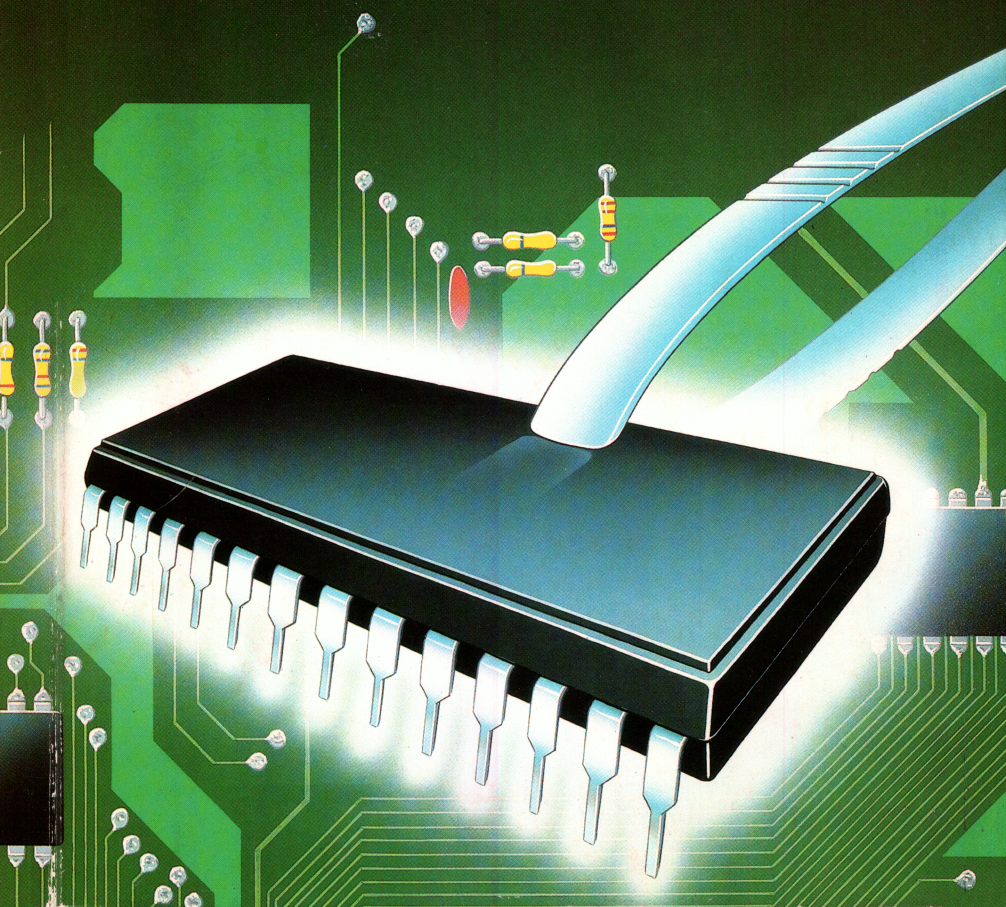


Peter Gerrard Kevin Bergin

The Complete COMMODORE 16 ROM Disassembly



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Commodore 16
ROM Disassembly**

**Peter Gerrard
&
Kevin Bergin**



Duckworth

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Preface

This book is intended to be used by the serious Commodore C16 programmer, and gives a complete disassembly of all the C16 ROM routines.

Also included for reference is the complete 8501 machine code instruction set.

Some sections of the code will obviously not make sense as disassemblies: error messages, for instance, will disassemble into pure garbage! However, for the sake of completeness, it's all been left in.

Many programmers could have produced this book, but not many programmers have access to amenable publishers, as we have. The book has been produced to serve purely as a reference guide and nothing else.

If it leads you to a better understanding of your computer and the way it works, and if it helps you to write better machine code programs, then the purpose of this book will have been achieved.

We'd like to thank the publishers for their help and advice in producing this book, and also the Hare and Hounds public house in Ashford, where the idea for this series of books was first conceived. Thanks are also due to readers of the previous ROM disassembly books. One of the suggestions they made was that we should include an ASCII dump of the tables (i.e. Keywords), and this suggestion has been taken up.

P.G. & K.B.

Fundamental memory map

0000	0	Chip directional register
0001	1	Chip I/O, serial bus & tape control
0002	2	Token value of search
0003 - 0006	3 - 4	Renumber parameters
0007	7	Search character for end of line
0008	8	Scan-quotes flag
0009	9	TAB column save
000A	10	Flag; 0 = load; 1 = verify
000B	11	BASIC input buffer pointer/subscript no.
000C	12	Default DIM flag
000D	13	Variable flag; FF = string; 00 = numeric
000E	14	Numeric flag; 80 = integer; 00 = floating point
000F	15	Flag; DATA scan; LIST quote; memory
0010	16	Flag; Subscript - FNx

0011	17	Flag; 0 = INPUT; 152 = READ; 64 = GET
0012	18	Flag; ATN sign - comparison evaluation
0013	19	Current I/O prompt flag (1 = prompt off)
0014 - 0015	20 - 21	BASIC stores integer values here
0016	22	Pointer; temporary string stack
0017 - 0018	23 - 24	Last temporary string vector
0019 - 0021	25 - 33	Stack for temporary string vector
0022 - 0025	34 - 37	Utility pointer area
0026 - 002A	38 - 42	Product area for multiplication
002B - 002C	43 - 44	Pointer; start of BASIC program
002D - 002E	45 - 46	Pointer; start of BASIC variables - end of current BASIC program
002F - 0030	47 - 48	Pointer; start of arrays - end of variables
0031 - 0032	49 - 50	Pointer; end of arrays
0033 - 0034	51 - 52	Pointer; start of string storage (moves down from top of available memory to arrays and OUT OF MEMORY)
0035 - 0036	53 - 54	Pointer; end of string storage

0037 - 0038	55 - 56	Pointer; to top of current RAM available to BASIC (alter these values to reset top of RAM)
0039 - 003A	57 - 58	Current BASIC line number
003B - 003C	59 - 60	Previous BASIC line number
003D - 003E	61 - 62	Pointer; BASIC statement for CONT
003F - 0040	63 - 64	Current DATA line number
0041 - 0042	65 - 66	Pointer; current DATA item
0043 - 0044	67 - 68	Vector; jump for INPUT statement
0045 - 0046	69 - 70	Current variable name
0047 - 0048	71 - 72	Current variable address
0049 - 004A	73 - 74	Variable pointer for FOR - NEXT statement
004B - 004C	75 - 76	Y-save; operator-save; BASIC pointer-save
004D	77	Comparison symbol
004E - 004F	78 - 79	Work area; function definition pointer
0050 - 0051	80 - 81	Work area; string descriptor pointer
0052	82	Length of string
0053	83	Garbage collect use
0054 - 0056	84 - 86	Jump vector for functions
0057 - 0060	87 - 96	Numeric work area

0061	97	Accumulator #1; exponent
0062 - 0065	98 - 101	Accumulator #1; mantissa
0066	102	Accumulator #1; sign
0067	103	Series evaluation constant pointer
0068	104	Accumulator #1; hi-order (overflow)
0069 - 006E	105 - 110	Accumulator #2; floating point
006F	111	Sign comparison; Accumulator 1 - Accumulator 2
0070	112	Accumulator #2; lo-order (rounding)
0071 - 0072	113 - 114	Cassette buffer length - series pointer
0073 - 0074	115 - 116	Line increment value for auto
0075	117	10k Hi-res; Flag
0076 - 0078	118 - 123	Misc work values
0079 - 007B	121 - 123	DS\$ descriptor
007C - 007D	124 - 125	Top of run-time stack
007E - 007F	126 - 127	Music, tone and volume; temps
0083	131	Current Graphic mode
0084	132	Current colour
0085	133	Multicolour one

0086	134	Foreground colour
0087	135	Maximum No. of columns
0088	136	Maximum No. of rows
0089	137	Paint-left; Flag
008A	138	Paint-right; Flag
008B	139	Paint-stop if not same as background colour
0090	144	Kernal I/O status word;ST
0091	145	STOP/RVS key; Flag
0092	146	Temp
0093	147	Flag; 0= Load. 1 = Verify
0094	148	Flag; serial bus
0095	149	Buffered character for serial bus
0096	150	Temp for BASIC
0097	151	No. of open files, index for file table
0098	152	Default input device (normally 0)
0099	153	Default output device (normally 3)
009A	154	Flag; \$80 = direct mode, \$00 = program mode
009B	155	Tape pass 1 error log
009c	156	Tape pass 2 error log

009F - 00A0	159 - 160	Temp. data area
00A1 - 00A2	160 - 161	Monitor working vector
00A3 - 00A5	163 - 165	Real time jiffy clock
00A6	166	Serial bus usage
00A7	167	Read/write byte from tape
00A8	168	Temp for serial routine
00A9	169	Temporary colour vector
00AA	170	Countdown, tape write/bit count
00AB	171	Current filename length
00AC	172	Current logical file number
00AD	173	Current secondary address
00AE	174	Current device number
00AF - 00B0	175 - 176	Pointer; current filename
00B2 - 00B3	178 - 179	I/O start address (low byte, high byte)
00B4 - 00B5	180 - 181	Load RAM base
00B6 - 00B7	182 - 183	Pointer to cassette base
00BA - 00BB	186 - 187	Pointer to data, tape write
00BE - 00BF	190 - 191	Pointer; Bank fetch
00C0 - 00C1	192 - 193	Temp; scrolling
00C2	194	Flag; RVS/n
00C3	195	End of line for Input pointer

00C4 - 00C5	196 - 197	Input cursor log (row, column)
00C6	198	Which key: 64 if no key
00C7	199	Flag; INPUT or GET from keyboard
00C8 - 00C9	200 - 201	Pointer; current screen line address
00CA	202	Cursor position on above line
00CB	203	0 = direct else programmed
00CC	204	Current screen line length
00CD	205	Current cursor physical line number
00CE	206	Last I/O character
00CF	207	Flag; insert mode
00D0 - 00D7	208 - 215	Used by speech software
00D8 - 00E8	216 - 232	Used by application software
00E9	233	Screen line link table
00EA - 00EB	234 - 235	Screen editor colour
00EC - 00EE	236 - 238	Screen work values
00EF	239	Number of characters in keyboard buffer
00F0	240	Flag; Pause
00F1 - 00F4	241 - 244	Monitor; storage
00F5	245	Cassette checksum
00F6	246	Monitor work value

00F7 - 00F8	247 - 248	Cassette work values
00F9	249	DMA control mask
00FA	250	Work byte
00FB	251	Current ROM bank
0100 - 010A	256 - 257	Processor stack area
0200 - 0258	512 - 600	BASIC input / Monitor buffer
0259 - 025C	601 - 604	BASIC storage
025D - 02AC	605 - 684	BASIC/DOS interface area
02AD - 02B0	685 - 688	Current x,y position
02B1 - 02B4	689 - 692	Destination for X and Y coordinates
02B5 - 02CB	693 - 715	Graphics work area
02CC - 02E8	716 - 744	Print using, Graphics work area
02E9	745	Temp screen row number
02EA	746	String length
02EB	747	Trace on = 255
02EC - 02EE	748 - 750	Directory work area
02EF	751	Graphics work area
02F0	752	Number of graphics parameters
02F1	753	Parameter relative or absolute (1 - 0)
02F2 - 02F3	754 - 755	Vector; Float-fixed

02F4 - 02F5	756 - 757	Vector; Fixed-float	
02F6 - 02FD	758 - 765	Unused	
02FE - 02FF	766 - 767	Vector; for function cartridge users	
0300 - 0301	768 - 769	Error message link	[8686]
0302 - 0303	770 - 771	Warm start link	[8712]
0304 - 0305	772 - 773	Crunch Basic Tokens link	[8956]
0306 - 0307	774 - 775	Char. list link	[8B6E]
0308 - 0309	776 - 777	Char. dispatch	[8BD6]
030A - 030B	778 - 779	Token evaluation	[9417]
030C - 030D	780 - 781	Crunch hook vector	[896A]
030E - 030F	782 - 783	List hook vector	[8B88]
0310 - 0311	784 - 785	Execute hook vector	[8C8B]
0312 - 0313	786 - 787	Interrupt link	[CE42]
0314 - 0315	788 - 789	Hardware interrupt vector	[CE0E]
0316 - 0317	790 - 791	BRK interrupt vector	[F44C]
0318 - 0319	792 - 793	OPEN vector	[EF53]
031A - 031B	794 - 795	CLOSE vector	[EE5D]
031C - 031D	796 - 797	Set-input vector	[ED18]
031E - 031F	798 - 799	Set-output vector	[ED60]
0320 - 0321	800 - 801	Restore I/O vector	[EFOC]
0322 - 0323	802 - 803	INPUT vector	[EBE8]

0324 - 0325	804 - 805	Output vector	[EC4B]
0326 - 0327	806 - 807	Test-STOP vector	[F265]
0328 - 0329	808 - 809	GET vector	[EBD9]
032A - 032B	810 - 811	Abort I/O vector	[EF08]
032C - 032D	812 - 813	User defined vector	[F44C]
032E - 032F	814 - 815	LOAD link	[F04A]
0330 - 0331	816 - 817	SAVE link	[F1A4]
0333 - 03F2	819 - 1010	Cassette buffer	
03F3 - 03F4	1011 - 1012	Data length to tape (write)	
03F5 - 03F6	1013 - 1014	Data length to tape (read)	
03F7 - 0436	1015 - 1078	RS232 input buffer	
0437 - 0472	1079 - 1138	Tape error log	
0473 - 0478	1139 - 1144	CHRGET	
0479 - 0484	1145 - 1156	CHRGOT	
04E7 - 04EA	1255 - 1258	PU characters	
04EB - 04EE	1259 - 1262	String work area	
04EF - 04F6	1263 - 1270	TRAP and error logs	
04F7	1271	Stack pointer for error trap	
04F8 - 04FB	1272 - 1275	DO loop work area	
04FC - 04FF	1276 - 1279	Sound work area	
0500 - 0502	1280 - 1282	USR program jump	
0503 - 0508	1283 - 1288	RND seed value	

0509 - 0512	1289 - 1298	Logical file number
0513 - 051C	1299 - 1308	Device number
051D - 0526	1309 - 1318	Secondary address
0527 - 0530	1319 - 1328	Keyboard buffer
0531 - 0532	1329 - 1330	Start of memory
0533 - 0534	1331 - 1332	Top of memory
0535 - 0536	1333 - 1334	Timeout/end flags
0537 - 0538	1335 - 1336	Tape buffer counts
0539	1337	Tape buffer pointer
053A	1338	Tape file type
053B	1339	Character (colour) attribute
053C	1340	Flash flag
053D	1341	Unused
053E	1342	Base location of screen top
053F	1343	Keyboard buffer size
0540	1344	Flag; key repeat; 128 = all - 64 = none
0541 - 0542	1345 - 1346	Key repeat counters
0543	1347	Key shift flag
0544	1348	Last shift pattern
0545 - 0546	1349 - 1350	Keyboard table setup vector
0548	1352	Flag; Auto scroll
0549 - 054A	1353 - 1354	Screen work values

054B - 055C	1355 - 1372	MLM work locations
055D	1373	FN key pending count
055E	1374	FN key pointer
055F - 05E6	1375 - 1510	Key definition area
05E7 - 05EB	1511 - 1515	DMA work locations
05EC - 06EB	1516 - 1771	Banking routine page
05F0 - 05F1	1520 - 1521	Long jump vector
05F2 - 05F4	1522 - 1524	Long jump registers
05F5 - 06EB	1525 - 1791	Reserved RAM for extra ROMs
06EC - 07AF	1792 - 1967	BASIC pseudo stack
07B0 - 07CC	1968 - 1996	Tape working values
07CD - 07D0	1997 - 2000	RS232 working values
07D1	2001	RS232 in pointer
07D2	2002	RS232 read pointer
07D3	2003	RS232 input counter
07D4 - 07D8	2004 - 2008	RS232 work values
07D9 - 07E4	2009 - 2020	Character load program
07E5	2021	Current screen bottom margin
07E6	2022	Current screen top margin
07E7	2023	Current screen left margin
07E8	2024	Current screen right margin

07E9	2025	0 = scrolling enabled
07EA	2026	255 = auto insert enable
07EB	2027	Previous character printed
07EC - 07ED	2028 - 2029	Current colour attribute
07EE - 07F1	2030 - 2033	Screen line wrap table
07F2	2034	SYS A-reg save
07F3	2035	SYS X-reg save
07F4	2036	SYS Y-reg save
07F5	2037	SYS status reg save
07F6	2038	New key detect
07F7	2039	Lockout CTRL-S
07F8	2040	Monitor read
07F9	2041	Colour decode switch
07FA	2042	Split screen bit mask
07FB	2043	Split screen video base
07FC	2044	Tape motor interlock
0800 - 0BFF	2048 - 3071	Colour memory
0C00 - 0FFF	3072 - 4095	Screen memory
1000	4096	Start of BASIC RAM (in lo-res)
2000	8192	Start of BASIC RAM (in hi-res)
8000 - FFFF	32768 - 65535	BASIC ROM

D000 - D7FF	53248 - 55295	Character sets in ROM
FD10 - FD1F	64784 - 64799	Parallel port-6529
FDD0 - FDDF	64976 - 64991	ROM bank select
FE00 - FEFF	65024 - 65279	DMA disk interface
FF00 - FF1F	65280 - 65311	TED I/O control chip

C16 ROM memory map

8 0 0 0 ; Module or Cold start
8 0 0 3 ; Warm restart
8 0 1 9 ; Initialize
8 0 2 E ; Initialize Basic
8 0 C F ; Power up message
8 1 0 5 ; Vectors for \$300
8 1 1 7 ; Initialize vectors
8 1 2 3 ; CHRGET
'
8 1 5 5 ; Error message vectors
8 1 8 E ; Keywords
8 3 8 3 ; Keyword Action vectors
8 4 1 B ; Function vectors
8 4 5 5 ; Operator vectors
8 4 7 1 ; Error messages
8 6 7 E ; Error routine
8 6 8 1 ; 'out of memory'
8 6 F 1 ; Break Entry
8 6 F B ; 'ready.'

8 7 0 6 ; Ready for Basic
8 7 2 E ; Handle new line
8 8 1 8 ; Re-chain lines
8 8 5 A ; Receive input line
8 8 6 E ; Scan stack FOR/GOSUB
8 8 C 0 ; Move memory
8 9 0 5 ; Check stack depth
8 9 2 3 ; Check memory space
8 9 5 3 ; Crunch tokens
8 A 3 D ; Find new Basic line
8 A 7 9 ; Perform [NEW]
8 A 9 8 ; Perform [CLR]
8 A E D ; Back up text pointer
8 A F F ; Perform [LIST]
8 B B C ; Perform [RUN]
8 C 2 5 ; Execute statement
8 C 9 A ; Perform [RESTORE]
8 C C 0 ; Break
8 C D 8 ; Perform [STOP]
8 C D A ; Perform [END]
8 D 0 3 ; Perform [CONT]
8 D 2 C ; Perform [GOSUB]

8 D 4 D ; Perform [GOTO]
8 D 8 3 ; Perform [RETURN]
8 D B 0 ; Perform [DATA]
8 D B E ; Scan for next statement
8 D E 1 ; Perform [IF]
8 E 0 B ; Perform [REM/ELSE]
8 E 1 B ; Perform [ON]
8 E 3 E ; Get fixed point number
8 E 7 C ; Perform [LET]
8 F E 0 ; Perform [PRINT #]
8 F E 6 ; Perform [CMD]
9 0 0 0 ; Perform [PRINT]
9 0 8 8 ; Print string from (y.a)
9 0 A 6 ; Print format character
9 0 B 8 ; Perform [GET]
9 0 E E ; Perform [INPUT #]
9 1 0 8 ; Perform [INPUT]
9 1 4 2 ; Prompt and input
9 1 4 F ; Perform [READ]
9 2 0 B ; Input error messages
9 2 9 4 ; Perform [NEXT]
9 3 1 4 ; Type match check

9 3 2 C ; Evaluate expression
9 4 3 9 ; Constant pi
9 4 8 5 ; Evaluate within brackets
9 4 8 B ; ')'
9 4 9 3 ; Comma..
9 4 A 1 ; Syntax error
9 4 A D ; Search for variable
9 5 6 1 ; Set up FN reference
9 5 F B ; Perform [OR]
9 6 0 2 ; Perform [AND]
9 6 2 8 ; Compare
9 6 9 B ; Perform [DIM]
9 6 A 5 ; Locate variable
9 7 3 A ; Check Alphabetic
9 7 4 4 ; Create variable
9 8 5 B ; Array pointer subroutine
9 8 6 C ; Value 32768
9 8 7 9 ; Float-fixed
9 8 9 B ; Set up array
9 9 1 C ; 'bad subscript'
9 9 2 1 ; Illegal quantity
9 A 2 F ; Compute array size

9 A 6 2 ; Perform [FRE]
9 A 7 6 ; Fix-float
9 A 7 D ; Perform [POS]
9 A 8 6 ; Check direct
9 A 9 D ; Perform [DEF]
9 A C B ; Check fn syntax
9 A D E ; Perform [FN]
9 B 5 4 ; Calculate string vector
9 B 6 6 ; Perform [STR\$]
9 B 7 4 ; Set up string
9 B D A ; Concatenate
9 C 1 B ; Build string to memory
9 C 4 B ; Discard unwanted string
9 C 5 2 ; Make room for string
9 C A A ; Clean descriptor stack
9 C B B ; Perform [CHR\$]
9 C C F ; Perform [LEFT\$]
9 D 0 3 ; Perform [RIGHT\$]
9 D 1 5 ; Perform [MID\$]
9 D 4 6 ; Pull string parameters
9 D 6 1 ; Perform [LEN]
9 D 6 7 ; Exit string mode

9 D 7 0 ; Perform [ASC]
9 D 8 1 ; input byte parameter
9 D 9 3 ; Perform [VAL]
9 D C F ; Parameters for POKE/WAIT
9 D D E ; Parameters for SOUND
9 D E 4 ; Float-fixed
9 D F A ; Perform [PEEK]
9 E 1 2 ; Perform [POKE]
9 E 1 B ; Perform [DEC]
9 E 6 A ; Perform [WAIT]
9 E 8 7 ; Perform [subtract]
9 E 9 E ; Perform [add]
9 F 7 B ; Complement FAC # 1
9 F B 2 ; 'overflow'
9 F B 7 ; Multiply by zero byte
A 0 1 E ; Perform [LOG]
A 0 7 B ; Perform [multiply]
A 0 A 9 ; Multiply-a-bit
A 0 D C ; Memory to FAC #2
A 1 0 7 ; Adjust FAC #1/2
A 1 5 4 ; Underflow/overflow
A 1 6 2 ; Multiply by 10

A 1 7 9 ; 10 in floating point
A 1 7 E ; Divide by 10
A 1 9 7 Perform [divide]
A 2 1 F ; Memory to FAC #1
A 2 4 C ; FAC #1 to memory
A 2 8 1 ; FAC #2 to FAC #1
A 2 9 1 ; FAC #1 to FAC #2
A 2 A 0 ; Round FAC #1
A 2 B 0 ; Get sign
A 2 B E ; Perform [SGN]
A 2 C E ; Fixed-float
A 2 D D ; Perform [ABS]
A 2 E 0 ; Compare FAC #1 to mem
A 3 2 0 ; Float-fixed
A 3 5 8 ; Perform [int]
A 3 7 F ; String to FAC
A 4 0 A ; Get ASCII digit
A 4 5 3 ; Print 'IN..'
A 4 5 F ; Print line number
A 4 6 F ; Float to ASCII
A 5 A 3 ; Decimal constants
A 5 C C TI constants

A 5 E 4 ; Perform [SQR]
A 5 E E ; Perform [power]
A 6 2 7 ; Perform [negative]
A 6 6 0 ; Perform [EXP]
A 6 B 3 ; Series evaluation 1.
A 6 C 9 ; Series evaluation 2.
A 7 0 7 ; Perform [RND]
A 7 6 0 ; Save Basic stack
A 7 6 9 ; Restore Basic stack
A 7 7 2 ; Trim Basic stack
A 7 7 D ; Kernal calls
A 7 B 5 ; Perform [SYS]
A 7 D E ; Perform [SAVE]
A 7 F 0 ; Perform [VERIFY]
A 7 F 3 ; Perform [LOAD]
A 8 4 D ; Perform [OPEN]
A 8 5 A ; Perform [CLOSE]
A 8 6 B ; Parameters for LOAD/SAVE
A 8 9 D ; Check default parameters
A 8 A 5 ; Check for comma
A 8 B 0 ; Parameters for open/close
A 9 0 6 ; Make room for string

A 9 5 4 ; Garbage collection
A A 5 7 ; Calculate end of string
A A 7 0 ; Perform [COS]
A A 7 7 ; Perform [SIN]
A A C 0 ; Perform [TAN]
A B 1 A ; Perform [ATN]
A B 8 F ; Perform [RENUMBER]
A D C A ; Perform [FOR]
A E 5 A ; Perform [DELETE]
A E F 7 ; Print using
B 4 2 B ; Perform [TRAP]
B 4 4 0 ; Perform [RESUME]
B 4 B E ; Perform [ERR\$]
B 5 0 7 ; Perform [HEX\$]
B 5 4 4 ; Perform [PUDEF]
B 5 5 7 ; Perform [DO]
B 5 A C ; Perform [EXIT]
B 6 0 3 ; Perform [LOOP]
B 6 5 2 ; Perform [TRON]
B 6 5 5 ; Perform [TROFF]
B 6 C D ; Perform [AUTO]
B 6 E 8 ; Perform [HELP]

B 7 2 9 ; Perform [KEY]
B 7 C 2 ; Key redefinition
B 8 4 9 ; Perform [SOUND]
B 8 B D ; Perform [VOL]
B 8 D 1 ; Perform [PAINT]
B 9 D 4 ; Perform [CHAR]
B A E 2 ; Perform [BOX]
B D 3 5 ; Perform [GSHAPE]
B E 2 9 ; Perform [SSHAPE]
B F 7 9 ; Perform [RGR]
B F 8 5 ; Perform [RCLR]
B F 8 7 ; Perform [RLUM]
B F C 1 ; Perform [RJOY]
B F F D ; Perform [RDOT]
C 0 1 E ; Perform [CIRCLE]
C 3 7 B ; Set graphics cursor
C 3 F 7 ; Parse graphics commands
C 4 8 F ; Get graphics parameters
C 4 D 9 ; Perform [DRAW]
C 5 0 F ; Perform [LOCATE]
C 5 1 A ; Perform [COLOR]
C 5 6 7 ; Perform [SCNCLR]

C 5 B 8 ; Perform [SCALE]
C 5 C 3 ; Perform [GRAPHIC]
C 7 B F ; Confirm graphics
C 8 B C ; Perform [DIRECTORY]
C 9 4 1 ; Perform [DSAVE]
C 9 5 1 ; Perform [DLOAD]
C 9 6 8 ; Perform [HEADER]
C 9 9 C ; Perform [SCRATCH]
C 9 C C ; Perform [COLLECT]
C 9 D A ; Perform [COPY]
C 9 F 4 ; Perform [RENAME]
C A 0 0 ; Perform [BACKUP]
C B 1 F ; Parse DOS command
C D A B ; List of names!
C E 0 0 ; Interrupt entry
C E 0 E ; IRQ sequence
C E 6 0 ; Do split screen
C E F 0 ; Kernal UDTIM
C F 2 6 ; Get time
C F 2 D ; Set time
C F 6 6 ; Print monitor messages
C F 8 A ; Get colour code

C F 9 6 ; Fetch memory
C F B F ; Handle tape motor
D 8 0 B ; Screen in address low
D 8 3 4 ; Get screen size
D 8 3 9 ; Put/get row/column
D 8 4 9 ; Get I/O address
D 8 4 E ; Initialize I/O
D 8 8 8 ; ESC-n normal screen
D 8 9 1 ; Clear screen
D 8 9 A ; Home cursor
D 8 A 1 ; Set screen pointers
D 8 D 4 ; Input from keyboard
D 9 6 5 ; Input from screen
D 9 B A ; Quote test
D 9 C 7 ; Setup screen print
D A 2 1 ; Check line increment
D B 1 1 ; Read keyboard
D C 4 9 ; Output to screen
D C D A ; Graphics/text control
D C E 6 ; Set colour code
D D 0 D ; Check line decrement
D D 2 E ; Lock shift

D D 3 5 ; Unlock shift
D E 0 6 ; Decode escapes
D E 1 A ; ESC vectors
D E 4 8 ; ESC-R; reduce screen
D E 5 E ; ESC-T; top of window
D E 6 0 ; ESC-B; bottom of window
D E 8 B ; ESC-I; insert line
D E A 0 ; ESC-D; delete line
D E C B ; ESC-Q; erase to end
D E E 1 ; ESC-P; erase from start
D E F 6 ; ESC-V; scroll up
D F 0 4 ; ESC-W; scroll down
D F 1 D ; ESC-L; scroll enable
D F 2 0 ; ESC-M; scroll disable
D F 2 6 ; ESC-C; cancel insert
D F 2 9 ; ESC-A; auto insert
D F 3 9 ; Check screen line wrap
D F 4 6 ; Break screen wrap
D F 5 9 ; Make screen wrap
D F 6 6 ; Calculate screen wrap mask
D F 8 2 ; ESC-J; start-line
D F 9 5 ; ESC-K; end-line

E 0 1 E ; Keyboard select vectors
E 0 2 6 ; Keyboard 1 - unshifted
E 0 6 7 ; Keyboard 2 - shifted
E 0 A 8 ; Keyboard 3 - 'comm'
E 0 E 9 ; Keyboard 4
E 1 2 A ; Shift/run equivalent
E 1 3 3 ; Colour code table
E 1 5 8 ; Send 'listen'
E 1 8 1 ; Send to serial bus
E 1 E E ; Serial timeout
E 1 F 7 ; Send listen SA
E 1 F C ; Clear ATN
E 2 0 3 ; Send talk SA
E 2 0 8 ; Wait for clock
E 2 1 D ; Send serial deferred
E 2 2 F ; Send 'untalk'
E 2 4 2 ; Send 'unlisten'
E 2 5 2 ; Receive from serial bus
E 2 B 8 ; Serial clock on
E 2 C D ; Serial clock off
E 2 D 4 ; Get serial in & clock
E 3 1 1 ; Delay 1 ms.

E 3 1 9 ; 'press record'
E 3 1 B ; 'press play'
E 3 2 7 ; Tape message
E 3 6 4 ; Blank screen
E 3 7 8 ; Screen on
E 3 8 D ; Start tape
E 3 A 2 ; Copyright message
E 3 B 0 ; Kill motor
E 5 3 5 ; Write tape header
E 5 B 0 ; Initiate tape write
E 8 F 3 ; Initiate tape read
E 9 C C ; Find any tape header
E A 2 1 ; Find specific header
E B 5 8 ; I/O error
E B 7 3 ; Tape messages...
E B C 6 ; Print if direct
E B D 9 ; Get...
E B E 8 ; Input
E C 4 B ; Output
E D 1 8 ; Set input device
E D 6 0 ; Set output device
E D F A ; Send 'talk'

E E 5 D ; Close file
E E F 8 ; Set file values
E F 0 8 ; Abort all files
E F 0 C ; Restore default I/O
E F 5 3 ; Do open file
F 0 0 5 ; Send SA
F 0 4 3 ; Load program
F 0 6 4 ; From serial
F 0 F 0 ; From tape
F 1 6 0 ; 'searching'
F 1 7 2 ; Print filename
F 1 8 9 ; Print 'loading/verifying'
F 1 9 4 ; Save program
F 1 A 4 ; Save link
F 1 B 5 ; Save to serial
F 2 0 6 ; Bump r/w pointer
F 2 2 8 ; Print 'saving'
F 2 3 4 ; Save to tape
F 2 6 5 ; Check stop key
F 2 7 3 ; Output error messages
F 2 A 4 ; Power reset entry
F 2 C E ; Kernal reset

F 2 D 3 ; Kernal move
F 2 E B ; IRQ Vectors
F 3 0 B ; Initialize I/O
F 3 5 2 ; Initialize system consts.
F 3 D 0 ; Function key commands
F 4 0 C ; Save filename data
F 4 1 3 ; Save file details
F 4 1 A ; Flag status
F 4 1 C ; Get status
F 4 1 E ; Set status
F 4 2 3 ; Set timeout
F 4 2 7 ; Read/set top of memory
F 4 2 9 ; Read top of memory
F 4 2 F ; Set top of memory
F 4 3 6 ; Read/set bottom of memory
F 4 4 5 ; Perform [MONITOR]
F 4 4 C ; BRK/USR entry
F 4 7 8 ; Perform ['R']
F 4 D 7 ; Perform ['M']
F 5 2 9 ; Perform ['>']
F 5 4 B ; Perform ['G']
F 5 7 0 ; Monitor commands

F 5 8 2 ; Addresses for Monitor commands

F 5 C E ; Perform ['C']

F 5 D 1 ; Perform ['T']

F 6 0 E Perform ['H']

F 6 C A ; Print '?'

