D4 B3             DB   DL5-$-AL.S
2540 12D5 4A8E           DB   4AH,8EH
2541
2542 12D7 02    SBCTAB:  DB   SBL
2543 12D8 11             DB   RP*16.RP
2544 12D9 00             DB   0
2545 12DA 0F             DB   DL1-$-SBL
2546 12DB AC             DB   DL5-$-SBL.S
2547 12DC 429E           DB   42H,9EH
2548
2549 12DE 04    ADDTAB:  DB   ADL
2550 12DF 11             DB   RP*16.RP
2551 12E0 21             DB   XY*16.RP
2552 12E1 22             DB   XY*16.XY
2553 12E2 00             DB   0
2554 12E3 07             DB   DL2-$-ADL
2555 12E4 0D             DB   DL3-$-ADL
2556 12E5 19             DB   DL4-$-ADL
2557 12E6 9F             DB   DL5-$-ADL.S
2558 12E7 09092986       DB   9,9,29H,86H
2559
2560 12EB CDDB0E DL1:    CALL MOFPRE
2561 12EE 7D     DL2:    LD   A,L
2562 12EF FE04           CP   IHL
2563 12F1 C0             RET  NZ
2564 12F2 C3D00E         JP   MOFMX2
2565 12F5 7B     DL3:    LD   A,E
2566 12F6 FE04           CP   IHL
2567 12F8 CACA0E         JP   Z,E6
2568 12FB 7D             LD   A,L
2569 12FC CDE70E         CALL MOF
2570 12FF C3D00E         JP   MOFMX2
2571 1302 7B     DL4:    LD   A,E
2572 1303 BD             CP   L
2573 1304 60             LD   H,B
2574 1305 C0             RET  NZ
2575 1306 C3DF0E         JP   MOFLH
2576 1309 79     DL5:    LD   A,C
2577 130A E6F0           AND  0F0H
2578 130C C0             RET  NZ
2579 130D CB53           BIT  2,E
2580 130F CACA0E         JP   Z,E6
2581 1312 79             LD   A,C
2582 1313 E60F           AND  0FH
2583
2584 1315 FE03   ML1:    CP   ND
2585 1317 200A           JR   NZ,ML2
2586 1319 CBF0           SET  6,B
2587 131B CDC20E ML11:   CALL LITLE2
2588 131E 65     ML12:   LD   H,L
2589 131F 68             LD   L,B
2590 1320 C3DF0E         JP   MOFLH
2591 1323 FE0A   ML2:    CP   XYD
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2592 1325 2005           JR   NZ,ML3
2593 1327 CDE30E         CALL MOFH
2594 132A 18F2           JR   ML12
2595 132C FE05   ML3:    CP   RPI
2596 132E CA6D12         JP   Z,JMP2
2597 1331 B7             OR   A
2598 1332 C0             RET  NZ
2599 1333 78             LD   A,B
2600 1334 E6F8           AND  0F8H
2601 1336 B5             OR   L
2602 1337 C3E70E         JP   MOF
2603
2604 133A CDBE0E BITH:   CALL LITLE
2605 133D 2004           JR   NZ,BIT2
2606 133F 3E07           LD   A,7
2607 1341 95             SUB  L
2608 1342 D8             RET  C
2609 1343 7D     BIT2:   LD   A,L
2610 1344 07             RLCA
2611 1345 07             RLCA
2612 1346 07             RLCA
2613 1347 B0             OR   B
2614 1348 47             LD   B,A
2615 1349 CD150F         CALL PARSER
2616
2617 134C FE0A   SRH:    CP   XYD
2618 134E 200C           JR   NZ,SR2
2619 1350 E5             PUSH HL
2620 1351 6C             LD   L,H
2621 1352 26CB           LD   H,0CBH
2622 1354 CDDF0E         CALL MOFLH
2623 1357 E1             POP  HL
2624 1358 60             LD   H,B
2625 1359 C3DF0E         JP   MOFLH
2626
2627 135C F5     SR2:    PUSH AF
2628 135D 3ECB           LD   A,0CBH
2629 135F CDE70E         CALL MOF
2630 1362 F1             POP  AF
2631 1363 18C7           JR   ML3
2632
2633 1365 03     INTAB:  DB   INL
2634 1366 07             DB   TR*16.NOI
2635 1367 04             DB   TR*16.TRI
2636 1368 00             DB   0
2637 1369 8D             DB   IO1-$-INL.S
2638 136A 93             DB   IO2-$-INL.S
2639 136B 19             DB   IOER-$-INL
2640 136C DB4000         DB   0DBH,40H,0
2641
2642 136F 03     OUTAB:  DB   OL
2643 1370 70             DB   NOI*16.TR
2644 1371 40             DB   TRI*16.TR
2645 1372 00             DB   0
2646 1373 03             DB   IO1-$-OL
2647 1374 09             DB   IO2-$-OL
2648 1375 0F             DB   IOER-$-OL
2649 1376 D34100         DB   0D3H,41H,0
2650
2651 1379 CB53   IO1:    BIT  2,E
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2652 137B 280A                JR   Z,IOER
2653 137D C31B13              JP   ML11
2654 1380 CDDB0E    IO2:      CALL MOFPRE
2655 1383 2D                  DEC  L
2656 1384 CAD00E              JP   Z,MOFMX2
2657 1387 C3CA0E    IOER:     JP   E6
2658
2659 138A 04        XTAB:     DB   XL
2660 138B 11                  DB   RP*16.RP
2661 138C 51                  DB   RPI*16.RP
2662 138D 52                  DB   RPI*16.XY
2663 138E 00                  DB   0
2664 138F 04                  DB   X1-$-XL
2665 1390 11                  DB   X2-$-XL
2666 1391 93                  DB   X3-$-XL.S
2667 1392 0D                  DB   XER-$-XL
2668 1393 EBE3E300            DB   0EBH,0E3H,0E3H,0
2669
2670 1397 FE24      X1:       CP   IDE*16.IHL
2671 1399 CAE60E              JP   Z,MOFB
2672 139C 0608                LD   B,8
2673 139E FEEE                CP   IAF*16.IAF
2674 13A0 CAE60E              JP   Z,MOFB
2675 13A3 18E2      XER:      JR   IOER
2676
2677 13A5 C3E811    X2:       JP   L5
2678
2679 13A8 C31112    X3:       JP   L9
2680
2681 13AB DF13      KEYTB:    DW   AOPS
2682 13AD EC13                DW   BOPS
2683 13AF F113                DW   COPS
2684 13B1 1414                DW   DOPS
2685 13B3 3D14                DW   EOPS
2686 13B5 5014                DW   FOPS
2687 13B7 5114                DW   GOPS
2688 13B9 5214                DW   HOPS
2689 13BB 5814                DW   IOPS
2690 13BD 7514                DW   JOPS
2691 13BF 7C14                DW   KOPS
2692 13C1 7D14                DW   LOPS
2693 13C3 9814                DW   MOPS
2694 13C5 9914                DW   NOPS
2695 13C7 A214                DW   OOPS
2696 13C9 C214                DW   POPS
2697 13CB CC14                DW   QOPS
2698 13CD CD14                DW   ROPS
2699 13CF 0C15                DW   SOPS
2700 13D1 2915                DW   TOPS
2701 13D3 2A15                DW   UOPS
2702 13D5 2B15                DW   VOPS
2703 13D7 2C15                DW   WOPS
2704 13D9 2D15                DW   XOPS
2705 13DB 3215                DW   YOPS
2706 13DD 3315                DW   ZOPS
2707
2708 13DF 44C33200  AOPS:     DB   'D','C'+S,50,0
2709 13E3 44C43000            DB   'D','D'+S,48,0
2710 13E7 4EC412A6            DB   'N','D'+S,18,0A6H
2711 13EB FF                  DB   0FFH
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2712
2713 13EC 49D41646  BOPS:     DB   'I','T'+S,22,46H
2714 13F0 FF                  DB   0FFH
2715
2716 13F1 414CCCA8  COPS:     DB   'AL','L'+S,40+S,0
2716 13F5 00
2717 13F6 D012BE              DB   'P'+S,18,0BEH
2718 13F9 43C6003F            DB   'C','F'+S,0,3FH
2719 13FD 50CC002F            DB   'P','L'+S,0,2FH
2720 1401 50C902A1            DB   'P','I'+S,2,0A1H
2721 1405 5049D202            DB   'PI','R'+S,2,0B1H
2721 1409 B1
2722 140A 50C402A9            DB   'P','D'+S,2,0A9H
2723 140E 5044D202            DB   'PD','R'+S,2,0B9H
2723 1412 B9
2724 1413 FF                  DB   0FFH
2725
2726 1414 45C3100B  DOPS:     DB   'E','C'+S,16,0BH
2727 1418 4A4EDA0E            DB   'JN','Z'+S,14,10H
2727 141C 10
2728 141D 41C10027            DB   'A','A'+S,0,27H
2729 1421 C900F3              DB   'I'+S,0,0F3H
2730 1424 C21A00              DB   'B'+S,26,0
2731 1427 4546C21A            DB   'EF','B'+S,26,0
2731 142B 00
2732 142C D71800              DB   'W'+S,24,0
2733 142F 4546D718            DB   'EF','W'+S,24,0
2733 1433 00
2734 1434 D31C00              DB   'S'+S,28,0
2735 1437 4546D31C            DB   'EF','S'+S,28,0
2735 143B 00
2736 143C FF                  DB   0FFH
2737
2738 143D D82C00    EOPS:     DB   'X'+S,44,0
2739 1440 58D800D9            DB   'X','X'+S,0,0D9H
2740 1444 C900FB              DB   'I'+S,0,0FBH
2741 1447 51D51E00            DB   'Q','U'+S,30,0
2742 144B 4EC404FF            DB   'N','D'+S,4,0FFH
2743 144F FF                  DB   0FFH
2744
2745 1450 FF        FOPS:     DB   0FFH
2746 1451 FF        GOPS:     DB   0FFH
2747
2748 1452 414CD400  HOPS:     DB   'AL','T'+S,0,76H
2748 1456 76
2749 1457 FF                  DB   0FFH
2750
2751 1458 4EC31003  IOPS:     DB   'N','C'+S,16,3
2752 145C CD2200              DB   'M'+S,34,0
2753 145F CE2E00              DB   'N'+S,46,0
2754 1462 4EC902A2            DB   'N','I'+S,2,0A2H
2755 1466 4E49D202            DB   'NI','R'+S,2,0B2H
2755 146A B2
2756 146B 4EC402AA            DB   'N','D'+S,2,0AAH
2757 146F 4E44D202            DB   'ND','R'+S,2,0BAH
2757 1473 BA
2758 1474 FF                  DB   0FFH
2759
2760 1475 D28C18    JOPS:     DB   'R'+S,12+S,18H
2761 1478 D0AA00              DB   'P'+S,42+S,0
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2762 147B FF                    DB   0FFH
2763
2764 147C FF          KOPS:     DB   0FFH
2765
2766 147D C42600      LOPS:     DB   'D'+S,38,0
2767 1480 44C902A0              DB   'D','I'+S,2,0A0H
2768 1484 4449D202              DB   'DI','R'+S,2,0B0H
2768 1488 B0
2769 1489 44C402A8              DB   'D','D'+S,2,0A8H
2770 148D 4444D202              DB   'DD','R'+S,2,0B8H
2770 1491 B8
2771 1492 4F41C424              DB   'OA','D'+S,36,0
2771 1496 00
2772 1497 FF                    DB   0FFH
2773
2774 1498 FF          MOPS:     DB   0FFH
2775
2776 1499 4FD00000    NOPS:     DB   'O','P'+S,0,0
2777 149D 45C70244              DB   'E','G'+S,2,44H
2778 14A1 FF                    DB   0FFH
2779
2780 14A2 D212B6      OOPS:     DB   'R'+S,18,0B6H
2781 14A5 55D43600              DB   'U','T'+S,54,0