F 6 E 0 ; Perform ['S']

F 6 F 1 ; Perform ['L']

F 6 F 3 ; Perform ['V']

F 7 0 A ; Perform ['F']

F 7 2 4 ; Perform ['D']

F 9 1 F ; Perform ['A']

F B D 8 ; Output messages

F C 1 9 ; Get I/O address

F C 1 E ; Check 8-rom

F C 5 6 ; 8-rom mask

F C 5 9 ; Phoenix routine

F C 7 F ; Long fetch routine

F C 8 9 ; Long jump routine

F C B 3 ; IRQ entry

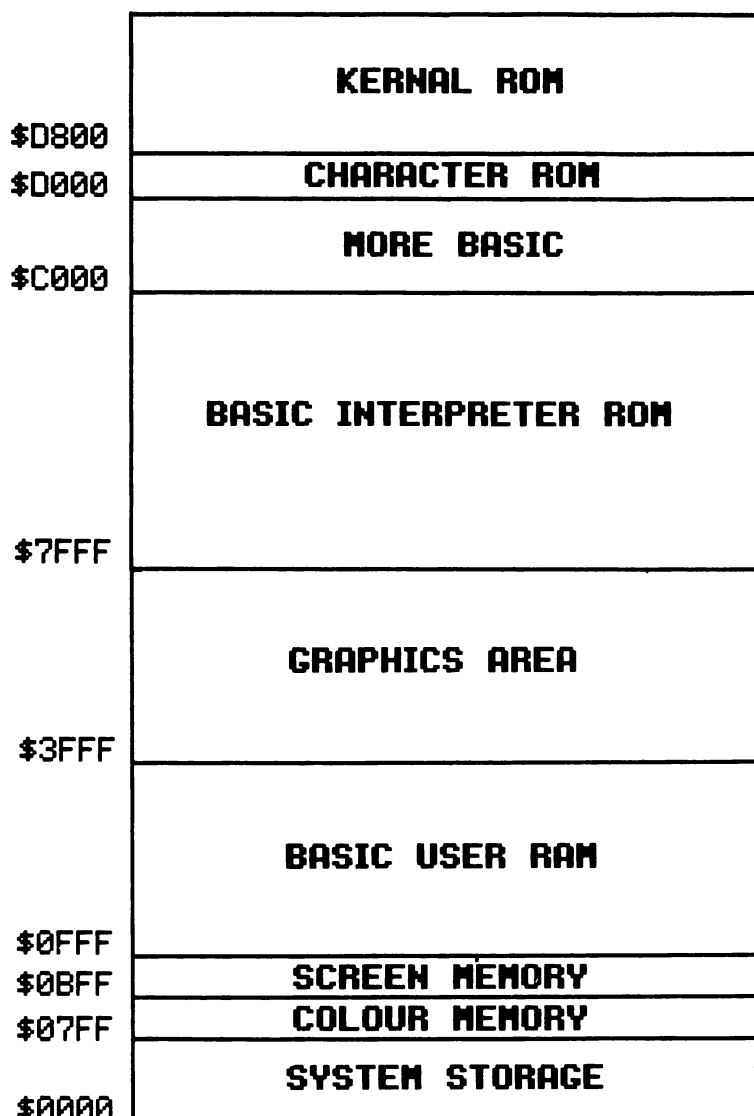
F C B 8 ; Long IRQ routine

F C D 1 ; ROM banking routines

F C F 4 ; Phoenix entry

F C F 7 ; Long fetch entry
F C F A ; Long jump entry
F C F D ; Long IRQ entry
F D 0 0 ; ACIA
F D 1 0 ; 6529 Parallel port
F D D 0 ; Cartridge Bank port
F E 0 0 ; DMA disk system
F F 3 0 ; Ted Chip
F F 4 9 ; Jump Table
F F 8 1 ; Jumbo jump table
F F F 6 ; Hardware vectors

Architecture map



TED chip

FF00											L	65280
FF01							T1				H	65281
FF02											L	65282
FF03			TIMERS								H	65283
FF04											L	65284
FF05							T3				H	65285
FF06									ROWS			65286
FF07									COLUMNS			65287
FF08									KEYBOARD LATCH			65288
FF09	IRQ	FLAG: T3					T2	T1	LP	RAST		65289
FF0A	IRQ:	T3					T2	T1	LP	RAST		65290
FF0B												65291
FF0C												65292
FF0D												65293
FF0E									SOUND-VOICE 1			65294
FF0F									VOICE 2			65295
FF10											VOICE 2 H1	65296
FF11									SOUND SELECT		VOLUME	65297
FF12											VOICE 1 H1	65298
FF13									CHARACTER BASE			65299
FF14									VIDEO MATRIX			65300
FF15											0	65301
FF16							LUMINANCE	COLOUR			1	65302
FF17											2	65303
FF18							BACKGROUND	COLOURS			3	65304
FF19											4	65305
FF1A												65306
FF1B												65307
FF1C												65308
FF1D												65309
FF1E												65310
FF1F												65311
FF3E									ROM SELECT			65342
FF3F									RAM SELECT			65343

ROM Disassembly

8000; Module or Cold start

8000 4C 19 80 JMP \$8019

8003; Warm restart

8003 4C 0A 80 JMP \$800A
 8006 00 BRK
 8007 43 ???
 8008 42 ???
 8009 4D 20 CC EOR \$CC20
 800C FF ???
 800D 20 D8 8A JSR \$8AD8
 8010 85 13 STA \$13
 8012 20 C9 C7 JSR \$C7C9
 8015 58 CLI
 8016 4C 7E 86 JMP \$867E

8019; Initialize

8019 20 17 81 JSR \$8117
 801C 20 2E 80 JSR \$802E
 801F 20 C2 80 JSR \$80C2
 8022 20 F4 FC JSR \$FCF4
 8025 A2 FB LDX #\$FB
 8027 9A TXS
 8028 D0 EC BNE \$8016
 802A 71 98 ADC (\$98),Y
 802C 71 94 ADC (\$94),Y

802E; Initialize Basic

802E A9 4C LDA #\$4C
 8030 85 54 STA \$54
 8032 8D 00 05 STA \$0500
 8035 A9 1C LDA #\$1C
 8037 A0 99 LDX #\$99
 8039 8D 01 05 STA \$0501
 803C 8C 02 05 STY \$0502
 803F A2 03 LDX #\$03
 8041 BD 2A 80 LDA \$802A,X
 8044 9D F2 02 STA \$02F2,X
 8047 CA DEX
 8048 10 F7 BPL \$8041
 804A A2 32 LDX #\$32
 804C BD 22 81 LDA \$8122,X
 804F 9D 72 04 STA \$0472,X
 8052 CA DEX
 8053 D0 F7 BNE \$804C
 8055 86 68 STX \$68
 8057 86 13 STX \$13
 8059 86 18 STX \$18
 805B 8E EB 02 STX \$02EB
 805E 8E 00 10 STX \$1000
 8061 8A TXA
 8062 A2 03 LDX #\$03
 8064 95 72 STA \$72,X

8066 9D E5 02 STA \$02E5,X
 8069 CA DEX
 806A D0 F8 BNE \$8064
 806C EA NOP
 806D 8E 03 05 STX \$0503
 8070 EB INX
 8071 8E FD 01 STX \$01FD
 8074 8E FC 01 STX \$01FC
 8077 AE 3B 05 LDX \$053B
 807A 86 86 STX \$86
 807C A2 36 LDX #\$36
 807E 86 85 STX \$85
 8080 A2 19 LDX #\$19
 8082 86 16 STX \$16
 8084 A2 01 LDX #\$01
 8086 A0 10 LDY #\$10
 8088 86 28 STX \$28
 808A 84 2C STY \$2C
 808C A2 05 LDX #\$05
 808E 86 22 STX \$22
 8090 A9 D0 LDA #\$D0
 8092 8D E4 02 STA \$02E4
 8095 A2 02 LDX #\$02
 8097 BD 32 05 LDA \$0532,X
 809A 95 36 STA \$36,X
 809C 95 32 STA \$32,X
 809E CA DEX
 809F D0 F6 BNE \$8097
 80A1 A0 00 LDY #\$00
 80A3 B9 47 81 LDA \$8147,Y
 80A6 9D A5 04 STA \$04A5,X
 80A9 EB INX
 80AA CB INY
 80AB C0 0B CPY #\$0B
 80AD 90 F4 BCC \$80A3
 80AF A4 22 LDY \$22
 80B1 B9 BC 80 LDA \$80BC,Y
 80B4 9D 9F 04 STA \$049F,X
 80B7 C6 22 DEC \$22
 80B9 10 E6 BPL \$80A1
 80BB 60 RTS
 80BC 64 ???
 80BD 5F ???
 80BE 6F ???
 80BF 24 22 BIT \$22
 80C1 3B ???
 80C2 A5 2B LDA \$2B
 80C4 A4 2C LDY \$2C
 80C6 20 23 89 JSR \$8923
 80C9 20 4F FF JSR \$FF4F
 80CC 93 ???

80CF; Power up message :COMMODORE

80CD 0D 20 43 ORA \$4320 :E BASIC
 80D0 4F ??? :V3.5 .%7
 80D1 4D 4D 4F EOR \$4F4D :8e+*%8e,
 80D4 44 ??? :_ \$ B
 80D5 4F ??? :YTES FRE
 :E..L(...

```

80D6 52 ???
80D7 45 20 EOR #20
80D9 42 ???
80DA 41 53 EOR (#53,X)
80DC 49 43 EOR #*43
80DE 20 56 33 JSR $3356
80E1 2E 35 20 ROL $2035
80E4 00 BRK
80E5 A5 37 LDA #37
80E7 38 SEC
80E8 E5 2B SBC #2B
80EA AA TAX
80EB A5 38 LDA #38
80ED E5 2C SBC #2C
80EF 20 5F A4 JSR #A45F
80F2 20 4F FF JSR $FF4F
80F5 20 42 59 JSR $5942
80F8 54 ???
80F9 45 53 EOR #53
80FB 20 46 52 JSR $5246
80FE 45 45 EOR #45
8100 0D 00 4C ORA $4C00
8103 7B ???
8104 8A TXA

```

8105; Vectors for \$300

```

8105 86 86 STX #86
8107 12 ???
8108 87 ???
8109 56 89 LSR #89,X
810B 6E 8B D6 ROR #D68B
810E 8B ???
810F 17 ???
8110 94 6A STY #6A,X
8112 89 ???
8113 88 DEY
8114 8B ???
8115 8B ???

```

8117; Initialize vectors

```

8116 8C A2 11 STY $11A2
8119 BD 05 81 LDA #8105,X
811C 9D 00 03 STA #0300,X
811F CA DEX
8120 10 F7 BPL #8119
8122 60 RTS

```

8123; CHRGET

```

8123 E6 3B INC #3B
8125 D0 02 BNE #8129
8127 E6 3C INC #3C
8129 78 SEI
812A 8D 3F FF STA $FF3F
812D A0 00 LDY #00
812F B1 38 LDA (#3B),Y
8131 8D 3E FF STA $FF3E
8134 58 CLI
8135 C9 3A CMP #*3A
8137 B0 0A BCS #8143
8139 C9 20 CMP #*20
813B F0 E6 BEQ #8123
813D 38 SEC
813E E9 30 SBC #*30
8140 38 SEC

```

```

8141 E9 D0 SBC #*D0
8143 60 RTS
8144 8D 9C 04 STA #049C
8147 78 SEI
8148 8D 3F FF STA $FF3F
814B B1 00 LDA (#00),Y
814D 8D 3E FF STA $FF3E
8150 58 CLI
8151 60 RTS
8152 00 BRK
8153 00 BRK
8154 00 BRK

```

8155; Error message vectors

```

8155 A9 43 LDA ##43
8157 D0 32 BNE #818B
8159 A9 4E LDA #*4E
815B D0 2E BNE #818B
815D A9 14 LDA #*14
815F D0 2A BNE #818B
8161 A9 47 LDA #*47
8163 D0 26 BNE #818B
8165 A9 4E LDA #*4E
8167 D0 22 BNE #818B
8169 A9 5C LDA #*5C
816B D0 1E BNE #818B
816D A9 5F LDA #*5F
816F D0 1A BNE #818B
8171 A9 3D LDA #*3D
8173 D0 16 BNE #818B
8175 A9 57 LDA #*57
8177 D0 12 BNE #818B
8179 A9 59 LDA #*59
817B D0 0E BNE #818B
817D A9 62 LDA #*62
817F D0 0A BNE #818B
8181 A9 50 LDA #*50
8183 D0 06 BNE #818B
8185 A9 6C LDA #*6C
8187 D0 02 BNE #818B
8189 A9 5A LDA #*5A
818B 4C 94 04 JMP #0494

```

818E; Keywords

```

818E 45 4E EOR #4E :ENDFORNE
8190 C4 46 CPY #46 :XTDATAIN
8192 4F ??? :PUT#INPU
8193 D2 ??? :TDIMREAD
8194 4E 45 58 LSR #5845 :LETGOTOR
8197 D4 ??? :UNIFREST
8198 44 ??? :OREGOSUB
8199 41 54 EOR (#54,X) :RETURNRE
819B C1 49 CMP (#49,X) :MSTOPONW
819D 4E 50 55 LSR #5550 :AITLOADS
81A0 54 ??? :AVEVERIF
81A1 A3 ??? :YDEFFPOKE
81A2 49 4E EOR #*4E :PRINT#PR
81A4 50 55 BVC #81FB :INTCNTL
81A6 D4 ??? :ISTCLRCM
81A7 44 ??? :DSYSOPEN
81A8 49 CD EOR #*CD :CLOSEGET
81AA 52 ??? :NEWTAB(T
81AB 45 41 EOR #41 :OFNSPC(T
81AD C4 4C CPY #4C :HENNOTST
81AF 45 D4 EOR #D4 :EP+~/^A

```

81B1	47	???	:NDOR>=<S	8226	4B	PHA			
81B2	4F	???	:GNINTABS	8227	45	CE	EDR \$CE		
81B3	54	???	:USRFREPO	8229	4E 4F	D4	LSR \$D44F		
81B4	CF	???	:SSQRNDL	822C	53	???			
81B5	52	???	:OGEXPCOS	822D	54	???			
81B6	55	CE	EDR \$CE, X	:SINTANAT	822E	45	D0	EDR \$D0	
81B8	49	C6	EDR \$#C6	:NPEEKLEN	8230	AB	???		
81BA	52	???	:STR\$VALA	8231	AD	AA	AF	LDA \$AFAA	
81BB	45	53	EDR \$53	:SCCHR\$LE	8234	DE	41	4E	DEC \$4E41, X
81BD	54	???	???	:FT\$RIGHT	8237	C4	4F	CPY \$4F	
81BE	4F	???	???	:\$MID\$GOR	8239	D2	???		
81BF	52	???	???	:GRRCLRRL	823A	BE	8D	BC	LDX \$BCBD, Y
81C0	C5	47	CMF \$47	:UMJOYRDD	823D	53	???		
81C2	4F	???	???	:TDECHEX\$	823E	47	???		
81C3	53	???	???	:ERR\$INST	823F	CE	49	4E	DEC \$4E49
81C4	55	C2	EDR \$C2, X	:RELSERES	8242	D4	???		
81C6	52	???	???	:UMETRAPT	8243	41	42	EDR (\$42, X)	
81C7	45	54	EDR \$54	:RONTROFF	8245	D3	???		
81C9	55	52	EDR \$52, X	:SOUNDVOL	8246	55	53	EDR \$53, X	
81CB	CE	52	45	DEC \$4552	:AUTOPUDE	8248	D2	???	
81CE	CD	53	54	CMF \$5453	:FGRAPHIC	8249	46	52	LSR \$52
81D1	4F	???	???	:PAINTCHA	824B	C5	50	CMF \$50	
81D2	D0	4F	BNE \$8223	:RBOXCIRC	824D	4F	???		
81D4	CE	57	41	DEC \$4157	:LEGSHAPE	824E	D3	???	
81D7	49	D4	EDR \$#D4	:SSHAPEDR	824F	53	???		
81D9	4C	4F	41	JMP \$414F	:AWLOCATE	8250	51	D2	EDR (\$D2), Y
81DC	C4	53	CPY \$53	:COLORSCN	8252	52	???		
81DE	41	56	EDR (\$56, X)	:CLRSCLAE	8253	4E	C4	4C	LSR \$4CC4
81E0	C5	56	CMF \$56	:HELDPDLO	8256	4F	???		
81E2	45	52	EDR \$52	:DPEXITDI	8257	C7	???		
81E4	49	46	EDR \$#46	:RECTORVD	8258	45	58	EDR \$58	
81E6	D9	44	45	CMF \$4544, Y	:SAVEDLOA	825A	D0	43	BNE \$829F
81E9	C6	50	DEC \$50	:DHEADERS	825C	4F	???		
81EB	4F	???	???	:CRATCHCO	825D	D3	???		
81EC	4B	???	???	:LLECTCOP	825E	53	???		
81ED	C5	50	CMF \$50	:YRENAMEB	825F	49	CE	EDR \$#CE	
81EF	52	???	???	:ACKUPDEL	8261	54	???		
81F0	49	4E	EDR \$#4E	:ETERENUM	8262	41	CE	EDR (\$CE, X)	
81F2	54	???	???	:BERKEYMO	8264	41	54	EDR (\$54, X)	
81F3	A3	???	???	:NITORUSI	8266	CE	50	45	DEC \$4550
81F4	50	52	BVC \$8248	:NGUNTILW	8269	45	CB	EDR \$CB	
81F6	49	4E	EDR \$#4E	:HILE.Y. I	826B	4C	45	CE	JMP \$CE45
81F8	D4	???	???	826E	53	???			
81F9	43	???	???	826F	54	???			
81FA	4F	???	???	8270	52	???			
81FB	4E	D4	4C	LSR \$4CD4	8271	A4	56	LDY \$56	
81FE	49	53	EDR \$#53	8273	41	CC	EDR (\$CC, X)		
8200	D4	???	???	8275	41	53	EDR (\$53, X)		
8201	43	???	???	8277	C3	???			
8202	4C	D2	43	JMP \$43D2	8278	43	???		
8205	4D	C4	53	EDR \$53C4	8279	48	PHA		
8208	59	D3	4F	EDR \$4FD3, Y	827A	52	???		
820B	50	45	BVC \$8252	827B	A4	4C	LDY \$4C		
820D	CE	43	4C	DEC \$4C43	827D	45	46	EDR \$46	
8210	4F	???	???	827F	54	???			
8211	53	???	???	8280	A4	52	LDY \$52		
8212	C5	47	CMF \$47	8282	49	47	EDR \$#47		
8214	45	D4	EDR \$D4	8284	48	PHA			
8216	4E	45	D7	LSR \$D745	8285	54	???		
8219	54	???	???	8286	A4	4D	LDY \$4D		
821A	41	42	EDR (\$42, X)	8288	49	44	EDR \$#44		
821C	AB	TAY		828A	A4	47	LDY \$47		
821D	58	???	???	828C	CF	???			
821E	CF	???	???	828D	52	???			
821F	46	CE	LSR \$CE	828E	47	???			
8221	53	???	???	828F	D2	???			
8222	50	43	BVC \$8267	8290	52	???			
8224	AB	TAY		8291	43	???			
8225	54	???	???	8292	4C	D2	52	JMP \$52D2	

8295 4C 55 CD JMP #CD55
8298 4A LBR
8299 4F ???
829A D9 52 44 CMP #4452,Y
829D 4F ???
829E D4 ???
829F 44 ???
82A0 45 C3 EOR #C3
82A2 48 PHA
82A3 45 58 EOR #58
82A5 A4 45 LDY #45
82A7 52 ???
82A8 52 ???
82A9 A4 49 LDY #49
82AB 4E 53 54 LBR #5453
82AE D2 ???
82AF 45 4C EOR #4C
82B1 53 ???
82B2 C5 52 CMP #52
82B4 45 53 EOR #53
82B6 55 4D EOR #4D,X
82B8 C5 54 CMP #54
82BA 52 ???
82BB 41 D0 EOR (#D0,X)
82BD 54 ???
82BE 52 ???
82BF 4F ???
82C0 CE 54 52 DEC #5254
82C3 4F ???
82C4 46 C6 LSR #C6
82C6 53 ???
82C7 4F ???
82C8 55 4E EOR #4E,X
82CA C4 56 CPY #56
82CC 4F ???
82CD CC 41 55 CPY #5541
82D0 54 ???
82D1 CF ???
82D2 50 55 BVC #8329
82D4 44 ???
82D5 45 C6 EOR #C6
82D7 47 ???
82D8 52 ???
82D9 41 50 EOR (#50,X)
82DB 48 PHA
82DC 49 C3 EOR #C3
82DE 50 41 BVC #8321
82E0 49 4E EOR #4E
82E2 D4 ???
82E3 43 ???
82E4 48 PHA
82E5 41 D2 EOR (#D2,X)
82E7 42 ???
82E8 4F ???
82E9 D8 CLD
82EA 43 ???
82EB 49 52 EOR #52
82ED 43 ???
82EE 4C C5 47 JMP #47C5
82F1 53 ???
82F2 48 PHA
82F3 41 50 EOR (#50,X)
82F5 C5 53 CMP #53
82F7 53 ???
82F8 48 PHA
82F9 41 50 EOR (#50,X)
82FB C5 44 CMP #44
82FD 52 ???
82FE 41 D7 EOR (#D7,X)

8300 4C 4F 43 JMP #434F
8303 41 54 EOR (#54,X)
8305 C5 43 CMP #43
8307 4F ???
8308 4C 4F D2 JMP #D24F
830B 53 ???
830C 43 ???
830D 4E 43 4C LBR #4C43
8310 D2 ???
8311 53 ???
8312 43 ???
8313 41 4C EOR (#4C,X)
8315 C5 48 CMP #48
8317 45 4C EOR #4C
8319 D0 44 BNE #835F
831B CF ???
831C 4C 4F 4F JMP #4F4F
831F D0 45 BNE #8366
8321 58 CLI
8322 49 D4 EOR #D4
8324 44 ???
8325 49 52 EOR #52
8327 45 43 EOR #43
8329 54 ???
832A 4F ???
832B 52 ???
832C D9 44 53 CMP #5344,Y
832F 41 56 EOR (#56,X)
8331 C5 44 CMP #44
8333 4C 4F 41 JMP #414F
8336 C4 48 CPY #48
8338 45 41 EOR #41
833A 44 ???
833B 45 D2 EOR #D2
833D 53 ???
833E 43 ???
833F 52 ???
8340 41 54 EOR (#54,X)
8342 43 ???
8343 C8 INY
8344 43 ???
8345 4F ???
8346 4C 4C 45 JMP #454C
8349 43 ???
834A D4 ???
834B 43 ???
834C 4F ???
834D 50 D9 BVC #8328
834F 52 ???
8350 45 4E EOR #4E
8352 41 4D EOR (#4D,X)
8354 C5 42 CMP #42
8356 41 43 EOR (#43,X)
8358 48 ???
8359 55 D0 EOR #D0,X
835B 44 ???
835C 45 4C EOR #4C
835E 45 54 EOR #54
8360 C5 52 CMP #52
8362 45 4E EOR #4E
8364 55 4D EOR #4D,X
8366 42 ???
8367 45 D2 EOR #D2
8369 48 ???
836A 45 D9 EOR #D9
836C 4D 4F 4E EOR #4E4F
836F 49 54 EOR #54
8371 4F ???
8372 D2 ???

8373 55 53 EOR #53,X
 8375 49 4E EOR ##4E
 8377 C7 ???
 8378 55 4E EOR #4E,X
 837A 54 ???
 837B 49 CC EOR ##CC
 837D 57 ???
 837E 48 PHA
 837F 49 4C EOR ##4C
 8381 C5 00 CMP #00

8383; Keyword Action
 vectors

8383 D9 8C C9 CMP #C98C,Y
 8386 AD 93 92 LDA #9293
 8389 AF ???
 838A 8D ED 90 STA #90ED
 838D 07 ???
 838E 91 9A STA (#9A),Y
 8390 96 4E STX #4E,Y
 8392 91 7B STA (#7B),Y
 8394 8E 4C 8D STX #8D4C
 8397 8B ???
 8398 8B ???
 8399 E0 8D CPX ##8D
 839B 99 8C 2B STA #2B8C,Y
 839E 8D 82 8D STA #8D82
 83A1 0A ASL
 83A2 8E D7 8C STX #8CD7
 83A5 1A ???
 83A6 8E 69 9E STX #9E69
 83A9 F2 ???
 83AA A7 ???
 83AB DD A7 EF CMP #EFA7,X
 83AE A7 ???
 83AF 9C ???
 83B0 9A TXS
 83B1 11 9E ORA (#9E),Y
 83B3 DF ???
 83B4 8F ???
 83B5 FF ???
 83B6 8F ???
 83B7 02 ???
 83B8 8D FE 8A STA #8AFE
 83BB 97 ???
 83BC 8A TXA
 83BD E5 8F SBC #8F
 83BF B4 A7 LDY #A7,X
 83C1 4C AB 59 JMP #59AB
 83C4 AB TAY
 83C5 B7 ???
 83C6 90 78 BCC #8440
 83C8 8A TXA
 83C9 0A ASL
 83CA 8E 3F B4 STX #B43F
 83CD 2A ROL
 83CE B4 51 LDY #51,X
 83D0 B6 54 LDX #54,Y
 83D2 B6 48 LDX #48,Y
 83D4 B8 CLV
 83D5 BC B8 CC LDY #CCB8,X
 83D8 B6 43 LDX #43,Y
 83DA B5 C2 LDA #C2,X
 83DC C5 D0 CMP #D0
 83DE B8 CLV
 83DF D3 ???
 83E0 B9 E1 BA LDA #BAE1,Y

83E3 1D C0 34 ORA #34C0,X
 83E6 BD 2B BE LDA #BE2B,X
 83E9 D8 CLD
 83EA C4 0E CPY #0E
 83EC C5 19 CMP #19
 83EE C5 66 CMP #66
 83F0 C5 B7 CMP #B7
 83F2 C5 E7 CMP #E7
 83F4 B6 56 LDX #56,Y
 83F6 B5 02 LDA #02,X
 83F8 B6 AB LDX #AB,Y
 83FA B5 BB LDA #BB,X
 83FC C8 INY
 83FD 40 RTI
 83FE C9 50 CMP ##50
 8400 C9 67 CMP ##67
 8402 C9 9B CMP #9B
 8404 C9 CB CMP #CB
 8406 C9 D9 CMP #D9
 8408 C9 F3 CMP #F3
 840A C9 FF CMP #FF
 840C C9 59 CMP #59
 840E AE 8E AB LDX #AB8E
 8411 2B PLP
 8412 B7 ???
 8413 51 FF EOR (FF),Y
 8415 BE A2 58 LDX #58A2,Y
 8418 A3 ???
 8419 DD A2 00 CMP #00A2,X

841B; Function vectors

841C 05 62 ORA #62
 841E 9A TXB
 841F 7D 9A E4 ADC #E49A,X
 8422 A5 07 LDA #07
 8424 A7 ???
 8425 1E A0 60 ASL #60A0,X
 8428 A6 70 LDX #70
 842A AA TAX
 842B 77 ???
 842C AA TAX
 842D C0 AA CPY ##AA
 842F 1A ???
 8430 AB ???
 8431 FA ???
 8432 9D 61 9D STA #9D61,X
 8435 66 9B ROR #9B
 8437 93 ???
 8438 9D 70 9D STA #9D70,X
 843B BB ???
 843C 9C ???
 843D CF ???
 843E 9C ???
 843F 03 ???
 8440 9D 15 9D STA #9D15,X
 8443 79 BF 85 ADC #85BF,Y
 8446 BF ???
 8447 87 ???
 8448 BF ???
 8449 C1 BF CMP (#BF,X)
 844B DF BF 1B SBC #1BBF,X
 844E 9E ???
 844F 07 ???
 8450 B5 BE LDA #BE,X
 8452 B4 79 LDY #79,X
 8454 9D 9E 79 STA #799E,X

8455; Operator vectors

8457 86 9E STX \$9E
 8459 7B ???
 845A 7A ???
 845B A0 7B LDY ##7B
 845D 96 A1 STX \$A1,Y
 845F 7F ???
 8460 ED A5 50 SBC \$50A5
 8463 FA ???
 8464 95 46 STA \$46,X
 8466 F7 ???
 8467 95 7D STA \$7D,X
 8469 26 A6 ROL \$A6
 846B 5A ???
 846C 64 ???
 846D 94 64 STY \$64,X
 846F 27 ???
 8470 96 54 STX \$54,Y

8471; Error messages

8472 4F ??? :TOD MANY
 8473 4F ??? :FILESFI
 8474 20 4D 41 JSR \$414D :LE OPENF
 8477 4E 59 20 LSR \$2059 :ILE NOT
 847A 46 49 LSR \$49 :OPENFILE
 847C 4C 45 D3 JMP \$D345 :NOT FOU
 847F 46 49 LSR \$49 :NDDEVICE
 8481 4C 45 20 JMP \$2045 :NOT PRE
 8484 4F ??? :SENTNOT
 8485 50 45 BVC \$84CC :INPUT FI
 8487 CE 46 49 DEC \$4946 :LENOT OU
 848A 4C 45 20 JMP \$2045 :TPUT FIL
 848D 4E 4F 54 LSR \$544F :EMISSING
 8490 20 4F 50 JSR \$504F :FILE NA
 8493 45 CE EOR \$CE :MEILLEGA
 8495 46 49 LSR \$49 :L DEVICE
 8497 4C 45 20 JMP \$2045 :NUMBERN
 849A 4E 4F 54 LSR \$544F :EXT WITH
 849D 20 46 4F JSR \$4F46 :OUT FORS
 84A0 55 4E EOR \$4E,X :YNTAXRET
 84A2 C4 44 CPY \$44 :URN WITH
 84A4 45 56 EOR \$56 :OUT GOSU
 84A6 49 43 EOR ##43 :BOUT OF
 84A8 45 20 EOR \$20 :DATAILLE
 84AA 4E 4F 54 LSR \$544F :GAL QUAN
 84AD 20 50 52 JSR \$5250 :TITYOVER
 84B0 45 53 EOR \$53 :FLOWOUT
 84B2 45 4E EOR \$4E :OF MEMOR
 84B4 D4 ??? :YUNDEF'D
 84B5 4E 4F 54 LSR \$544F :STATEME
 84B8 20 49 4E JSR \$4E49 :NTBAD SU
 84BB 50 55 BVC \$8512 :BSCRIPTR
 84BD 54 ??? :EDIM'D A
 84BE 20 46 49 JSR \$4946 :RRAYDIVI
 84C1 4C C5 4E JMP \$4EC5 :SION BY
 84C4 4F ??? :ZEROILLE
 84C5 54 ??? :GAL DIRE
 84C6 20 4F 55 JSR \$554F :CTTYPE M
 84C9 54 ??? :ISMATCHS
 84CA 50 55 BVC \$8521 :TRING TO
 84CC 54 ??? :O LONGFI
 84CD 20 46 49 JSR \$4946 :LE DATAF
 84D0 4C C5 4D JMP \$4DC5 :ORMULA T
 84D3 49 53 EOR ##53 :OO COMPL