2782 14A9 5554C902              DB   'UT','I'+S,2,0A3H
2782 14AD A3
2783 14AE 5449D202              DB   'TI','R'+S,2,0B3H
2783 14B2 B3
2784 14B3 5554C402              DB   'UT','D'+S,2,0ABH
2784 14B7 AB
2785 14B8 5444D202              DB   'TD','R'+S,2,0BBH
2785 14BC BB
2786 14BD 52C72000              DB   'R','G'+S,32,0
2787 14C1 FF                    DB   0FFH
2788
2789 14C2 5553C80A    POPS:     DB   'US','H'+S,10,0C5H
2789 14C6 C5
2790 14C7 4FD00AC1              DB   'O','P'+S,10,0C1H
2791 14CB FF                    DB   0FFH
2792
2793 14CC FF          QOPS:     DB   0FFH
2794
2795 14CD 45D488C0    ROPS:     DB   'E','T'+S,8+S,0C0H
2796 14D1 53D406C7              DB   'S','T'+S,6,0C7H
2797 14D5 45D31686              DB   'E','S'+S,22,86H
2798 14D9 CC1416                DB   'L'+S,20,16H
2799 14DC 4CC31406              DB   'L','C'+S,20,6
2800 14E0 4C43C100              DB   'LC','A'+S,0,7
2800 14E4 07
2801 14E5 4CC10017              DB   'L','A'+S,0,17H
2802 14E9 D2141E                DB   'R'+S,20,1EH
2803 14EC 52C3140E              DB   'R','C'+S,20,0EH
2804 14F0 5243C100              DB   'RC','A'+S,0,0FH
2804 14F4 0F
2805 14F5 52C1001F              DB   'R','A'+S,0,1FH
2806 14F9 4CC4026F              DB   'L','D'+S,2,6FH
2807 14FD 52C40267              DB   'R','D'+S,2,67H
2808 1501 4554C902              DB   'ET','I'+S,2,4DH
2808 1505 4D
2809 1506 4554CE02              DB   'ET','N'+S,2,45H
2809 150A 45
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2810 150B FF                    DB   0FFH
2811
2812 150C 42C33400    SOPS:     DB   'B','C'+S,52,0
2813 1510 43C60037              DB   'C','F'+S,0,37H
2814 1514 4CC11426              DB   'L','A'+S,20,26H
2815 1518 52C1142E              DB   'R','A'+S,20,2EH
2816 151C 52CC143E              DB   'R','L'+S,20,3EH
2817 1520 45D416C6              DB   'E','T'+S,22,0C6H
2818 1524 55C21296              DB   'U','B'+S,18,96H
2819 1528 FF                    DB   0FFH
2820
2821 1529 FF          TOPS:     DB   0FFH
2822 152A FF          UOPS:     DB   0FFH
2823 152B FF          VOPS:     DB   0FFH
2824 152C FF          WOPS:     DB   0FFH
2825
2826 152D 4FD212AE    XOPS:     DB   'O','R'+S,18,0AEH
2827 1531 FF                    DB   0FFH
2828
2829 1532 FF          YOPS:     DB   0FFH
2830 1533 FF          ZOPS:     DB   0FFH
2831
2832 1534 4EDA0009    CCODES:   DB   'N','Z'+S,INZ,CC
2833 1538 DA0809                DB   'Z'+S,IZ,CC
2834 153B 4EC31009              DB   'N','C'+S,INCY,CC
2835 153F C31809                DB   'C'+S,ICY,CC
2836 1542 50CF2009              DB   'P','O'+S,IPO,CC
2837 1546 50C52809              DB   'P','E'+S,IPE,CC
2838 154A D03009                DB   'P'+S,IPOS,CC
2839 154D CD3809                DB   'M'+S,IMIN,CC
2840 1550 C20000      TREGS:    DB   'B'+S,IB,TR
2841 1553 C30100                DB   'C'+S,IC,TR
2842 1556 C40200                DB   'D'+S,ID,TR
2843 1559 C50300                DB   'E'+S,IE,TR
2844 155C C80400                DB   'H'+S,IH,TR
2845 155F CC0500                DB   'L'+S,IL,TR
2846 1562 C10700                DB   'A'+S,IA,TR
2847 1565 42C30001    RPAIRS:   DB   'B','C'+S,IBC,RP
2848 1569 44C50201              DB   'D','E'+S,IDE,RP
2849 156D 48CC0401              DB   'H','L'+S,IHL,RP
2850 1571 53D00601              DB   'S','P'+S,ISP,RP
2851 1575 41C60E01              DB   'A','F'+S,IAF,RP
2852 1579 49D8DD02    XYPAIRS:  DB   'I','X'+S,IIX,XY
2853 157D 49D9FD02              DB   'I','Y'+S,IIY,XY
2854 1581 C90008      REREGS:   DB   'I'+S,IINT,RE
2855 1584 D20808                DB   'R'+S,IREF,RE
2856 1587 FF                    DB   0FFH
2857
2858                  ; Disassembler
2859
2860                  ADCOP:    EQU  0*16+0
2861                  ADDOP:    EQU  0*16+1
2862                  ANDOP:    EQU  0*16+2
2863                  BITOP:    EQU  1*16+0
2864                  CALLOP:   EQU  2*16+0
2865                  CPOP:     EQU  2*16+1
2866                  CCFOP:    EQU  2*16+2
2867                  CPLOP:    EQU  2*16+3
2868                  CPIOP:    EQU  2*16+4
2869                  CPIROP:   EQU  2*16+5
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2870                    CPDOP:      EQU  2*16+6
2871                    CPDROP:     EQU  2*16+7
2872                    DECOP:      EQU  3*16+0
2873                    DJNZOP:     EQU  3*16+1
2874                    DAAOP:      EQU  3*16+2
2875                    DIOP:       EQU  3*16+3
2876                    DBOP:       EQU  3*16+4
2877                    EXOP:       EQU  4*16+0
2878                    EXXOP:      EQU  4*16+1
2879                    EIOP:       EQU  4*16+2
2880                    HALTOP:     EQU  5*16+0
2881                    INCOP:      EQU  6*16+0
2882                    IMOP:       EQU  6*16+1
2883                    INOP:       EQU  6*16+2
2884                    INIOP:      EQU  6*16+3
2885                    INIROP:     EQU  6*16+4
2886                    INDOP:      EQU  6*16+5
2887                    INDROP:     EQU  6*16+6
2888                    JROP:       EQU  7*16+0
2889                    JPOP:       EQU  7*16+1
2890                    LDOP:       EQU  8*16+0
2891                    LDIOP:      EQU  8*16+1
2892                    LDIROP:     EQU  8*16+2
2893                    LDDOP:      EQU  8*16+3
2894                    LDDROP:     EQU  8*16+4
2895                    NOPOP:      EQU  9*16+0
2896                    NEGOP:      EQU  9*16+1
2897                    OROP:       EQU  10*16+0
2898                    OUTOP:      EQU  10*16+1
2899                    OUTIOP:     EQU  10*16+2
2900                    OTIROP:     EQU  10*16+3
2901                    OUTDOP:     EQU  10*16+4
2902                    OTDROP:     EQU  10*16+5
2903                    PUSHOP:     EQU  11*16+0
2904                    POPOP:      EQU  11*16+1
2905                    RETOP:      EQU  12*16+0
2906                    RSTOP:      EQU  12*16+1
2907                    RESOP:      EQU  12*16+2
2908                    RLOP:       EQU  12*16+3
2909                    RLCOP:      EQU  12*16+4
2910                    RLCAOP:     EQU  12*16+5
2911                    RLAOP:      EQU  12*16+6
2912                    RROP:       EQU  12*16+7
2913                    RRCOP:      EQU  12*16+8
2914                    RRCAOP:     EQU  12*16+9
2915                    RRAOP:      EQU  12*16+10
2916                    RLDOP:      EQU  12*16+11
2917                    RRDOP:      EQU  12*16+12
2918                    RETIOP:     EQU  12*16+13
2919                    RETNOP:     EQU  12*16+14
2920                    SBCOP:      EQU  13*16+0
2921                    SCFOP:      EQU  13*16+1
2922                    SLAOP:      EQU  13*16+2
2923                    SRAOP:      EQU  13*16+3
2924                    SRLOP:      EQU  13*16+4
2925                    SETOP:      EQU  13*16+5
2926                    SUBOP:      EQU  13*16+6
2927                    XOROP:      EQU  14*16+0
2928
2929 1588 CD0709       DASM:       CALL STARTSTOP
```



```
2930 158B 2B                       DEC  HL
2931 158C E5                       PUSH HL
2932 158D 19                       ADD  HL,DE
2933 158E ED533C02                 LD   (DSTART),DE
2934 1592 223E02                   LD   (DSTOP),HL
2935 1595 2E33                     LD   L,M11&255
2936 1597 CDF208                   CALL PARAMETER
2937 159A 3001                     JR   NC,DSM2
2938 159C EB                       EX   DE,HL
2939 159D 224202          DSM2:    LD   (DRSTART),HL
2940 15A0 D1                       POP  DE
2941 15A1 19                       ADD  HL,DE
2942 15A2 224402                   LD   (DRSTOP),HL
2943 15A5 21B61C                   LD   HL,AEND+1
2944 15A8 222A02                   LD   (FEP),HL
2945 15AB 36FF                     LD   (HL),0FFH
2946 15AD 23                       INC  HL
2947 15AE 224802                   LD   (DEOAP),HL
2948 15B1 2A4A02                   LD   HL,(DSOSP)
2949 15B4 224C02                   LD   (DEOSP),HL
2950 15B7 CDFA15                   CALL GETAREAS
2951 15BA CD950C                   CALL GETOPTION
2952 15BD CDC415                   CALL DPASS
2953 15C0 DDCB00AE                 RES  5,(IX+F1)
2954 15C4 2A3C02          DPASS:   LD   HL,(DSTART)
2955 15C7 FD2A4202                 LD   IY,(DRSTART)
2956 15CB 224002          DPS2:    LD   (DIP),HL
2957 15CE FD224602                 LD   (DRIP),IY
2958 15D2 CDAA0C                   CALL HOLD
2959 15D5 DDCB03E6                 SET  4,(IX+F4)
2960 15D9 CD9216                   CALL DINSTR
2961 15DE DDCB006E                 BIT  5,(IX+F1)
2962 15E0 CC4A16                   CALL Z,DLIST
2963 15E3 ED5B4002                 LD   DE,(DIP)
2964 15E7 E5              DPS3:    PUSH HL
2965 15E8 2A3E02                   LD   HL,(DSTOP)
2966 15EB B7                       OR   A
2967 15EC ED52                     SBC  HL,DE
2968 15EE E1                       POP  HL
2969 15EF C8                       RET  Z
2970 15F0 13                       INC  DE
2971 15F1 E5                       PUSH HL
2972 15F2 B7                       OR   A
2973 15F3 ED52                     SBC  HL,DE
2974 15F5 E1                       POP  HL
2975 15F6 20EF                     JR   NZ,DPS3
2976 15F8 18D1                     JR   DPS2
2977
2978 15FA 2E27            GETAREAS: LD   L,M9&255
2979 15FC CD7C07                   CALL PR2
2980 15FF ED5B4802        GTA2:    LD   DE,(DEOAP)
2981 1603 13                       INC  DE
2982 1604 13                       INC  DE
2983 1605 13                       INC  DE
2984 1606 13                       INC  DE
2985 1607 2A4A02                   LD   HL,(DSOSP)
2986 160A B7                       OR   A
2987 160B ED52                     SBC  HL,DE
2988 160D DAA117                   JP   C,E4
2989 1610 CD0709                   CALL STARTSTOP
```

```
2990 1613 2B                    DEC  HL
2991 1614 ED5A                  ADC  HL,DE
2992 1616 C8                    RET  Z
2993 1617 E5                    PUSH HL
2994 1618 2A4802                LD   HL,(DEOAP)
2995 161B 73                    LD   (HL),E
2996 161C 23                    INC  HL
2997 161D 72                    LD   (HL),D
2998 161E 23                    INC  HL
2999 161F D1                    POP  DE
3000 1620 73                    LD   (HL),E
3001 1621 23                    INC  HL
3002 1622 72                    LD   (HL),D
3003 1623 23                    INC  HL
3004 1624 224802                LD   (DEOAP),HL
3005 1627 18D6                  JR   GTA2
3006
3007 1629 3804      UNSCRAMBLE: JR   C,UM2
3008 162B ED434002              LD   (DIP),BC
3009 162F 2A4002    UM2:        LD   HL,(DIP)
3010 1632 0609                  LD   B,9
3011 1634 224002    UM3:        LD   (DIP),HL
3012 1637 224602                LD   (DRIP),HL
3013 163A 05                    DEC  B
3014 163B C8                    RET  Z
3015 163C C5                    PUSH BC
3016 163D DDCB03A6              RES  4,(IX+F4)
3017 1641 CD9216                CALL DINSTR
3018 1644 CD4A16                CALL DLIST
3019 1647 C1                    POP  BC
3020 1648 18EA                  JR   UM3
3021
3022 164A DDCB0076  DLIST:      BIT  6,(IX+F1)
3023 164E 2829                  JR   Z,DLS3
3024 1650 3E81                  LD   A,81H
3025 1652 DDCB0366              BIT  4,(IX+F4)
3026 1656 2002                  JR   NZ,DLS2
3027 1658 3EC1                  LD   A,0C1H
3028 165A DD7701    DLS2:       LD   (IX+F2),A
3029 165D E5                    PUSH HL
3030 165E FDE5                  PUSH IY
3031 1660 2A4002                LD   HL,(DIP)
3032 1663 119902                LD   DE,TBUFF
3033 1666 010400                LD   BC,4
3034 1669 EDB0                  LDIR
3035 166B ED532802              LD   (TEMP),DE
3036 166F 2A4602                LD   HL,(DRIP)
3037 1672 CD890D                CALL LIST
3038 1675 FDE1                  POP  IY
3039 1677 E1                    POP  HL
3040 1678 C9                    RET
3041 1679 E5        DLS3:       PUSH HL
3042 167A 219D02                LD   HL,TBUFF+4
3043 167D E5                    PUSH HL
3044 167E CDA909                CALL NXO
3045 1681 2A2202                LD   HL,(EOFP)
3046 1684 E5                    PUSH HL
3047 1685 CD8709                CALL MEMCHECK
3048 1688 D1                    POP  DE
3049 1689 E1                    POP  HL
```



```
3050 168A EDB0                  LDIR
3051 168C ED532202              LD   (EOFP),DE
3052 1690 E1                    POP  HL
3053 1691 C9                    RET
3054
3055 1692 CDA019    DINSTR:     CALL DECODE
3056 1695 CDD716                CALL CHKHL
3057 1698 CDF716                CALL CHKXY
3058 169B CD3817                CALL CHKOPD
3059 169E 23                    INC  HL
3060 169F D5                    PUSH DE
3061 16A0 E5                    PUSH HL
3062 16A1 ED5B4002              LD   DE,(DIP)
3063 16A5 B7                    OR   A
3064 16A6 ED52                  SBC  HL,DE
3065 16A8 DD7502                LD   (IX+F3),L
3066 16AB FD2A4602              LD   IY,(DRIP)
3067 16AF EB                    EX   DE,HL
3068 16B0 FD19                  ADD  IY,DE
3069 16B2 E1                    POP  HL
3070 16B3 D1                    POP  DE
3071 16B4 DDCB006E              BIT  5,(IX+F1)
3072 16B8 C0                    RET  NZ
3073 16B9 CD0A18                CALL DLABEL
3074 16BC F5                    PUSH AF
3075 16BD CD3C18                CALL DOUTOPT
3076 16C0 3E20                  LD   A,BLANK
3077 16C2 CD5419                CALL DOUT
3078 16C5 78                    LD   A,B
3079 16C6 CD7418                CALL DOUTOPD
3080 16C9 CD2F18                CALL COMMA
3081 16CC 79                    LD   A,C
3082 16CD CD7418                CALL DOUTOPD
3083 16D0 3E0D                  LD   A,CR
3084 16D2 CD5419                CALL DOUT
3085 16D5 F1                    POP  AF
3086 16D6 C9                    RET
3087
3088 16D7 F5        CHKHL:      PUSH AF
3089 16D8 78                    LD   A,B
3090 16D9 CDE416                CALL SWAPHL
3091 16DC 47                    LD   B,A
3092 16DD 79                    LD   A,C
3093 16DE CDE416                CALL SWAPHL
3094 16E1 4F                    LD   C,A
3095 16E2 F1                    POP  AF
3096 16E3 C9                    RET
3097
3098 16E4 FE06      SWAPHL:     CP   TR*16+6
3099 16E6 C0                    RET  NZ
3100 16E7 3E54                  LD   A,RPI*16+IHL
3101 16E9 DDCB034E              BIT  1,(IX+F4)
3102 16ED C8                    RET  Z
3103 16EE 3EA0                  LD   A,XYD*16
3104 16F0 DDCB0356              BIT  2,(IX+F4)
3105 16F4 C0                    RET  NZ
3106 16F5 23                    INC  HL
3107 16F6 C9                    RET
3108
3109 16F7 DDCB034E  CHKXY:      BIT  1,(IX+F4)
```

```
3110 16FB C8                    RET  Z
3111 16FC F5                    PUSH AF
3112 16FD 78                    LD   A,B
3113 16FE CD1A17                CALL SWAPXY
3114 1701 47                    LD   B,A
3115 1702 79                    LD   A,C
3116 1703 CD1A17                CALL SWAPXY
3117 1706 4F                    LD   C,A
3118 1707 F1                    POP  AF
3119 1708 DDCB035E              BIT  3,(IX+F4)
3120 170C 2809                  JR   Z,CXY2
3121 170E FE40                  CP   EXOP
3122 1710 C0                    RET  NZ
3123 1711 78                    LD   A,B
3124 1712 FE12                  CP   RP*16+IDE
3125 1714 3E40                  LD   A,EXOP
3126 1716 C0                    RET  NZ
3127 1717 3E34      CXY2:       LD   A,DBOP
3128 1719 C9                    RET
3129
3130 171A C5        SWAPXY:     PUSH BC
3131 171B 47                    LD   B,A
3132 171C FEA0                  CP   XYD*16
3133 171E 280C                  JR   Z,SXY2
3134 1720 0620                  LD   B,XY*16
3135 1722 FE14                  CP   RP*16+IHL
3136 1724 2806                  JR   Z,SXY2
3137 1726 0660                  LD   B,XYI*16
3138 1728 FE54                  CP   RPI*16+IHL
3139 172A 200A                  JR   NZ,SXY3
3140 172C DDCB03DE  SXY2:       SET  3,(IX+F4)
3141 1730 DD7E03                LD   A,(IX+F4)
3142 1733 E601                  AND  1
3143 1735 B0                    OR   B
3144 1736 C1        SXY3:       POP  BC
3145 1737 C9                    RET
3146
3147 1738 FD2A4002  CHKOPD:     LD   IY,(DIP)
3148 173C FD5602                LD   D,(IY+2)
3149 173F FE61                  CP   IMOP
3150 1741 C8                    RET  Z
3151 1742 FEC1                  CP   RSTOP
3152 1744 C8                    RET  Z
3153 1745 FE10                  CP   BITOP
3154 1747 C8                    RET  Z
3155 1748 FED5                  CP   SETOP
3156 174A C8                    RET  Z
3157 174B FEC2                  CP   RESOP
3158 174D C8                    RET  Z
3159 174E F5                    PUSH AF
3160 174F CD5417                CALL GETOPD
3161 1752 F1                    POP  AF
3162 1753 C9                    RET
3163
3164 1754 FE34      GETOPD:     CP   DBOP
3165 1756 2008                  JR   NZ,GD2
3166 1758 01B0C0                LD   BC,TNO*256+EOL*16
3167 175B 2A4002                LD   HL,(DIP)
3168 175E 5E                    LD   E,(HL)
3169 175F C9                    RET
```



```
3170 1760 FE70      GD2:        CP   JROP
3171 1762 2804                  JR   Z,GD22
3172 1764 FE31                  CP   DJNZOP
3173 1766 2005                  JR   NZ,GD3
3174 1768 CDA617    GD22:       CALL OFFSET
3175 176B 1810                  JR   GD5
3176 176D CDC517    GD3:        CALL CHKTNO
3177 1770 2003                  JR   NZ,GD4
3178 1772 23                    INC  HL
3179 1773 5E                    LD   E,(HL)
3180 1774 C9                    RET
3181 1775 CDB917    GD4:        CALL CHKNO
3182 1778 C0                    RET  NZ
3183 1779 23                    INC  HL
3184 177A 5E                    LD   E,(HL)
3185 177B 23                    INC  HL
3186 177C 56                    LD   D,(HL)
3187 177D DDCB006E  GD5:        BIT  5,(IX+F1)
3188 1781 C8                    RET  Z
3189 1782 CDD117                CALL DBOUND
3190 1785 D8                    RET  C
3191 1786 CDE517                CALL DSYMSCH
3192 1789 D0                    RET  NC
3193 178A E5                    PUSH HL
3194 178B 2A4C02                LD   HL,(DEOSP)
3195 178E E5                    PUSH HL
3196 178F 23                    INC  HL
3197 1790 23                    INC  HL
3198 1791 23                    INC  HL