84D5 53 ??? :EXCAN'T
 84D6 49 4E EOR ##4E :CONTINUE
 84D8 47 ??? :UNDEF'D
 84D9 20 46 49 JSR \$4946 :FUNCTION
 84DC 4C 45 20 JMP \$2045 :VERIFYLO
 84DF 4E 41 4D LSR \$4D41 :ADDBREAK.
 84E2 C5 49 CMP \$49 :CAN'T R
 84E4 4C 4C 45 JMP \$454C :ESUMELQO
 84E7 47 ??? :P NOT FO
 84E8 41 4C EOR (\$4C,X) :UNLOOP
 84EA 20 44 45 JSR \$4544 :WITHOUT
 84ED 56 49 LSR \$49,X :DODIRECT
 84EF 43 ??? :MODE ON
 84F0 45 20 EOR \$20 :LYNO GRA
 84F2 4E 55 4D LSR \$4D55 :PHICS AR
 84F5 42 ??? :EABAD DI
 84F6 45 D2 EOR \$D2 :SK* .)q.
 84F8 4E 45 58 LSR \$5845
 84FB 54 ???
 84FC 20 57 49 JSR \$4957
 84FF 54 ???
 8500 48 PHA
 8501 4F ???
 8502 55 54 EOR \$54,X
 8504 20 46 4F JSR \$4F46
 8507 D2 ???
 8508 53 ???
 8509 59 4E 54 EOR \$544E,Y
 850C 41 D8 EOR (\$D8,X)
 850E 52 ???
 850F 45 54 EOR \$54
 8511 55 52 EOR \$52,X
 8513 4E 20 57 LSR \$5720
 8516 49 54 EOR ##54
 8518 48 PHA
 8519 4F ???
 851A 55 54 EOR \$54,X
 851C 20 47 4F JSR \$4F47
 851F 53 ???
 8520 55 C2 EOR \$C2,X
 8522 4F ???
 8523 55 54 EOR \$54,X
 8525 20 4F 46 JSR \$464F
 8528 20 44 41 JSR \$4144
 852B 54 ???
 852C C1 49 CMP (\$49,X)
 852E 4C 4C 45 JMP \$454C
 8531 47 ???
 8532 41 4C EOR (\$4C,X)
 8534 20 51 55 JSR \$5551
 8537 41 4E EOR (\$4E,X)
 8539 54 ???
 853A 49 54 EOR ##54
 853C D9 4F 56 CMP \$564F,Y
 853F 45 52 EOR \$52
 8541 46 4C LSR \$4C
 8543 4F ???
 8544 D7 ???
 8545 4F ???
 8546 55 54 EOR \$54,X
 8548 20 4F 46 JSR \$464F
 854B 20 4D 45 JSR \$454D
 854E 4D 4F 52 EOR \$524F
 8551 D9 55 4E CMP \$4E55,Y
 8554 44 ???
 8555 45 46 EOR \$46
 8557 27 ???
 8558 44 ???
 8559 20 53 54 JSR \$5453

855C 41 54 EOR (#54, X)
 855E 45 4D EOR #4D
 8560 45 4E EOR #4E
 8562 D4 ???
 8563 42 ???
 8564 41 44 EOR (#44, X)
 8566 20 53 55 JSR #5553
 8569 42 ???
 856A 53 ???
 856B 43 ???
 856C 52 ???
 856D 49 50 EOR ##50
 856F D4 ???
 8570 52 ???
 8571 45 44 EOR #44
 8573 49 4D EOR ##4D
 8575 27 ???
 8576 44 ???
 8577 20 41 52 JSR #5241
 857A 52 ???
 857B 41 D9 EOR (#D9, X)
 857D 44 ???
 857E 49 56 EOR ##56
 8580 49 53 EOR ##53
 8582 49 4F EOR ##4F
 8584 4E 20 42 LSR #4220
 8587 59 20 5A EOR #5A20, Y
 858A 45 52 EOR #52
 858C CF ???
 858D 49 4C EOR ##4C
 858F 4C 45 47 JMP #4745
 8592 41 4C EOR (#4C, X)
 8594 20 44 49 JSR #4944
 8597 52 ???
 8598 45 43 EOR #43
 859A D4 ???
 859B 54 ???
 859C 59 50 45 EOR #4550, Y
 859F 20 4D 49 JSR #494D
 85A2 53 ???
 85A3 4D 41 54 EOR #5441
 85A6 43 ???
 85A7 C8 INY
 85A8 53 ???
 85A9 54 ???
 85AA 52 ???
 85AB 49 4E EOR ##4E
 85AD 47 ???
 85AE 20 54 4F JSR #4F54
 85B1 4F ???
 85B2 20 4C 4F JSR #4F4C
 85B5 4E C7 46 LSR #46C7
 85B8 49 4C EOR ##4C
 85BA 45 20 EOR #20
 85BC 44 ???
 85BD 41 54 EOR (#54, X)
 85BF C1 46 CMP (#46, X)
 85C1 4F ???
 85C2 52 ???
 85C3 4D 55 4C EOR #4C55
 85C6 41 20 EOR (#20, X)
 85C8 54 ???
 85C9 4F ???
 85CA 4F ???
 85CB 20 43 4F JSR #4F43
 85CE 4D 50 4C EOR #4C50
 85D1 45 D8 EOR #D8
 85D3 43 ???
 85D4 41 4E EOR (#4E, X)

85D6 27 ???
 85D7 54 ???
 85D8 20 43 4F JSR #4F43
 85DB 4E 54 49 LSR #4954
 85DE 4E 55 C5 LSR #C555
 85E1 55 4E EOR #4E, X
 85E3 44 ???
 85E4 45 46 EOR #46
 85E6 27 ???
 85E7 44 ???
 85E8 20 46 55 JSR #5546
 85EB 4E 43 54 LSR #5443
 85EE 49 4F EOR #4F
 85F0 CE 56 45 DEC #4556
 85F3 52 ???
 85F4 49 46 EOR #46
 85F6 D9 4C 4F CMP #4F4C, Y
 85F9 41 C4 EOR (#C4, X)
 85FB 42 ???
 85FC 52 ???
 85FD 45 41 EOR #41
 85FF 4B ???
 8600 00 BRK
 8601 A0 43 LDY ##43
 8603 41 4E EOR (#4E, X)
 8605 27 ???
 8606 54 ???
 8607 20 52 45 JSR #4552
 860A 53 ???
 860B 55 4D EOR #4D, X
 860D C5 4C CMP #4C
 860F 4F ???
 8610 4F ???
 8611 50 20 BVC #8633
 8613 4E 4F 54 LSR #544F
 8616 20 46 4F JSR #4F46
 8619 55 4E EOR #4E, X
 861B C4 4C CPY #4C
 861D 4F ???
 861E 4F ???
 861F 50 20 BVC #8641
 8621 57 ???
 8622 49 54 EOR ##54
 8624 48 PHA
 8625 4F ???
 8626 55 54 EOR #54, X
 8628 20 44 CF JSR #CF44
 862B 44 ???
 862C 49 52 EOR ##52
 862E 45 43 EOR #43
 8630 54 ???
 8631 20 4D 4F JSR #4F4D
 8634 44 ???
 8635 45 20 EOR #20
 8637 4F ???
 8638 4E 4C D9 LSR #D94C
 863B 4E 4F 20 LSR #204F
 863E 47 ???
 863F 52 ???
 8640 41 50 EOR (#50, X)
 8642 48 PHA
 8643 49 43 EOR ##43
 8645 53 ???
 8646 20 41 52 JSR #5241
 8649 45 C1 EOR #C1
 864B 42 ???
 864C 41 44 EOR (#44, X)
 864E 20 44 49 JSR #4944
 8651 53 ???

```

8652 CB      ???
8653 AA      TAX
8654 A0 00   LDY  ##00
8656 A9 71   LDA  ##71
8658 85 24   STA  $24
865A A9 84   LDA  ##84
865C 85 25   STA  $25
865E CA      DEX
865F 30 1C   BMI  $B67D
8661 B1 24   LDA  ($24),Y
8663 48      PHA
8664 E6 24   INC  $24
8666 D0 02   BNE  $B66A
8668 E6 25   INC  $25
866A 68      PLA
866B 10 F4   BPL  $B661
866D 30 EF   BMI  $B65E
866F 20 4F   FF JSR $FF4F
8672 00 0A 52 ORA  $520A :READY...
8675 45 41   EOR  $41
8677 44      ???
867B 59 2E 0D EOR  $0D2E,Y
867B 0A      ABL
867C 00      BRK
867D 60      RTS

```

867E; Error routine

```

867E A2 80   LDX  ##80
8680 2C A2 10 BIT  $10A2

```

8681; 'out of memory'

```

8683 6C 00 03 JMP  ($0300)
8686 8A      TXA
8687 30 7A   BMI  $B703
8689 0E EF 04 STX  $04EF
868C 24 81   BIT  $81
868E 10 35   BPL  $B6C5
8690 A0 01   LDY  ##01
8692 B9 39 00 LDA  $0039,Y
8695 99 F0 04 STA  $04F0,Y
8698 B9 5B 02 LDA  $025B,Y
869B 99 F3 04 STA  $04F3,Y
869E 88      DEY
869F 10 F1   BPL  $B692
86A1 E0 11   CPX  ##11
86A3 F0 20   BEQ  $B6C5
86A5 AC F3 04 LDY  $04F3
86A8 C8      INY
86A9 F0 1A   BEQ  $B6C5
86AB 88      DEY
86AC 84 15   STY  $15
86AE 8C F4 04 STY  $04F4
86B1 AC F2 04 LDY  $04F2
86B4 84 14   STY  $14
86B6 A2 FF   LDX  ##FF
86B8 8E F3 04 STX  $04F3
86BB AE F7 04 LDX  $04F7
86BE 9A      TXS
86BF 20 69 0D JSR  $B069
86C2 4C DC 0B JMP  $B8DC
86C5 CA      DEX
86C6 BA      TXA
86C7 48      PHA
86C8 A9 00   LDA  ##00
86CA 85 83   STA  $83

```

```

86CC 20 C9 C7 JSR  $C7C9
86CF 68      PLA
86D0 20 53 86 JSR  $B653
86D3 20 CC FF JSR  $FFCC
86D6 A9 00   LDA  ##00
86D8 85 13   STA  $13
86DA 20 3E 90 JSR  $903E
86DD 20 B0 90 JSR  $90B0
86E0 A0 00   LDA  ##00
86E2 B1 24   LDA  ($24),Y
86E4 48      PHA
86E5 29 7F   AND  ##7F
86E7 20 B2 90 JSR  $90B2
86EA C8      INY
86EB 68      PLA
86EC 10 F4   BPL  $B6E2
86EE 20 DB 8A JSR  $BADB

```

86F1; Break Entry

```

86F1 20 4F FF JSR  $FF4F
86F4 20 45 52 JSR  $5245
86F7 52      ???
86F8 4F      ???
86F9 52      ???
86FA 00      BRK

```

86FB; 'ready.'

```

86FB A4 3A   LDY  $3A
86FD C8      INY
86FE F0 03   BEQ  $B703
8700 20 53 A4 JSR  $A453
8703 20 6F B6 JSR  $B66F

```

8706; Ready for Basic

```

8706 A9 80   LDA  ##80
8708 20 90 FF JSR  $FF90
870B A9 00   LDA  ##00
870D 85 81   STA  $81
870F 6C 02 03 JMP  ($0302)
8712 A2 FF   LDX  ##FF
8714 86 3A   STX  $3A
8716 20 5A 88 JSR  $885A
8719 86 3B   STX  $3B
871B 84 3C   STY  $3C
871D 20 73 04 JSR  $0473
8720 AA      TAX
8721 F0 EC   BEQ  $B70F
8723 90 09   BCC  $B72E
8725 20 53 89 JSR  $B953
8728 20 79 04 JSR  $0479
872B 4C D9 8B JMP  $BBD9

```

872E; Handle new line

```

872E 20 3E 8E JSR  $BE3E
8731 20 53 89 JSR  $B953
8734 84 0B   STY  $0B
8736 20 3D 8A JSR  $8A3D
8739 90 4A   BCC  $B785
873B A0 01   LDY  ##01
873D 20 D1 04 JSR  $04D1
8740 85 23   STA  $23

```

8742 A5 2D LDA #2D
 8744 85 22 STA #22
 8746 A5 60 LDA #60
 8748 85 25 STA #25
 874A 88 DEY
 874B 20 D1 04 JSR #04D1
 874E 18 CLC
 874F E5 5F SBC #5F
 8751 49 FF EOR #FF
 8753 18 CLC
 8754 65 2D ADC #2D
 8756 85 2D STA #2D
 8758 85 24 STA #24
 875A A5 2E LDA #2E
 875C 69 FF ADC #FF
 875E 85 2E STA #2E
 8760 E5 60 SBC #60
 8762 AA TAX
 8763 38 SEC
 8764 A5 5F LDA #5F
 8766 E5 2D SBC #2D
 8768 AB TAY
 8769 B0 03 BCS #876E
 876B E8 INX
 876C C6 25 DEC #25
 876E 18 CLC
 876F 65 22 ADC #22
 8771 90 03 BCC #8776
 8773 C6 23 DEC #23
 8775 18 CLC
 8776 20 B0 04 JSR #04B0
 8779 91 24 STA (#24),Y
 877B C8 INY
 877C D0 F8 BNE #8776
 877E E6 23 INC #23
 8780 E6 25 INC #25
 8782 CA DEX
 8783 D0 F1 BNE #8776
 8785 20 9A 8A JSR #8A9A
 8788 20 18 8B JSR #8B18
 878B A0 00 LDY #00
 878D 20 A5 04 JSR #04A5
 8790 F0 8F BEQ #8721
 8792 18 CLC
 8793 A5 2D LDA #2D
 8795 A4 2E LDY #2E
 8797 85 5A STA #5A
 8799 84 5B STY #5B
 879B 65 0B ADC #0B
 879D 90 01 BCC #87A0
 879F C8 INY
 87A0 18 CLC
 87A1 69 04 ADC #04
 87A3 90 01 BCC #87A6
 87A5 C8 INY
 87A6 85 5B STA #5B
 87A8 84 59 STY #59
 87AA 20 C0 8B JSR #8BC0
 87AD A0 00 LDY #00
 87AF A9 01 LDA #01
 87B1 91 5F STA (#5F),Y
 87B3 C8 INY
 87B4 91 5F STA (#5F),Y
 87B6 C8 INY
 87B7 A5 14 LDA #14
 87B9 91 5F STA (#5F),Y
 87BB A5 15 LDA #15
 87BD C8 INY
 87BE 91 5F STA (#5F),Y

87C0 C8 INY
 87C1 98 TYA
 87C2 18 CLC
 87C3 65 5F ADC #5F
 87C5 85 5F STA #5F
 87C7 90 02 BCC #87CB
 87C9 E6 60 INC #60
 87CB A5 31 LDA #31
 87CD A4 32 LDY #32
 87CF 85 2D STA #2D
 87D1 84 2E STY #2E
 87D3 A4 0B LDY #0B
 87D5 88 DEY
 87D6 20 A5 04 JSR #04A5
 87D9 91 5F STA (#5F),Y
 87DB 88 DEY
 87DC 10 F8 BPL #87D6
 87DE 20 18 8B JSR #8B18
 87E1 20 93 8A JSR #8A93
 87E4 A5 73 LDA #73
 87E6 05 74 ORA #74
 87E8 F0 2B BEQ #8B15
 87EA A5 14 LDA #14
 87EC 18 CLC
 87ED 65 73 ADC #73
 87EF 85 63 STA #63
 87F1 A5 15 LDA #15
 87F3 65 74 ADC #74
 87F5 85 62 STA #62
 87F7 A2 90 LDX #90
 87F9 38 SEC
 87FA 20 CE A2 JSR #A2CE
 87FD 20 6F A4 JSR #A46F
 8800 A2 00 LDX #00
 8802 BD 01 01 LDA #0101,X
 8805 F0 06 BEQ #8B0D
 8807 9D 27 05 STA #0527,X
 880A E8 INX
 880B D0 F5 BNE #8B02
 880D A9 1D LDA #1D
 880F 9D 27 05 STA #0527,X
 8812 E8 INX
 8813 86 EF STX #EF
 8815 4C 0F 87 JMP #870F

8818; Re-chain lines

8818 A5 2B LDA #2B
 881A A4 2C LDY #2C
 881C 85 22 STA #22
 881E 84 23 STY #23
 8820 18 CLC
 8821 A0 00 LDY #00
 8823 20 B0 04 JSR #04B0
 8826 D0 06 BNE #8B2E
 8828 C8 INY
 8829 20 B0 04 JSR #04B0
 882C F0 2B BEQ #8B59
 882E A0 04 LDY #04
 8830 C8 INY
 8831 20 B0 04 JSR #04B0
 8834 D0 FA BNE #8B3D
 8836 C8 INY
 8837 98 TYA
 8838 65 22 ADC #22
 883A AA TAX
 883B A0 00 LDY #00
 883D 91 22 STA (#22),Y

```

883F 98 TYA
8840 65 23 ADC #23
8842 C8 INY
8843 91 22 STA (#22),Y
8845 86 22 STX #22
8847 85 23 STA #23
8849 90 D6 BCC #8821
884B 18 CLC
884C A5 22 LDA #22
884E A4 23 LDY #23
8850 69 02 ADC #02
8852 90 01 BCC #8855
8854 C8 INY
8855 85 2D STA #2D
8857 84 2E STY #2E
8859 60 RTS

```

885A; Receive input line

```

885A A2 00 LDX #00
885C 20 91 A7 JSR #A791
885F C9 0D CMP #0D
8861 F0 0B BEQ #886E
8863 9D 00 02 STA #0200,X
8866 E8 INX
8867 E0 59 CPX #59
8869 90 F1 BCC #885C
886B 4C 4C CC JMP #CC4C

```

886E; Scan stack
FOR/GOSUB

```

886E 4C 31 90 JMP #9031
8871 28 60 A7 JSR #A760
8874 A5 3D LDA #3D
8876 C9 B0 CMP #B0
8878 D0 06 BNE #8880
887A A5 3E LDA #3E
887C C9 07 CMP #07
887E F0 3D BEQ #88BD
8880 A0 00 LDY #00
8882 A5 02 LDA #02
8884 C9 B1 CMP #B1
8886 D0 1B BNE #88A3
8888 D1 3D CMP (#3D),Y
888A D0 33 BNE #88BF
888C A0 02 LDY #02
888E A5 4A LDA #4A
8890 C9 FF CMP #FF
8892 F0 2B BEQ #88BF
8894 D1 3D CMP (#3D),Y
8896 D0 07 BNE #889F
8898 B8 DEY
8899 A5 49 LDA #49
889B D1 3D CMP (#3D),Y
889D F0 20 BEQ #88BF
889F A2 12 LDX #12
88A1 D0 0E BNE #88B1
88A3 B1 3D LDA (#3D),Y
88A5 C5 02 CMP #02
88A7 F0 16 BEQ #88BF
88A9 A2 12 LDX #12
88AB C9 B1 CMP #B1
88AD F0 02 BEQ #88B1
88AF A2 05 LDX #05
88B1 B8 TXA
88B2 18 CLC

```

```

88B3 65 3D ADC #3D
88B5 85 3D STA #3D
88B7 90 B8 BCC #8874
88B9 E6 3E INC #3E
88BB D0 B7 BNE #8874
88BD A0 01 LDY #01
88BF 60 RTS

```

88C0; Move memory

```

88C0 20 23 89 JSR #8923
88C3 85 31 STA #31
88C5 84 32 STY #32
88C7 38 SEC
88C8 A5 5A LDA #5A
88CA E5 5F SBC #5F
88CC 85 22 STA #22
88CE A8 TAY
88CF A5 58 LDA #58
88D1 E5 60 SBC #60
88D3 AA TAX
88D4 E8 INX
88D5 98 TYA
88D6 F0 25 BEQ #88FD
88D8 A5 5A LDA #5A
88DA 38 SEC
88DB E5 22 SBC #22
88DD 85 5A STA #5A
88DF B0 03 BCS #88E4
88E1 C6 58 DEC #58
88E3 38 SEC
88E4 A5 58 LDA #58
88E6 E5 22 SBC #22
88E8 85 58 STA #58
88EA B0 09 BCS #88F5
88EC C6 59 DEC #59
88EE 90 05 BCC #88F5
88F0 20 89 81 JSR #8189
88F3 91 58 STA (#58),Y
88F5 88 DEY
88F6 D0 F8 BNE #88F0
88F8 20 89 81 JSR #8189
88FB 91 58 STA (#58),Y
88FD C6 58 DEC #58
88FF C6 59 DEC #59
8901 CA DEX
8902 D0 F1 BNE #88F5
8904 60 RTS

```

8905; Check stack depth

```

8905 8C F4 07 STY #07F4
8908 38 SEC
8909 A5 7C LDA #7C
890B ED F4 07 STB #07F4
890E 85 7C STA #7C
8910 A5 7D LDA #7D
8912 E9 00 SBC #00
8914 85 7D STA #7D
8916 C9 06 CMP #06
8918 90 36 BCC #8950
891A D0 06 BNE #8922
891C A5 7C LDA #7C
891E C9 EC CMP #EC
8920 90 2E BCC #8950
8922 60 RTS

```

8923; Check memory space

8923 C4 34 CPY #34
8925 90 28 BCC #894F
8927 D0 04 BNE #892D
8929 C5 33 CMP #33
892B 90 22 BCC #894F
892D 48 PHA
892E A2 09 LDX ##09
8930 98 TYA
8931 48 PHA
8932 B5 57 LDA #57,X
8934 CA DEX
8935 10 FA BPL #8931
8937 20 54 A9 JSR #A954
893A A2 F7 LDX ##F7
893C 68 PLA
893D 95 61 STA #61,X
893F E8 INX
8940 30 FA BMI #893C
8942 68 PLA
8943 A8 TAY
8944 68 PLA
8945 C4 34 CPY #34
8947 90 06 BCC #894F
8949 D0 05 BNE #8950
894B C5 33 CMP #33
894D B0 01 BCS #8950
894F 60 RTS
8950 4C 81 86 JMP #8681

8953; Crunch tokens

8953 6C 04 03 JMP (#0304)
8956 A5 3B LDA #3B
8958 48 PHA
8959 A5 3C LDA #3C
895B 48 PHA
895C 20 79 04 JSR #0479
895F 4C 65 89 JSR #8965
8962 20 73 04 JSR #0473
8965 90 FB BCC #8962
8967 6C 0C 03 JMP (#030C)
896A 90 68 BCC #89D4
896C C9 00 CMP ##00
896E F0 55 BEQ #89C5
8970 C9 3A CMP ##3A
8972 F0 EE BEQ #8962
8974 C9 3F CMP ##3F
8976 D0 04 BNE #897C
8978 A9 99 LDA ##99
897A D0 2E BNE #89AA
897C C9 80 CMP ##80
897E 90 0B BCC #898B
8980 C9 FF CMP ##FF
8982 F0 DE BEQ #8962
8984 A0 01 LDY ##01
8986 20 EA 89 JSR #89EA
8989 F0 D1 BEQ #895C
898B C9 22 CMP ##22
898D D0 0D BNE #899C
898F 20 73 04 JSR #0473
8992 C9 00 CMP ##00
8994 F0 2F BEQ #89C5
8996 C9 22 CMP ##22
8998 F0 C8 BEQ #8962

899A D0 F3 BNE #898F
899C 20 03 8A JSR #8A03
899F 90 C1 BCC #8962
89A1 C0 00 CPY ##00
89A3 F0 03 BEQ #89A8
89A5 20 EA 89 JSR #89EA
89A8 A5 0B LDA #0B
89AA A0 00 LDY ##00
89AC 91 3B STA (#3B),Y
89AE C9 8F CMP #8F
89B0 F0 0D BEQ #89BF
89B2 C9 83 CMP ##83
89B4 D0 AC BNE #8962
89B6 20 73 04 JSR #0473
89B9 20 80 8D JSR #8D80
89BC 4C 5C 89 JMP #895C
89BF 20 73 04 JSR #0473
89C2 20 0B BE JSR #8E0B
89C5 A6 3B LDX #3B
89C7 68 PLA
89C8 85 3C STA #3C
89CA 68 PLA
89CB 85 3B STA #3B
89CD 38 SEC
89CE 8A TXA
89CF E5 3B SBC #3B
89D1 A8 TAY
89D2 C8 INY
89D3 60 RTS
89D4 48 PHA
89D5 88 DEY
89D6 88 DEY
89D7 20 EA 89 JSR #89EA
89DA A0 00 LDY ##00
89DC A9 FE LDA #FE
89DE 91 3B STA (#3B),Y
89E0 C8 INY
89E1 68 PLA
89E2 91 3B STA (#3B),Y
89E4 20 73 04 JSR #0473
89E7 4C 62 89 JMP #8962
89EA 18 CLC
89EB 98 TYA
89EC 65 3B ADC #3B
89EE 85 22 STA #22
89F0 A5 3C LDA #3C
89F2 69 00 ADC ##00
89F4 85 23 STA #23
89F6 A0 00 LDY ##00
89F8 20 80 04 JSR #0480
89FB 91 3B STA (#3B),Y
89FD C8 INY
89FE C9 00 CMP ##00
8A00 D0 F6 BNE #89F8
8A02 60 RTS
8A03 A9 81 LDA ##81
8A05 A0 8E LDY ##8E
8A07 85 23 STA #23
8A09 84 22 STY #22
8A0B A0 00 LDY ##00
8A0D 84 0B STY #0B
8A0F 88 DEY
8A10 C8 INY
8A11 20 A5 04 JSR #04A5
8A14 38 SEC
8A15 F1 22 SBC (#22),Y
8A17 F0 F7 BEQ #8A10
8A19 C9 80 CMP ##80
8A1B F0 1B BEQ #8A38


```

BA1D B1 22 LDA (#22),Y
BA1F 30 03 BMI #BA24
BA21 C8 INY
BA22 D0 F9 BNE #BA1D
BA24 C8 INY
BA25 E6 0B INC #0B
BA27 18 CLC
BA28 98 TYA
BA29 65 22 ADC #22
BA2B 85 22 STA #22
BA2D 90 02 BCC #BA31
BA2F E6 23 INC #23
BA31 18 CLC
BA32 A0 00 LDY ##00
BA34 B1 22 LDA (#22),Y
BA36 D0 D9 BNE #BA11
BA38 05 0B ORA #0B
BA3A 85 0B STA #0B
BA3C 60 RTS

```

BA3D; Find new Basic line

```

BA3D A5 2B LDA #2B
BA3F A6 2C LDX #2C
BA41 A0 01 LDY ##01
BA43 85 5F STA #5F
BA45 86 60 STX #60
BA47 20 D1 04 JSR #04D1
BA4A F0 2B BEQ #BA77
BA4C C8 INY
BA4D C8 INY
BA4E 20 D1 04 JSR #04D1
BA51 85 78 STA #78
BA53 A5 15 LDA #15
BA55 C5 78 CMP #78
BA57 90 1F BCC #BA78
BA59 F0 03 BEQ #BA5E
BA5B 88 DEY
BA5C D0 0E BNE #BA6C
BA5E 88 DEY
BA5F 20 D1 04 JSR #04D1
BA62 85 78 STA #78
BA64 A5 14 LDA #14
BA66 C5 78 CMP #78
BA68 90 0E BCC #BA78
BA6A F0 0C BEQ #BA78
BA6C 88 DEY
BA6D 20 D1 04 JSR #04D1
BA70 AA TAX
BA71 88 DEY
BA72 20 D1 04 JSR #04D1
BA75 B0 CA BCS #BA41
BA77 18 CLC
BA78 60 RTS

```

BA79; Perform [NEW]

```

BA79 D0 FD BNE #BA78
BA7B A9 00 LDA ##00
BA7D A8 TAY
BA7E 91 2B STA (#2B),Y
BA80 C8 INY
BA81 91 2B STA (#2B),Y
BA83 BD EB 02 STA #02EB
BA86 A5 2B LDA #2B
BA88 18 CLC
BA89 69 02 ADC ##02

```

```

BA8B 85 2D STA #2D
BA8D A5 2C LDA #2C
BA8F 69 00 ADC ##00
BA91 85 2E STA #2E
BA93 20 F1 8A JSR #BAF1
BA96 A9 00 LDA ##00

```

BA9B; Perform [CLR]

```

BA9B D0 52 BNE #BAEC
BA9A 20 E7 FF JSR #FFE7
BA9D A0 00 LDY ##00
BA9F 84 79 STY #79
BAA1 88 DEY
BAA2 8C F3 04 STY #04F3
BAA5 8C F0 04 STY #04F0
BAAB 8C F1 04 STY #04F1
BAAB 8C EF 04 STY #04EF
BAAE A5 37 LDA #37
BA80 A4 38 LDY #38
BA82 85 33 STA #33
BA84 84 34 STY #34
BA86 A9 80 LDA ##80
BA88 A0 07 LDY #07
BA8A 85 7C STA #7C
BA8C 84 7D STY #7D
BA8E A5 2D LDA #2D
BA80 A4 2E LDY #2E
BA82 85 2F STA #2F
BA84 84 30 STY #30
BA86 85 31 STA #31
BA88 84 32 STY #32
BA8A A2 03 LDX ##03
BA8C BD ED 8A LDA #BAED,X
BA8F 9D E7 04 STA #0AE7,X
BA8D CA DEX
BA8D 10 F7 BPL #BA8C
BA85 20 B1 8C JSR #8CB1
BA88 A2 19 LDX ##19
BA8A 86 16 STX #16
BA8C 68 PLA
BA8D A8 TAY
BA8E 68 PLA
BA8F A2 FA LDX ##FA
BAE1 9A TXS
BAE2 48 PHA
BAE3 98 TYA
BAE4 48 PHA
BAE5 A9 00 LDA ##00
BAE7 8D 5C 02 STA #025C
BAEA 85 10 STA #10
BAEC 60 RTS

```

BAED; Back up text pointer

```

BAED 20 2C 2E JSR #2E2C
BAF0 24 18 BIT #18
BAF2 A5 2B LDA #2B
BAF4 69 FF ADC ##FF
BAF6 85 3B STA #3B
BAF8 A5 2C LDA #2C
BAFA 69 FF ADC ##FF
BAFC 85 3C STA #3C
BAFE 60 RTS

```

BAFF; Perform [LIST]

BAFF 20 CA AE JSR \$AECA
BB02 A0 01 LDY ##01
BB04 20 D1 04 JSR \$04D1
BB07 D0 06 BNE \$BB0F
BB09 88 DEY
BB0A 20 D1 04 JSR \$04D1
BB0D F0 2E BEQ \$BB3D
BB0F 20 C0 8C JSR \$BCC0
BB12 20 3E 90 JSR \$903E
BB15 A0 02 LDY ##02
BB17 20 D1 04 JSR \$04D1
BB1A AA TAX
BB1B CB INY
BB1C 20 D1 04 JSR \$04D1
BB1F C5 15 CMP \$15
BB21 D0 04 BNE \$BB27
BB23 E4 14 CPX \$14
BB25 F0 02 BEQ \$BB29
BB27 B0 14 BCS \$BB3D
BB29 20 40 8B JSR \$BB40
BB2C A0 00 LDY ##00
BB2E 20 D1 04 JSR \$04D1
BB31 AA TAX
BB32 CB INY
BB33 20 D1 04 JSR \$04D1
BB36 86 5F STX \$5F
BB38 85 60 STA \$60
BB3A 4C 02 8B JMP \$BB02
BB3D 4C 3E 90 JMP \$903E
BB40 A0 03 LDY ##03
BB42 84 49 STY \$49
BB44 84 0F STY \$0F
BB46 20 5F A4 JSR \$A45F
BB49 A9 20 LDA ##20
BB4B A4 49 LDY \$49
BB4D 29 7F AND ##7F
BB4F 20 B2 90 JSR \$90B2
BB52 C9 22 CMP ##22
BB54 D0 06 BNE \$BB5C
BB56 A5 0F LDA \$0F
BB58 49 FF EOR ##FF
BB5A 85 0F STA \$0F
BB5C CB INY
BB5D F0 DE BEQ \$BB3D
BB5F 24 53 BIT \$53
BB61 10 03 BPL \$BB66
BB63 20 0C B7 JSR \$B70C
BB66 20 D1 04 JSR \$04D1
BB69 F0 50 BEQ \$BB6B
BB6B 6C 06 03 JMP (\$0306)
BB6E 10 DF BPL \$BB4F
BB70 C9 FF CMP ##FF
BB72 F0 DB BEQ \$BB4F
BB74 24 0B BIT \$0F
BB76 30 D7 BMI \$BB4F
BB7B C9 FE CMP ##FE
BB7A D0 17 BNE \$BB93
BB7C CB INY
BB7D 20 D1 04 JSR \$04D1
BB80 F0 0C BEQ \$BB8E
BB82 84 49 STY \$49
BB84 38 SEC
BB85 6C 0E 03 JMP (\$030E)
BB88 B0 C5 BCS \$BB4F
BB8A A0 00 LDY ##00

BB8C F0 24 BEQ \$BBB2
BB8E 88 DEY
BB8F A9 FE LDA ##FE
BB91 D0 BC BNE \$BB4F
BB93 AA TAX
BB94 84 49 STY \$49
BB96 A0 81 LDY ##81
BB98 84 23 STY \$23
BB9A A0 8E LDY ##8E
BB9C 84 22 STY \$22
BB9E A0 00 LDY ##00
BBA0 CA DEX
BBA1 10 0F BPL \$BBB2
BBA3 B1 22 LDA (\$22),Y
BBA5 48 PHA
BBA6 E6 22 INC \$22
BBA8 D0 02 BNE \$BBAC
BBA A E6 23 INC \$23
BBAC 68 PLA
BBAD 10 F4 BPL \$BBA3
BBAF 30 EF BMI \$BBA0
BBB1 CB INY
BBB2 B1 22 LDA (\$22),Y
BBB4 30 95 BMI \$BB4B
BBB6 20 B2 90 JSR \$90B2
BBB9 D0 F6 BNE \$BBB1
BBBB 60 RTS

BBBC; Perform [RUN]

BBBC D0 06 BNE \$BBC4
BBBE 20 20 8D JSR \$BD20
BBC1 4C 93 8A JMP \$BA93
BBC4 20 9A 8A JSR \$BA9A
BBC7 20 79 04 JSR \$0479
BBCA 20 4D 8D JSR \$BD4D
BBCD 20 20 8D JSR \$BD20
BBDD 4C DC 8B JMP \$BDDC
BBD3 6C 08 03 JMP (\$0308)
BBD6 20 73 04 JSR \$0473
BBD9 20 25 8C JSR \$BC25
BBDC 20 C0 8C JSR \$BCC0
BBDF 24 81 BIT \$81
BBE1 10 07 BPL \$BBEA
BBE3 20 1A 8C JSR \$BC1A
BBE6 BA TSX
BBE7 8E F7 04 STX \$04F7
BBEA A0 00 LDY ##00
BBEC 20 A5 04 JSR \$04A5
BBEF F0 03 BEQ \$BBF4
BBF1 4C 93 8C JMP \$BC93
BBF4 24 81 BIT \$81
BBF6 10 1F BPL \$BC17
BBF8 A0 02 LDY ##02
BBFA 20 A5 04 JSR \$04A5
BBFD F0 18 BEQ \$BC17
BBFF CB INY
BCC0 20 A5 04 JSR \$04A5
BCC3 85 39 STA \$39
BCC5 CB INY
BCC6 20 A5 04 JSR \$04A5
BCC9 85 3A STA \$3A
BCCB 98 TYA
BCCD 18 CLC
BCCD 65 3B ADC \$3B
BCCF 85 3B STA \$3B
BC11 90 C0 BCC \$BBD3
BC13 E6 3C INC \$3C

8C15 D0 BC BNE #8BD3
 8C17 4C 7E 86 JMP #867E
 8C1A A5 3B LDA #3B
 8C1C A4 3C LDY #3C
 8C1E 8D 5B 02 STA #025B
 8C21 8C 5C 02 STY #025C
 8C24 60 RTB

8C25; Execute statement

8C25 F0 FD BEQ #8C24
 8C27 2C EB 02 BIT #02EB
 8C2A 10 13 BPL #8C3F
 8C2C 24 81 BIT #81
 8C2E 10 0F BPL #8C3F
 8C30 48 PHA
 8C31 A9 5B LDA ##5B
 8C33 20 B2 90 JSR #90B2
 8C36 20 5B A4 JSR #A45B
 8C39 A9 5D LDA #5D
 8C3B 20 B2 90 JSR #90B2
 8C3E 68 PLA
 8C3F C9 FE CMP ##FE
 8C41 F0 3F BEQ #8C82
 8C43 C9 CB CMP ##CB
 8C45 F0 2D BEQ #8C74
 8C47 C9 CA CMP ##CA
 8C49 F0 20 BEQ #8C6B
 8C4B C9 FB CMP ##FB
 8C4D B0 3E BCS #8C8D
 8C4F C9 A3 CMP ##A3
 8C51 90 06 BCC #8C59
 8C53 C9 D5 CMP ##D5
 8C55 90 36 BCC #8C8D
 8C57 E9 32 SBC ##32
 8C59 38 SEC
 8C5A E9 80 SBC ##80
 8C5C 90 32 BCC #8C90
 8C5E 0A ABL
 8C5F A8 TAY
 8C60 B9 84 83 LDA #8384,Y
 8C63 48 PHA
 8C64 B9 83 83 LDA #8383,Y
 8C67 48 PHA
 8C68 4C 73 04 JMP #0473
 8C6B A9 B6 LDA ##B6
 8C6D 48 PHA
 8C6E A9 5A LDA ##5A
 8C70 48 PHA
 8C71 4C 73 04 JMP #0473
 8C74 20 73 04 JSR #0473
 8C77 C9 A4 CMP ##A4
 8C79 D0 12 BNE #8C8D
 8C7B 20 73 04 JSR #0473
 8C7E 4C 4D 8D JMP #8D4D
 8C81 00 BRK
 8C82 20 73 04 JSR #0473
 8C85 F0 06 BEQ #8C8D
 8C87 38 SEC
 8C88 6C 10 03 JMP (#0310)
 8C8B 90 E4 BCC #8C71
 8C8D 4C A1 94 JMP #94A1
 8C90 4C 7C 8E JMP #8E7C
 8C93 C9 3A CMP ##3A
 8C95 D0 F6 BNE #8C8D
 8C97 4C D3 8B JMP #8BD3

8C9A; Perform [RESTORE]

8C9A F0 15 BEQ #8CB1
 8C9C 20 E1 9D JSR #9DE1
 8C9F 84 14 STY #14
 8CA1 85 15 STA #15
 8CA3 20 3D 8A JSR #8A3D
 8CA6 B0 03 BCS #8CAB
 8CAB 4C 8F 8D JMP #8DF
 8CAB A5 5F LDA #5F
 8CAD A4 60 LDY #60
 8CAF B0 05 BCS #8CB6
 8CB1 38 SEC
 8CB2 A5 2B LDA #2B
 8CB4 A4 2C LDY #2C
 8CB6 E9 01 SBC ##01
 8CB8 B0 01 BCS #8CBB
 8CBA 88 DEY
 8CBB 85 41 STA #41
 8CBD 84 42 STY #42
 8CBF 60 RTS

8CC0; Break

8CC0 20 E1 FF JSR #FFE1
 8CC3 D0 FA BNE #8CBF
 8CC5 08 PHP
 8CC6 AC F3 04 LDY #04F3
 8CC9 C8 INY
 8CCA F0 0B BEQ #8CD7
 8CCC 20 E1 FF JSR #FFE1
 8CCF F0 FB BEQ #8CCC
 8CD1 28 PLP
 8CD2 A2 1E LDX ##1E
 8CD4 4C 83 86 JMP #8683
 8CD7 28 PLP

8CDB; Perform [STOP]

8CDB B0 01 BCS #8CDB

8CDA; Perform [END]

8CDA 18 CLC
 8CDB D0 E2 BNE #8CBF
 8CDD 24 81 BIT #81
 8CDF 10 0D BPL #8CEE
 8CE1 20 1A 8C JSR #8C1A
 8CE4 A5 39 LDA #39
 8CE6 A4 3A LDY #3A
 8CE8 8D 59 02 STA #0259
 8CEB 8C 5A 02 STY #025A
 8CEE 68 PLA
 8CEF 68 PLA
 8CF0 90 0E BCC #8D00
 8CF2 20 4F FF JSR #FF4F
 8CF5 0D 0A 42 ORA #420A :BREAK.L
 8CF8 52 ???
 8CF9 45 41 EOR #41
 8CFB 4B ???
 8CFC 00 BRK
 8CFD 4C FB 86 JMP #86FB
 8D00 4C 7E 86 JMP #867E

8D03; Perform [CONT]

8D03 D0 BA BNE #8CBF
8D05 A2 1A LDX ##1A
8D07 AC 5C 02 LDY #025C
8D0A D0 03 BNE #8D0F
8D0C 4C 83 86 JMP #8683
8D0F AD 5B 02 LDA #025B
8D12 85 3B STA #3B
8D14 84 3C STY #3C
8D16 AD 59 02 LDA #0259
8D19 AC 5A 02 LDY #025A
8D1C 85 39 STA #39
8D1E 84 3A STY #3A
8D20 A9 80 LDA #80
8D22 85 81 STA #81
8D24 0A ASL
8D25 85 73 STA #73
8D27 85 74 STA #74
8D29 4C 90 FF JMP #FF90

8D2C; Perform [GOSUB]

8D2C A0 05 LDY ##05
8D2E 20 05 89 JSR #8905
8D31 88 DEY
8D32 A5 3C LDA #3C
8D34 91 7C STA (#7C),Y
8D36 88 DEY
8D37 A5 3B LDA #3B
8D39 91 7C STA (#7C),Y
8D3B 88 DEY
8D3C A5 3A LDA #3A
8D3E 91 7C STA (#7C),Y
8D40 88 DEY
8D41 A5 39 LDA #39
8D43 91 7C STA (#7C),Y
8D45 88 DEY
8D46 A9 8D LDA #8D
8D48 91 7C STA (#7C),Y
8D4A 20 79 04 JSR #0479

8D4D; Perform [GOTO]

8D4D 20 3E 0E JSR #8E3E
8D50 20 C1 8D JSR #8DC1
8D53 38 SEC
8D54 A5 39 LDA #39
8D56 E5 14 SBC #14
8D58 A5 3A LDA #3A
8D5A E5 15 SBC #15
8D5C 80 0B BCS #8D69
8D5E 98 TYA
8D5F 38 SEC
8D60 65 3B ADC #3B
8D62 A6 3C LDX #3C
8D64 90 07 BCC #8D6D
8D66 E8 INX
8D67 80 04 BCS #8D6D
8D69 A5 2B LDA #2B
8D6B A6 2C LDX #2C
8D6D 20 41 8A JSR #8A41
8D70 90 1D BCC #8D8F
8D72 A5 5F LDA #5F
8D74 E9 01 SBC ##01

8D76 85 3B STA #3B
8D78 A5 60 LDA #60
8D7A E9 00 SBC ##00
8D7C 85 3C STA #3C
8D7E 24 81 BIT #81
8D80 10 9E BPL #8D20
8D82 60 RTS

8D83; Perform [RETURN]

8D83 A9 8D LDA #8D
8D85 85 02 STA #02
8D87 20 71 88 JSR #8871
8D8A F0 08 BEQ #8D94
8D8C A2 0C LDX #0C
8D8E 2C A2 11 BIT #11A2
8D91 4C 83 86 JMP #8683
8D94 20 69 A7 JSR #A769
8D97 A0 05 LDY ##05
8D99 20 72 A7 JSR #A772
8D9C 88 DEY
8D9D B1 3D LDA (#3D),Y
8D9F 85 3C STA #3C
8DA1 88 DEY
8DA2 B1 3D LDA (#3D),Y
8DA4 85 3B STA #3B
8DA6 88 DEY
8DA7 B1 3D LDA (#3D),Y
8DA9 20 7F CD JSR #CD7F
8DAC B1 3D LDA (#3D),Y
8DAE 85 39 STA #39

8DB0; Perform [DATA]

8DB0 20 BE 8D JSR #8DBE
8DB3 98 TYA
8DB4 18 CLC
8DB5 65 3B ADC #3B
8DB7 85 3B STA #3B
8DB9 90 02 BCC #8DBD
8DBB E6 3C INC #3C
8DBD 60 RTS

8DBE; Scan for next statement

8DBE A2 3A LDX ##3A
8DC0 2C A2 00 BIT #00A2
8DC3 86 07 STX #07
8DC5 A0 00 LDY ##00
8DC7 84 08 STY #08
8DC9 A5 08 LDA #08
8DCB A6 07 LDX #07
8DCD 85 07 STA #07
8DCF 86 08 STX #08
8DD1 20 A5 04 JSR #04A5
8DD4 F0 E7 BEQ #8DBD
8DD6 C5 08 CMP #08
8DD8 F0 E3 BEQ #8DBD
8DDA C8 INY
8DDB C9 22 CMP ##22
8DDD D0 F2 BNE #8DD1
8DDF F0 E8 BEQ #8DC9

8DE1; Perform [IF]

8DE1 20 2C 93 JSR #932C
 8DE4 20 79 04 JSR #0479
 8DE7 C9 89 CMP ##89
 8DE9 F0 05 BEQ #8DF0
 8DEB A9 A7 LDA ##A7
 8DED 20 93 94 JSR #9493
 8DF0 A5 61 LDA #61
 8DF2 D0 1C BNE #8E10
 8DF4 20 B0 8D JSR #8DB0
 8DF7 A0 00 LDY ##00
 8DF9 20 A5 04 JSR #04A5
 8DFC F0 0D BEQ #8E0B
 8DFE 20 73 04 JSR #0473
 8E01 C9 D5 CMP ##D5
 8E03 D0 EF BNE #8DF4
 8E05 20 73 04 JSR #0473
 8E08 4C 10 8E JMP #8E10

8E0B; Perform [REM]

8E0B 20 C1 8D JSR #8DC1
 8E0E F0 A3 BEQ #8DB3
 8E10 20 79 04 JSR #0479
 8E13 B0 03 BCS #8E18
 8E15 4C 4D 8D JMP #8D4D
 8E18 4C 25 8C JMP #8C25

8E1B; Perform [ON]

8E1B 20 84 9D JSR #9DB4
 8E1E 48 PHA
 8E1F C9 8D CMP ##8D
 8E21 F0 07 BEQ #8E2A
 8E23 C9 89 CMP ##89
 8E25 F0 03 BEQ #8E2A
 8E27 4C A1 94 JMP #94A1
 8E2A C6 65 DEC #65
 8E2C D0 04 BNE #8E32
 8E2E 68 PLA
 8E2F 4C 3F 8C JMP #8C3F
 8E32 20 73 04 JSR #0473
 8E35 20 3E 8E JSR #8E3E
 8E38 C9 2C CMP ##2C
 8E3A F0 EE BEQ #8E2A
 8E3C 68 PLA
 8E3D 60 RTS

8E3E; Get fixed point number

8E3E A2 00 LDX ##00
 8E40 86 08 STX #08
 8E42 86 14 STX #14
 8E44 86 15 STX #15
 8E46 B0 F5 BCS #8E3D
 8E48 E6 08 INC #08
 8E4A E9 2F SBC #2F
 8E4C 85 07 STA #07
 8E4E A5 15 LDA #15
 8E50 85 22 STA #22
 8E52 C9 19 CMP #19
 8E54 B0 CD BCS #8E23

8E56 A5 14 LDA #14
 8E58 0A ASL
 8E59 26 22 ROL #22
 8E5B 0A ASL
 8E5C 26 22 ROL #22
 8E5E 65 14 ADC #14
 8E60 85 14 STA #14
 8E62 A5 22 LDA #22
 8E64 65 15 ADC #15
 8E66 85 15 STA #15
 8E68 06 14 ASL #14
 8E6A 26 15 ROL #15
 8E6C A5 14 LDA #14
 8E6E 65 07 ADC #07
 8E70 85 14 STA #14
 8E72 90 02 BCC #8E76
 8E74 E6 15 INC #15
 8E76 20 73 04 JSR #0473
 8E79 4C 46 8E JMP #8E46

8E7C; Perform [LET]

8E7C 20 A5 96 JSR #96A5
 8E7F 85 49 STA #49
 8E81 84 4A STY #4A
 8E83 A9 B2 LDA ##B2
 8E85 20 93 94 JSR #9493
 8E88 A5 0E LDA #0E
 8E8A 48 PHA
 8E8B A5 0D LDA #0D
 8E8D 48 PHA
 8E8E 20 2C 93 JSR #932C
 8E91 68 PLA
 8E92 2A ROL
 8E93 20 1B 93 JSR #931B
 8E96 D0 18 BNE #8E80
 8E98 68 PLA
 8E99 10 12 BPL #8EAD
 8E9B 20 A0 A2 JSR #A2A0
 8E9E 20 86 98 JSR #9886
 8EA1 A0 00 LDY ##00
 8EA3 A5 64 LDA #64
 8EA5 91 49 STA (#49),Y
 8EA7 C8 INY
 8EAB A5 65 LDA #65
 8EAC 91 49 STA (#49),Y
 8EAD 60 RTS
 8EAD 4C 55 A2 JMP #A255
 8EB0 68 PLA
 8EB1 A4 4A LDY #4A
 8EB3 C0 04 CPY ##04
 8EB5 D0 72 BNE #8F29
 8EB7 20 4E 9C JSR #9C4E
 8EBA C9 06 CMP ##06
 8EBC D0 3E BNE #8EFC
 8EBE A0 00 LDY ##00
 8EC0 84 61 STY #61
 8EC2 84 66 STY #66
 8EC4 84 71 STY #71
 8EC6 20 F4 8E JSR #8EF4
 8EC9 20 62 A1 JSR #A162
 8ECC E6 71 INC #71
 8ECE A4 71 LDY #71
 8ED0 20 F4 8E JSR #8EF4
 8ED3 20 91 A2 JSR #A291
 8ED6 AA TAX
 8ED7 F0 05 BEQ #8EDE
 8ED9 E8 INX

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8EDA BA TXA
8EDB 20 6D A1 JSR #A16D
8EDE A4 71 LDY #71
8EE0 C8 INY
8EE1 C0 06 CPY ##06
8EE3 D0 DF BNE #8EC4
8EE5 20 62 A1 JSR #A162
8EE8 20 27 A3 JSR #A327
8EEB A6 64 LDX #64
8EED A4 63 LDY #63
8EEF A5 65 LDA #65
8EF1 4C DB FF JMP #FFDB
8EF4 20 B0 04 JSR #04B0
8EF7 20 85 04 JSR #0485
8EFA 90 03 BCC #8EFF
8EFC 4C 1C 99 JMP #991C
8EFF E9 2F SBC #2F
8F01 4C 0A A4 JMP #A40A
8F04 68 PLA
8F05 C8 INY
8F06 C5 34 CMP #34
8F08 90 18 BCC #8F22
8F0A D0 08 BNE #8F14
8F0C 88 DEY
8F0D 20 DC 04 JSR #04DC
8F10 C5 33 CMP #33
8F12 90 0E BCC #8F22
8F14 A4 65 LDY #65
8F16 C4 2E CPY #2E
8F18 90 08 BCC #8F22
8F1A D0 24 BNE #8F40
8F1C A5 64 LDA #64
8F1E C5 2D CMP #2D
8F20 B0 1E BCS #8F40
8F22 A5 64 LDA #64
8F24 A4 65 LDY #65
8F26 4C 5E 8F JMP #8F5E
8F29 A0 02 LDY #02
8F2B 20 DC 04 JSR #04DC
8F2E C5 7B CMP #7B
8F30 D0 D4 BNE #8F06
8F32 48 PHA
8F33 88 DEY
8F34 20 DC 04 JSR #04DC
8F37 C5 7A CMP #7A
8F39 D0 C9 BNE #8F04
8F3B A5 79 LDA #79
8F3D F0 C5 BEQ #8F04
8F3F 68 PLA
8F40 A0 00 LDY ##00
8F42 20 DC 04 JSR #04DC
8F45 20 54 9B JSR #9B54
8F48 A5 50 LDA #50
8F4A A4 51 LDY #51
8F4C 85 6F STA #6F
8F4E 84 70 STY #70
8F50 20 1B 9C JSR #9C1B
8F53 A5 6F LDA #6F
8F55 A4 70 LDY #70
8F57 20 AA 9C JSR #9CAA
8F5A A9 61 LDA #61
8F5C A0 00 LDY ##00
8F5E 85 50 STA #50
8F60 84 51 STY #51
8F62 85 22 STA #22
8F64 84 23 STY #23
8F66 20 AA 9C JSR #9CAA
8F69 20 9C 8F JSR #8F9C
8F6C 90 0B BCC #8F79

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```

8F6E A0 00 LDY ##00
8F70 A5 49 LDA #49
8F72 91 22 STA (#22),Y
8F74 C8 INY
8F75 A5 4A LDA #4A
8F77 91 22 STA (#22),Y
8F79 A5 49 LDA #49
8F7B 85 22 STA #22
8F7D A5 4A LDA #4A
8F7F 85 23 STA #23
8F81 20 9C 8F JSR #8F9C
8F84 90 09 BCC #8F8F
8F86 88 DEY
8F87 A9 FF LDA #FF
8F89 91 22 STA (#22),Y
8F8B 88 DEY
8F8C 8A TXA
8F8D 91 22 STA (#22),Y
8F8F A0 02 LDY ##02
8F91 A9 50 LDA #50
8F93 20 94 04 JSR #0494
8F96 91 49 STA (#49),Y
8F98 88 DEY
8F99 10 F6 BPL #8F91
8F9B 60 RTS
8F9C A0 00 LDY ##00
8F9E 20 B0 04 JSR #04B0
8FA1 48 PHA
8FA2 F0 39 BEQ #8FDD
8FA4 C8 INY
8FA5 20 B0 04 JSR #04B0
8FAB CA TAX
8FA9 C8 INY
8FAA 20 B0 04 JSR #04B0
8FAD C5 38 CMP #38
8FAF 90 06 BCC #8FB7
8FB1 D0 2A BNE #8FDD
8FB3 E4 37 CPX #37
8FB5 B0 26 BCS #8FDD
8FB7 20 B0 04 JSR #04B0
8FBA C5 34 CMP #34
8FBC 90 1F BCC #8FDD
8FBE D0 04 BNE #8FC4
8FC0 E4 33 CPX #33
8FC2 90 19 BCC #8FDD
8FC4 C5 7B CMP #7B
8FC6 D0 04 BNE #8FCC
8FC8 E4 7A CPX #7A
8FCA F0 11 BEQ #8FDD
8FCC 86 22 STX #22
8FCE 85 23 STA #23
8FD0 68 PLA
8FD1 AA TAX
8FD2 18 CLC
8FD3 65 22 ADC #22
8FD5 85 22 STA #22
8FD7 90 02 BCC #8FDB
8FD9 E6 23 INC #23
8FDB 38 SEC
8FDC 60 RTS
8FDD 68 PLA
8FDE 18 CLC
8FDF 60 RTS

```

8FE0; Perform [PRINT#1]