3199 1792 CD7C09                CALL SOF
3200 1795 380A                  JR   C,E4
3201 1797 E1                    POP  HL
3202 1798 73                    LD   (HL),E
3203 1799 23                    INC  HL
3204 179A 72                    LD   (HL),D
3205 179B 23                    INC  HL
3206 179C 224C02                LD   (DEOSP),HL
3207 179F E1                    POP  HL
3208 17A0 C9                    RET
3209
3210 17A1 2E45      E4:         LD   L,M14&255
3211 17A3 C37407                JP   ERR
3212
3213 17A6 23        OFFSET:     INC  HL
3214 17A7 1600                  LD   D,0
3215 17A9 5E                    LD   E,(HL)
3216 17AA E5                    PUSH HL
3217 17AB 2A4602                LD   HL,(DRIP)
3218 17AE 23                    INC  HL
3219 17AF 23                    INC  HL
3220 17B0 CB7B                  BIT  7,E
3221 17B2 2801                  JR   Z,OFS2
3222 17B4 15                    DEC  D
3223 17B5 19        OFS2:       ADD  HL,DE
3224 17B6 EB                    EX   DE,HL
3225 17B7 E1                    POP  HL
3226 17B8 C9                    RET
3227
3228 17B9 78        CHKNO:      LD   A,B
3229 17BA CDBF17                CALL CKN2
```

```
3230 17BD C8             RET  Z
3231 17BE 79             LD   A,C
3232 17BF FE30   CKN2:   CP   NO*16
3233 17C1 C8             RET  Z
3234 17C2 FE70           CP   NOI*16
3235 17C4 C9             RET
3236
3237 17C5 78     CHKTNO: LD   A,B
3238 17C6 CDCB17         CALL CKTN2
3239 17C9 C8             RET  Z
3240 17CA 79             LD   A,C
3241 17CB FEC0   CKTN2:  CP   TNO*16
3242 17CD C8             RET  Z
3243 17CE FED0           CP   TNOI*16
3244 17D0 C9             RET
3245
3246 17D1 E5     DBOUND: PUSH HL
3247 17D2 D5             PUSH DE
3248 17D3 EB             EX   DE,HL
3249 17D4 ED5B4202       LD   DE,(DRSTART)
3250 17D8 B7             OR   A
3251 17D9 ED52           SBC  HL,DE
3252 17DB D1             POP  DE
3253 17DC 3805           JR   C,DBD2
3254 17DE 2A4402         LD   HL,(DRSTOP)
3255 17E1 ED52           SBC  HL,DE
3256 17E3 E1     DBD2:   POP  HL
3257 17E4 C9             RET
3258
3259 17E5 DDCB0366 DSYMSCH: BIT  4,(IX+F4)
3260 17E9 37             SCF
3261 17EA C8             RET  Z
3262 17EB C5             PUSH BC
3263 17EC E5             PUSH HL
3264 17ED 2A4A02         LD   HL,(DSOSP)
3265 17F0 ED4B4C02 DSS2: LD   BC,(DEOSP)
3266 17F4 B7             OR   A
3267 17F5 ED42           SBC  HL,BC
3268 17F7 09             ADD  HL,BC
3269 17F8 37             SCF
3270 17F9 280C           JR   Z,DSS3
3271 17FB 4E             LD   C,(HL)
3272 17FC 23             INC  HL
3273 17FD 46             LD   B,(HL)
3274 17FE 23             INC  HL
3275 17FF EB             EX   DE,HL
3276 1800 B7             OR   A
3277 1801 ED42           SBC  HL,BC
3278 1803 09             ADD  HL,BC
3279 1804 EB             EX   DE,HL
3280 1805 20E9           JR   NZ,DSS2
3281 1807 E1     DSS3:   POP  HL
3282 1808 C1             POP  BC
3283 1809 C9             RET
3284
3285 180A F5     DLABEL: PUSH AF
3286 180B D5             PUSH DE
3287 180C E5             PUSH HL
3288 180D 219D02         LD   HL,TBUFF+4
3289 1810 222802         LD   (TEMP),HL
```



```
3290 1813 ED5B4602       LD   DE,(DRIP)
3291 1817 CDE517         CALL DSYMSCH
3292 181A 3E00           LD   A,0
3293 181C 380A           JR   C,DLB2
3294 181E CD0219         CALL DN2
3295 1821 3E3A           LD   A,':'
3296 1823 CD5419         CALL DOUT
3297 1826 3E06           LD   A,6
3298 1828 DD7706 DLB2:   LD   (IX+F7),A
3299 182B E1             POP  HL
3300 182C D1             POP  DE
3301 182D F1             POP  AF
3302 182E C9             RET
3303
3304 182F 78     COMMA:  LD   A,B
3305 1830 FEB0           CP   EOL*16
3306 1832 C8             RET  Z
3307 1833 79             LD   A,C
3308 1834 FEB0           CP   EOL*16
3309 1836 C8             RET  Z
3310 1837 3E2C           LD   A,','
3311 1839 C35419         JP   DOUT
3312
3313 183C C5     DOUTOPT: PUSH BC
3314 183D D5             PUSH DE
3315 183E E5             PUSH HL
3316 183F 47             LD   B,A
3317 1840 CD5618         CALL GETKEY
3318 1843 CD6518         CALL KEYADDR
3319 1846 C641           ADD  A,'A'
3320 1848 CD5419         CALL DOUT
3321 184B CDD718         CALL DC2
3322 184E 0C             INC  C
3323 184F DD7105         LD   (IX+F6),C
3324 1852 E1             POP  HL
3325 1853 D1             POP  DE
3326 1854 C1             POP  BC
3327 1855 C9             RET
3328
3329 1856 219119 GETKEY: LD   HL,KEYTRAN
3330 1859 0F     GK2:    RRCA
3331 185A 0F             RRCA
3332 185B 0F             RRCA
3333 185C 0F             RRCA
3334 185D E60F           AND  0FH
3335 185F 5F             LD   E,A
3336 1860 1600           LD   D,0
3337 1862 19             ADD  HL,DE
3338 1863 7E             LD   A,(HL)
3339 1864 C9             RET
3340
3341 1865 21AB13 KEYADDR: LD   HL,KEYTB
3342 1868 D5             PUSH DE
3343 1869 5F             LD   E,A
3344 186A 1600           LD   D,0
3345 186C 19             ADD  HL,DE
3346 186D 19             ADD  HL,DE
3347 186E 5E             LD   E,(HL)
3348 186F 23             INC  HL
3349 1870 56             LD   D,(HL)
```

```
3350 1871 EB                EX   DE,HL
3351 1872 D1                POP  DE
3352 1873 C9                RET
3353
3354 1874 C5    DOUTOPD:    PUSH BC
3355 1875 D5                PUSH DE
3356 1876 E5                PUSH HL
3357 1877 47                LD   B,A
3358 1878 CD5F19            CALL CHKIND
3359 187B F5                PUSH AF
3360 187C 3E28              LD   A,'('
3361 187E CC5419            CALL Z,DOUT
3362 1881 CD8E18            CALL DOPD
3363 1884 F1                POP  AF
3364 1885 3E29              LD   A,')'
3365 1887 CC5419            CALL Z,DOUT
3366 188A E1                POP  HL
3367 188B D1                POP  DE
3368 188C C1                POP  BC
3369 188D C9                RET
3370
3371 188E D5    DOPD:       PUSH DE
3372 188F 219A18            LD   HL,DOPDTAB
3373 1892 78                LD   A,B
3374 1893 CD5918            CALL GK2
3375 1896 5F                LD   E,A
3376 1897 19                ADD  HL,DE
3377 1898 D1                POP  DE
3378 1899 E9                JP   (HL)
3379
3380 189A 0E    DOPDTAB:    DB   DOTR-$
3381 189B 1A                DB   DORP-$
3382 189C 28                DB   DOXY-$
3383 189D 56                DB   DONO-$
3384 189E 0A                DB   DOTR-$
3385 189F 16                DB   DORP-$
3386 18A0 24                DB   DOXY-$
3387 18A1 52                DB   DONO-$
3388 18A2 27                DB   DORE-$
3389 18A3 31                DB   DOCC-$
3390 18A4 3A                DB   DOXYD-$
3391 18A5 B9                DB   DUT2-$
3392 18A6 68                DB   DOTNO-$
3393 18A7 83                DB   DOTNOI-$
3394
3395 18A8 215015    DOTR:   LD   HL,TREGS
3396 18AB 78                LD   A,B
3397 18AC E60F              AND  0FH
3398 18AE FE07              CP   IA
3399 18B0 2026              JR   NZ,DC3
3400 18B2 3D                DEC  A
3401 18B3 1823              JR   DC3
3402
3403 18B5 216515    DORP:   LD   HL,RPAIRS
3404 18B8 78                LD   A,B
3405 18B9 E60F              AND  0FH
3406 18BB 0F                RRCA
3407 18BC FE07              CP   IAF/2
3408 18BE 2018              JR   NZ,DC3
3409 18C0 3E04              LD   A,4
```



```
3410 18C2 1814              JR   DC3
3411
3412 18C4 217915    DOXY:   LD   HL,XYPAIRS
3413 18C7 180E              JR   DC2
3414
3415 18C9 218115    DORE:   LD   HL,REREGS
3416 18CC 78                LD   A,B
3417 18CD E60F              AND  0FH
3418 18CF 0F                RRCA
3419 18D0 0F                RRCA
3420 18D1 0F                RRCA
3421 18D2 1804              JR   DC3
3422
3423 18D4 213415    DOCC:   LD   HL,CCODES
3424 18D7 78        DC2:    LD   A,B
3425 18D8 CD7419    DC3:    CALL IDFIND
3426 18DB C38219            JP   IDOUT
3427
3428 18DE CDC418    DOXYD:  CALL DOXY
3429 18E1 3E2B              LD   A,'+'
3430 18E3 CB7A              BIT  7,D
3431 18E5 2806              JR   Z,DXD2
3432 18E7 7A                LD   A,D
3433 18E8 ED44              NEG
3434 18EA 57                LD   D,A
3435 18EB 3E2D              LD   A,'-'
3436 18ED CD5419    DXD2:   CALL DOUT
3437 18F0 7A                LD   A,D
3438 18F1 1838              JR   DTNI2
3439
3440 18F3 CDE517    DONO:   CALL DSYMSCH
3441 18F6 300A              JR   NC,DN2
3442 18F8 7A                LD   A,D
3443 18F9 CD3A19            CALL DOUTHB
3444 18FC 7B                LD   A,E
3445 18FD CD4319            CALL DHB2
3446 1900 1834              JR   DTNI4
3447 1902 3E4C      DN2:    LD   A,'L'
3448 1904 CD5419            CALL DOUT
3449 1907 7A                LD   A,D
3450 1908 CD4319            CALL DHB2
3451 190B 7B                LD   A,E
3452 190C 1835              JR   DHB2
3453
3454 190E 7B        DOTNO:  LD   A,E
3455 190F FE41              CP   'A'
3456 1911 3817              JR   C,DOTNOI
3457 1913 FE5B              CP   'Z'+1
3458 1915 3808              JR   C,DTN2
3459 1917 FE61              CP   'a'
3460 1919 380F              JR   C,DOTNOI
3461 191B FE7B              CP   'z'+1
3462 191D 300B              JR   NC,DOTNOI
3463 191F CD2619    DTN2:   CALL DTN3
3464 1922 7B                LD   A,E