```

8FE0 20 E6 8F JSR #8FE6
8FE3 4C FE 90 JMP #90FE

```

BFE6; Perform [CMD]

BFE6 20 04 9D JSR \$9D84
BFE9 F0 05 BEQ \$0FF0
BFEB A9 2C LDA ##2C
BFED 20 93 94 JSR \$9493
BFF0 00 PHP
BFF1 06 13 STX #13
BFF3 20 97 A7 JSR \$A797
BFF6 28 PLP
BFF7 4C 00 90 JMP \$9000
BFFA 20 0B 90 JSR \$900B
BFFD 20 79 04 JSR \$0479

9000; Perform [PRINT]

9000 F0 3C BEQ \$903E
9002 C9 FB CMP ##FB
9004 D0 03 BNE \$9009
9006 4C F7 AE JMP \$AEF7
9009 F0 43 BEQ \$904E
900B C9 A3 CMP ##A3
900D F0 50 BEQ \$905F
900F C9 A6 CMP ##A6
9011 10 CLC
9012 F0 4B BEQ \$905F
9014 C9 2C CMP ##2C
9016 F0 37 BEQ \$904F
9018 C9 3B CMP ##3B
901A F0 5E BEQ \$907A
901C 20 2C 93 JSR \$932C
901F 24 0D BIT \$0D
9021 30 D7 BMI \$BFFA
9023 20 6F A4 JSR \$A46F
9026 20 74 9B JSR \$9B74
9029 20 0B 90 JSR \$900B
902C 20 A6 90 JSR \$90A6
902F D0 CC BNE \$BFFD
9031 A9 00 LDA ##00
9033 9D 00 02 STA \$0200,X
9036 A2 FF LDX ##FF
9038 A0 01 LDY ##01
903A A5 13 LDA #13
903C D0 10 BNE \$904E
903E A9 0D LDA ##0D
9040 20 B2 90 JSR \$90B2
9043 24 13 BIT #13
9045 10 05 BPL \$904C
9047 A9 0A LDA ##0A
9049 20 B2 90 JSR \$90B2
904C 49 FF EOR ##FF
904E 60 RTS
904F 38 SEC
9050 20 F0 FF JSR \$FFF0
9053 98 TYA
9054 38 SEC
9055 E9 0A SBC ##0A
9057 B0 FC BCS \$9055
9059 49 FF EOR ##FF
905B 69 01 ADC ##01
905D D0 16 BNE \$9075
905F 08 PHP
9060 38 SEC
9061 20 F0 FF JSR \$FFF0
9064 B4 09 STY #09
9066 20 B1 9D JSR \$9D81
9069 C9 29 CMP ##29

906B D0 13 BNE \$9080
906D 28 PLP
906E 90 06 BCC \$9076
9070 0A TXA
9071 E5 09 SBC #09
9073 90 05 BCC \$907A
9075 AA TAX
9076 E8 INX
9077 CA DEX
9078 D0 09 BNE \$9083
907A 20 73 04 JSR \$0473
907D 4C 09 90 JMP \$9009
9080 4C A1 94 JMP \$94A1
9083 20 A6 90 JSR \$90A6
9086 D0 EF BNE \$9077

9088; Print string from (y.a)

9088 20 74 9B JSR \$9B74
908B 20 4E 9C JSR \$9C4E
908E AA TAX
908F A0 00 LDY ##00
9091 E8 INX
9092 CA DEX
9093 F0 B9 BEQ \$904E
9095 20 B0 04 JSR \$04B0
9098 20 B2 90 JSR \$90B2
909B C8 INY
909C C9 0D CMP ##0D
909E D0 F2 BNE \$9092
90A0 20 4C 90 JSR \$904C
90A3 4C 92 90 JMP \$9092

90A6; Print format character

90A6 A5 13 LDA #13
90A8 F0 03 BEQ \$90AD
90AA A9 20 LDA ##20
90AC 2C A9 1D BIT \$1DA9
90AF 2C A9 3F BIT \$3FA9
90B2 20 0B A7 JSR \$A70B
90B5 29 FF AND ##FF
90B7 60 RTS

90BB; Perform [GET]

90BB 20 86 9A JSR \$9A86
90BD 85 00 STA #00
90BD C9 23 CMP ##23
90BF F0 0A BEQ \$90CB
90C1 C9 F9 CMP ##F9
90C3 D0 16 BNE \$90DB
90C5 20 73 04 JSR \$0473
90C8 4C DB 90 JMP \$90DB
90CB 20 73 04 JSR \$0473
90CE 20 84 9D JSR \$9D84
90D1 A9 2C LDA ##2C
90D3 20 93 94 JSR \$9493
90D6 86 13 STX #13
90D8 20 A6 A7 JSR \$A7A6
90DB A2 01 LDX ##01
90DD A0 02 LDY ##02
90DF A9 00 LDY ##00
90E1 8D 01 02 STA \$0201
90E4 A9 40 LDA ##40

90E6 20 58 91 JSR #9158
 90E9 A6 13 LDX #13
 90EB D0 13 BNE #9100
 90ED 60 RTS

90EE; Perform [INPUT#]

90EE 20 84 9D JSR #9D84
 90F1 A9 2C LDA ##2C
 90F3 20 93 94 JSR #9493
 90F6 86 13 STX #13
 90FB 20 A6 A7 JSR #A7A6
 90FB 20 17 91 JSR #9117
 90FE A5 13 LDA #13
 9100 20 CC FF JSR #FFCC
 9103 A2 00 LDX ##00
 9105 86 13 STX #13
 9107 60 RTS

9108; Perform [INPUT]

9108 C9 22 CMP ##22
 910A D0 0B BNE #9117
 910C 20 4E 94 JSR #944E
 910F A9 3B LDA ##3B
 9111 20 93 94 JSR #9493
 9114 20 8B 90 JSR #908B
 9117 20 86 9A JSR #9A86
 911A A9 2C LDA ##2C
 911C 8D FF 01 STA #01FF
 911F 20 42 91 JSR #9142
 9122 A5 13 LDA #13
 9124 F0 0D BEQ #9133
 9126 20 B7 FF JSR #FFB7
 9129 29 02 AND ##02
 912B F0 06 BEQ #9133
 912D 20 FE 90 JSR #90FE
 9130 4C B0 8D JMP #8DB0
 9133 AD 00 02 LDA #0200
 9136 D0 1E BNE #9156
 9138 A5 13 LDA #13
 913A D0 E3 BNE #911F
 913C 20 BE 8D JSR #8DBE
 913F 4C B3 8D JMP #8DB3

9142; Prompt and input

9142 A5 13 LDA #13
 9144 D0 06 BNE #914C
 9146 20 B0 90 JSR #90B0
 9149 20 AA 90 JSR #90AA
 914C 4C 5A 8B JMP #8B5A

914F; Perform [READ]

914F A6 41 LDX #41
 9151 A4 42 LDY #42
 9153 A9 98 LDA ##98
 9155 2C A9 00 BIT #00A9
 9158 85 11 STA #11
 915A 86 43 STX #43
 915C 84 44 STY #44
 915E 20 A5 96 JSR #96A5
 9161 85 49 STA #49
 9163 84 4A STY #4A

9165 A2 01 LDX ##01
 9167 B5 3B LDA #3B,X
 9169 95 4B STA #4B,X
 916B B5 43 LDA #43,X
 916D 95 3B STA #3B,X
 916F CA DEX
 9170 10 F5 BPL #9167
 9172 20 79 04 JSR #0479
 9175 D0 31 BNE #91A8
 9177 24 11 BIT #11
 9179 50 1A BVC #9195
 917B A5 80 LDA #80
 917D C9 F9 CMP ##F9
 917F D0 0B BNE #9189
 9181 20 AF A7 JSR #A7AF
 9184 AA TAX
 9185 F0 FA BEQ #9181
 9187 D0 03 BNE #918C
 9189 20 AF A7 JSR #A7AF
 918C 8D 00 02 STA #0200
 918F A2 FF LDX ##FF
 9191 A0 01 LDY ##01
 9193 D0 0F BNE #91A4
 9195 10 03 BPL #919A
 9197 4C 40 92 JMP #9240
 919A A5 13 LDA #13
 919C D0 03 BNE #91A1
 919E 20 B0 90 JSR #90B0
 91A1 20 42 91 JSR #9142
 91A4 86 3B STX #3B
 91A6 84 3C STY #3C
 91A8 20 73 04 JSR #0473
 91AB 24 0D BIT #0D
 91AD 10 31 BPL #91E0
 91AF 24 11 BIT #11
 91B1 50 09 BVC #91BC
 91B3 E8 INX
 91B4 86 3B STX #3B
 91B6 A9 00 LDA ##00
 91B8 85 07 STA #07
 91BA F0 0C BEQ #91C8
 91BC 85 07 STA #07
 91BE C9 22 CMP ##22
 91C0 F0 07 BEQ #91C9
 91C2 A9 3A LDA #3A
 91C4 85 07 STA #07
 91C6 A9 2C LDA ##2C
 91C8 18 CLC
 91C9 85 0B STA #0B
 91CB A5 3B LDA #3B
 91CD A4 3C LDY #3C
 91CF 69 00 ADC ##00
 91D1 90 01 BCC #91D4
 91D3 C8 INY
 91D4 20 7A 9B JSR #9B7A
 91D7 20 C6 9D JSR #9DC6
 91DA 20 B1 8E JSR #8EB1
 91DD 4C E8 91 JMP #91E8
 91E0 20 7F A3 JSR #A37F
 91E3 A5 0E LDA #0E
 91E5 20 99 8E JSR #8E99
 91E8 20 79 04 JSR #0479
 91EB F0 3B BEQ #922B
 91ED C9 2C CMP ##2C
 91EF F0 37 BEQ #922B
 91F1 A5 11 LDY #11
 91F3 F0 0A BEQ #91FF
 91F5 30 04 BMI #91FB
 91F7 A6 13 LDX #13

91F9 D0 08 BNE \$9203
 91FB A2 16 LDX #16
 91FD D0 06 BNE \$9205
 91FF A5 13 LDA #13
 9201 F0 05 BEQ \$9208
 9203 A2 18 LDX #18
 9205 4C 83 86 JMP \$8683
 9208 20 4F FF JSR \$FF4F

920B; Input error
 messages

920B 3F ??? :?REDD FR
 920C 52 ??? :OM START
 920D 45 44 EOR \$44
 920F 4F ???
 9210 20 46 52 JSR \$5246
 9213 4F ???
 9214 4D 20 53 EOR \$5320
 9217 54 ???
 9218 41 52 EOR (\$52,X)
 921A 54 ???
 921B 0D 00 AD ORA \$AD00
 921E 5B ???
 921F 02 ???
 9220 AC 5C 02 LDY \$025C
 9223 85 3B STA \$3B
 9225 84 3C STY \$3C
 9227 60 RTS
 9228 A2 01 LDX #01
 922A B5 3B LDA \$3B,X
 922C 95 43 STA \$43,X
 922E B5 4B LDA \$4B,X
 9230 95 3B STA \$3B,X
 9232 CA DEX
 9233 10 F5 BPL \$922A
 9235 20 79 04 JSR \$0479
 9238 F0 30 BEQ \$926A
 923A 20 91 94 JSR \$9491
 923D 4C 5E 91 JMP \$915E
 9240 20 BE 8D JSR \$8DBE
 9243 C8 INY
 9244 AA TAX
 9245 D0 15 BNE \$925C
 9247 A2 0D LDX #0D
 9249 C8 INY
 924A 20 A5 04 JSR \$04A5
 924D F0 6C BEQ \$92BB
 924F C8 INY
 9250 20 A5 04 JSR \$04A5
 9253 85 3F STA \$3F
 9255 C8 INY
 9256 20 A5 04 JSR \$04A5
 9259 C8 INY
 925A 85 40 STA \$40
 925C 20 B3 8D JSR \$8DB3
 925F 20 79 04 JSR \$0479
 9262 AA TAX
 9263 E0 83 CPX #83
 9265 D0 D9 BNE \$9240
 9267 4C A8 91 JMP \$91A8
 926A A5 43 LDA \$43
 926C A4 44 LDY \$44
 926E A6 11 LDX \$11
 9270 10 03 BPL \$9275
 9272 4C BB 8C JMP \$8CBB
 9275 A0 00 LDY #00
 9277 20 55 81 JSR \$8155

927A F0 17 BEQ \$9293
 927C A5 13 LDA \$13
 927E D0 13 BNE \$9293
 9280 20 4F FF JSR \$FF4F
 9283 3F ??? :?EXTRA I
 9284 45 58 EOR \$58 :GNORED..
 9286 54 ???
 9287 52 ???
 9288 41 20 EOR (\$20,X)
 928A 49 47 EOR #47
 928C 4E 4F 52 LSR \$524F
 928F 45 44 EOR \$44
 9291 8D 00 60 ORA \$6000

9294; Perform [NEXT]

9294 D0 13 BNE \$92A9
 9296 A0 FF LDY #FF
 9298 D0 14 BNE \$92AE
 929A A0 12 LDY #12
 929C 20 72 A7 JSR \$A772
 929F 20 79 04 JSR \$0479
 92A2 C9 2C CMP #2C
 92A4 D0 6D BNE \$9313
 92A6 20 73 04 JSR \$0473
 92A9 20 A5 96 JSR \$96A5
 92AC 85 49 STA \$49
 92AE 84 4A STY \$4A
 92B0 A0 81 LDY #81
 92B2 84 02 STY \$02
 92B4 20 71 88 JSR \$8871
 92B7 F0 05 BEQ \$92BE
 92B9 A2 0A LDX #0A
 92BB 4C 83 86 JMP \$8683
 92BE 20 69 A7 JSR \$A769
 92C1 A5 3D LDA \$3D
 92C3 18 CLC
 92C4 69 03 ADC #03
 92C6 A4 3E LDY \$3E
 92C8 90 01 BCC \$92CB
 92CA C8 INY
 92CB 20 1F A2 JSR \$A21F
 92CE A0 08 LDY #08
 92D0 B1 3D LDA (\$3D),Y
 92D2 85 66 STA \$66
 92D4 A0 01 LDY #01
 92D6 B1 3D LDA (\$3D),Y
 92D8 48 PHA
 92D9 AA TAX
 92DA C8 INY
 92DB B1 3D LDA (\$3D),Y
 92DD 48 PHA
 92DE A8 TAY
 92DF 8A TXA
 92E0 20 9B 9E JSR \$9E9B
 92E3 68 PLA
 92E4 A8 TAY
 92E5 68 PLA
 92E6 AA TAX
 92E7 20 59 A2 JSR \$A259
 92EA A5 3D LDA \$3D
 92EC 18 CLC
 92ED 69 09 ADC #09
 92EF A4 3E LDY \$3E
 92F1 90 01 BCC \$92F4
 92F3 C8 INY
 92F4 20 E0 A2 JSR \$A2E0
 92F7 A0 08 LDY #08

92F9 38 SEC
 92FA F1 3D SBC (#3D),Y
 92FC F0 9C BEQ #929A
 92FE A0 11 LDY ##11
 9300 B1 3D LDA (#3D),Y
 9302 85 3B STA #3B
 9304 88 DEY
 9305 B1 3D LDA (#3D),Y
 9307 85 3C STA #3C
 9309 88 DEY
 930A B1 3D LDA (#3D),Y
 930C 85 3A STA #3A
 930E 88 DEY
 930F B1 3D LDA (#3D),Y
 9311 85 39 STA #39
 9313 60 RTS

9314; Type match check

9314 20 2C 93 JSR #932C
 9317 18 CLC
 9318 90 01 BCC #931B
 931A 38 SEC
 931B 24 0D BIT #0D
 931D 30 03 BMI #9322
 931F B0 03 BCS #9324
 9321 60 RTS
 9322 B0 FD BCS #9321
 9324 A2 16 LDX ##16
 9326 2C A2 19 BIT #19A2
 9329 4C 83 86 JMP #8683

932C; Evaluate expression

932C A6 3B LDX #3B
 932E D0 02 BNE #9332
 9330 C6 3C DEC #3C
 9332 C6 3B DEC #3B
 9334 A2 00 LDX ##00
 9336 24 48 BIT #48
 9338 BA TXA
 9339 48 PHA
 933A BA TSX
 933B E0 28 CPX ##28
 933D 90 EB BCC #9327
 933F 20 14 94 JSR #9414
 9342 A9 00 LDA ##00
 9344 85 4D STA #4D
 9346 20 79 04 JSR #0479
 9349 38 SEC
 934A E9 B1 SBC ##B1
 934C 90 17 BCC #9365
 934E C9 03 CMP ##03
 9350 B0 13 BCS #9365
 9352 C9 01 CMP ##01
 9354 2A ROL
 9355 49 01 EOR ##01
 9357 45 4D EOR #4D
 9359 C5 4D CMP #4D
 935B 90 61 BCC #93BE
 935D 85 4D STA #4D
 935F 20 73 04 JSR #0473
 9362 4C 49 93 JMP #9349
 9365 A6 4D LDX #4D
 9367 D0 2C BNE #9395
 9369 B0 7E BCS #93E9
 936B 69 07 ADC ##07

936D 90 7A BCC #93E9
 936F 65 0D ADC #0D
 9371 D0 03 BNE #9376
 9373 4C DA 9B JMP #9BDA
 9376 69 FF ADC ##FF
 9378 85 22 STA #22
 937A 0A ASL
 937B 65 22 ADC #22
 937D A8 TAY
 937E 68 PLA
 937F D9 53 84 CMP #8453,Y
 9382 B0 6A BCS #93EE
 9384 20 17 93 JSR #9317
 9387 48 PHA
 9388 20 AE 93 JSR #93AE
 938B 68 PLA
 938C A4 4B LDY #4B
 938E 10 17 BPL #93A7
 9390 AA TAX
 9391 F0 59 BEQ #93EC
 9393 D0 62 BNE #93F7
 9395 46 0D LSR #0D
 9397 8A TXA
 9398 2A ROL
 9399 A6 3B LDX #3B
 939B D0 02 BNE #939F
 939D C6 3C DEC #3C
 939F C6 3B DEC #3B
 93A1 A0 1B LDY ##1B
 93A3 85 4D STA #4D
 93A5 D0 D7 BNE #937E
 93A7 D9 53 84 CMP #8453,Y
 93AA B0 4B BCS #93F7
 93AC 90 D9 BCC #9387
 93AE B9 55 84 LDA #8455,Y
 93B1 46 PHA
 93B2 B9 54 84 LDA #8454,Y
 93B5 48 PHA
 93B6 20 C1 93 JSR #93C1
 93B9 A5 4D LDA #4D
 93BB 4C 37 93 JMP #9337
 93BE 4C A1 94 JMP #94A1
 93C1 A5 66 LDA #66
 93C3 BE 53 84 LDX #8453,Y
 93C6 A8 TAY
 93C7 18 CLC
 93C8 68 PLA
 93C9 69 01 ADC ##01
 93CB 85 22 STA #22
 93CD 68 PLA
 93CE 69 00 ADC ##00
 93D0 85 23 STA #23
 93D2 98 TYA
 93D3 48 PHA
 93D4 20 A0 A2 JSR #A2A0
 93D7 A5 65 LDA #65
 93D9 48 PHA
 93DA A5 64 LDA #64
 93DC 48 PHA
 93DD A5 63 LDA #63
 93DF 48 PHA
 93E0 A5 62 LDA #62
 93E2 48 PHA
 93E3 A5 61 LDA #61
 93E5 48 PHA
 93E6 6C 22 00 JMP (#0022)
 93E9 A0 FF LDY ##FF
 93EB 68 PLA
 93EC F0 23 BEQ #9411

93EE C9 64 CMP ##64
 93F0 F0 03 BEQ #93F5
 93F2 20 17 93 JSR #9317
 93F5 84 4B STY #4B
 93F7 68 PLA
 93FB 4A LBR
 93F9 85 12 STA #12
 93FB 68 PLA
 93FC 85 69 STA #69
 93FE 68 PLA
 93FF 85 6A STA #6A
 9401 68 PLA
 9402 85 6B STA #6B
 9404 68 PLA
 9405 85 6C STA #6C
 9407 68 PLA
 9408 85 6D STA #6D
 940A 68 PLA
 940B 85 6E STA #6E
 940D 45 66 EOR #66
 940F 85 6F STA #6F
 9411 A5 61 LDA #61
 9413 60 RTS
 9414 6C 0A 03 JMP (#030A)
 9417 A9 00 LDA ##00
 9419 85 0D STA #0D
 941B 20 73 04 JSR #0473
 941E B0 03 BCB #9423
 9420 4C 7F A3 JMP #A37F
 9423 20 3A 97 JSR #973A
 9426 90 03 BCC #942B
 942B 4C AD 94 JMP #94AD
 942B C9 FF CMP ##FF
 942D D0 0F BNE #943E
 942F A9 39 LDA ##39
 9431 A0 94 LDY ##94
 9433 20 21 A2 JSR #A221
 9436 4C 73 04 JMP #0473

9439; Constant pi

9439 B2 ??? ???
 943A 49 0F EOR ##0F
 943C DA ??? ???
 943D A1 C9 LDA (#C9,X)
 943F 2E F0 DE ROL #DEF0
 9442 C9 AB CMP ##AB
 9444 F0 60 BEQ #94A6
 9446 C9 AA CMP ##AA
 944B F0 D1 BEQ #941B
 944A C9 22 CMP ##22
 944C D0 0F BNE #945D
 944E A5 3B LDA #3B
 9450 A4 3C LDY #3C
 9452 69 00 ADC ##00
 9454 90 01 BCC #9457
 9456 C8 INY
 9457 20 74 9B JSR #9B74
 945A 4C C6 9D JMP #9DC6
 945D C9 AB CMP ##AB
 945F D0 16 BNE #9477
 9461 A0 18 LDY ##18
 9463 D0 43 BNE #94A8
 9465 20 86 9B JSR #9B86
 946B A5 65 LDA #65
 946A 49 FF EOR ##FF
 946C AB TAY
 946D A5 64 LDA #64

946F 49 FF EOR ##FF
 9471 20 92 9A JSR #9A92
 9474 4C C9 A2 JMP #A2C9
 9477 C9 A5 CMP ##A5
 9479 D0 03 BNE #947E
 947B 4C DE 9A JMP #9ADE
 947E C9 B4 CMP ##B4
 9480 90 03 BCC #9485
 9482 4C 99 95 JMP #9599

9485; Evaluate within brackets

9485 20 8E 94 JSR #948E
 9488 20 2C 93 JSR #932C

948B; ') '

948B A9 29 LDA ##29
 948D 2C A9 2B BIT #2BA9
 9490 2C A9 2C BIT #2CA9

9493; comma..

9493 A0 00 LDY ##00
 9495 85 78 STA #78
 9497 20 A5 04 JSR #04A5
 949A C5 78 CMP #78
 949C D0 03 BNE #94A1
 949E 4C 73 04 JMP #0473

94A1; Syntax error

94A1 A2 0B LDX ##0B
 94A3 4C B3 86 JMP #86B3
 94A6 A0 15 LDY ##15
 94AB 68 PLA
 94A9 68 PLA
 94AA 4C 8B 93 JMP #938B

94AD; Search for variable

94AD 20 A5 96 JSR #96A5
 94B0 85 64 STA #64
 94B2 84 65 STY #65
 94B4 A6 45 LDX #45
 94B6 A4 46 LDY #46
 94B8 A5 0D LDA #0D
 94BA F0 45 BEQ #9501
 94BC A9 00 LDA ##00
 94BE 85 70 STA #70
 94C0 E0 54 CPX #54
 94C2 D0 24 BNE #94EB
 94C4 C0 C9 CPY #C9
 94C6 D0 76 BNE #953E
 94C8 A5 64 LDA #64
 94CA C9 A2 CMP ##A2
 94CC D0 70 BNE #953E
 94CE A5 65 LDA #65
 94D0 C9 04 CMP ##04
 94D2 D0 6A BNE #953E
 94D4 20 31 95 JSR #9531
 94D7 84 5E STY #5E
 94D9 8B DEY

94DA	B4	71	STY	#71	9564	0A	ASL	
94DC	A0	06	LDY	##06	9565	0A	ASL	
94DE	B4	5D	STY	#5D	9566	65	0F	ADC #0F
94E0	A0	24	LDY	##24	9568	85	0F	STA #0F
94E2	20	FA	A4	JSR #A4FA	956A	C8		INY
94E5	4C	70	9B	JMP #9B70	956B	A9	7A	LDA ##7A
94EB	E0	44	CPX	##44	956D	20	94	04 JSR #0494
94EA	D0	52	BNE	#953E	9570	29	0F	AND ##0F
94EC	C0	D3	CPY	##D3	9572	65	0F	ADC #0F
94EE	D0	4E	BNE	#953E	9574	4C	C1	A2 JMP #A2C1
94F0	20	FA	94	JSR #94FA	9577	E0	45	CPX ##45
94F3	A5	7A	LDA	#7A	9579	D0	17	BNE #9592
94F5	A4	7B	LDY	#7B	957B	C0	52	CPY ##52
94F7	4C	74	9B	JMP #9B74	957D	F0	0D	BEG #958C
94FA	A5	79	LDA	#79	957F	C0	4C	CPY ##4C
94FC	D0	40	BNE	#953E	9581	D0	0F	BNE #9592
94FE	4C	CF	CC	JMP #CCCF	9583	AD	F1	04 LDA #04F1
9501	24	0E	BIT	#0E	9586	AC	F0	04 LDY #04F0
9503	10	0F	BPL	#9514	9589	4C	76	9A JMP #9A76
9505	A0	00	LDY	##00	958C	AD	EF	04 LDA #04EF
9507	20	DC	04	JSR #04DC	958F	4C	C1	A2 JMP #A2C1
950A	AA		TAX		9592	A5	64	LDA #64
950B	C8		INY		9594	A4	65	LDY #65
950C	20	DC	04	JSR #04DC	9596	4C	1F	A2 JMP #A21F
950F	A8		TAY		9599	C9	D5	CMY ##D5
9510	8A		TXA		959B	B0	58	BCS #95F5
9511	4C	71	94	JMP #9471	959D	C9	CB	CMY ##CB
9514	A5	65	LDA	#65	959F	90	02	BCC #95A3
9516	C9	04	CMY	##04	95A1	E9	01	SBC ##01
9518	D0	78	BNE	#9592	95A3	48		PHA
951A	A5	64	LDA	#64	95A4	AA		TAX
951C	C9	A2	CMY	##A2	95A5	20	73	04 JSR #0473
951E	D0	72	BNE	#9592	95A8	E0	D3	CPX ##D3
9520	E0	54	CPX	##54	95AA	F0	08	BEG #95B4
9522	D0	1B	BNE	#953F	95AC	E0	CB	CPX ##CB
9524	C0	49	CPY	##49	95AE	B0	29	BCS #95D9
9526	D0	6A	BNE	#9592	95B0	E0	CB	CPX ##CB
9528	20	31	95	JSR #9531	95B2	90	25	BCC #95D9
952B	98		TYA		95B4	20	8E	94 JSR #948E
952C	A2	A0	LDX	##A0	95B7	20	2C	93 JSR #932C
952E	4C	D4	A2	JMP #A2D4	95BA	20	91	94 JSR #9491
9531	20	DE	FF	JSR #FFDE	95BD	20	1A	93 JSR #931A
9534	86	64	STX	#64	95C0	68		PLA
9536	84	63	STY	#63	95C1	C9	D3	CMY ##D3
9538	85	65	STA	#65	95C3	F0	2D	BEG #95F2
953A	A0	00	LDY	##00	95C5	AA		TAX
953C	84	62	STY	#62	95C6	A5	65	LDA #65
953E	60		RTS		95C8	48		PHA
953F	E0	53	CPX	##53	95C9	A5	64	LDA #64
9541	D0	0A	BNE	#954D	95CB	48		PHA
9543	C0	54	CPY	##54	95CC	8A		TXA
9545	D0	4B	BNE	#9592	95CD	48		PHA
9547	20	B7	FF	JSR #FFB7	95CE	20	B4	9D JSR #9D84
954A	4C	C1	A2	JMP #A2C1	95D1	68		PLA
954D	E0	44	CPX	##44	95D2	A8		TAY
954F	D0	26	BNE	#9577	95D3	8A		TXA
9551	C0	53	CPY	##53	95D4	48		PHA
9553	D0	3D	BNE	#9592	95D5	98		TYA
9555	20	FA	94	JSR #94FA	95D6	4C	DD	95 JMP #95DD
9558	A0	00	LDY	##00	95D9	20	85	94 JSR #9485
955A	A9	7A	LDA	#7A	95DC	68		PLA
955C	20	94	04	JSR #0494	95DD	38		SEC
955F	29	0F	AND	##0F	95DE	E9	B4	SBC ##B4
					95E0	0A		ASL
					95E1	A8		TAY
9561;			Set up FN reference		95E2	B9	16	84 LDA #8416,Y
9561	0A		ASL		95E5	85	56	STA #56
9562	85	0F	STA #0F		95E7	B9	15	84 LDA #8415,Y
					95EA	85	55	STA #55

95EC 20 54 00 JSR \$0054
 95EF 4C 17 93 JMP \$9317
 95F2 4C 86 B3 JMP \$B3B6
 95F5 4C A1 94 JMP \$94A1
 95F8 A0 FF LDY ##FF

95FB; Perform [OR]

95FA 2C A0 00 BIT \$00A0
 95FD 84 0B STY \$0B
 95FF 20 86 98 JSR \$9886

9602; Perform [AND]

9602 A5 64 LDA \$64
 9604 45 0B EOR \$0B
 9606 85 07 STA \$07
 9608 A5 65 LDA \$65
 960A 45 0B EOR \$0B
 960C 85 0B STA \$0B
 960E 20 81 A2 JSR \$A281
 9611 20 86 98 JSR \$9886
 9614 A5 65 LDA \$65
 9616 45 0B EOR \$0B
 9618 25 0B AND \$0B
 961A 45 0B EOR \$0B
 961C A8 TAY
 961D A5 64 LDA \$64
 961F 45 0B EOR \$0B
 9621 25 07 AND \$07
 9623 45 0B EOR \$0B
 9625 4C 71 94 JMP \$9471

962B; Compare

962B 20 1B 93 JSR \$931B
 962B B0 13 BCS \$9640
 962D A5 6E LDA \$6E
 962F 09 7F ORA ##7F
 9631 25 6A AND \$6A
 9633 85 6A STA \$6A
 9635 A9 69 LDA ##69
 9637 A0 00 LDY ##00
 9639 20 E0 A2 JSR \$A2E0
 963C AA TAX
 963D 4C 73 96 JMP \$9673
 9640 A9 0B LDA ##0B
 9642 85 0D STA \$0D
 9644 C6 4D DEC \$4D
 9646 20 4E 9C JSR \$9C4E
 9649 85 61 STA \$61
 964B 86 62 STX \$62
 964D 84 63 STY \$63
 964F A5 6C LDA \$6C
 9651 A4 6D LDY \$6D
 9653 20 52 9C JSR \$9C52
 9656 86 6C STX \$6C
 9658 84 6D STY \$6D
 965A AB TAX
 965B 3B BEC
 965C E5 61 SBC \$61
 965E F0 0B BEQ \$9668
 9660 A9 01 LDA ##01
 9662 90 04 BCC \$9668
 9664 A6 61 LDX \$61
 9666 A9 FF LDA ##FF

9668 85 66 STA \$66
 966A A0 FF LDY ##FF
 966C EB INX
 966D C8 INY
 966E CA DEX
 966F D0 07 BNE \$9678
 9671 A6 66 LDX \$66
 9673 30 17 BMI \$968C
 9675 18 CLC
 9676 90 14 BCC \$968C
 9678 20 85 81 JSR \$8185
 967B 48 PHA
 967C 20 7D 81 JSR \$817D
 967F 85 78 STA \$78
 9681 68 PLA
 9682 C5 78 CMP \$78
 9684 F0 E7 BEQ \$966D
 9686 A2 FF LDX ##FF
 9688 B0 02 BCS \$968C
 968A A2 01 LDX ##01
 968C EB INX
 968D 8A TXA
 968E 2A ROL
 968F 25 12 AND \$12
 9691 F0 02 BEQ \$9695
 9693 A9 FF LDA ##FF
 9695 4C C1 A2 JMP \$A2C1
 9698 20 91 94 JSR \$9491

969B; Perform [DIM]

969B AA TAX
 969C 20 AA 96 JSR \$96AA
 969F 20 79 04 JSR \$0479
 96A2 D0 F4 BNE \$9698
 96A4 60 RTS

96A5; Locate variable

96A5 A2 00 LDX ##00
 96A7 20 79 04 JSR \$0479
 96AA 86 0C STX \$0C
 96AC 85 45 STA \$45
 96AE 20 79 04 JSR \$0479
 96B1 20 3A 97 JSR \$973A
 96B4 B0 03 BCS \$96B9
 96B6 4C A1 94 JMP \$94A1
 96B9 A2 00 LDX ##00
 96BB 86 0D STX \$0D
 96BD 86 0E STX \$0E
 96BF 20 73 04 JSR \$0473
 96C2 90 05 BCC \$96C9
 96C4 20 3A 97 JSR \$973A
 96C7 90 0B BCC \$96D4
 96C9 AA TAX
 96CA 20 73 04 JSR \$0473
 96CD 90 FB BCC \$96CA
 96CF 20 3A 97 JSR \$973A
 96D2 B0 F6 BCS \$96CA
 96D4 C9 24 CMP ##24
 96D6 D0 06 BNE \$96DE
 96D8 A9 FF LDA ##FF
 96DA B5 0D STA \$0D
 96DC D0 10 BNE \$96EE
 96DE C9 25 CMP ##25
 96E0 D0 13 BNE \$96F5
 96E2 A5 10 LDA \$10

96E4	D0	D0	BNE	#96B6	9757	F0	18	BEQ	#9771	
96E6	A9	80	LDA	#80	9759	C0	D3	CPY	#8D3	
96E8	85	0E	STA	#0E	975B	F0	14	BEQ	#9771	
96EA	05	45	ORA	#45	975D	C0	53	CPY	#853	
96EC	85	45	STA	#45	975F	D0	27	BNE	#9788	
96EE	8A		TXA		9761	F0	0E	BEQ	#9771	
96EF	09	80	ORA	#80	9763	C0	54	CPY	#854	
96F1	AA		TAX		9765	D0	21	BNE	#9788	
96F2	20	73	04	JSR	#0473	9767	F0	08	BEQ	#9771
96F5	86	46	STX	#46	9769	C0	52	CPY	#852	
96F7	38		SEC		976B	F0	04	BEQ	#9771	
96F8	05	10	ORA	#10	976D	C0	4C	CPY	#84C	
96FA	E9	28	SBC	#828	976F	D0	17	BNE	#9788	
96FC	D0	03	BNE	#9701	9771	4C	A1	94	JMP	#94A1
96FE	4C	98	98	JMP	#9898	9774	A5	45	LDA	#45
9701	A0	00	LDY	#800	9776	A4	46	LDY	#46	
9703	84	10	STY	#10	9778	C9	54	CMP	#854	
9705	A5	2D	LDA	#2D	977A	F0	D3	BEQ	#974F	
9707	A6	2E	LDX	#2E	977C	C9	53	CMP	#853	
9709	86	60	STX	#60	977E	F0	E3	BEQ	#9763	
970B	85	5F	STA	#5F	9780	C9	45	CMP	#845	
970D	E4	30	CPX	#30	9782	F0	E5	BEQ	#9769	
970F	D0	04	BNE	#9715	9784	C9	44	CMP	#844	
9711	C5	2F	CMP	#2F	9786	F0	D1	BEQ	#9759	
9713	F0	2F	BEQ	#9744	9788	A5	2F	LDA	#2F	
9715	20	D1	04	JSR	#04D1	978A	A4	30	LDY	#30
9718	85	78	STA	#78	978C	85	5F	STA	#5F	
971A	A5	45	LDA	#45	978E	84	60	STY	#60	
971C	C5	78	CMP	#78	9790	A5	31	LDA	#31	
971E	D0	10	BNE	#9730	9792	A4	32	LDY	#32	
9720	C8		INY		9794	85	5A	STA	#5A	
9721	20	D1	04	JSR	#04D1	9796	84	5B	STY	#5B
9724	85	78	STA	#78	9798	18		CLC		
9726	A5	46	LDA	#46	9799	69	07	ADC	#807	
9728	C5	78	CMP	#78	979B	90	01	BCC	#979E	
972A	D0	03	BNE	#972F	979D	C8		INY		
972C	4C	4C	98	JMP	#984C	979E	85	58	STA	#58
972F	88		DEY		97A0	84	59	STY	#59	
9730	18		CLC		97A2	20	C0	88	JBR	#88C0
9731	A5	5F	LDA	#5F	97A5	A5	58	LDA	#58	
9733	69	07	ADC	#807	97A7	A4	59	LDY	#59	
9735	90	D4	BCC	#970B	97A9	C8		INY		
9737	EB		INX		97AA	85	2F	STA	#2F	
9738	D0	CF	BNE	#9709	97AC	84	30	STY	#30	
					97AE	85	58	STA	#58	
					97B0	84	59	STY	#59	
					97B2	A5	58	LDA	#58	
973A;	Check	Alphabetic			97B4	A6	59	LDX	#59	
973A	C9	41	CMP	#841	97B6	E4	32	CPX	#32	
973C	90	05	BCC	#9743	97B8	D0	06	BNE	#97C0	
973E	E9	5B	SBC	#85B	97BA	C5	31	CMP	#31	
9740	38		SEC		97BC	D0	02	BNE	#97C0	
9741	E9	A5	SBC	#8A5	97BE	F0	78	BEQ	#9838	
9743	60		RTS		97C0	85	22	STA	#22	
					97C2	86	23	STX	#23	
					97C4	A0	00	LDY	#800	
9744;	Create	variable			97C6	20	80	04	JBR	#0480
9744	68		PLA		97C9	A0		TAX		
9745	48		PHA		97CA	C8		INY		
9746	C9	AF	CMP	#8AF	97CB	20	80	04	JSR	#0480
9748	D0	2A	BNE	#9774	97CE	08		PHP		
974A	A9	A2	LDA	#8A2	97CF	C8		INY		
974C	A0	04	LDY	#804	97D0	20	80	04	JSR	#0480
974E	60		RTS		97D3	65	58	ADC	#58	
974F	C0	C9	CPY	#8C9	97D5	85	58	STA	#58	
9751	F0	F7	BEQ	#974A	97D7	C8		INY		
9753	C0	49	CPY	#849	97D8	20	80	04	JSR	#0480
9755	D0	31	BNE	#9788	97DB	65	59	ADC	#59	
					97DD	85	59	STA	#59	

97DF 28 P L P
 97E0 10 D0 B P L \$97B2
 97E2 8A T X A
 97E3 30 C D B M I \$97B2
 97E5 C8 I N Y
 97E6 20 B0 04 J S R \$04B0
 97E9 A0 00 L D Y \$*00
 97EB 0A A S L
 97EC 69 05 A D C \$*05
 97EE 65 22 A D C \$22
 97F0 85 22 S T A \$22
 97F2 90 02 B C C \$97F6
 97F4 E6 23 I N C \$23
 97F6 A6 23 L D X \$23
 97F8 E4 59 C P X \$59
 97FA D0 04 B N E \$9800
 97FC C5 58 C M P \$58
 97FE F0 B6 B E Q \$97B6
 9800 A0 00 L D Y \$*00
 9802 20 B0 04 J S R \$04B0
 9805 F0 24 B E Q \$982B
 9807 85 78 S T A \$78
 9809 C8 I N Y
 980A 20 B0 04 J S R \$04B0
 980D 18 C L C
 980E 65 78 A D C \$78
 9810 85 5A S T A \$5A
 9812 C8 I N Y
 9813 20 B0 04 J S R \$04B0
 9816 69 00 A D C \$*00
 9818 85 58 S T A \$58
 981A A0 00 L D Y \$*00
 981C 20 B9 81 J S R \$81B9
 981F 69 07 A D C \$*07
 9821 91 5A S T A (\$5A), Y
 9823 C8 I N Y
 9824 20 B9 81 J S R \$81B9
 9827 69 00 A D C \$*00
 9829 91 5A S T A (\$5A), Y
 982B A9 03 L D A \$*03
 982D 18 C L C
 982E 65 22 A D C \$22
 9830 85 22 S T A \$22
 9832 90 C2 B C C \$97F6
 9834 E6 23 I N C \$23
 9836 D0 BE B N E \$97F6
 9838 A0 00 L D Y \$*00
 983A A5 45 L D A \$45
 983C 91 5F S T A (\$5F), Y
 983E C8 I N Y
 983F A5 46 L D A \$46
 9841 91 5F S T A (\$5F), Y
 9843 A9 00 L D A \$*00
 9845 C8 I N Y
 9846 91 5F S T A (\$5F), Y
 9848 C0 06 C P Y \$*06
 984A D0 F9 B N E \$9845
 984C A5 5F L D A \$5F
 984E 18 C L C
 984F 69 02 A D C \$*02
 9851 A4 60 L D Y \$60
 9853 90 01 B C C \$9856
 9855 C8 I N Y
 9856 85 47 S T A \$47
 9858 84 48 S T Y \$48
 985A 60 R T S

985B; Array pointer subroutine

985B A5 0B L D A \$0B
 985D 0A A S L
 985E 69 05 A D C \$*05
 9860 65 5F A D C \$5F
 9862 A4 60 L D Y \$60
 9864 90 01 B C C \$9867
 9866 C8 I N Y
 9867 85 58 S T A \$58
 9869 84 59 S T Y \$59
 986B 60 R T S

986C; Value 32768

986C 90 80 B C C \$97EE
 986E 00 B R K
 986F 00 B R K
 9870 00 B R K
 9871 20 86 98 J S R \$9886
 9874 A5 64 L D A \$64
 9876 A4 65 L D Y \$65
 9878 60 R T S

9879; Float-fixed

9879 20 73 04 J S R \$0473
 987C 20 2C 93 J S R \$932C
 987F 20 17 93 J S R \$9317
 9882 A5 66 L D A \$66
 9884 30 0D B M I \$9893
 9886 A5 61 L D A \$61
 9888 C9 90 C M P \$*90
 988A 90 0C B C C \$9898
 988C A9 6C L D A \$*6C
 988E A0 98 L D Y \$*98
 9890 20 E0 A2 J S R \$A2E0
 9893 D0 03 B N E \$9898
 9895 4C 1C 99 J M P \$991C
 9898 4C 27 A3 J M P \$A327

989B; Set up array

989B A5 0C L D A \$0C
 989D 05 0E O R A \$0E
 989F 48 P H A
 98AA A5 0D L D A \$0D
 98A2 48 P H A
 98A3 A0 00 L D Y \$*00
 98A5 98 T Y A
 98A6 48 P H A
 98A7 A5 46 L D A \$46
 98A9 48 P H A
 98AA A5 45 L D A \$45
 98AC 48 P H A
 98AD 20 79 98 J S R \$9879
 98B0 68 P L A
 98B1 85 45 S T A \$45
 98B3 68 P L A
 98B4 85 46 S T A \$46
 98B6 68 P L A
 98B7 A8 T A Y
 98B8 BA T B X

98B9 BD 02 01 LDA #0102,X
 98BC 48 PHA
 98BD BD 01 01 LDA #0101,X
 98C0 48 PHA
 98C1 A5 64 LDA \$64
 98C3 9D 02 01 STA #0102,X
 98C6 A5 65 LDA \$65
 98C8 9D 01 01 STA #0101,X
 98CB CB INY
 98CC 84 0B STY #0B
 98CE 20 79 04 JSR #0479
 98D1 A4 0B LDY #0B
 98D3 C9 2C CMP ##2C
 98D5 F0 CE BEQ #98A5
 98D7 20 8B 94 JSR #948B
 98DA 68 PLA
 98DB 85 0D STA #0D
 98DD 68 PLA
 98DE 85 0E STA #0E
 98E0 29 7F AND ##7F
 98E2 85 0C STA #0C
 98E4 A6 2F LDX \$2F
 98E6 A5 30 LDA \$30
 98E8 86 5F STX \$5F
 98EA 85 60 STA \$60
 98EC C5 32 CMP #32
 98EE D0 04 BNE #98F4
 98F0 E4 31 CPX \$31
 98F2 F0 46 BEQ #993A
 98F4 A0 00 LDY ##00
 98F6 20 D1 04 JSR #04D1
 98F9 CB INY
 98FA C5 45 CMP \$45
 98FC D0 0B BNE #9909
 98FE 20 D1 04 JSR #04D1
 9901 85 78 STA \$78
 9903 A5 46 LDA \$46
 9905 C5 78 CMP \$78
 9907 F0 18 BEQ #9921
 9909 CB INY
 990A 20 D1 04 JSR #04D1
 990D 18 CLC
 990E 65 5F ADC \$5F
 9910 AA TAX
 9911 CB INY
 9912 20 D1 04 JSR #04D1
 9915 65 60 ADC \$60
 9917 90 CF BCC #98E8
 9919 A2 12 LDX ##12

991C; 'bad subscript'

991B 2C A2 0E BIT #0EA2
 991E 4C 83 86 JMP #8683

9921; Illegal quantity

9921 A2 13 LDX ##13
 9923 A5 0C LDA #0C
 9925 D0 F7 BNE #991E
 9927 20 5B 98 JSR #985B
 992A A0 04 LDY ##04
 992C 20 D1 04 JSR #04D1
 992F 85 78 STA \$78
 9931 A5 0B LDA #0B
 9933 C5 78 CMP \$78
 9935 D0 E2 BNE #9919

9937 4C C3 99 JMP #99C3
 993A 20 5B 98 JSR #985B
 993D 20 23 89 JSR #8923
 9940 A0 00 LDY ##00
 9942 84 72 STY \$72
 9944 A2 05 LDX ##05
 9946 A5 45 LDA \$45
 9948 91 5F STA (\$5F),Y
 994A 10 01 BPL #994D
 994C CA DEX
 994D CB INY
 994E A5 46 LDA \$46
 9950 91 5F STA (\$5F),Y
 9952 10 02 BPL #9956
 9954 CA DEX
 9955 CA DEX
 9956 86 71 STX \$71
 9958 A5 0B LDA #0B
 995A CB INY
 995B CB INY
 995C CB INY
 995D 91 5F STA (\$5F),Y
 995F A2 0B LDX ##0B
 9961 A9 00 LDA ##00
 9963 24 0C BIT #0C
 9965 50 08 BVC #996F
 9967 68 PLA
 9968 18 CLC
 9969 69 01 ADC ##01
 996B AA TAX
 996C 68 PLA
 996D 69 00 ADC ##00
 996F CB INY
 9970 91 5F STA (\$5F),Y
 9972 CB INY
 9973 8A TXA
 9974 91 5F STA (\$5F),Y
 9976 20 2F 9A JSR #9A2F
 9979 86 71 STX \$71
 997B 85 72 STA \$72
 997D A4 22 LDY \$22
 997F C6 0B DEC #0B
 9981 D0 DC BNE #995F
 9983 65 59 ADC \$59
 9985 80 67 BCB #99EE
 9987 85 59 STA \$59
 9989 AB TAY
 998A 8A TXA
 998B 65 58 ADC \$58
 998D 90 03 BCC #9992
 998F CB INY
 9990 F0 5C BEQ #99EE
 9992 20 23 89 JSR #8923
 9995 85 31 STA \$31
 9997 84 32 STY \$32
 9999 A9 00 LDA ##00
 999B E6 72 INC \$72
 999D A4 71 LDY \$71
 999F F0 05 BEQ #99A6
 99A1 8B DEY
 99A2 91 58 STA (\$58),Y
 99A4 D0 FB BNE #99A1
 99A6 C6 59 DEC \$59
 99A8 C6 72 DEC \$72
 99AA D0 F5 BNE #99A1
 99AC E6 59 INC \$59
 99AE 3B SEC
 99AF A5 31 LDA \$31
 99B1 E5 5F SBC \$5F

99B3	A0 02	LDY ##02	
99B5	91 5F	STA (#5F),Y	
99B7	A5 32	LDA \$32	9A2F; Compute array size
99B9	C8	INY	
99BA	E5 60	SBC #60	9A2F 04 22 STY #22
99BC	91 5F	STA (#5F),Y	9A31 20 D1 04 JSR #04D1
99BE	A5 0C	LDA #0C	9A34 05 28 STA #28
99C0	D0 6C	BNE #9A2E	9A36 08 DEY
99C2	C8	INY	9A37 20 D1 04 JSR #04D1
99C3	20 D1 04	JSR #04D1	9A3A 05 29 STA #29
99C6	05 0B	STA #0B	9A3C A9 10 LDA ##10
99C8	A9 00	LDA ##00	9A3E 05 5D STA #5D
99CA	05 71	STA #71	9A40 A2 00 LDX ##00
99CC	05 72	STA #72	9A42 0A 00 LDY ##00
99CE	C8	INY	9A44 0A TXA
99CF	68	PLA	9A45 0A ABL
99D0	AA	TAX	9A46 AA TAX
99D1	05 64	STA #64	9A47 98 TYA
99D3	20 D1 04	JSR #04D1	9A48 2A ROL
99D6	05 78	STA #78	9A49 AB TAY
99D8	68	PLA	9A4A B0 A2 BCS \$99EE
99D9	05 65	STA #65	9A4C 06 71 ASL #71
99DB	C5 78	CMP #78	9A4E 26 72 ROL #72
99DD	90 12	BCC #99F1	9A50 90 0B BCC #9A5D
99DF	D0 0A	BNE #99EB	9A52 18 CLC
99E1	C8	INY	9A53 0A TXA
99E2	20 D1 04	JSR #04D1	9A54 65 28 ADC #28
99E5	05 78	STA #78	9A56 AA TAX
99E7	E4 78	CPX #78	9A57 98 TYA
99E9	90 07	BCC #99F2	9A58 65 29 ADC #29
99EB	4C 19 99	JMP #9919	9A5A AB TAY
99EE	4C 01 06	JMP #0601	9A5B B0 91 BCS #99EE
99F1	C8	INY	9A5D C6 5D DEC #5D
99F2	A5 72	LDA #72	9A5F D0 E3 BNE #9A44
99F4	05 71	ORA #71	9A61 60 RTB
99F6	18	CLC	
99F7	F0 0A	BEQ #9A03	
99F9	20 2F 9A	JSR #9A2F	9A62 Perform [FRE]
99FC	0A	TXA	
99FD	65 64	ADC #64	9A62 A5 0D LDA #0D
99FF	AA	TAX	9A64 F0 03 BEQ #9A69
9A00	98	TYA	9A66 20 4E 9C JSR #9C4E
9A01	A4 22	LDY #22	9A69 20 54 A9 JSR #A954
9A03	65 65	ADC #65	9A6C 38 SEC
9A05	06 71	STX #71	9A6D A5 33 LDA #33
9A07	C6 0B	DEC #0B	9A6F E5 31 SBC #31
9A09	D0 C1	BNE #99CC	9A71 A8 TAY
9A0B	05 72	STA #72	9A72 A5 34 LDA #34
9A0D	A2 05	LDX ##05	9A74 E5 32 SBC #32
9A0F	A5 45	LDA #45	
9A11	10 01	BPL #9A14	
9A13	CA	DEX	9A76; Fix-float
9A14	A5 46	LDA #46	
9A16	10 02	BPL #9A1A	9A76 20 92 9A JSR #9A92
9A18	CA	DEX	9A79 38 SEC
9A19	CA	DEX	9A7A 4C CE A2 JMP #A2CE
9A1A	06 28	STX #28	
9A1C	A9 00	LDA ##00	9A7D; Perform [POS]
9A1E	20 3A 9A	JSR #9A3A	
9A21	0A	TXA	9A7D 38 SEC
9A22	65 58	ADC #58	9A7E 20 F0 FF JSR #FFF0
9A24	05 47	STA #47	9A81 A9 00 LDA ##00
9A26	98	TYA	9A83 4C 71 94 JMP #9471
9A27	65 59	ADC #59	
9A29	05 48	STA #48	
9A2B	AB	TAY	9A86; Check direct
9A2C	A5 47	LDA #47	
9A2E	60	RTB	9A86 24 01 BIT #01

9A8B 30 A4 BMI \$9A2E
 9A8A A2 15 LDX ##15
 9A8C 2C A2 1B BIT \$1BA2
 9A8F 4C 83 86 JMP \$8683
 9A92 A2 00 LDX ##00
 9A94 86 0D STX \$0D
 9A96 85 62 STA \$62
 9A98 84 63 STY \$63
 9A9A A2 90 LDX ##90
 9A9C 60 RTS

9A9D; Perform [DEF]

9A9D 20 CB 9A JSR \$9ACB
 9AA0 20 86 9A JSR \$9A86
 9AA3 20 8E 94 JSR \$948E
 9AA6 A9 80 LDA ##80
 9AA8 85 10 STA \$10
 9AAA 20 A5 96 JSR \$96A5
 9AAD 20 17 93 JSR \$9317
 9AB0 20 8B 94 JSR \$948B
 9AB3 A9 82 LDA ##82
 9AB5 20 93 94 JSR \$9493
 9AB8 48 PHA
 9AB9 A5 48 LDA \$48
 9ABB 48 PHA
 9ABC A5 47 LDA \$47
 9ABE 48 PHA
 9ABF A5 3C LDA \$3C
 9AC1 48 PHA
 9AC2 A5 3B LDA \$3B
 9AC4 48 PHA
 9AC5 20 80 8D JSR \$8DB0
 9AC8 4C 3E 9B JMP \$9B3E

9ACB; Check fn syntax

9ACB A9 A5 LDA ##A5
 9ACD 20 93 94 JSR \$9493
 9AD0 09 80 ORA ##80
 9AD2 85 10 STA \$10
 9AD4 20 AC 96 JSR \$96AC
 9AD7 85 4E STA \$4E
 9AD9 84 4F STY \$4F
 9ADB 4C 17 93 JMP \$9317

9ADE; Perform [FN]

9ADE 20 CB 9A JSR \$9ACB
 9AE1 A5 4F LDA \$4F
 9AE3 48 PHA
 9AE4 A5 4E LDA \$4E
 9AE6 48 PHA
 9AE7 20 85 94 JSR \$9485
 9AEA 20 17 93 JSR \$9317
 9AED 68 PLA
 9AEE 85 4E STA \$4E
 9AF0 68 PLA
 9AF1 85 4F STA \$4F
 9AF3 A0 02 LDY ##02
 9AF5 20 59 81 JSR \$8159
 9AF8 85 47 STA \$47
 9AFA AA TAX
 9AFB C8 INY
 9AFC 20 59 81 JSR \$8159
 9AFF F0 8C BEQ \$9A8D

9B01 85 48 STA \$48
 9B03 C8 INY
 9B04 20 61 81 JSR \$8161
 9B07 48 PHA
 9B08 88 DEY
 9B09 10 F9 BPL \$9B04
 9B0B A4 48 LDY \$48
 9B0D 20 59 A2 JSR \$A259
 9B10 A5 3C LDA \$3C
 9B12 48 PHA
 9B13 A5 3B LDA \$3B
 9B15 48 PHA
 9B16 20 59 81 JSR \$8159
 9B19 85 3B STA \$3B
 9B1B C8 INY
 9B1C 20 59 81 JSR \$8159
 9B1F 85 3C STA \$3C
 9B21 A5 48 LDA \$48
 9B23 48 PHA
 9B24 A5 47 LDA \$47
 9B26 48 PHA
 9B27 20 14 93 JSR \$9314
 9B2A 68 PLA
 9B2B 85 4E STA \$4E
 9B2D 68 PLA
 9B2E 85 4F STA \$4F
 9B30 20 79 04 JSR \$0479
 9B33 F0 03 BEQ \$9B38
 9B35 4C A1 94 JMP \$94A1
 9B38 68 PLA
 9B39 85 3B STA \$3B
 9B3B 68 PLA
 9B3C 85 3C STA \$3C
 9B3E A0 00 LDY ##00
 9B40 68 PLA
 9B41 91 4E STA (\$4E),Y
 9B43 68 PLA
 9B44 C8 INY
 9B45 91 4E STA (\$4E),Y
 9B47 68 PLA
 9B48 C8 INY
 9B49 91 4E STA (\$4E),Y
 9B4B 68 PLA
 9B4C C8 INY
 9B4D 91 4E STA (\$4E),Y
 9B4F 68 PLA
 9B50 C8 INY
 9B51 91 4E STA (\$4E),Y
 9B53 60 RTS

9B54; Calculate string vector

9B54 A6 64 LDX \$64
 9B56 A4 65 LDY \$65
 9B58 86 50 STX \$50
 9B5A 84 51 STY \$51
 9B5C 20 06 A9 JSR \$A906
 9B5F 86 62 STX \$62
 9B61 84 63 STY \$63
 9B63 85 61 STA \$61
 9B65 60 RTS

9B66; Perform [STR\$]

9B66 20 17 93 JSR \$9317
 9B69 A0 00 LDY ##00

9B6B 20 71 A4 JSR #A471
 9B6E 68 PLA
 9B6F 68 PLA
 9B70 A9 FF LDA #FF
 9B72 A0 00 LDY #00

9B74; Set up string

9B74 A2 22 LDX #22
 9B76 06 07 STX #07
 9B78 06 08 STX #08
 9B7A 05 6F STA #6F
 9B7C 04 70 STY #70
 9B7E 05 62 STA #62
 9B80 04 63 STY #63
 9B82 A0 FF LDY #FF
 9B84 C8 INY
 9B85 20 C6 04 JSR #04C6
 9B88 F0 0C BEQ #9B96
 9B8A C5 07 CMP #07
 9B8C F0 04 BEQ #9B92
 9B8E C5 08 CMP #08
 9B90 D0 F2 BNE #9B84
 9B92 C9 22 CMP #22
 9B94 F0 01 BEQ #9B97
 9B96 18 CLC
 9B97 04 61 STY #61
 9B99 98 TYA
 9B9A 65 6F ADC #6F
 9B9C 05 71 STA #71
 9B9E A6 70 LDX #70
 9BA0 90 01 BCC #9BA3
 9BA2 E8 INX
 9BA3 06 72 STX #72
 9BA5 98 TYA
 9BA6 20 54 9B JSR #9B54
 9BA9 A6 6F LDX #6F
 9BAB A4 70 LDY #70
 9BAD 20 2C 9C JSR #9C2C
 9BB0 A6 16 LDX #16
 9BB2 E0 22 CPX #22
 9BB4 D0 05 BNE #9BB8
 9BB6 A2 19 LDX #19
 9BB8 4C 83 86 JMP #8683
 9BBB A5 61 LDA #61
 9BBD 95 00 STA #00,X
 9BBF A5 62 LDA #62
 9BC1 95 01 STA #01,X
 9BC3 A5 63 LDA #63
 9BC5 95 02 STA #02,X
 9BC7 A0 00 LDY #00
 9BC9 06 64 STX #64
 9BCB 04 65 STY #65
 9BCD 04 70 STY #70
 9BCF 08 DEY
 9BD0 04 00 STY #00
 9BD2 06 17 STX #17
 9BD4 E8 INX
 9BD5 E8 INX
 9BD6 E8 INX
 9BD7 06 16 STX #16
 9BD9 60 RTS

9BDA; Concatenate

9BDA A5 65 LDA #65
 9BDC 48 PHA

9BDD A5 64 LDA #64
 9BDF 48 PHA
 9BE0 20 14 94 JSR #9414
 9BE3 20 1A 93 JSR #931A
 9BE6 68 PLA
 9BE7 05 6F STA #6F
 9BE9 68 PLA
 9BEA 05 70 STA #70
 9BEC A0 00 LDY #00
 9BEE 20 C6 04 JSR #04C6
 9BF1 05 78 STA #78
 9BF3 20 DC 04 JSR #04DC
 9BF6 18 CLC
 9BF7 65 78 ADC #78
 9BF9 90 03 BCC #9BFE
 9BFB 4C 4C CC JMP #CC4C
 9BFE 20 54 9B JSR #9B54
 9C01 20 1B 9C JSR #9C1B
 9C04 A5 50 LDA #50
 9C06 A4 51 LDY #51
 9C08 20 52 9C JSR #9C52
 9C0B 20 30 9C JSR #9C30
 9C0E A5 6F LDA #6F
 9C10 A4 70 LDY #70
 9C12 20 52 9C JSR #9C52
 9C15 20 80 9B JSR #9B80
 9C18 4C 46 93 JMP #9346

9C1B; Build string to memory

9C1B A0 00 LDY #00
 9C1D 20 C6 04 JSR #04C6
 9C20 48 PHA
 9C21 C8 INY
 9C22 20 C6 04 JSR #04C6
 9C25 AA TAX
 9C26 C8 INY
 9C27 20 C6 04 JSR #04C6
 9C2A AB TAY
 9C2B 68 PLA
 9C2C 06 22 STX #22
 9C2E 04 23 STY #23
 9C30 AB TAY
 9C31 F0 0B BEQ #9C3E
 9C33 48 PHA
 9C34 08 DEY
 9C35 20 B0 04 JSR #04B0
 9C38 91 35 STA (#35),Y
 9C3A 98 TYA
 9C3B D0 F7 BNE #9C34
 9C3D 68 PLA
 9C3E 18 CLC
 9C3F 65 35 ADC #35
 9C41 05 35 STA #35
 9C43 90 02 BCC #9C47
 9C45 E6 36 INC #36
 9C47 60 RTS
 9C48 20 2C 93 JSR #932C

9C4B; Discard unwanted string

9C4B 20 1A 93 JSR #931A
 9C4E A5 64 LDA #64
 9C50 A4 65 LDY #65

9C52; Make room for string

9C52 05 22 STA #22

9C54 84 23 STY #23
 9C56 20 AA 9C JSR #9CAA
 9C59 D0 39 BNE #9C94
 9C5B 20 9C 8F JSR #8F9C
 9C5E 90 34 BCC #9C94
 9C60 88 DEY
 9C61 A9 FF LDA ##FF
 9C63 91 22 STA (#22),Y
 9C65 88 DEY
 9C66 8A TXA
 9C67 91 22 STA (#22),Y
 9C69 48 PHA
 9C6A 49 FF EOR ##FF
 9C6C 38 SEC
 9C6D 65 22 ADC #22
 9C6F A4 23 LDY #23
 9C71 B0 01 BCB #9C74
 9C73 88 DEY
 9C74 85 22 STA #22
 9C76 84 23 STY #23
 9C78 AA TAX
 9C79 68 PLA
 9C7A C4 34 CPY #34
 9C7C D0 3C BNE #9CBA
 9C7E E4 33 CPX #33
 9C80 D0 38 BNE #9CBA
 9C82 48 PHA
 9C83 38 SEC
 9C84 65 33 ADC #33
 9C86 85 33 STA #33
 9C88 90 02 BCC #9C8C
 9C8A E6 34 INC #34
 9C8C E6 33 INC #33
 9C8E D0 02 BNE #9C92
 9C90 E6 34 INC #34
 9C92 68 PLA
 9C93 60 RTS
 9C94 A0 00 LDY ##00
 9C96 20 B0 04 JSR #04B0
 9C99 48 PHA
 9C9A C8 INV
 9C9B 20 B0 04 JSR #04B0
 9C9E AA TAX
 9C9F C8 INV
 9CA0 20 B0 04 JSR #04B0
 9CA3 A8 TAY
 9CA4 86 22 STX #22
 9CA6 84 23 STY #23
 9CA8 68 PLA
 9CA9 60 RTS

 9CAA; Clean descriptor
 stack

 9CAA C4 18 CPY #18
 9CAC D0 0C BNE #9CBA
 9CAE C5 17 CMP #17
 9CB0 D0 08 BNE #9CBA
 9CB2 85 16 STA #16
 9CB4 E9 03 SBC ##03
 9CB6 85 17 STA #17
 9CB8 A0 00 LDY ##00
 9CBA 60 RTS

 9CBB; Perform [CHR\$]

 9CBB 20 87 9D JSR #9DB7

9CBE 8A TXA
 9CBF 48 PHA
 9CC0 A9 01 LDA ##01
 9CC2 20 5C 9B JSR #9B5C
 9CC5 68 PLA
 9CC6 A0 00 LDY ##00
 9CC8 91 62 STA (#62),Y
 9CCA 68 PLA
 9CCB 68 PLA
 9CCC 4C B0 9B JMP #9BB0

 9CCF; Perform [LEFT\$]

 9CCF 20 46 9D JSR #9D46
 9CD2 48 PHA
 9CD3 20 81 81 JSR #8181
 9CD6 85 78 STA #78
 9CD8 68 PLA
 9CD9 C5 78 CMP #78
 9CDB 98 TYA
 9CDC 90 05 BCC #9CE3
 9CDE 20 81 81 JSR #8181
 9CE1 AA TAX
 9CE2 98 TYA
 9CE3 48 PHA
 9CE4 8A TXA
 9CE5 48 PHA
 9CE6 20 5C 9B JSR #9B5C
 9CE9 A5 50 LDA #50
 9CEB A4 51 LDY #51
 9CED 20 52 9C JSR #9C52
 9CF0 68 PLA
 9CF1 A8 TAY
 9CF2 68 PLA
 9CF3 18 CLC
 9CF4 65 22 ADC #22
 9CF6 85 22 STA #22
 9CF8 90 02 BCC #9CFC
 9CFA E6 23 INC #23
 9CFC 98 TYA
 9CFD 20 30 9C JSR #9C30
 9D00 4C B0 9B JMP #9BB0

 9D03; Perform [RIGHT\$]

 9D03 20 46 9D JSR #9D46
 9D06 48 PHA
 9D07 20 81 81 JSR #8181
 9D0A 85 78 STA #78
 9D0C 68 PLA
 9D0D 18 CLC
 9D0E E5 78 SBC #78
 9D10 49 FF EOR ##FF
 9D12 4C DC 9C JMP #9CDC

 9D15; Perform [MID\$]

 9D15 A9 FF LDA ##FF
 9D17 85 65 STA #65
 9D19 20 79 04 JSR #0479
 9D1C C9 29 CMP ##29
 9D1E F0 06 BEQ #9D26
 9D20 20 91 94 JSR #9491
 9D23 20 84 9D JSR #9D84
 9D26 20 46 9D JSR #9D46
 9D29 F0 53 BEQ #9D7E

9D2B CA DEX
 9D2C 8A TXA
 9D2D 48 PHA
 9D2E A2 00 LDX ##00
 9D30 48 PHA
 9D31 20 81 81 JSR \$8181
 9D34 85 78 STA \$78
 9D36 68 PLA
 9D37 18 CLC
 9D38 E5 78 SBC \$78
 9D3A B0 A8 BCS \$9CE4
 9D3C 49 FF EDR ##FF
 9D3E C5 65 CMP \$65
 9D40 90 A3 BCC \$9CE5
 9D42 A5 65 LDA \$65
 9D44 B0 9F BCS \$9CE5

9D46; Pull string parameters

9D46 20 8B 94 JSR \$948B
 9D49 68 PLA
 9D4A A8 TAY
 9D4B 68 PLA
 9D4C 85 55 STA \$55
 9D4E 68 PLA
 9D4F 68 PLA
 9D50 68 PLA
 9D51 AA TAX
 9D52 68 PLA
 9D53 85 50 STA \$50
 9D55 68 PLA
 9D56 85 51 STA \$51
 9D58 A5 55 LDA \$55
 9D5A 48 PHA
 9D5B 98 TYA
 9D5C 48 PHA
 9D5D A0 00 LDY ##00
 9D5F 8A TXA
 9D60 60 RTS

9D61; Perform [LEN]

9D61 20 67 9D JSR \$9D67
 9D64 4C 81 9A JMP \$9A81

9D67; Exit string mode

9D67 20 48 9C JSR \$9C48
 9D6A A2 00 LDX ##00
 9D6C 86 0D STX \$0D
 9D6E A8 TAY
 9D6F 60 RTS

9D70; Perform [ASC]

9D70 20 67 9D JSR \$9D67
 9D73 F0 06 BEQ \$9D7B
 9D75 A0 00 LDY ##00
 9D77 20 B0 04 JSR \$04B0
 9D7A A8 TAY
 9D7B 4C 81 9A JMP \$9A81
 9D7E 4C 1C 99 JMP \$991C

9DB1; input byte parameter

9DB1 20 73 04 JSR \$0473
 9DB4 20 14 93 JSR \$9314
 9DB7 20 7F 98 JSR \$987F
 9DBA A6 64 LDX \$64
 9DBC D0 F0 BNE \$9D7E
 9DBE A6 65 LDX \$65
 9D90 4C 79 04 JMP \$0479

9D93; Perform [VAL]

9D93 20 67 9D JSR \$9D67
 9D96 F0 37 BEQ \$9DCF
 9D98 A6 3B LDX \$3B
 9D9A A4 3C LDY \$3C
 9D9C 86 71 STX \$71
 9D9E 84 72 STY \$72
 9DA0 A6 22 LDX \$22
 9DA2 86 3B STX \$3B
 9DA4 18 CLC
 9DA5 65 22 ADC \$22
 9DA7 85 24 STA \$24
 9DA9 A6 23 LDX \$23
 9DAB 86 3C STX \$3C
 9DAD 90 01 BCC \$9DB0
 9DAF E8 INX
 9DB0 86 25 STX \$25
 9DB2 A0 00 LDY ##00
 9DB4 20 8B 04 JSR \$048B
 9DB7 48 PHA
 9DB8 98 TYA
 9DB9 91 24 STA (\$24),Y
 9DBB 20 79 04 JSR \$0479
 9DBE 20 7F A3 JSR \$A37F
 9DC1 68 PLA
 9DC2 A0 00 LDY ##00
 9DC4 91 24 STA (\$24),Y
 9DC6 A6 71 LDX \$71
 9DC8 A4 72 LDY \$72
 9DCA 86 3B STX \$3B
 9DCC 84 3C STY \$3C
 9DCE 60 RTS

9DCF; Parameters for POKE/WAIT

9DCF 4C 2B 9F JMP \$9F2B
 9DD2 20 14 93 JSR \$9314
 9DD5 20 E4 9D JSR \$9DE4
 9DD8 20 91 94 JSR \$9491
 9DDB 4C 84 9D JMP \$9D84

9DDE; Parameters for SOUND

9DDE 20 91 94 JSR \$9491
 9DE1 20 14 93 JSR \$9314

9DE4; Float-fixed

9DE4 A5 66 LDA \$66
 9DE6 30 96 BMI \$9D7E
 9DE8 A5 61 LDA \$61
 9DEA C9 91 CMP ##91
 9DEC B0 90 BCS \$9D7E
 9DEE 20 27 A3 JSR \$A327
 9DF1 A5 64 LDA \$64

9DF3 A4 65 LDY #65
9DF5 84 14 STY \$14
9DF7 85 15 STA \$15
9DF9 60 RTS

9DFA; Perform [PEEK]

9DFA A5 15 LDA \$15
9DFC 48 PHA
9DFD A5 14 LDA \$14
9DFE 48 PHA
9E00 20 E4 9D JSR \$9DE4
9E03 A0 00 LDY ##00
9E05 20 5D 81 JSR \$815D
9E08 A8 TAY
9E09 68 PLA
9E0A 85 14 STA \$14
9E0C 68 PLA
9E0D 85 15 STA \$15
9E0F 4C 81 9A JMP \$9A81

9E12; Perform [POKE]

9E12 20 D2 9D JSR \$9DD2
9E15 84 TXA
9E16 A0 00 LDY ##00
9E18 91 14 STA (\$14),Y
9E1A 60 RTS

9E1B; Perform [DEC]

9E1B 20 67 9D JSR \$9D67
9E1E 85 24 STA \$24
9E20 A0 00 LDY ##00
9E22 84 25 STY \$25
9E24 84 71 STY \$71
9E26 84 72 STY \$72
9E28 C4 24 CPY \$24
9E2A F0 34 BEQ \$9E60
9E2C 20 B0 04 JSR \$04B0
9E2F C8 INY
9E30 C9 20 CMP ##20
9E32 F0 F4 BEQ \$9E28
9E34 E6 25 INC \$25
9E36 A6 25 LDX \$25
9E38 E0 05 CPX ##05
9E3A F0 2B BEQ \$9E67
9E3C C9 30 CMP ##30
9E3E 90 27 BCC \$9E67
9E40 C9 3A CMP ##3A
9E42 90 0A BCC \$9E4E
9E44 C9 41 CMP ##41
9E46 90 1F BCC \$9E67
9E48 C9 47 CMP ##47
9E4A B0 1B BCS \$9E67
9E4C E9 07 SBC ##07
9E4E E9 2F SBC ##2F
9E50 0A ASL
9E51 0A ASL
9E52 0A ASL
9E53 0A ASL
9E54 A2 04 LDX ##04
9E56 0A ASL
9E57 26 71 ROL \$71
9E59 26 72 ROL \$72
9E5B CA DEX
9E5C D0 FB BNE \$9E56
9E5E F0 C8 BEQ \$9E28
9E60 A4 71 LDY \$71
9E62 A5 72 LDA \$72

9E64 4C 76 9A JMP \$9A76
9E67 4C 1C 99 JMP \$991C

9E6A; Perform [WAIT]

9E6A 20 D2 9D JSR \$9DD2
9E6D 86 49 STX \$49
9E6F A2 00 LDX ##00
9E71 20 79 04 JSR \$0479
9E74 F0 03 BEQ \$9E79
9E76 20 D8 9D JSR \$9DD8
9E79 86 4A STX \$4A
9E7B A0 00 LDY ##00
9E7D 20 5D 81 JSR \$815D
9E80 45 4A EOR \$4A
9E82 25 49 AND \$49
9E84 F0 F7 BEQ \$9E7D
9E86 60 RTS

9E87; Perform [subtract]

9E87 A5 66 LDA \$66
9E89 49 FF EOR ##FF
9E8B 85 66 STA \$66
9E8D 45 6E EOR \$6E
9E8F 85 6F STA \$6F
9E91 A5 61 LDA \$61
9E93 4C 9E 9E JMP \$9E9E
9E96 20 CD 9F JSR \$9FCD
9E99 90 3C BCC \$9ED7
9E9B 20 07 A1 JSR \$A107

9E9E; Perform [add]

9E9E D0 03 BNE \$9EA3
9EA0 4C 81 A2 JMP \$A281
9EA3 A6 70 LDX \$70
9EA5 86 56 STX \$56
9EA7 A2 69 LDX ##69
9EA9 A5 69 LDA \$69
9EAB A8 TAY
9EAC F0 D8 BEQ \$9E86
9EAE 38 SEC
9EAF E5 61 SBC \$61
9EB1 F0 24 BEQ \$9ED7
9EB3 90 12 BCC \$9EC7
9EB5 84 61 STY \$61
9EB7 A4 6E LDY \$6E
9EB9 84 66 BTY \$66
9EBB 49 FF EOR ##FF
9EBD 69 00 ADC ##00
9EBF A0 00 LDY ##00
9EC1 84 56 STY \$56
9EC3 A2 61 LDX ##61
9EC5 D0 04 BNE \$9EC8
9EC7 A0 00 LDY ##00
9EC9 84 70 STY \$70
9ECB C9 F9 CMP ##F9
9ECD 30 C7 BMI \$9E96
9ECF A8 TAY
9ED0 A5 70 LDA \$70
9ED2 56 01 LSR \$01,X
9ED4 20 E4 9F JSR \$9FE4
9ED7 24 6F BIT \$6F
9ED9 10 57 BPL \$9F32

9EDB A0 61 LDY ##61
 9EDD E0 69 CPX ##69
 9EDF F0 02 BEQ \$9EE3
 9EE1 A0 69 LDY ##69
 9EE3 38 SEC
 9EE4 49 FF EOR ##FF
 9EE6 65 56 ADC \$56
 9EE8 85 70 STA \$70
 9EEA B9 04 00 LDA #0004,Y
 9EED F5 04 SBC \$04,X
 9EEF 85 65 STA \$65
 9EF1 B9 03 00 LDA #0003,Y
 9EF4 F5 03 SBC \$03,X
 9EF6 85 64 STA \$64
 9EF8 B9 02 00 LDA #0002,Y
 9EFB F5 02 SBC \$02,X
 9EFD 85 63 STA \$63
 9EFF B9 01 00 LDA #0001,Y
 9F02 F5 01 SBC \$01,X
 9F04 85 62 STA \$62
 9F06 B0 03 BCS \$9F0B
 9F08 20 7B 9F JSR \$9F7B
 9F0B A0 00 LDY ##00
 9F0D 98 TYA
 9F0E 18 CLC
 9F0F A6 62 LDX \$62
 9F11 D0 4A BNE \$9F5D
 9F13 A6 63 LDX \$63
 9F15 86 62 STX \$62
 9F17 A6 64 LDX \$64
 9F19 86 63 STX \$63
 9F1B A6 65 LDX \$65
 9F1D 86 64 STX \$64
 9F1F A6 70 LDX \$70
 9F21 86 65 STX \$65
 9F23 84 70 STY \$70
 9F25 69 08 ADC ##08
 9F27 C9 20 CMP ##20
 9F29 D0 E4 BNE \$9F0F
 9F2B A9 00 LDA ##00
 9F2D 85 61 STA \$61
 9F2F 85 66 STA \$66
 9F31 60 RTS
 9F32 65 56 ADC \$56
 9F34 85 70 STA \$70
 9F36 A5 65 LDA \$65
 9F38 65 6D ADC \$6D
 9F3A 85 65 STA \$65
 9F3C A5 64 LDA \$64
 9F3E 65 6C ADC \$6C
 9F40 85 64 STA \$64
 9F42 A5 63 LDA \$63
 9F44 65 6B ADC \$6B
 9F46 85 63 STA \$63
 9F48 A5 62 LDA \$62
 9F4A 65 6A ADC \$6A
 9F4C 85 62 STA \$62
 9F4E 4C 6A 9F JMP \$9F6A
 9F51 69 01 ADC ##01
 9F53 06 70 ABL \$70
 9F55 26 65 ROL \$65
 9F57 26 64 ROL \$64
 9F59 26 63 ROL \$63
 9F5B 26 62 ROL \$62
 9F5D 10 F2 BPL \$9F51
 9F5F 38 SEC
 9F60 E5 61 SBC \$61
 9F62 B0 C7 BCS \$9F2B
 9F64 49 FF EOR ##FF

9F66 69 01 ADC ##01
 9F68 85 61 STA \$61
 9F6A 90 0E BCC \$9F7A
 9F6C E6 61 INC \$61
 9F6E F0 42 BEQ \$9FB2
 9F70 66 62 ROR \$62
 9F72 66 63 ROR \$63
 9F74 66 64 ROR \$64
 9F76 66 65 ROR \$65
 9F78 66 70 ROR \$70
 9F7A 60 RTS

9F7B; Complement FAC#1

9F7B A5 66 LDA \$66
 9F7D 49 FF EOR ##FF
 9F7F 85 66 STA \$66
 9F81 A5 62 LDA \$62
 9F83 49 FF EOR ##FF
 9F85 85 62 STA \$62
 9F87 A5 63 LDA \$63
 9F89 49 FF EOR ##FF
 9F8B 85 63 STA \$63
 9F8D A5 64 LDA \$64
 9F8F 49 FF EOR ##FF
 9F91 85 64 STA \$64
 9F93 A5 65 LDA \$65
 9F95 49 FF EOR ##FF
 9F97 85 65 STA \$65
 9F99 A5 70 LDA \$70
 9F9B 49 FF EOR ##FF
 9F9D 85 70 STA \$70
 9F9F E6 70 INC \$70
 9FA1 D0 0E BNE \$9FB1
 9FA3 E6 65 INC \$65
 9FA5 D0 0A BNE \$9FB1
 9FA7 E6 64 INC \$64
 9FA9 D0 06 BNE \$9FB1
 9FAB E6 63 INC \$63
 9FAD D0 02 BNE \$9FB1
 9FAF E6 62 INC \$62
 9FB1 60 RTS

9FB2; 'overflow'

9FB2 A2 0F LDX ##0F
 9FB4 4C 83 86 JMP \$86B3

9FB7; Multiply by zero byte

9FB7 A2 25 LDX ##25
 9FB9 B4 04 LDY \$04,X
 9FBB 84 70 STY \$70
 9FBD B4 03 LDY \$03,X
 9FBF 94 04 STY \$04,X
 9FC1 B4 02 LDY \$02,X
 9FC3 94 03 STY \$03,X
 9FC5 B4 01 LDY \$01,X
 9FC7 94 02 STY \$02,X
 9FC9 A4 68 LDY \$68
 9FCB 94 01 STY \$01,X
 9FCD 69 08 ADC ##08
 9FCF 30 E8 BMI \$9FB9
 9FD1 F0 E6 BEQ \$9FB9
 9FD3 E9 08 SBC ##08

9FD5 A8 TAY
 9FD6 A5 70 LDA \$70
 9FDB B0 14 BCS \$9FEE
 9FDA 16 01 ASL \$01,X
 9FDC 90 02 BCC \$9FE0
 9FDE F6 01 INC \$01,X
 9FE0 76 01 ROR \$01,X
 9FE2 76 01 ROR \$01,X
 9FE4 76 02 ROR \$02,X
 9FE6 76 03 ROR \$03,X
 9FE8 76 04 ROR \$04,X
 9FEA 6A ROR
 9FEB C8 INY
 9FEC D0 EC BNE \$9FDA
 9FEE 18 CLC
 9FEF 60 RTS
 9FF0 81 00 STA (\$00,X)
 9FF2 00 BRK
 9FF3 00 BRK
 9FF4 00 BRK
 9FF5 03 ???
 9FF6 7F ???
 9FF7 5E 56 CB LSR \$CB56,X
 9FFA 79 80 13 ADC \$1380,Y
 9FFD 9B ???
 9FFE 0B ???
 9FFF 64 ???
 A000 80 ???
 A001 76 38 ROR \$38,X
 A003 93 ???
 A004 16 82 ASL \$82,X
 A006 38 SEC
 A007 AA TAX
 A008 3B ???
 A009 20 80 35 JSR \$3580
 A00C 04 ???
 A00D F3 ???
 A00E 34 ???
 A00F 81 35 STA (\$35,X)
 A011 04 ???
 A012 F3 ???
 A013 34 ???
 A014 80 ???
 A015 80 ???
 A016 00 BRK
 A017 00 BRK
 A018 00 BRK
 A019 80 ???
 A01A 31 72 AND (\$72),Y
 A01C 17 ???
 A01D FB SED

A01E; Perform [LOG]

A01E 20 B0 A2 JSR \$A2B0
 A021 F0 02 BEQ \$A025
 A023 10 03 BPL \$A028
 A025 4C 1C 99 JMP \$991C
 A028 A5 61 LDA \$61
 A02A E9 7F SBC #\$7F
 A02C 4B PHA
 A02D A9 80 LDA #\$80
 A02F 85 61 STA \$61
 A031 A9 0A LDA #\$0A
 A033 A0 0A LDY #\$A0
 A035 20 66 A0 JSR \$A066
 A038 A9 0F LDA #\$0F
 A03A A0 A0 LDY #\$A0

A03C 20 72 A0 JSR \$A072
 A03F A9 F0 LDA #\$F0
 A041 A0 9F LDY #\$9F
 A043 20 6C A0 JSR \$A06C
 A046 A9 F5 LDA #\$F5
 A048 A0 9F LDY #\$9F
 A04A 20 B3 A6 JSR \$A6B3
 A04D A9 14 LDA \$14
 A04F A0 A0 LDY #\$A0
 A051 20 66 A0 JSR \$A066
 A054 6B PLA
 A055 20 0A A4 JSR \$A40A
 A058 A9 19 LDA #\$19
 A05A A0 A0 LDY #\$A0
 A05C 20 DC A0 JSR \$A0DC
 A05F 4C 7B A0 JMP \$A07B
 A062 A9 A3 LDA #\$A3
 A064 A0 A5 LDY #\$A5
 A066 20 DC A0 JSR \$A0DC
 A069 4C 9E 9E JMP \$9E9E
 A06C 20 DC A0 JSR \$A0DC
 A06F 4C 87 9E JMP \$9E87
 A072 20 DC A0 JSR \$A0DC
 A075 4C 97 A1 JMP \$A197
 A07B 20 07 A1 JSR \$A107

A07B; Perform [multiply]

A07B D0 03 BNE \$A080
 A07D 4C DB A0 JMP \$A0DB
 A080 20 37 A1 JSR \$A137
 A083 A9 00 LDA #\$00
 A085 85 26 STA \$26
 A087 85 27 STA \$27
 A089 85 28 STA \$28
 A08B 85 29 STA \$29
 A08D A5 70 LDA \$70
 A08F 20 A9 A0 JSR \$A0A9
 A092 A5 65 LDA \$65
 A094 20 A9 A0 JSR \$A0A9
 A097 A5 64 LDA \$64
 A099 20 A9 A0 JSR \$A0A9
 A09C A5 63 LDA \$63
 A09E 20 A9 A0 JSR \$A0A9
 A0A1 A5 62 LDA \$62
 A0A3 20 AE A0 JSR \$A0AE
 A0A6 4C 0C A2 JMP \$A20C

A0A9; Multiply-a-bit

A0A9 D0 03 BNE \$A0AE
 A0AB 4C B7 9F JMP \$9FB7
 A0AE 4A LSR
 A0AF 09 80 ORA #\$80
 A0B1 A8 TAY
 A0B2 90 19 BCC \$A0CD
 A0B4 18 CLC
 A0B5 A5 29 LDA \$29
 A0B7 65 6D ADC \$6D
 A0B9 85 29 STA \$29
 A0BB A5 28 LDA \$28
 A0BD 65 6C ADC \$6C
 A0BF 85 28 STA \$28
 A0C1 A5 27 LDA \$27
 A0C3 65 68 ADC \$68
 A0C5 85 27 STA \$27
 A0C7 A5 26 LDA \$26

A0C9 65 6A ADC \$6A
 A0CB 85 26 STA \$26
 A0CD 66 26 ROR \$26
 A0CF 66 27 ROR \$27
 A0D1 66 28 ROR \$28
 A0D3 66 29 ROR \$29
 A0D5 66 70 ROR \$70
 A0D7 98 TYA
 A0D8 4A LSR
 A0D9 D0 D6 BNE \$A0B1
 A0DB 60 RTS

A0DC; Memory to FAC#2

A0DC 85 22 STA \$22
 A0DE 84 23 STY \$23
 A0E0 A0 04 LDY ##04
 A0E2 B1 22 LDA (\$22),Y
 A0E4 85 6D STA \$6D
 A0E6 88 DEY
 A0E7 B1 22 LDA (\$22),Y
 A0E9 85 6C STA \$6C
 A0EB 88 DEY
 A0EC B1 22 LDA (\$22),Y
 A0EE 85 6B STA \$6B
 A0F0 88 DEY
 A0F1 B1 22 LDA (\$22),Y
 A0F3 85 6E STA \$6E
 A0F5 45 66 EOR \$66
 A0F7 85 6F STA \$6F
 A0F9 A5 6E LDA \$6E
 A0FB 09 80 ORA ##80
 A0FD 85 6A STA \$6A
 A0FF 88 DEY
 A100 B1 22 LDA (\$22),Y
 A102 85 69 STA \$69
 A104 A5 61 LDA \$61
 A106 60 RTS

A107; Adjust FAC#1/2

A107 85 22 STA \$22
 A109 84 23 STY \$23
 A10B A0 04 LDY ##04
 A10D 20 B0 04 JSR \$04B0
 A110 85 6D STA \$6D
 A112 88 DEY
 A113 20 B0 04 JSR \$04B0
 A116 85 6C STA \$6C
 A118 88 DEY
 A119 20 B0 04 JSR \$04B0
 A11C 85 6B STA \$6B
 A11E 88 DEY
 A11F 20 B0 04 JSR \$04B0
 A122 85 6E STA \$6E
 A124 45 66 EOR \$66
 A126 85 6F STA \$6F
 A128 A5 6E LDA \$6E
 A12A 09 80 ORA ##80
 A12C 85 6A STA \$6A
 A12E 88 DEY
 A12F 20 B0 04 JSR \$04B0
 A132 85 69 STA \$69
 A134 A5 61 LDA \$61
 A136 60 RTS
 A137 A5 69 LDA \$69
 A139 F0 1F BEQ \$A15A

A13B 18 CLC
 A13C 65 61 ADC \$61
 A13E 90 04 BCC \$A144
 A140 30 1D BMI \$A15F
 A142 18 CLC
 A143 2C 10 14 BIT \$1410
 A146 69 80 ADC ##80
 A148 85 61 STA \$61