3465 1923 CD5419            CALL DOUT
3466 1926 3E27      DTN3:   LD   A,"'"
3467 1928 182A              JR   DOUT
3468
3469 192A 7B        DOTNOI: LD   A,E
```

```
3470 192B FE0A   DTNI2:    CP   10
3471 192D 3004             JR   NC,DTNI3
3472 192F C630             ADD  A,'0'
3473 1931 1821             JR   DOUT
3474 1933 CD3A19 DTNI3:    CALL DOUTHB
3475 1936 3E48   DTNI4:    LD   A,'H'
3476 1938 181A             JR   DOUT
3477
3478 193A FEA0   DOUTHB:   CP   0A0H
3479 193C F5               PUSH AF
3480 193D 3E30             LD   A,'0'
3481 193F D45419           CALL NC,DOUT
3482 1942 F1               POP  AF
3483 1943 F5     DHB2:     PUSH AF
3484 1944 0F               RRCA
3485 1945 0F               RRCA
3486 1946 0F               RRCA
3487 1947 0F               RRCA
3488 1948 CD4C19           CALL DHB3
3489 194B F1               POP  AF
3490 194C E60F   DHB3:     AND  0FH
3491 194E C690             ADD  A,90H
3492 1950 27               DAA
3493 1951 CE40             ADC  A,40H
3494 1953 27               DAA
3495 1954 E5     DOUT:     PUSH HL
3496 1955 2A2802           LD   HL,(TEMP)
3497 1958 77               LD   (HL),A
3498 1959 23               INC  HL
3499 195A 222802           LD   (TEMP),HL
3500 195D E1               POP  HL
3501 195E C9     DUT2:     RET
3502
3503 195F 78     CHKIND:   LD   A,B
3504 1960 E6F0             AND  0F0H
3505 1962 FE50             CP   RPI*16
3506 1964 C8               RET  Z
3507 1965 FE40             CP   TRI*16
3508 1967 C8               RET  Z
3509 1968 FE70             CP   NOI*16
3510 196A C8               RET  Z
3511 196B FED0             CP   TNOI*16
3512 196D C8               RET  Z
3513 196E FE60             CP   XYI*16
3514 1970 C8               RET  Z
3515 1971 FEA0             CP   XYD*16
3516 1973 C9               RET
3517
3518 1974 E60F   IDFIND:   AND  0FH
3519 1976 C8               RET  Z
3520 1977 CB7E   IDF2:     BIT  7,(HL)
3521 1979 23               INC  HL
3522 197A 28FB             JR   Z,IDF2
3523 197C 23               INC  HL
3524 197D 23               INC  HL
3525 197E 3D               DEC  A
3526 197F 20F6             JR   NZ,IDF2
3527 1981 C9               RET
3528
3529 1982 0E00   IDOUT:    LD   C,0
```



```
3530 1984 7E     IDT2:     LD   A,(HL)
3531 1985 CBBF             RES  7,A
3532 1987 CD5419           CALL DOUT
3533 198A 0C               INC  C
3534 198B CB7E             BIT  7,(HL)
3535 198D 23               INC  HL
3536 198E 28F4             JR   Z,IDT2
3537 1990 C9               RET
3538
3539 1991 00     KEYTRAN:  DB   'A'-'A'
3540 1992 01               DB   'B'-'A'
3541 1993 02               DB   'C'-'A'
3542 1994 03               DB   'D'-'A'
3543 1995 04               DB   'E'-'A'
3544 1996 07               DB   'H'-'A'
3545 1997 08               DB   'I'-'A'
3546 1998 09               DB   'J'-'A'
3547 1999 0B               DB   'L'-'A'
3548 199A 0D               DB   'N'-'A'
3549 199B 0E               DB   'O'-'A'
3550 199C 0F               DB   'P'-'A'
3551 199D 11               DB   'R'-'A'
3552 199E 12               DB   'S'-'A'
3553 199F 17               DB   'X'-'A'
3554
3555 19A0 CD171B DECODE:   CALL CHKAREAS
3556 19A3 3E34             LD   A,DBOP
3557 19A5 D8               RET  C
3558 19A6 DD7E03           LD   A,(IX+F4)
3559 19A9 E6F0             AND  0F0H
3560 19AB 47               LD   B,A
3561 19AC 2A4002           LD   HL,(DIP)
3562 19AF 7E               LD   A,(HL)
3563 19B0 FEDD             CP   0DDH
3564 19B2 2805             JR   Z,DCD2
3565 19B4 04               INC  B
3566 19B5 FEFD             CP   0FDH
3567 19B7 2004             JR   NZ,DCD3
3568 19B9 CBC8   DCD2:     SET  1,B
3569 19BB 23               INC  HL
3570 19BC 7E               LD   A,(HL)
3571 19BD DD7003 DCD3:     LD   (IX+F4),B
3572 19C0 01B0B0           LD   BC,EOL*256+EOL*16
3573 19C3 110000           LD   DE,0
3574 19C6 FEED             CP   0EDH
3575 19C8 CAEA1A           JP   Z,DGED
3576 19CB FECB             CP   0CBH
3577 19CD CAB11A           JP   Z,DGCB
3578 19D0 FE40             CP   40H
3579 19D2 DA5D1A           JP   C,DG00
3580 19D5 FE80             CP   80H
3581 19D7 3872             JR   C,DG40
3582 19D9 FEC0             CP   0C0H
3583 19DB 3854             JR   C,DG80
3584
3585 19DD E607   DGC0:     AND  7
3586 19DF 2835             JR   Z,DGC00
3587 19E1 FD21531B         LD   IY,DGC0TAB1
3588 19E5 3D               DEC  A
3589 19E6 2839             JR   Z,DGC0135
```

```
3590 19E8 3D                    DEC   A
3591 19E9 2825                  JR    Z,DGC02
3592 19EB FD216B1B              LD    IY,DGC0TAB3
3593 19EF 3D                    DEC   A
3594 19F0 282F                  JR    Z,DGC0135
3595 19F2 3D                    DEC   A
3596 19F3 2817                  JR    Z,DGC04
3597 19F5 FD21831B              LD    IY,DGC0TAB5
3598 19F9 3D                    DEC   A
3599 19FA 2825                  JR    Z,DGC0135
3600 19FC 3D                    DEC   A
3601 19FD 2809                  JR    Z,DGC06
3602 19FF 7E            DGC07:  LD    A,(HL)
3603 1A00 E638                  AND   38H
3604 1A02 5F                    LD    E,A
3605 1A03 06C0                  LD    B,TNO*16
3606 1A05 3EC1                  LD    A,RSTOP
3607 1A07 C9                    RET
3608 1A08 06C0          DGC06:  LD    B,TNO*16
3609 1A0A 1829                  JR    DG802
3610 1A0C 3E20          DGC04:  LD    A,CALLOP
3611 1A0E 1802                  JR    DGC022
3612 1A10 3E71          DGC02:  LD    A,JPOP
3613 1A12 0E30          DGC022: LD    C,NO*16
3614 1A14 1802                  JR    DGC002
3615 1A16 3EC0          DGC00:  LD    A,RETOP
3616 1A18 F5            DGC002: PUSH  AF
3617 1A19 CD461B                CALL  TRIPLET
3618 1A1C F690                  OR    CC*16
3619 1A1E 47                    LD    B,A
3620 1A1F F1                    POP   AF
3621 1A20 C9                    RET
3622 1A21 CD461B        DGC0135: CALL TRIPLET
3623 1A24 5F            DGC01352: LD  E,A
3624 1A25 07                    RLCA
3625 1A26 83                    ADD   A,E
3626 1A27 CDCD1A                CALL  DGCB4
3627 1A2A FD4601                LD    B,(IY+1)
3628 1A2D FD4E02                LD    C,(IY+2)
3629 1A30 C9                    RET
3630
3631 1A31 CD4D1B        DG80:   CALL  GETREG
3632 1A34 47                    LD    B,A
3633 1A35 FD219B1B      DG802:  LD    IY,DG80TAB
3634 1A39 CDCA1A                CALL  DGCB3
3635 1A3C FE01                  CP    ADDOP
3636 1A3E 2807                  JR    Z,DG803
3637 1A40 FE00                  CP    ADCOP
3638 1A42 2803                  JR    Z,DG803
3639 1A44 FED0                  CP    SBCOP
3640 1A46 C0                    RET   NZ
3641 1A47 48            DG803:  LD    C,B
3642 1A48 0607                  LD    B,TR*16+IA
3643 1A4A C9                    RET
3644
3645 1A4B FE76          DG40:   CP    76H
3646 1A4D 3E50                  LD    A,HALTOP
3647 1A4F C8                    RET   Z
3648 1A50 CD4D1B                CALL  GETREG
3649 1A53 4F                    LD    C,A
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3650 1A54 CD461B        DG402:  CALL  TRIPLET
3651 1A57 F600                  OR    TR*16
3652 1A59 47                    LD    B,A
3653 1A5A 3E80                  LD    A,LDOP
3654 1A5C C9                    RET
3655
3656 1A5D FD21A31B      DG00:   LD    IY,DG00TAB0
3657 1A61 E607                  AND   7
3658 1A63 28BC                  JR    Z,DGC0135
3659 1A65 3D                    DEC   A
3660 1A66 283B                  JR    Z,DG001
3661 1A68 FD21BB1B              LD    IY,DG00TAB2
3662 1A6C 3D                    DEC   A
3663 1A6D 28B2                  JR    Z,DGC0135
3664 1A6F 3D                    DEC   A
3665 1A70 2820                  JR    Z,DG003
3666 1A72 3D                    DEC   A
3667 1A73 2812                  JR    Z,DG004
3668 1A75 3D                    DEC   A
3669 1A76 280B                  JR    Z,DG005
3670 1A78 FD21D31B              LD    IY,DG00TAB7
3671 1A7C 3D                    DEC   A
3672 1A7D 204B                  JR    NZ,DGCB3
3673 1A7F 0EC0          DG006:  LD    C,TNO*16
3674 1A81 18D1                  JR    DG402
3675 1A83 3E30          DG005:  LD    A,DECOP
3676 1A85 1802                  JR    DG0042
3677 1A87 3E60          DG004:  LD    A,INCOP
3678 1A89 F5            DG0042: PUSH  AF
3679 1A8A CD461B                CALL  TRIPLET
3680 1A8D F600                  OR    TR*16
3681 1A8F 47                    LD    B,A
3682 1A90 F1                    POP   AF
3683 1A91 C9                    RET
3684 1A92 7E            DG003:  LD    A,(HL)
3685 1A93 0F                    RRCA
3686 1A94 0F                    RRCA
3687 1A95 0F                    RRCA
3688 1A96 E606                  AND   6
3689 1A98 F610                  OR    RP*16
3690 1A9A 47                    LD    B,A
3691 1A9B 3E60                  LD    A,INCOP
3692 1A9D CB5E                  BIT   3,(HL)
3693 1A9F C8                    RET   Z
3694 1AA0 3E30                  LD    A,DECOP
3695 1AA2 C9                    RET
3696 1AA3 CD921A        DG001:  CALL  DG003
3697 1AA6 0E30                  LD    C,NO*16
3698 1AA8 3E80                  LD    A,LDOP
3699 1AAA C8                    RET   Z
3700 1AAB 48                    LD    C,B