 A14A D0 03 BNE \$A14F
 A14C 4C 2F 9F JMP \$9F2F
 A14F A5 6F LDA \$6F
 A151 85 66 STA \$66
 A153 60 RTS

A154; Underflow/overflow

A154 A5 66 LDA \$66
 A156 49 FF EOR ##FF
 A158 30 05 BMI \$A15F
 A15A 68 PLA
 A15B 68 PLA
 A15C 4C 2B 9F JMP \$9F2B
 A15F 4C B2 9F JMP \$9FB2

A162; Multiply by 10

A162 20 91 A2 JSR \$A291
 A165 AA TAX
 A166 F0 10 BEQ \$A17B
 A168 18 CLC
 A169 69 02 ADC ##02
 A16B B0 F2 BCS \$A15F
 A16D A2 00 LDX ##00
 A16F 86 6F STX \$6F
 A171 20 AB 9E JSR \$9EAB
 A174 E6 61 INC \$61
 A176 F0 E7 BEQ \$A15F
 A178 60 RTS

A179; + 10 in floating point

A179 84 20 STY \$20
 A17B 00 BRK
 A17C 00 BRK
 A17D 00 BRK

A17E; Divide by 10

A17E A2 14 LDX ##14
 A180 4C 83 86 JMP \$8683
 A183 20 91 A2 JSR \$A291
 A186 A9 79 LDA \$79
 A188 A0 A1 LDY ##A1
 A18A A2 00 LDX ##00
 A18C 86 6F STX \$6F
 A18E 20 21 A2 JSR \$A221
 A191 4C 97 A1 JMP \$A197
 A194 20 07 A1 JSR \$A107

A197 Perform [divide]

A197 F0 E5 BEQ \$A17E
 A199 20 A0 A2 JSR \$A2A0

A19C	A9 00	LDA	##00	A21A	85 65	STA	##5
A19E	38	SEC		A21C	4C 0B 9F	JMP	##9F0B
A19F	E5 61	SBC	##1				
A1A1	85 61	STA	##1				
A1A3	20 37 A1	JSR	##A137	A21F;		Memory to FAC#1	
A1A6	E6 61	INC	##1	A21F	18	CLC	
A1A8	F0 B5	BEQ	##A15F	A220	24 38	BIT	##38
A1AA	A2 FC	LDX	##FC	A222	85 22	STA	##22
A1AC	A9 01	LDA	##01	A224	84 23	STY	##23
A1AE	A4 6A	LDY	##6A	A226	A0 04	LDY	##04
A1B0	C4 62	CPY	##62	A228	20 20 A3	JSR	##A320
A1B2	D0 10	BNE	##A1C4	A22B	85 65	STA	##65
A1B4	A4 6B	LDY	##6B	A22D	88	DEY	
A1B6	C4 63	CPY	##63	A22E	20 20 A3	JSR	##A320
A1B8	D0 0A	BNE	##A1C4	A231	85 64	STA	##64
A1BA	A4 6C	LDY	##6C	A233	88	DEY	
A1BC	C4 64	CPY	##64	A234	20 20 A3	JSR	##A320
A1BE	D0 04	BNE	##A1C4	A237	85 63	STA	##63
A1C0	A4 6D	LDY	##6D	A239	88	DEY	
A1C2	C4 65	CPY	##65	A23A	20 20 A3	JSR	##A320
A1C4	08	PHP		A23D	85 66	STA	##66
A1C5	2A	ROL		A23F	09 80	ORA	##80
A1C6	90 09	BCC	##A1D1	A241	85 62	STA	##62
A1C8	E8	INX		A243	88	DEY	
A1C9	95 29	STA	##29, X	A244	20 20 A3	JSR	##A320
A1CB	F0 32	BEQ	##A1FF	A247	85 61	STA	##61
A1CD	10 34	BPL	##A203	A249	84 70	STY	##70
A1CF	A9 01	LDA	##01	A24B	60	RTS	
A1D1	28	PLP					
A1D2	B0 0E	BCB	##A1E2	A24C;		FAC#1 to memory	
A1D4	06 6D	ASL	##6D	A24C	A2 5C	LDX	##5C
A1D6	26 6C	ROL	##6C	A24E	2C A2 57	BIT	##57A2
A1D8	26 6B	ROL	##6B	A251	A0 00	LDY	##00
A1DA	26 6A	ROL	##6A	A253	F0 04	BEQ	##A259
A1DC	B0 E6	BCB	##A1C4	A255	A6 49	LDX	##49
A1DE	30 CE	BMI	##A1AE	A257	A4 4A	LDY	##4A
A1E0	10 E2	BPL	##A1C4	A259	20 A0 A2	JSR	##A2A0
A1E2	A8	TAY		A25C	86 22	STX	##22
A1E3	A5 6D	LDA	##6D	A25E	84 23	STY	##23
A1E5	E5 65	SBC	##65	A260	A0 04	LDY	##04
A1E7	85 6D	STA	##6D	A262	A5 65	LDA	##65
A1E9	A5 6C	LDA	##6C	A264	91 22	STA	##22, Y
A1EB	E5 64	SBC	##64	A266	88	DEY	
A1ED	85 6C	STA	##6C	A267	A5 64	LDA	##64
A1EF	A5 6B	LDA	##6B	A269	91 22	STA	##22, Y
A1F1	E5 63	SBC	##63	A26B	88	DEY	
A1F3	85 6B	STA	##6B	A26C	A5 63	LDA	##63
A1F5	A5 6A	LDA	##6A	A26E	91 22	STA	##22, Y
A1F7	E5 62	SBC	##62	A270	88	DEY	
A1F9	85 6A	STA	##6A	A271	A5 66	LDA	##66
A1FB	98	TYA		A273	09 7F	ORA	##7F
A1FC	4C D4 A1	JMP	##A1D4	A275	25 62	AND	##62
A1FF	A9 40	LDA	##40	A277	91 22	STA	##22, Y
A201	D0 CE	BNE	##A1D1	A279	88	DEY	
A203	0A	ASL		A27A	A5 61	LDA	##61
A204	0A	ASL		A27C	91 22	STA	##22, Y
A205	0A	ASL		A27E	84 70	STY	##70
A206	0A	ASL		A280	60	RTS	
A207	0A	ASL					
A208	0A	ASL		A281;		FAC#2 to FAC#1	
A209	85 70	STA	##70	A281	A5 6E	LDA	##6E
A20B	28	PLP		A283	85 66	STA	##66
A20C	A5 26	LDA	##26	A285	A2 05	LDX	##05
A20E	85 62	STA	##62	A287	85 68	LDA	##68, X
A210	A5 27	LDA	##27				
A212	85 63	STA	##63				
A214	A5 28	LDA	##28				
A216	85 64	STA	##64				
A218	A5 29	LDA	##29				

A289 95 60 STA \$60,X
 A28B CA DEX
 A28C D0 F9 BNE \$A287
 A28E 86 70 STX \$70
 A290 60 RTS

A291; FAC#1 to FAC#2

A291 20 A0 A2 JSR \$A2A0
 A294 A2 06 LDX ##06
 A296 B5 60 LDA \$60,X
 A298 95 68 STA \$68,X
 A29A CA DEX
 A29B D0 F9 BNE \$A296
 A29D 86 70 STX \$70
 A29F 60 RTS

A2A0; Round FAC#1

A2A0 A5 61 LDA \$61
 A2A2 F0 FB BEQ \$A29F
 A2A4 06 70 ASL \$70
 A2A6 90 F7 BCC \$A29F
 A2A8 20 A3 9F JSR \$9FA3
 A2AB D0 F2 BNE \$A29F
 A2AD 4C 6C 9F JMP \$9F6C

A2B0; Get sign

A2B0 A5 61 LDA \$61
 A2B2 F0 09 BEQ \$A2BD
 A2B4 A5 66 LDA \$66
 A2B6 2A ROL
 A2B7 A9 FF LDA ##FF
 A2B9 B0 02 BCS \$A2BD
 A2BB A9 01 LDA ##01
 A2BD 60 RTS

A2BE; Perform [SGN]

A2BE 20 B0 A2 JSR \$A2B0
 A2C1 85 62 STA \$62
 A2C3 A9 00 LDA ##00
 A2C5 95 63 STA \$63
 A2C7 A2 88 LDX ##88
 A2C9 A5 62 LDA \$62
 A2CB 49 FF EOR ##FF
 A2CD 2A ROL

A2CE; Fixed float

A2CE A9 00 LDA ##00
 A2D0 85 63 STA \$63
 A2D2 85 64 STA \$64
 A2D4 86 61 STX \$61
 A2D6 85 70 STA \$70
 A2D8 85 66 STA \$66
 A2DA 4C 06 9F JMP \$9F06

A2DD; Perform [ABS]

A2DD 46 66 LSR \$66
 A2DF 60 RTS

A2E0; Compare FAC#1 to mem

A2E0 85 24 STA \$24
 A2E2 84 25 STY \$25
 A2E4 A0 00 LDY ##00
 A2E6 B1 24 LDA (\$24),Y
 A2E8 C8 INY
 A2E9 AA TAX
 A2EA F0 C4 BEQ \$A2B0
 A2EC B1 24 LDA (\$24),Y
 A2EE 45 66 EOR \$66
 A2F0 30 C2 BMI \$A2B4
 A2F2 E4 61 CPX \$61
 A2F4 D0 21 BNE \$A317
 A2F6 B1 24 LDA (\$24),Y
 A2F8 09 80 ORA ##80
 A2FA C5 62 CMP \$62
 A2FC D0 19 BNE \$A317
 A2FE C8 INY
 A2FF B1 24 LDA (\$24),Y
 A301 C5 63 CMP \$63
 A303 D0 12 BNE \$A317
 A305 C8 INY
 A306 B1 24 LDA (\$24),Y
 A308 C5 64 CMP \$64
 A30A D0 0B BNE \$A317
 A30C C8 INY
 A30D A9 7F LDA ##7F
 A30F C5 70 CMP \$70
 A311 B1 24 LDA (\$24),Y
 A313 E5 65 SBC \$65
 A315 F0 2F BEQ \$A346
 A317 A5 66 LDA \$66
 A319 90 02 BCC \$A31D
 A31B 49 FF EOR ##FF
 A31D 4C B6 A2 JMP \$A2B6

A320; Float-fixed

A320 B1 22 LDA (\$22),Y
 A322 B0 22 BCS \$A346
 A324 4C B0 04 JMP \$04B0
 A327 A5 61 LDA \$61
 A329 F0 4A BEQ \$A375
 A32B 38 SEC
 A32C E9 A0 SBC ##A0
 A32E 24 66 BIT \$66
 A330 10 09 BPL \$A33B
 A332 AA TAX
 A333 A9 FF LDA ##FF
 A335 85 68 STA \$68
 A337 20 81 9F JSR \$9FB1
 A33A 8A TXA
 A33B A2 61 LDX ##61
 A33D C9 F9 CMP ##F9
 A33F 10 06 BPL \$A347
 A341 20 CD 9F JSR \$9FCD
 A344 84 68 STY \$68
 A346 60 RTS
 A347 A8 TAY
 A348 A5 66 LDA \$66
 A34A 29 80 AND ##80
 A34C 46 62 LSR \$62
 A34E 05 62 ORA \$62
 A350 85 62 STA \$62
 A352 20 E4 9F JSR \$9FE4

A355 84 68 STY #68
 A357 60 RTS

A358; Perform [int]

A358 A5 61 LDA #61
 A35A C9 A0 CMP ##A0
 A35C B0 20 BCS #A37E
 A35E 20 27 A3 JSR #A327
 A361 84 70 STY #70
 A363 A5 66 LDA #66
 A365 84 66 STY #66
 A367 49 80 EOR ##80
 A369 2A ROL
 A36A A9 A0 LDA ##A0
 A36C 85 61 STA #61
 A36E A5 65 LDA #65
 A370 85 07 STA #07
 A372 4C 06 9F JMP #9F06
 A375 85 62 STA #62
 A377 85 63 STA #63
 A379 85 64 STA #64
 A37B 85 65 STA #65
 A37D AB TAY
 A37E 60 RTS

A37F; String to FAC

A37F A0 00 LDY ##00
 A381 A2 0A LDX ##0A
 A383 94 5D STY #5D,X
 A385 CA DEX
 A386 10 FB BPL #A383
 A388 90 0F BCC #A399
 A38A C9 2D CMP #2D
 A38C D0 04 BNE #A392
 A38E 86 67 STX #67
 A390 F0 04 BEQ #A396
 A392 C9 2B CMP ##2B
 A394 D0 05 BNE #A39B
 A396 20 73 04 JSR #0473
 A399 90 5B BCC #A3F6
 A39B C9 2E CMP ##2E
 A39D F0 2E BEQ #A3CD
 A39F C9 45 CMP ##45
 A3A1 D0 30 BNE #A3D3
 A3A3 20 73 04 JSR #0473
 A3A6 90 17 BCC #A3BF
 A3AB C9 AB CMP ##AB
 A3AA F0 0E BEQ #A3BA
 A3AC C9 2D CMP #2D
 A3AE F0 0A BEQ #A3BA
 A3B0 C9 AA CMP ##AA
 A3B2 F0 08 BEQ #A3BC
 A3B4 C9 2B CMP ##2B
 A3B6 F0 04 BEQ #A3BC
 A3B8 D0 07 BNE #A3C1
 A3BA 66 60 ROR #60
 A3BC 20 73 04 JSR #0473
 A3BF 90 5C BCC #A41D
 A3C1 24 60 BIT #60
 A3C3 10 0E BPL #A3D3
 A3C5 A9 00 LDA ##00
 A3C7 38 SEC
 A3CB E5 5E SBC #5E
 A3CA 4C D5 A3 JMP #A3D5
 A3CD 66 5F ROR #5F

A3CF 24 5F BIT #5F
 A3D1 50 C3 BVC #A396
 A3D3 A5 5E LDA #5E
 A3D5 38 SEC
 A3D6 E5 5D SBC #5D
 A3D8 85 5E STA #5E
 A3DA F0 12 BEQ #A3EE
 A3DC 10 09 BPL #A3E7
 A3DE 20 83 A1 JSR #A183
 A3E1 E6 5E INC #5E
 A3E3 D0 F9 BNE #A3DE
 A3E5 F0 07 BEQ #A3EE
 A3E7 20 62 A1 JSR #A162
 A3EA C6 5E DEC #5E
 A3EC D0 F9 BNE #A3E7
 A3EE A5 67 LDA #67
 A3F0 30 01 BMI #A3F3
 A3F2 60 RTS
 A3F3 4C 27 A6 JMP #A627
 A3F6 4B PHA
 A3F7 24 5F BIT #5F
 A3F9 10 02 BPL #A3FD
 A3FB E6 5D INC #5D
 A3FD 20 62 A1 JSR #A162
 A400 68 PLA
 A401 38 SEC
 A402 E9 30 SBC ##30
 A404 20 0A A4 JSR #A40A
 A407 4C 96 A3 JMP #A396

A40A; Get ASCII digit

A40A 4B PHA
 A40B 20 91 A2 JSR #A291
 A40E 68 PLA
 A40F 20 C1 A2 JSR #A2C1
 A412 A5 6E LDA #6E
 A414 45 66 EOR #66
 A416 85 6F STA #6F
 A418 A6 61 LDX #61
 A41A 4C 9E 9E JMP #9E9E
 A41D A5 5E LDA #5E
 A41F C9 0A CMP ##0A
 A421 90 09 BCC #A42C
 A423 A9 64 LDA #64
 A425 24 60 BIT #60
 A427 30 16 BMI #A43F
 A429 4C B2 9F JMP #9FB2
 A42C 0A ASL
 A42D 0A ASL
 A42E 18 CLC
 A42F 65 5E ADC #5E
 A431 0A ASL
 A432 18 CLC
 A433 A0 00 LDY ##00
 A435 85 78 STA #78
 A437 20 A5 04 JSR #04A5
 A43A 65 78 ADC #78
 A43C 38 SEC
 A43D E9 30 SBC ##30
 A43F 85 5E STA #5E
 A441 4C BC A3 JMP #A3BC
 A444 9B ???
 A445 3E BC 1F ROL #1FBC,X
 A448 FD 9E 6E SBC #6E9E,X
 A44B 6B ???
 A44C 27 ???
 A44D FD 9E 6E SBC #6E9E,X

A450	6B	???		A4CB	1B	CLC	
A451	2B	PLP		A4CC	69 0A	ADC	##0A
A452	0B	BRK		A4CE	30 09	BMI	##A4D9
				A4D0	C9 0B	CMF	##0B
				A4D2	B0 06	BCS	##A4DA
A453;	Print 'IN..'			A4D4	69 FF	ADC	##FF
				A4D6	AA	TAX	
A453	20 4F FF	JSR	##FF4F	A4D7	A9 02	LDA	##02
A456	20 49 4E	JSR	##4E49	A4D9	3B	SEC	
A459	20 00 A5	JSR	##A500	A4DA	E9 02	SBC	##02
A45C	3A	???		A4DC	85 5E	STA	##5E
A45D	A6 39	LDX	##39	A4DE	86 5D	STX	##5D
				A4E0	8A	TXA	
				A4E1	F0 02	BEQ	##A4E5
A45F;	Print line number			A4E3	10 13	BPL	##A4F8
				A4E5	A4 71	LDY	##71
A45F	85 62	STA	##62	A4E7	A9 2E	LDA	##2E
A461	86 63	STX	##63	A4E9	C8	INY	
A463	A2 90	LDX	##90	A4EA	99 FF 00	STA	##00FF,Y
A465	3B	SEC		A4ED	8A	TXA	
A466	20 CE A2	JSR	##A2CE	A4EE	F0 06	BEQ	##A4F6
A469	20 71 A4	JSR	##A471	A4F0	A9 30	LDA	##30
A46C	4C 8B 90	JMP	##908B	A4F2	C8	INY	
				A4F3	99 FF 00	STA	##00FF,Y
A46F;	Float to ASCII			A4F6	84 71	STY	##71
				A4F8	A0 00	LDY	##00
A46F	A0 01	LDY	##01	A4FA	A2 80	LDX	##80
A471	A9 20	LDA	##20	A4FC	A5 65	LDA	##65
A473	24 66	BIT	##66	A4FE	1B	CLC	
A475	10 02	BPL	##A479	A4FF	79 AB A5	ADC	##A5AB,Y
A477	A9 2D	LDA	##2D	A502	85 65	STA	##65
A479	99 FF 00	STA	##00FF,Y	A504	A5 64	LDA	##64
A47C	85 66	STA	##66	A506	79 AA A5	ADC	##A5AA,Y
A47E	84 71	STY	##71	A509	85 64	STA	##64
A480	C8	INY		A50B	A5 63	LDA	##63
A481	A9 30	LDA	##30	A50D	79 A9 A5	ADC	##A5A9,Y
A483	A6 61	LDX	##61	A510	85 63	STA	##63
A485	D0 03	BNE	##A48A	A512	A5 62	LDA	##62
A487	4C 96 A5	JMP	##A596	A514	79 AB A5	ADC	##A5AB,Y
A48A	A9 00	LDA	##00	A517	85 62	STA	##62
A48C	E0 80	CPX	##80	A519	E8	INX	
A48E	F0 02	BEQ	##A492	A51A	B0 04	BCS	##A520
A490	B0 09	BCS	##A49B	A51C	10 DE	BPL	##A4FC
A492	A9 4E	LDA	##4E	A51E	30 02	BMI	##A522
A494	A0 A4	LDY	##A4	A520	30 DA	BMI	##A4FC
A496	20 5C A0	JSR	##A05C	A522	8A	TXA	
A499	A9 F7	LDA	##F7	A523	90 04	BCC	##A529
A49B	85 5D	STA	##5D	A525	49 FF	EOR	##FF
A49D	A9 49	LDA	##49	A527	69 0A	ADC	##0A
A49F	A0 A4	LDY	##A4	A529	69 2F	ADC	##2F
A4A1	20 E0 A2	JBR	##A2E0	A52B	C8	INY	
A4A4	F0 1E	BEQ	##A4C4	A52C	C8	INY	
A4A6	10 12	BPL	##A4BA	A52E	C8	INY	
A4AB	A9 44	LDA	##44	A52F	84 47	STY	##47
A4AA	A0 A4	LDY	##A4	A531	A4 71	LDY	##71
A4AC	20 E0 A2	JSR	##A2E0	A533	C8	INY	
A4AF	F0 02	BEQ	##A4B3	A534	AA	TAX	
A4B1	10 0E	BPL	##A4C1	A535	29 7F	AND	##7F
A4B3	20 62 A1	JSR	##A162	A537	99 FF 00	STA	##00FF,Y
A4B6	C6 5D	DEC	##5D	A53A	C6 5D	DEC	##5D
A4B8	D0 EE	BNE	##A4AB	A53C	D0 06	BNE	##A544
A4BA	20 83 A1	JSR	##A1B3	A53E	A9 2E	LDA	##2E
A4BD	E6 5D	INC	##5D	A540	C8	INY	
A4BF	D0 DC	BNE	##A49D	A541	99 FF 00	STA	##00FF,Y
A4C1	20 62 A0	JSR	##A062	A544	84 71	STY	##71
A4C4	20 27 A3	JSR	##A327	A546	A4 47	LDY	##47
A4C7	A2 01	LDX	##01	A548	8A	TXA	
A4C9	A5 5D	LDA	##5D	A549	49 FF	EOR	##FF

A54B 29 00 AND ##80
 A54D AA TAX
 A54E C0 24 CPY ##24
 A550 F0 04 BEQ \$A556
 A552 C0 3C CPY ##3C
 A554 D0 A6 BNE \$A4FC
 A556 A4 71 LDY #71
 A558 B9 FF 00 LDA \$00FF,Y
 A55B 88 DEY
 A55C C9 30 CMP ##30
 A55E F0 FB BEQ \$A558
 A560 C9 2E CMP ##2E
 A562 F0 01 BEQ \$A565
 A564 C8 INY
 A565 A9 2B LDA ##2B
 A567 A6 5E LDX #5E
 A569 F0 2E BEQ \$A599
 A56B 10 08 BPL \$A575
 A56D A9 00 LDA ##00
 A56F 38 SEC
 A570 E5 5E SBC #5E
 A572 AA TAX
 A573 A9 2D LDA ##2D
 A575 99 01 01 STA \$0101,Y
 A578 A9 45 LDA ##45
 A57A 99 00 01 STA \$0100,Y
 A57D 8A TXA
 A57E A2 2F LDX ##2F
 A580 38 SEC
 A581 E8 INX
 A582 E9 0A SBC ##0A
 A584 B0 FB BCS \$A581
 A586 69 3A ADC ##3A
 A588 99 03 01 STA \$0103,Y
 A58B 8A TXA
 A58C 99 02 01 STA \$0102,Y
 A58F A9 00 LDA ##00
 A591 99 04 01 STA \$0104,Y
 A594 F0 08 BEQ \$A59E
 A596 99 FF 00 STA \$00FF,Y
 A599 A9 00 LDA ##00
 A59B 99 00 01 STA \$0100,Y
 A59E A9 00 LDA ##00
 A5A0 A0 01 LDY ##01
 A5A2 60 RTS

A5A3; Decimal constants

A5A3 80 ???
 A5A4 00 BRK
 A5A5 00 BRK
 A5A6 00 BRK
 A5A7 00 BRK
 A5A8 FA ???
 A5A9 0A ASL
 A5AA 1F ???
 A5AB 00 BRK
 A5AC 00 BRK
 A5AD 98 TYA
 A5AE 96 80 STX #80,Y
 A5B0 FF ???
 A5B1 F0 8D BEQ \$A570
 A5B3 C0 00 CPY ##00
 A5B5 01 86 ORA (#86,X)
 A5B7 A0 FF LDY ##FF
 A5B9 FF ???
 A5BA D8 CLD
 A5BB F0 00 BEQ \$A5BD

A5BD 00 BRK
 A5BE 03 ???
 A5BF EB INX
 A5C0 FF ???
 A5C1 FF ???
 A5C2 FF ???
 A5C3 9C ???
 A5C4 00 BRK
 A5C5 00 BRK
 A5C6 00 BRK
 A5C7 0A ASL
 A5C8 FF ???
 A5C9 FF ???
 A5CA FF ???
 A5CB FF ???

A5CC TI constants

A5CC FF ???
 A5CD DF ???
 A5CE 0A ASL
 A5CF 80 ???
 A5D0 00 BRK
 A5D1 03 ???
 A5D2 4B ???
 A5D3 C0 FF CPY ##FF
 A5D5 FF ???
 A5D6 73 ???
 A5D7 60 RTS
 A5D8 00 BRK
 A5D9 00 BRK
 A5DA 0E 10 FF ASL ##FF10
 A5DD FF ???
 A5DE FD AB 00 SBC \$00AB,X
 A5E1 00 BRK
 A5E2 00 BRK
 A5E3 3C ???

A5E4; Perform [SQR]

A5E4 20 91 A2 JSR \$A291
 A5E7 A9 A3 LDA ##A3
 A5E9 A0 A5 LDY ##A5
 A5EB 20 21 A2 JSR \$A221

A5EE; Perform [power]

A5EE F0 70 BEQ \$A660
 A5F0 A5 69 LDA \$69
 A5F2 D0 03 BNE \$A5F7
 A5F4 4C 2D 9F JMP \$9F2D
 A5F7 A2 4E LDX ##4E
 A5F9 A0 00 LDY ##00
 A5FB 20 59 A2 JSR \$A259
 A5FE A5 6E LDA \$6E
 A600 10 0F BPL \$A611
 A602 20 58 A3 JSR \$A358
 A605 A9 4E LDA ##4E
 A607 A0 00 LDY ##00
 A609 20 E0 A2 JSR \$A2E0
 A60C D0 03 BNE \$A611
 A60E 98 TYA
 A60F A4 07 LDY #07
 A611 20 83 A2 JSR \$A283
 A614 98 TYA
 A615 48 PHA

A616 20 1E A0 JSR \$A01E
 A619 A9 4E LDA ##4E
 A61B A0 00 LDY ##00
 A61D 20 78 A0 JSR \$A078
 A620 20 60 A6 JSR \$A660
 A623 68 PLA
 A624 4A LSR
 A625 90 0A BCC \$A631

A627; Perform [negative]

A627 A5 61 LDA \$61
 A629 F0 06 BEQ \$A631
 A62B A5 66 LDA \$66
 A62D 49 FF EOR ##FF
 A62F 85 66 STA \$66
 A631 60 RTS
 A632 81 38 STA (\$38,X)
 A634 AA TAX
 A635 3B ???
 A636 29 07 AND ##07
 A638 71 34 ADC (\$34),Y
 A63A 58 CLI
 A63B 3E 56 74 ROL \$7456,X
 A63E 16 7E ASL \$7E,X
 A640 B3 ???
 A641 1B ???
 A642 77 ???
 A643 2F ???
 A644 EE E3 85 INC \$85E3
 A647 7A ???
 A648 1D 84 1C ORA \$1C84,X
 A64B 2A ROL
 A64C 7C ???
 A64D 63 ???
 A64E 59 58 0A EOR \$0A58,Y
 A651 7E 75 FD ROR \$FD75,X
 A654 E7 ???
 A655 C6 80 DEC \$80
 A657 31 72 AND (\$72),Y
 A659 18 CLC
 A65A 10 81 BPL \$A5DD
 A65C 00 BRK
 A65D 00 BRK
 A65E 00 BRK
 A65F 00 BRK

A660; Perform [EXP]

A660 A9 32 LDA ##32
 A662 A0 A6 LDY ##A6
 A664 20 5C A0 JSR \$A05C
 A667 A5 70 LDA \$70
 A669 69 50 ADC ##50
 A66B 90 03 BCC \$A670
 A66D 20 A8 A2 JSR \$A2A8
 A670 85 56 STA \$56
 A672 20 94 A2 JSR \$A294
 A675 A5 61 LDA \$61
 A677 C9 88 CMP ##88
 A679 90 03 BCC \$A67E
 A67B 20 54 A1 JSR \$A154
 A67E 20 58 A3 JSR \$A358
 A681 A5 07 LDA \$07
 A683 18 CLC
 A684 69 B1 ADC ##B1
 A686 F0 F3 BEQ \$A67B

A688 38 SEC
 A689 E9 01 SBC ##01
 A68B 48 PHA
 A68C A2 05 LDX ##05
 A68E B5 69 LDA \$69,X
 A690 B4 61 LDY \$61,X
 A692 95 61 STA \$61,X
 A694 94 69 STY \$69,X
 A696 CA DEX
 A697 10 F5 BPL \$A68E
 A699 A5 56 LDA \$56
 A69B 85 70 STA \$70
 A69D 20 87 9E JSR \$9E87
 A6A0 20 27 A6 JSR \$A627
 A6A3 A9 37 LDA ##37
 A6A5 A0 A6 LDY ##A6
 A6A7 20 C9 A6 JSR \$A6C9
 A6AA A9 00 LDA ##00
 A6AC 85 6F STA \$6F
 A6AE 68 PLA
 A6AF 20 39 A1 JSR \$A139
 A6B2 60 RTS

A6B3; Series evaluation 1.

A6B3 85 71 STA \$71
 A6B5 84 72 STY \$72
 A6B7 20 4F A2 JSR \$A24F
 A6BA A9 57 LDA ##57
 A6BC 20 78 A0 JSR \$A078
 A6BF 20 CD A6 JSR \$A6CD
 A6C2 A9 57 LDA ##57
 A6C4 A0 00 LDY ##00
 A6C6 4C 78 A0 JMP \$A078

A6C9; Series evaluation 2.

A6C9 85 71 STA \$71
 A6CB 84 72 STY \$72
 A6CD 20 4C A2 JSR \$A24C
 A6D0 B1 71 LDA (\$71),Y
 A6D2 85 67 STA \$67
 A6D4 A4 71 LDY \$71
 A6D6 C8 INY
 A6D7 98 TYA
 A6DB D0 02 BNE \$A6DC
 A6DA E6 72 INC \$72
 A6DC 85 71 STA \$71
 A6DE A4 72 LDY \$72
 A6E0 20 5C A0 JSR \$A05C
 A6E3 A5 71 LDA \$71
 A6E5 A4 72 LDY \$72
 A6E7 18 CLC
 A6E8 69 05 ADC ##05
 A6EA 90 01 BCC \$A6ED
 A6EC C8 INY
 A6ED 85 71 STA \$71
 A6EF 84 72 STY \$72
 A6F1 20 66 A0 JSR \$A066
 A6F4 A9 5C LDA ##5C
 A6F6 A0 00 LDY ##00
 A6F8 C6 67 DEC \$67
 A6FA D0 E4 BNE \$A6E0
 A6FC 60 RTS
 A6FD 98 TYA

A6FE 35 44 AND \$44,X
 A700 7A ???
 A701 00 BRK
 A702 68 PLA
 A703 28 PLP
 A704 B1 46 LDA (\$46),Y
 A706 00 BRK

A707; Perform [RND]

A707 20 00 A2 JSR \$A2B0
 A70A 30 2E BMI \$A73A
 A70C D0 17 BNE \$A725
 A70E AD 00 FF LDA \$FF00
 A711 85 62 STA \$62
 A713 AD 01 FF LDA \$FF01
 A716 85 64 STA \$64
 A718 AD 02 FF LDA \$FF02
 A71B 85 63 STA \$63
 A71D AD 03 FF LDA \$FF03
 A720 85 65 STA \$65
 A722 4C 4A A7 JMP \$A74A
 A725 A9 03 LDA #\$03
 A727 A0 05 LDY #\$05
 A729 20 21 A2 JSR \$A221
 A72C A9 FD LDA \$FFD
 A72E A0 A6 LDY #\$A6
 A730 20 5C A0 JSR \$A05C
 A733 A9 02 LDA #\$02
 A735 A0 A7 LDY #\$A7
 A737 20 66 A0 JSR \$A066
 A73A A6 65 LDX \$65
 A73C A5 62 LDA \$62
 A73E 85 65 STA \$65
 A740 86 62 STX \$62
 A742 A6 63 LDX \$63
 A744 A5 64 LDA \$64
 A746 85 63 STA \$63
 A748 86 64 STX \$64
 A74A A9 00 LDA #\$00
 A74C 85 66 STA \$66
 A74E A5 61 LDA \$61
 A750 85 70 STA \$70
 A752 A9 80 LDA #\$80
 A754 85 61 STA \$61
 A756 20 0B 9F JSR \$9F0B
 A759 A2 03 LDX #\$03
 A75B A0 05 LDY #\$05
 A75D 4C 59 A2 JMP \$A259

A760; Save Basic stack

A760 A5 7C LDA \$7C
 A762 85 3D STA \$3D
 A764 A5 7D LDA \$7D
 A766 85 3E STA \$3E
 A768 60 RTS

A769; Restore Basic stack

A769 A5 3D LDA \$3D
 A76B 85 7C STA \$7C
 A76D A5 3E LDA \$3E
 A76F 85 7D STA \$7D
 A771 60 RTS

A772; Trim Basic stack

A772 98 TYA

A773 18 CLC
 A774 65 7C ADC \$7C
 A776 85 7C STA \$7C
 A778 90 02 BCC \$A77C
 A77A E6 7D INC \$7D
 A77C 60 RTS

A77D; Kernal calls

A77D AA TAX
 A77E D0 02 BNE \$A782
 A780 A2 1E LDX #\$1E
 A782 4C 83 86 JMP \$8683
 A785 20 C0 FF JSR \$FFC0
 A788 B0 F3 BCS \$A77D
 A78A 60 RTS
 A78B 20 D2 FF JSR \$FFD2
 A78E B0 ED BCS \$A77D
 A790 60 RTS
 A791 20 CF FF JSR \$FFCF
 A794 B0 E7 BCS \$A77D
 A796 60 RTS
 A797 4B PHA
 A798 20 C9 FF JSR \$FFC9
 A79B 20 F8 AB JSR \$ABF8
 A79E AA TAX
 A79F 6B PLA
 A7A0 90 03 BCC \$A7A5
 A7A2 BA TXA
 A7A3 B0 DB BCS \$A77D
 A7A5 60 RTS
 A7A6 20 C6 FF JSR \$FFC6
 A7A9 20 F8 AB JSR \$ABF8
 A7AC B0 CF BCS \$A77D
 A7AE 60 RTS
 A7AF 20 E4 FF JSR \$FFE4
 A7B2 B0 C9 BCS \$A77D
 A7B4 60 RTS

A7B5; Perform [SYS]

A7B5 20 E1 9D JSR \$9DE1
 A7B8 A9 A7 LDA \$A7
 A7BA 4B PHA
 A7BB A9 CE LDA \$ACE
 A7BD 4B PHA
 A7BE AD F5 07 LDA \$07F5
 A7C1 4B PHA
 A7C2 AD F2 07 LDA \$07F2
 A7C5 AE F3 07 LDX \$07F3
 A7C8 AC F4 07 LDY \$07F4
 A7CB 2B PLP
 A7CC 6C 14 00 JMP (\$0014)
 A7CF 0B PHP
 A7D0 8D F2 07 STA \$07F2
 A7D3 8E F3 07 STX \$07F3
 A7D6 8C F4 07 STY \$07F4
 A7D9 6B PLA
 A7DA 8D F5 07 STA \$07F5
 A7DD 60 RTS

A7DE; Perform [SAVE]

A7DE 20 6B AB JSR \$AB6B
 A7E1 A6 2D LDX \$2D
 A7E3 A4 2E LDY \$2E
 A7E5 A9 2B LDA \$2B
 A7E7 20 D8 FF JSR \$FFD8
 A7EA 20 F8 AB JSR \$ABF8
 A7ED B0 8E BCS \$A77D
 A7EF 60 RTS

A7F0; Perform [VERIFY]

A7F0 A9 01 LDA ##01

A7F3; Perform [LOAD]

A7F2 2C A9 00 BIT \$00A9
A7F5 85 0A STA \$0A
A7F7 20 6B AB JSR \$AB6B
A7FA A5 0A LDA \$0A
A7FC A6 2B LDX \$2B
A7FE A4 2C LDY \$2C
A800 20 D5 FF JSR \$FFD5
A803 08 PHF
A804 20 F8 AB JSR \$ABF8
A807 2B PLP
A808 B0 5E BCS \$AB68
A80A A5 0A LDA \$0A
A80C F0 16 BEQ \$A824
A80E A2 1C LDX ##1C
A810 20 B7 FF JSR \$FFB7
A813 29 10 AND ##10
A815 D0 16 BNE \$A82D
A817 24 01 BIT \$01
A819 30 08 BMI \$A823
A81B 20 4F FF JSR \$FF4F
A81E 0D 4F 4B ORA \$4B4F
A821 0D 08 60 ORA \$6000
A824 20 B7 FF JSR \$FFB7
A827 29 BF AND ##BF
A829 F0 05 BEQ \$A830
A82B A2 1D LDX ##1D
A82D 4C 83 86 JMP \$8683
A830 24 01 BIT \$01
A832 30 10 BMI \$A844
A834 86 2D STX \$2D
A836 84 2E STY \$2E
A838 20 6F 86 JSR \$866F
A83B 20 18 88 JSR \$8818
A83E 20 93 8A JSR \$8A93
A841 4C 0F 87 JMP \$870F
A844 20 F1 8A JSR \$8AF1
A847 20 18 88 JSR \$8818
A84A 4C D5 8A JMP \$8AD5

A84D; Perform [OPEN]

A84D 20 B0 AB JSR \$AB80
A850 18 CLC
A851 20 85 A7 JSR \$A785
A854 20 F8 AB JSR \$ABF8
A857 B0 0F BCS \$AB68
A859 60 RTS

A85A; Perform [CLOSE]

A85A 20 B0 AB JSR \$AB80
A85D A5 49 LDA \$49
A85F 18 CLC
A860 20 C3 FF JSR \$FFC3
A863 20 F8 AB JSR \$ABF8
A866 90 BB BCC \$A823
A868 4C 7D A7 JMP \$A77D

AB6B; Parameters for
LOAD/SAVE

AB6B A9 00 LDA ##00
AB6D 20 BD FF JSR \$FFBD
AB70 A2 01 LDX ##01
AB72 A0 00 LDY ##00
AB74 20 BA FF JSR \$FFBA
AB77 20 9D AB JSR \$AB9D
AB7A 20 EE AB JSR \$ABEE
AB7D 20 9D AB JSR \$AB9D
AB80 20 97 AB JSR \$AB97
AB83 A0 00 LDY ##00
AB85 86 49 STX \$49
AB87 20 BA FF JSR \$FFBA
AB8A 20 9D AB JSR \$AB9D
AB8D 20 97 AB JSR \$AB97
AB90 8A TXA
AB91 A8 TAY
AB92 A6 49 LDX \$49
AB94 4C BA FF JMP \$FFBA
AB97 20 A5 AB JSR \$ABA5
AB9A 4C 84 9D JMP \$9DB4

AB9D; Check default
parameters

AB9D 20 79 04 JSR \$0479
ABA0 D0 02 BNE \$ABA4
ABA2 68 PLA
ABA3 68 PLA
ABA4 60 RTS

ABA5; Check for comma

ABA5 20 91 94 JSR \$9491
ABA8 20 79 04 JSR \$0479
ABAB D0 F7 BNE \$ABA4
ABAD 4C A1 94 JMP \$94A1

ABB0; Parameters for
open/close

ABB0 A9 00 LDA ##00
ABB2 20 BD FF JSR \$FFBD
ABB5 20 AB AB JSR \$ABAB
ABB8 20 84 9D JSR \$9DB4
ABB8 86 49 STX \$49
ABBD 8A TXA
ABBE A2 01 LDX ##01
ABC0 A0 00 LDY ##00
ABC2 20 BA FF JSR \$FFBA
ABC5 20 9D AB JSR \$AB9D
ABC8 20 97 AB JSR \$AB97
ABC9 86 4A STX \$4A
ABCD A0 00 LDY ##00
ABCF A5 49 LDA \$49
ABD1 E0 03 CPF ##03
ABD3 90 01 BCC \$ABD6
ABD5 88 DEY
ABD6 20 BA FF JSR \$FFBA
ABD9 20 9D AB JSR \$AB9D
ABDC 20 97 AB JSR \$AB97
ABDF 8A TXA

ABE0 AB TAY
 ABE1 A6 4A LDX #4A
 ABE3 A5 49 LDA #49
 ABE5 20 BA FF JSR \$FFBA
 ABE8 20 9D AB JSR \$AB9D
 ABE9 20 A5 AB JSR \$ABA5
 ABEE 20 48 9C JSR \$9C48
 ABF1 A6 22 LDX #22
 ABF3 A4 23 LDY #23
 ABF5 4C BD FF JMP \$FFBD
 ABF8 00 PHP
 ABF9 48 PHA
 ABFA A5 AE LDA #AE
 ABFC C9 04 CMP #\$04
 ABFE 90 03 BCC \$A903
 A900 20 57 CD JSR \$CD57
 A903 68
 A904 28 PLP
 A905 60 RTS

A906; Make room for string

A906 46 0F LSR #0F
 A908 AA TAX
 A909 F0 38 BEQ \$A943
 A90B 48 PHA
 A90C A5 33 LDA #33
 A90E 38 SEC
 A90F E9 02 SBC #\$02
 A911 A4 34 LDY #34
 A913 B0 01 BCS \$A916
 A915 88 DEY
 A916 85 22 STA #22
 A918 84 23 STY #23
 A91A 8A TXA
 A91B 49 FF EOR #\$FF
 A91D 38 SEC
 A91E 65 22 ADC #22
 A920 B0 01 BCS \$A923
 A922 88 DEY
 A923 C4 32 CPY #32
 A925 90 1D BCC \$A944
 A927 D0 04 BNE \$A92D
 A929 C5 31 CMP #31
 A92B 90 17 BCC \$A944
 A92D 85 35 STA #35
 A92F 84 36 STY #36
 A931 A0 01 LDY #\$01
 A933 A9 FF LDA #\$FF
 A935 91 22 STA (\$22),Y
 A937 88 DEY
 A938 68 PLA
 A939 91 22 STA (\$22),Y
 A93B A6 35 LDX #35
 A93D A4 36 LDY #36
 A93F 86 33 STX #33
 A941 84 34 STY #34
 A943 60 RTS
 A944 A5 0F LDA #0F
 A946 30 09 BMI \$A951
 A948 20 54 A9 JSR \$A954
 A94B 38 SEC
 A94C 66 0F ROR #0F
 A94E 68 PLA
 A94F D0 B7 BNE \$A908
 A951 4C 81 B6 JMP \$B681

A954; Garbage collection

A954 A6 16 LDX #16

A956 E0 19 CPX #\$19
 A958 F0 10 BEQ \$A96A
 A95A 20 57 AA JSR \$AA57
 A95D F0 F7 BEQ \$A956
 A95F 8A TXA
 A960 A0 00 LDY #\$00
 A962 91 5C STA (\$5C),Y
 A964 98 TYA
 A965 CB INY
 A966 91 5C STA (\$5C),Y
 A968 D0 EC BNE \$A956
 A96A A0 00 LDY #\$00
 A96C 84 58 STY #58
 A96E A6 37 LDX #37
 A970 A4 38 LDY #38
 A972 86 5F STX #5F
 A974 86 4E STX #4E
 A976 86 35 STX #35
 A978 84 60 STY #60
 A97A 84 4F STY #4F
 A97C 84 36 STY #36
 A97E 8A TXA
 A97F 20 EA A9 JSR \$A9EA
 A982 D0 0C BNE \$A990
 A984 88 DEY
 A985 20 65 B1 JSR \$B165
 A988 20 39 AA JSR \$AA39
 A98B 38 SEC
 A98C 66 58 ROR #58
 A98E D0 EF BNE \$A97F
 A990 24 58 BIT #58
 A992 10 42 BPL \$A9D6
 A994 A2 00 LDX #\$00
 A996 86 58 STX #58
 A998 A9 02 LDA #\$02
 A99A A0 01 LDY #\$01
 A99C 20 65 B1 JSR \$B165
 A99F 91 5F STA (\$5F),Y
 A9A1 88 DEY
 A9A2 20 65 B1 JSR \$B165
 A9A5 91 5F STA (\$5F),Y
 A9A7 20 B0 04 JSR \$B04B0
 A9AA AA TAX
 A9AB 20 48 AA JSR \$AA48
 A9AE 85 35 STA #35
 A9B0 84 36 STY #36
 A9B2 8A TXA
 A9B3 20 39 AA JSR \$AA39
 A9B6 8A TXA
 A9B7 AB TAY
 A9B8 88 DEY
 A9B9 20 65 B1 JSR \$B165
 A9BC 91 5F STA (\$5F),Y
 A9BE CA DEX
 A9BF D0 F7 BNE \$A9BB
 A9C1 A0 02 LDY #\$02
 A9C3 B9 5E 00 LDA \$B95E,Y
 A9C6 91 22 STA (\$22),Y
 A9C8 88 DEY
 A9C9 D0 F8 BNE \$A9C3
 A9CB A5 4E LDA #4E
 A9CD A4 4F LDY #4F
 A9CF 20 EA A9 JSR \$A9EA
 A9D2 F0 B0 BEQ \$A984
 A9D4 D0 C4 BNE \$A99A
 A9D6 A0 00 LDY #\$00
 A9D8 20 B0 04 JSR \$B04B0
 A9DB AA TAX
 A9DC 20 48 AA JSR \$AA48