3701 1AAC 0614                  LD    B,RP*16+IHL
3702 1AAE 3E01                  LD    A,ADDOP
3703 1AB0 C9                    RET
3704
3705 1AB1 23            DGCB:   INC   HL
3706 1AB2 DDCB034E              BIT   1,(IX+F4)
3707 1AB6 2005                  JR    Z,DGCB1
3708 1AB8 DDCB03D6              SET   2,(IX+F4)
3709 1ABC 23                    INC   HL
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3710 1ABD 7E          DGCB1:    LD    A,(HL)
3711 1ABE E6C0                  AND   0C0H
3712 1AC0 2012                  JR    NZ,DGCB5
3713 1AC2 FD21DB1B              LD    IY,DGCBTAB1
3714 1AC6 CD4D1B                CALL  GETREG
3715 1AC9 47                    LD    B,A
3716 1ACA CD461B      DGCB3:    CALL  TRIPLET
3717 1ACD 5F          DGCB4:    LD    E,A
3718 1ACE FD19                  ADD   IY,DE
3719 1AD0 FD7E00                LD    A,(IY+0)
3720 1AD3 C9                    RET
3721 1AD4 FD21E21B    DGCB5:    LD    IY,DGCBTAB2-1
3722 1AD8 07                    RLCA
3723 1AD9 07                    RLCA
3724 1ADA CDCD1A                CALL  DGCB4
3725 1ADD F5                    PUSH  AF
3726 1ADE CD4D1B                CALL  GETREG
3727 1AE1 4F                    LD    C,A
3728 1AE2 CD461B                CALL  TRIPLET
3729 1AE5 5F                    LD    E,A
3730 1AE6 06C0                  LD    B,TNO*16
3731 1AE8 F1                    POP   AF
3732 1AE9 C9                    RET
3733
3734 1AEA DDCB034E    DGED:     BIT   1,(IX+F4)
3735 1AEE 2024                  JR    NZ,DGED4
3736 1AF0 23                    INC   HL
3737 1AF1 7E                    LD    A,(HL)
3738 1AF2 D640                  SUB   40H
3739 1AF4 381E                  JR    C,DGED4
3740 1AF6 FE3C                  CP    3CH
3741 1AF8 300E                  JR    NC,DGED3
3742 1AFA FD21E61B              LD    IY,DGEDTAB1
3743 1AFE CD241A                CALL  DGC01352
3744 1B01 FE61                  CP    IMOP
3745 1B03 C0                    RET   NZ
3746 1B04 59                    LD    E,C
3747 1B05 0EB0                  LD    C,EOL*16
3748 1B07 C9                    RET
3749 1B08 D660        DGED3:    SUB   60H
3750 1B0A 3808                  JR    C,DGED4
3751 1B0C FD219A1C              LD    IY,DGEDTAB2
3752 1B10 FE1C                  CP    1CH
3753 1B12 38B9                  JR    C,DGCB4
3754 1B14 3E34        DGED4:    LD    A,DBOP
3755 1B16 C9                    RET
3756
3757 1B17 B7          CHKAREAS: OR    A
3758 1B18 DDCB0366              BIT   4,(IX+F4)
3759 1B1C C8                    RET   Z
3760 1B1D 21B71C                LD    HL,AEND+2
3761 1B20 E5          CKA2:     PUSH  HL
3762 1B21 ED5B4802              LD    DE,(DEOAP)
3763 1B25 B7                    OR    A
3764 1B26 ED52                  SBC   HL,DE
3765 1B28 E1                    POP   HL
3766 1B29 C8                    RET   Z
3767 1B2A 5E                    LD    E,(HL)
3768 1B2B 23                    INC   HL
3769 1B2C 56                    LD    D,(HL)
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3770 1B2D 23                    INC   HL
3771 1B2E 4E                    LD    C,(HL)
3772 1B2F 23                    INC   HL
3773 1B30 46                    LD    B,(HL)
3774 1B31 23                    INC   HL
3775 1B32 E5                    PUSH  HL
3776 1B33 2A4002                LD    HL,(DIP)
3777 1B36 B7                    OR    A
3778 1B37 ED52                  SBC   HL,DE
3779 1B39 3F                    CCF
3780 1B3A 3004                  JR    NC,CKA3
3781 1B3C 19                    ADD   HL,DE
3782 1B3D B7                    OR    A
3783 1B3E ED42                  SBC   HL,BC
3784 1B40 E1          CKA3:     POP   HL
3785 1B41 D8                    RET   C
3786 1B42 37                    SCF
3787 1B43 C8                    RET   Z
3788 1B44 18DA                  JR    CKA2
3789
3790 1B46 7E          TRIPLET:  LD    A,(HL)
3791 1B47 0F                    RRCA
3792 1B48 0F                    RRCA
3793 1B49 0F                    RRCA
3794 1B4A E607                  AND   7
3795 1B4C C9                    RET
3796
3797 1B4D 7E          GETREG:   LD    A,(HL)
3798 1B4E E607                  AND   7
3799 1B50 F600                  OR    TR*16
3800 1B52 C9                    RET
3801
3802 1B53 B1          DGC0TAB1: DB    POPOP
3803 1B54 10                    DB    RP*16+IBC
3804 1B55 B0                    DB    EOL*16
3805 1B56 C0                    DB    RETOP
3806 1B57 B0                    DB    EOL*16
3807 1B58 B0                    DB    EOL*16
3808 1B59 B1                    DB    POPOP
3809 1B5A 12                    DB    RP*16+IDE
3810 1B5B B0                    DB    EOL*16
3811 1B5C 41                    DB    EXXOP
3812 1B5D B0                    DB    EOL*16
3813 1B5E B0                    DB    EOL*16
3814 1B5F B1                    DB    POPOP
3815 1B60 14                    DB    RP*16+IHL
3816 1B61 B0                    DB    EOL*16
3817 1B62 71                    DB    JPOP
3818 1B63 54                    DB    RPI*16+IHL
3819 1B64 B0                    DB    EOL*16
3820 1B65 B1                    DB    POPOP
3821 1B66 1E                    DB    RP*16+IAF
3822 1B67 B0                    DB    EOL*16
3823 1B68 00                    DB    LDOP
3824 1B69 16                    DB    RP*16+ISP
3825 1B6A 14                    DB    RP*16+IHL
3826
3827 1B6B 71          DGC0TAB3: DB    JPOP
3828 1B6C 30                    DB    NO*16
3829 1B6D B0                    DB    EOL*16
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3830 1B6E 34                    DB    DBOP
3831 1B6F B0                    DB    EOL*16
3832 1B70 B0                    DB    EOL*16
3833 1B71 A1                    DB    OUTOP
3834 1B72 D0                    DB    TNOI*16
3835 1B73 07                    DB    TR*16+IA
3836 1B74 62                    DB    INOP
3837 1B75 07                    DB    TR*16+IA
3838 1B76 D0                    DB    TNOI*16
3839 1B77 40                    DB    EXOP
3840 1B78 56                    DB    RPI*16+ISP
3841 1B79 14                    DB    RP*16+IHL
3842 1B7A 40                    DB    EXOP
3843 1B7B 12                    DB    RP*16+IDE
3844 1B7C 14                    DB    RP*16+IHL
3845 1B7D 33                    DB    DIOP
3846 1B7E B0                    DB    EOL*16
3847 1B7F B0                    DB    EOL*16
3848 1B80 42                    DB    EIOP
3849 1B81 B0                    DB    EOL*16
3850 1B82 B0                    DB    EOL*16
3851
3852 1B83 B0    DGC0TAB5:       DB    PUSHOP
3853 1B84 10                    DB    RP*16+IBC
3854 1B85 B0                    DB    EOL*16
3855 1B86 20                    DB    CALLOP
3856 1B87 30                    DB    NO*16
3857 1B88 B0                    DB    EOL*16
3858 1B89 B0                    DB    PUSHOP
3859 1B8A 12                    DB    RP*16+IDE
3860 1B8B B0                    DB    EOL*16
3861 1B8C 34                    DB    DBOP
3862 1B8D B0                    DB    EOL*16
3863 1B8E B0                    DB    EOL*16
3864 1B8F B0                    DB    PUSHOP
3865 1B90 14                    DB    RP*16+IHL
3866 1B91 B0                    DB    EOL*16
3867 1B92 34                    DB    DBOP
3868 1B93 B0                    DB    EOL*16
3869 1B94 B0                    DB    EOL*16
3870 1B95 B0                    DB    PUSHOP
3871 1B96 1E                    DB    RP*16+IAF
3872 1B97 B0                    DB    EOL*16
3873 1B98 34                    DB    DBOP
3874 1B99 B0                    DB    EOL*16
3875 1B9A B0                    DB    EOL*16
3876
3877 1B9B 01    DG80TAB:        DB    ADDOP
3878 1B9C 00                    DB    ADCOP
3879 1B9D D6                    DB    SUBOP
3880 1B9E D0                    DB    SBCOP
3881 1B9F 02                    DB    ANDOP
3882 1BA0 E0                    DB    XOROP
3883 1BA1 A0                    DB    OROP
3884 1BA2 21                    DB    CPOP
3885
3886 1BA3 90    DG00TAB0:       DB    NOPOP
3887 1BA4 B0                    DB    EOL*16
3888 1BA5 B0                    DB    EOL*16
3889 1BA6 40                    DB    EXOP
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3890 1BA7 1E                    DB    RP*16+IAF
3891 1BA8 1E                    DB    RP*16+IAF
3892 1BA9 31                    DB    DJNZOP
3893 1BAA 30                    DB    NO*16
3894 1BAB B0                    DB    EOL*16
3895 1BAC 70                    DB    JROP
3896 1BAD 30                    DB    NO*16
3897 1BAE B0                    DB    EOL*16
3898 1BAF 70                    DB    JROP
3899 1BB0 90                    DB    CC*128+INZ/8
3900 1BB1 30                    DB    NO*16
3901 1BB2 70                    DB    JROP
3902 1BB3 91                    DB    CC*128+IZ/8
3903 1BB4 30                    DB    NO*16
3904 1BB5 70                    DB    JROP
3905 1BB6 92                    DB    CC*128+INCY/8
3906 1BB7 30                    DB    NO*16
3907 1BB8 70                    DB    JROP
3908 1BB9 93                    DB    CC*128+ICY/8
3909 1BBA 30                    DB    NO*16
3910
3911 1BBB 80    DG00TAB2:       DB    LDOP
3912 1BBC 50                    DB    RPI*16+IBC
3913 1BBD 07                    DB    TR*16+IA
3914 1BBE 80                    DB    LDOP
3915 1BBF 07                    DB    TR*16+IA
3916 1BC0 50                    DB    RPI*16+IBC
3917 1BC1 80                    DB    LDOP
3918 1BC2 52                    DB    RPI*16+IDE
3919 1BC3 07                    DB    TR*16+IA
3920 1BC4 80                    DB    LDOP
3921 1BC5 07                    DB    TR*16+IA
3922 1BC6 52                    DB    RPI*16+IDE
3923 1BC7 80                    DB    LDOP
3924 1BC8 70                    DB    NOI*16
3925 1BC9 14                    DB    RP*16+IHL
3926 1BCA 80                    DB    LDOP
3927 1BCB 14                    DB    RP*16+IHL
3928 1BCC 70                    DB    NOI*16
3929 1BCD 80                    DB    LDOP
3930 1BCE 70                    DB    NOI*16
3931 1BCF 07                    DB    TR*16+IA
3932 1BD0 80                    DB    LDOP
3933 1BD1 07                    DB    TR*16+IA
3934 1BD2 70                    DB    NOI*16
3935
3936 1BD3 C5    DG00TAB7:       DB    RLCAOP
3937 1BD4 C9                    DB    RRCAOP
3938 1BD5 C6                    DB    RLAOP
3939 1BD6 CA                    DB    RRAOP
3940 1BD7 32                    DB    DAAOP
3941 1BD8 23                    DB    CPLOP
3942 1BD9 D1                    DB    SCFOP
3943 1BDA 22                    DB    CCFOP
3944
3945 1BDB C4    DGCBTAB1:       DB    RLCOP
3946 1BDC C8                    DB    RRCOP
3947 1BDD C3                    DB    RLOP
3948 1BDE C7                    DB    RROP
3949 1BDF D2                    DB    SLAOP
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3950 1BE0 D3                    DB    SRAOP
3951 1BE1 34                    DB    DBOP
3952 1BE2 D4                    DB    SRLOP
3953
3954 1BE3 10    DGCBTAB2:       DB    BITOP
3955 1BE4 C2                    DB    RESOP
3956 1BE5 D5                    DB    SETOP
3957
3958 1BE6 62    DGEDTAB1:       DB    INOP
3959 1BE7 00                    DB    TR*16+IB
3960 1BE8 41                    DB    TRI*16+IC
3961 1BE9 A1                    DB    OUTOP
3962 1BEA 41                    DB    TRI*16+IC
3963 1BEB 00                    DB    TR*16+IB
3964 1BEC D0                    DB    SBCOP
3965 1BED 14                    DB    RP*16+IHL
3966 1BEE 10                    DB    RP*16+IBC
3967 1BEF 80                    DB    LDOP
3968 1BF0 70                    DB    NOI*16
3969 1BF1 10                    DB    RP*16+IBC
3970 1BF2 91                    DB    NEGOP
3971 1BF3 B0                    DB    EOL*16
3972 1BF4 B0                    DB    EOL*16
3973 1BF5 CE                    DB    RETNOP
3974 1BF6 B0                    DB    EOL*16
3975 1BF7 B0                    DB    EOL*16
3976 1BF8 61                    DB    IMOP
3977 1BF9 C0                    DB    TNO*16
3978 1BFA 00                    DB    0
3979 1BFB 80                    DB    LDOP
3980 1BFC 80                    DB    RE*16+IINT
3981 1BFD 07                    DB    TR*16+IA
3982 1BFE 62                    DB    INOP
3983 1BFF 01                    DB    TR*16+IC
3984 1C00 41                    DB    TRI*16+IC
3985 1C01 A1                    DB    OUTOP
3986 1C02 41                    DB    TRI*16+IC
3987 1C03 01                    DB    TR*16+IC
3988 1C04 00                    DB    ADCOP
3989 1C05 14                    DB    RP*16+IHL
3990 1C06 10                    DB    RP*16+IBC
3991 1C07 80                    DB    LDOP
3992 1C08 10                    DB    RP*16+IBC
3993 1C09 70                    DB    NOI*16
3994 1C0A 34                    DB    DBOP
3995 1C0B B0                    DB    EOL*16
3996 1C0C B0                    DB    EOL*16
3997 1C0D CD                    DB    RETIOP
3998 1C0E B0                    DB    EOL*16
3999 1C0F B0                    DB    EOL*16
4000 1C10 34                    DB    DBOP
4001 1C11 B0                    DB    EOL*16
4002 1C12 B0                    DB    EOL*16
4003 1C13 80                    DB    LDOP
4004 1C14 88                    DB    RE*16+IREF
4005 1C15 07                    DB    TR*16+IA
4006 1C16 62                    DB    INOP
4007 1C17 02                    DB    TR*16+ID
4008 1C18 41                    DB    TRI*16+IC
4009 1C19 A1                    DB    OUTOP
```



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4010 1C1A 41                    DB    TRI*16+IC
4011 1C1B 02                    DB    TR*16+ID
4012 1C1C D0                    DB    SBCOP
4013 1C1D 14                    DB    RP*16+IHL
4014 1C1E 12                    DB    RP*16+IDE
4015 1C1F 80                    DB    LDOP
4016 1C20 70                    DB    NOI*16
4017 1C21 12                    DB    RP*16+IDE
4018 1C22 34                    DB    DBOP
4019 1C23 B0                    DB    EOL*16
4020 1C24 B0                    DB    EOL*16
4021 1C25 34                    DB    DBOP
4022 1C26 B0                    DB    EOL*16
4023 1C27 B0                    DB    EOL*16
4024 1C28 61                    DB    IMOP
4025 1C29 C0                    DB    TNO*16
4026 1C2A 01                    DB    1
4027 1C2B 80                    DB    LDOP
4028 1C2C 07                    DB    TR*16+IA
4029 1C2D 80                    DB    RE*16+IINT
4030 1C2E 62                    DB    INOP
4031 1C2F 03                    DB    TR*16+IE
4032 1C30 41                    DB    TRI*16+IC
4033 1C31 A1                    DB    OUTOP
4034 1C32 41                    DB    TRI*16+IC
4035 1C33 03                    DB    TR*16+IE
4036 1C34 00                    DB    ADCOP
4037 1C35 14                    DB    RP*16+IHL
4038 1C36 12                    DB    RP*16+IDE
4039 1C37 80                    DB    LDOP
4040 1C38 12                    DB    RP*16+IDE
4041 1C39 70                    DB    NOI*16
4042 1C3A 34                    DB    DBOP
4043 1C3B B0                    DB    EOL*16
4044 1C3C B0                    DB    EOL*16
4045 1C3D 34                    DB    DBOP
4046 1C3E B0                    DB    EOL*16
4047 1C3F B0                    DB    EOL*16
4048 1C40 61                    DB    IMOP
4049 1C41 C0                    DB    TNO*16
4050 1C42 02                    DB    2
4051 1C43 80                    DB    LDOP
4052 1C44 07                    DB    TR*16+IA
4053 1C45 88                    DB    RE*16+IREF
4054 1C46 62                    DB    INOP
4055 1C47 04                    DB    TR*16+IH
4056 1C48 41                    DB    TRI*16+IC
4057 1C49 A1                    DB    OUTOP
4058 1C4A 41                    DB    TRI*16+IC
4059 1C4B 04                    DB    TR*16+IH
4060 1C4C D0                    DB    SBCOP
4061 1C4D 14                    DB    RP*16+IHL
4062 1C4E 14                    DB    RP*16+IHL
4063 1C4F 34                    DB    DBOP
4064 1C50 B0                    DB    EOL*16
4065 1C51 B0                    DB    EOL*16
4066 1C52 34                    DB    DBOP
4067 1C53 B0                    DB    EOL*16
4068 1C54 B0                    DB    EOL*16
4069 1C55 34                    DB    DBOP
```

```
4070 1C56 B0            DB    EOL*16
4071 1C57 B0            DB    EOL*16
4072 1C58 34            DB    DBOP
4073 1C59 B0            DB    EOL*16
4074 1C5A B0            DB    EOL*16
4075 1C5B CC            DB    RRDOP
4076 1C5C B0            DB    EOL*16
4077 1C5D B0            DB    EOL*16
4078 1C5E 62            DB    INOP
4079 1C5F 05            DB    TR*16+IL
4080 1C60 41            DB    TRI*16+IC
4081 1C61 A1            DB    OUTOP
4082 1C62 41            DB    TRI*16+IC
4083 1C63 05            DB    TR*16+IL
4084 1C64 00            DB    ADCOP
4085 1C65 14            DB    RP*16+IHL
4086 1C66 14            DB    RP*16+IHL
4087 1C67 34            DB    DBOP
4088 1C68 B0            DB    EOL*16
4089 1C69 B0            DB    EOL*16
4090 1C6A 34            DB    DBOP
4091 1C6B B0            DB    EOL*16
4092 1C6C B0            DB    EOL*16
4093 1C6D 34            DB    DBOP
4094 1C6E B0            DB    EOL*16
4095 1C6F B0            DB    EOL*16
4096 1C70 34            DB    DBOP
4097 1C71 B0            DB    EOL*16
4098 1C72 B0            DB    EOL*16
4099 1C73 CB            DB    RLDOP
4100 1C74 B0            DB    EOL*16
4101 1C75 B0            DB    EOL*16
4102 1C76 34            DB    DBOP
4103 1C77 B0            DB    EOL*16
4104 1C78 B0            DB    EOL*16
4105 1C79 34            DB    DBOP
4106 1C7A B0            DB    EOL*16
4107 1C7B B0            DB    EOL*16
4108 1C7C D0            DB    SBCOP
4109 1C7D 14            DB    RP*16+IHL
4110 1C7E 16            DB    RP*16+ISP
4111 1C7F 80            DB    LDOP
4112 1C80 70            DB    NOI*16
4113 1C81 16            DB    RP*16+ISP
4114 1C82 34            DB    DBOP
4115 1C83 B0            DB    EOL*16
4116 1C84 B0            DB    EOL*16
4117 1C85 34            DB    DBOP
4118 1C86 B0            DB    EOL*16
4119 1C87 B0            DB    EOL*16
4120 1C88 34            DB    DBOP
4121 1C89 B0            DB    EOL*16
4122 1C8A B0            DB    EOL*16
4123 1C8B 34            DB    DBOP
4124 1C8C B0            DB    EOL*16
4125 1C8D B0            DB    EOL*16
4126 1C8E 62            DB    INOP
4127 1C8F 07            DB    TR*16+IA
4128 1C90 41            DB    TRI*16+IC
4129 1C91 A1            DB    OUTOP
```



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4130 1C92 41            DB    TRI*16+IC
4131 1C93 07            DB    TR*16+IA
4132 1C94 00            DB    ADCOP
4133 1C95 14            DB    RP*16+IHL
4134 1C96 16            DB    RP*16+ISP
4135 1C97 80            DB    LDOP
4136 1C98 16            DB    RP*16+ISP
4137 1C99 70            DB    NOI*16
4138
4139 1C9A 81    DGEDTAB2:   DB    LDIOP
4140 1C9B 24            DB    CPIOP
4141 1C9C 63            DB    INIOP
4142 1C9D A2            DB    OUTIOP
4143 1C9E 34            DB    DBOP
4144 1C9F 34            DB    DBOP
4145 1CA0 34            DB    DBOP
4146 1CA1 34            DB    DBOP
4147 1CA2 83            DB    LDDOP
4148 1CA3 26            DB    CPDOP
4149 1CA4 65            DB    INDOP
4150 1CA5 A4            DB    OUTDOP
4151 1CA6 34            DB    DBOP
4152 1CA7 34            DB    DBOP
4153 1CA8 34            DB    DBOP
4154 1CA9 34            DB    DBOP
4155 1CAA 82            DB    LDIROP
4156 1CAB 25            DB    CPIROP
4157 1CAC 64            DB    INIROP
4158 1CAD A3            DB    OTIROP
4159 1CAE 34            DB    DBOP
4160 1CAF 34            DB    DBOP
4161 1CB0 34            DB    DBOP
4162 1CB1 34            DB    DBOP
4163 1CB2 84            DB    LDDROP
4164 1CB3 27            DB    CPDROP
4165 1CB4 66            DB    INDROP
4166 1CB5 A5    AEND:   DB    OTDROP
4167 1CB6 FF            DB    0FFH
4168
4169                    END
```

AL	0002	ADL	0004	ASMB	0C31	ADCTAB	12D0
ADDTAB	12DE	AOPS	13DF	ADCOP	0000	ADDOP	0001
ANDOP	0002	AEND	1CB5	BS	0008	BLANK	0020
BDOS	0005	BKPTADDR	0234	BKPTCODE	0236	BIOS	0811
BIOS	081F	BYTESP	09E6	BYTE	09EB	BAD	0E8C
BITH	133A	BIT2	1343	BOPS	13EC	BITOP	0010
CR	000D	COMWIDTH	020E	CURRENT	021E	CWRITE	04FD
CW2	0503	CW3	050A	CREAD	055E	CRD2	0566
COPY	0630	COMTAB	0726	CRLF	0781	CONSTAT	0808
CUE	0831	CONVERT	091C	CV0	092D	CV1	0931
CV2	093D	CV3	094F	CLEAR	0977	CHKCHAR	0A9E
CKE2	0AA7	CHECKTYPE	0AB0	CLOSE	0ACC	CL	0001
CO	0009	CLASS	1084	CL1	108C	CL3	1093
CL2	1094	CL4	10A1	CL41	10A3	CL5	10BE
CL6	10CA	CLER	10D8	CL7	10DB	CL71	10DD
CL72	10F1	CALTAB	1274	COPS	13F1	CCODES	1534
CALLOP	0020	CPOP	0021	CCFOP	0022	CPLOP	0023
CPIOP	0024	CPIROP	0025	CPDOP	0026	CPDROP	0027
CHKHL	16D7	CHKXY	16F7	CXY2	1717	CHKOPD	1738
CHKNO	17B9	CKN2	17BF	CHKTNO	17C5	CKTN2	17CB
COMMA	182F	CHKIND	195F	CHKAREAS	1B17	CKA2	1B20
CKA3	1B40	DEL	0019	DMA	0080	DMACTR	023A
DSTART	023C	DSTOP	023E	DIP	0240	DRSTART	0242
DRSTOP	0244	DRIP	0246	DEOAP	0248	DSOSP	024A
DEOSP	024C	DOWN	03CF	DELAY	095C	DEL1	095F
DERR	0B0C	DJH	1105	DJ1	111E	DJ2	1120
DWH	1124	DBH	112A	DBH1	112E	DBH3	1138
DBH4	113F	DSH	1147	DL1	12EB	DL2	12EE
DL3	12F5	DL4	1302	DL5	1309	DOPS	1414
DECOP	0030	DJNZOP	0031	DAAOP	0032	DIOP	0033
DBOP	0034	DASM	1588	DSM2	159D	DPASS	15C4
DPS2	15CB	DPS3	15E7	DLIST	164A	DLS2	165A
DL83	1679	DINSTR	1692	DBOUND	17D1	DBD2	17E3
DSYMSCH	17E5	DSS2	17F0	DSS3	1807	DLABEL	180A
DLB2	1828	DOUTOPT	183C	DOUTOPD	1874	DOPD	188E
DOPDTAB	189A	DOTR	18A8	DORP	18B5	DOXY	18C4
DORE	18C9	DOCC	18D4	DC2	18D7	DC3	18D8
DOXYD	18DE	DXD2	18ED	DONO	18F3	DN2	1902
DOTNO	190E	DTN2	191F	DTN3	1926	DOTNOI	192A
DTNI2	192B	DTNI3	1933	DTNI4	1936	DOUTHB	193A
DHB2	1943	DHB3	194C	DOUT	1954	DUT2	195E
DECODE	19A0	DCD2	19B9	DCD3	19BD	DGC0	19DD
DGC07	19FF	DGC06	1A08	DGC04	1A0C	DGC02	1A10
DGC022	1A12	DGC00	1A16	DGC002	1A18	DGC0135	1A21
DGC01352	1A24	DG80	1A31	DG802	1A35	DG803	1A47
DG40	1A4B	DG402	1A54	DG00	1A5D	DG006	1A7F
DG005	1A83	DG004	1A87	DG0042	1A89	DG003	1A92
DG001	1AA3	DGCB	1AB1	DGCB1	1ABD	DGCB3	1ACA
DGCB4	1ACD	DGCB5	1AD4	DGED	1AEA	DGED3	1B08
DGED4	1B14	DGC0TAB1	1B53	DGC0TAB3	1B6B	DGC0TAB5	1B83
DG00TAB	1B9B	DG00TAB0	1BA3	DG00TAB2	1BBB	DG00TAB7	1BD3
DGCBTAB1	1BDB	DGCBTAB2	1BE3	DGEDTAB1	1BE6	DGEDTAB2	1C9A
ENTRY	0100	EOFP	0222	EXIT	028C	E0	03F5
ER	03F7	ENTER	042D	EOF	0766	ERR	0774
ERR2	077B	EXTERN	07D4	E10	0917	E20	0993
E31	0AF6	E32	0AFA	E33	0AFE	E34	0B02
E35	0B06	E36	0B0A	EOL	000B	E1	0C90
E6	0ECA	E7	1020	E11	109C	EQUH	117B
ED2	117E	ENDH	1185	EOPS	143D	EXOP	0040
EIOP	0041	EIOP	0042	E4	17A1	FF	000C

FCB	005C	F1	0000	F2	0001	F3	0002
F4	0003	F5	0004	F6	0005	F7	0006
FLAGS	0207	FEP	022A	FTYPE	023B	FILL	063E
FIL2	0649	FIELD	0E22	FD1	0E2E	FD2	0E37
FD3	0E38	FD4	0E45	FD5	0E49	FD6	0E4D
FD7	0E53	FD8	0E5B	FIND	1035	FIN1	103B
FIN2	1042	FOPS	1450	GOTO	05F1	GOT2	05F7
GOT3	0612	GETNAME	0A29	GN2	0A3E	GN3	0A56
GN4	0A5E	GN5	0A89	GN6	0A90	GETOPTION	0C95
GOPS	1451	GETAREAS	15FA	GTA2	15FF	GETOPD	1754
GD2	1760	GD22	1768	GD3	176D	GD4	1775
GD5	177D	GETKEY	1856	GK2	1859	GETREG	1B4D
HWRITE	04B7	HW1	04C4	HW2	04D0	HW3	04DB
HW32	04E9	HW4	04EE	HREAD	0545	HRD1	0550
HRD2	0553	HOWBIG	0572	HOLD	0CAA	HOPS	1452
HALTOP	0050	IMAGE	0276	INSERT	0474	INPORT	070E
IN2	0717	INL	0003	IBC	0000	IDE	0002
IHL	0004	IAF	000E	ISP	0006	IB	0000
IC	0001	ID	0002	IE	0003	IH	0004
IL	0005	IA	0007	IIX	00DD	IIY	00FD
IREF	0008	IINT	0000	ICY	0018	INCY	0010
IZ	0008	INZ	0000	IPO	0020	IPE	0028
IMIN	0038	IPOS	0030	IMH	12A2	IM2	12AB
IMTAB	12B3	INCH	12B6	INC2	12C6	INTAB	1365
IO1	1379	IO2	1380	IOER	1387	IOPS	1458
INCOP	0060	IMOP	0061	INOP	0062	INIOP	0063
INIROP	0064	INDOP	0065	INDROP	0066	IDFIND	1974
IDF2	1977	IDOUT	1982	IDT2	1984	JL	0003
JUMP	0D0F	JP2	0D18	JP3	0D49	JPTAB	0D51
JRH	10F7	JMPTAB	125F	JMP1	1269	JMP2	126D
JMP21	1270	JMP3	127B	JOPS	1475	JROP	0070
JPOP	0071	KILL	03B8	KEYBOARD	07B0	KB1	07C3
KB2	07C9	KEYTB	13AB	KOPS	147C	KEYADDR	1865
KEYTRAN	1991	LF	000A	LCT	021A	LIMIT	021C
LBLP	022E	LBUFF	0293	LOCATE	0380	LC1	038E
LC2	039E	LINE	03DE	LAST	0412	LINC	0A02
LL	0015	LIST	0D89	LS1	0D9A	LS12	0DAF
LS2	0DBB	LS3	0DCA	LS4	0DCD	LS5	0DEE
LS6	0DFB	LS7	0DFF	LS8	0E00	LS9	0E09
LITLE	0EBE	LITLE2	0EC2	LOADH	115B	LTAB	1187
L1	11C7	L2	11CB	L21	11D2	L3	11D5
L30	11DC	L31	11DF	L4	11E2	L5	11E8
L6	11ED	L61	11EE	L62	11F1	L63	11F4
L7	11F7	LER	11FC	L8	11FF	L9	1211
LA	1218	LB	1220	LC	1225	LE	122E
LE1	123C	LOPS	147D	LDOP	0080	LDIOP	0081
LDIROP	0082	LDDOP	0083	LDDROP	0084	M1	0106
M2	010B	M4	0110	M5	0115	M6	0119
M7	011F	M9	0127	M11	0133	M12	013C
M14	0145	M13	014A	M15	0151	M16	0158
M17	0160	M18	016A	M20	016F	M21	0176
M22	017C	M23	0183	M24	0189	M25	018F
M27	0195	M28	019B	M29	01A1	M30	01B9
M31	01CC	M32	01D5	M33	01DF	M35	01E9
M36	01F2	M40	01FE	M41	0201	M42	0204
MDEF	0224	MODIFY	0651	MOD1	0657	MOD2	065A
MOD3	065D	MOD4	067A	MOD5	0685	MEMCHECK	0987
MEMTOP	0998	MMT2	09A4	MAKE	0AC7	MOFMIX	0ECF
MOFMX2	0ED0	MOFPRE	0EDB	MOFLH	0EDF	MOFH	0EE3
MOFB	0EE6	MOF	0EE7	MOF2	0F04	MOF5	0F0E

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MATH    0F96 MA2
MA5     0FB9 MA50
MA6     0FD8 MA61
ML11    131B ML12
MOPS    1498 NEW
NX1     09AC NYB
NOPS    1499 NOPOP
ONEPAIR 06F7 OUTPORT
OL      0003 OPDSCH
OUTAB   136F OOPS
OUTIOP  00A2 OTIROP
OFFSET  17A6 OFS2
PRINT   0404 PAIR
PAGE    0862 PG2
POSITION 09B4 POS1
PS1     0C46 PS2
PA2     0F31 PA31
PER     0F73 PA4
PPH     128A PP2
PUSHOP  00B0 POPOP
QU2     0696 QU3
QU7     06B9 QOPS
REMOVE  08D6 RNAME
RIHREC  0B93 RIHR1
RIHCH   0BE2 RIHD
RDC2    0C1E RDC3
RE      0008 RESOLV
RETH    1255 ROPS
RETOP   00C0 RSTOP
RLCOP   00C4 RLCAOP
RRCOP   00C8 RRCAOP
RRDOP   00CC RETIOP
SOFP    0220 STK
SREAD   0521 SRD2
SRT2    059E SCAN
SCN3    05B6 SCN31
STRING  0825 STR1
SETDMA  0AED SBL
SYMFIELD 0E1E SYMSCH
SC3     0E9F SBCTAB
SOPS    150C SBCOP
SRAOP   00D3 SRLOP
SWAPHL  16E4 SWAPXY
TEMP    0228 TBUFF
THIS    041C TRAP
TBO2    0ADD TL
TNO     000C TNOI
TOPO    0032 TCOM
TSUB    00C0 TMUL
TOR     0083 TDEF
TE2     0FF7 TE3
TOPS    1529 TREGS
USP     028D UPC
USB     0838 US1
UPDATE  09FF UOPS
UMC     1634 VECTOR
WOPS    152B WRITE
WSED    0AD6 WSCH
WDMRC   0842 WIHCH
WDCC    0B7B WOPS

0F9C MA3
0FC0 MA51
0FE1 MA62
131E ML2
0446 NEXT
09F4 NO
0090 NEGOP
0704 OUTPUT
0E67 OPTSCH
14A2 OROP
00A3 OUTDOP
17B5 PAGENO
06F8 PR2
0B70 PARAMETER
09BC POS2
0C81 PARSER
0F5E PA3
0F76 PA5
1299 PP21
00B1 QDEF
069F QU4
14CC REENTRY
0A1E RSEQ
0BC4 RIHR2
0BF5 RDMACH
0C2E RP
0EAF RSTH
14CD RPAIRS
00C1 RESOP
00C5 RLAOP
00C9 RRAOP
00CD RETNOP
022C SWRITE
0528 SRD3
05A7 SCN1
05D7 SCN4
0827 STARTSTOP
0002 SYMBOL
0E62 SEARCH
12D7 SRH
00D0 SCFOP
00D4 SETOP
171A SXY2
0299 TOP
0898 TRAP2
0010 TR
000D TALPHA
0033 TIND
0080 TDIV
0035 TLIT
1001 TYPE
1550 TRIPLET
0291 UP
083E US2
152A UNSCRAMBLE
0237 VIDEO
0490 WORDSP
0B0F WIHREC
0B50 WIHD
152C XAMINE

0FA3 MA4
0FC6 MA52
0FE8 ML1
1323 ML3
09A6 NX0
0003 NOI
0091 OBJ
0790 OPEN
0E75 ORGH
00A0 OUTOP
00A4 OTDROP
0218 PC
077C PR3
08F2 PARAM1
09CB PASS
0F15 PA1
0F62 PA7
0F7C PA6
129C POPS
0226 QUERY
06A5 QU5
0103 READ
0AD1 RSCH
0BCD RIHR3
0C00 RDC1
0001 RPI
1248 RST2
1565 REREGS
00C2 RLOP
00C6 RROP
00CA RLDOP
00CE SYMWIDTH
049B SW2
053D SORT
05AA SCN2
05DC SPACE
0907 SOF
0CBB SY2
0E94 SC2
134C SR2
00D1 SLAOP
00D5 SUBOP
172C SXY3
03BE TARGET
08CE TBDOS
0000 TRI
0030 TLAB
0034 TADD
0081 TAND
0036 TERM
1025 TYPTAB
1B46 USTK
03AC USER
084D US4
1629 UM2
0796 VID2
09E1 WNAME
0B1A WIHR2
0B61 WDMACH
06C9 XL

0FAE
0FCE
1315
132C
09A9
0007
0232
0AC2
1167
00A1
00A5
0230
077E
08F5
0C43
0F22
0F66
0F94
14C2
0690
06B2
0516
0B8B
0BDA
0C1C
0005
1250
1581
00C3
00C7
00CB
0210
04AB
0587
05AB
078E
097C
0D0C
0E9A
135C
00D2
00D6
1736
03CB
0AD9
0004
0031
0040
0082
0FEF
1053
024E
0834
085D
162F
07A4
0A0C
0B36
0B69
0004
```

XY	0002	XYI	0006	XYD	000A	XTAB	138A
X1	1397	XER	13A3	X2	13A5	X3	13A8
XOPS	152D	XYPAIRS	1579	XOROP	00E0	YOPS	1532
ZEN	0325	ZEN2	037C	ZAP	03E7	ZOPS	1533