```

A9DF 05 35 STA #35
A9E1 04 36 STY #36
A9E3 0A TXA
A9E4 20 39 AA JSR #AA39
A9E7 4C 7F A9 JMP #A97F
A9EA C4 34 CPY #34
A9EC 90 2A BCC #AA18
A9EE D0 06 BNE #A9F6
A9F0 C5 33 CMP #33
A9F2 F0 24 BEQ #AA18
A9F4 90 22 BCC #AA18
A9F6 24 58 BIT #58
A9F8 30 05 BMI #A9FF
A9FA A9 02 LDA ##02
A9FC 20 48 AA JSR #AA48
A9FF A9 02 LDA ##02
AA01 20 39 AA JSR #AA39
AA04 A0 01 LDY ##01
AA06 20 65 B1 JSR #B165
AA09 C9 FF CMP #FF
AA0B D0 01 BNE #AA0E
AA0D 60 RTS
AA0E 20 65 B1 JSR #B165
AA11 99 22 00 STA #0022,Y
AA14 08 DEY
AA15 10 F7 BPL #AA0E
AA17 60 RTS
AA18 A6 16 LDX #16
AA1A E0 19 CPX ##19
AA1C F0 10 BEQ #AA2E
AA1E 20 57 AA JSR #AA57
AA21 F0 F7 BEQ #AA1A
AA23 A0 00 LDY ##00
AA25 91 5C STA (#5C),Y
AA27 C8 INY
AA2B A9 FF LDA #FF
AA2A 91 5C STA (#5C),Y
AA2C D0 EC BNE #AA1A
AA2E 68 PLA
AA2F 60 PLA
AA30 A5 35 LDA #35
AA32 A4 36 LDY #36
AA34 05 33 STA #33
AA36 04 34 STY #34
AA3B 60 RTS
AA39 49 FF EOR #FF
AA3B 38 SEC
AA3C 65 4E ADC #4E
AA3E A4 4F LDY #4F
AA40 B0 01 BCB #AA43
AA42 08 DEY
AA43 05 4E STA #4E
AA45 04 4F STY #4F
AA47 60 RTS
AA48 49 FF EOR #FF
AA4A 38 SEC
AA4B 65 5F ADC #5F
AA4D A4 68 LDY #68
AA4F B0 01 BCB #AA52
AA51 08 DEY
AA52 05 5F STA #5F
AA54 04 68 STY #68
AA56 60 RTS

```

AA57; Calculate end of string

```

AA57 CA DEX
AA58 B5 00 LDA #00,X
AA5A 05 5D STA #5D

```

```

AA5C CA DEX
AA5D B5 00 LDA #00,X
AA5F 05 5C STA #5C
AA61 CA DEX
AA62 B5 00 LDA #00,X
AA64 48 PHA
AA65 18 CLC
AA66 65 5C ADC #5C
AA68 05 5C STA #5C
AA6A 90 02 BCC #AA6E
AA6C E6 5D INC #5D
AA6E 68 PLA
AA6F 60 RTS

```

AA70; Perform [COS]

```

AA70 A9 EC LDA ##EC
AA72 A0 AA LDY ##AA
AA74 20 66 A0 JSR #A066

```

AA77; Perform [SIN]

```

AA77 20 91 A2 JSR #A291
AA7A A9 F1 LDA ##F1
AA7C A0 AA LDY ##AA
AA7E A6 6E LDX #6E
AA80 20 8C A1 JSR #A18C
AA83 20 91 A2 JSR #A291
AA86 20 58 A3 JSR #A358
AA89 A9 00 LDA #00
AA8B 05 6F STA #6F
AA8D 20 07 9E JSR #9E07
AA90 A9 F6 LDA ##F6
AA92 A0 AA LDY ##AA
AA94 20 6C A0 JSR #A06C
AA97 A5 66 LDA #66
AA99 48 PHA
AA9A 10 0D BPL #AAA9
AA9C 20 62 A0 JSR #A062
AA9F A5 66 LDA #66
AAA1 30 09 BMI #AAC
AAA3 A5 12 LDA #12
AAA5 49 FF EOR #FF
AAA7 05 12 STA #12
AAA9 20 27 A6 JSR #A627
AAAC A9 F6 LDA ##F6
AAAE A0 AA LDY ##AA
AAB0 20 66 A0 JSR #A066
AAB3 68 PLA
AAB4 10 03 BPL #AAB9
AAB6 20 27 A6 JSR #A627
AAB9 A9 FB LDA #FB
AABB A0 AA LDY ##AA
AABD 4C B3 A6 JMP #A6B3

```

AAC0; Perform [TAN]

```

AAC0 20 4F A2 JSR #A24F
AAC3 A9 00 LDA #00
AAC5 05 12 STA #12
AAC7 20 77 AA JSR #AA77
AACA A2 4E LDX #4E
AACC A0 00 LDY #00
AACE 20 5D A7 JSR #A75D
AAD1 A9 57 LDA #57
AAD3 A0 00 LDY #00
AAD5 20 21 A2 JSR #A221
AAD8 A9 00 LDA #00
AADA 05 66 STA #66

```

AADC	A5	12	LDA	#12
AADE	20	EB	AA	JSR \$AAEB
AAE1	A9	4E	LDA	##4E
AAE3	A0	00	LDY	##00
AAE5	4C	94	A1	JMP \$A194
AAEB	4B		PHA	
AAE9	4C	A9	AA	JMP \$AAA9
AAEC	B1	49	STA	(\$49,X)
AAEE	0F		???	
AAEF	DA		???	
AAF0	A2	B3	LDX	##B3
AAF2	49	0F	EOR	##0F
AAF4	DA		???	
AAF5	A2	7F	LDX	##7F
AAF7	00		BRK	
AAF8	00		BRK	
AAF9	00		BRK	
AAFA	00		BRK	
AAFB	05	B4	ORA	\$B4
AAFD	E6	1A	INC	\$1A
A AFF	2D	1B	B6	AND \$B61B
AB02	2B		PLP	
AB03	07		???	
AB04	FB		???	
AB05	FB		SED	
AB06	B7		???	
AB07	99	6B	B9	STA \$B96B,Y
AB0A	01	B7	ORA	(\$B7,X)
AB0C	23		???	
AB0D	35	DF	AND	\$DF,X
AB0F	E1	B6	SBC	(\$B6,X)
AB11	A5	5D	LDA	\$5D
AB13	E7		???	
AB14	2B		PLP	
AB15	B3		???	
AB16	49	0F	EOR	##0F
AB18	DA		???	
AB19	A2	A5	LDX	##A5

AB51	1E	F4	A6	ASL \$A6F4,X
AB54	F5	7B		SBC \$7B,X
AB56	B3			???
AB57	FC			???
AB58	B0	10		BCB \$AB6A
AB5A	7C			???
AB5B	0C			???
AB5C	1F			???
AB5D	67			???
AB5E	CA			DEX
AB5F	7C			???
AB60	DE	53	CB	DEC \$CB53,X
AB63	C1	7D		CMP (\$7D,X)
AB65	14			???
AB66	64			???
AB67	70	4C		BVS \$ABB5
AB69	7D	B7	EA	ADC \$EAB7,X
AB6C	51	7A		EDR (\$7A),Y
AB6E	7D	63	30	ADC \$3063,X
AB71	B8			DEY
AB72	7E	7E	92	ROR \$927E,X
AB75	44			???
AB76	99	3A	7E	STA \$7E3A,Y
AB79	4C	CC	91	JMP \$91CC
AB7C	C7			???
AB7D	7F			???
AB7E	AA			TAX
AB7F	AA			TAX
AB80	AA			TAX
AB81	13			???
AB82	B1	00		STA (\$00,X)
AB84	00			BRK
AB85	00			BRK
AB86	00			BRK
AB87	B9			???
AB88	8A			TXA
AB89	BD	A7	BC	STA \$BCA7
AB8C	D6	D7		DEC \$D7,X

AB1A; Perform [ATN]

AB1B	66	4B		ROR \$4B
AB1D	10	03		BPL \$AB22
AB1F	20	27	A6	JSR \$A627
AB22	A5	61		LDA \$61
AB24	4B			PHA
AB25	C9	B1		CMP ##B1
AB27	90	07		BCC \$AB30
AB29	A9	F0		LDA ##F0
AB2B	A0	9F		LDY ##9F
AB2D	20	72	A0	JSR \$A072
AB30	A9	4A		LDA ##4A
AB32	A0	AB		LDY ##AB
AB34	20	B3	A6	JSR \$A6B3
AB37	6B			PLA
AB38	C9	B1		CMP ##B1
AB3A	90	07		BCC \$AB43
AB3C	A9	EC		LDA ##EC
AB3E	A0	AA		LDY ##AA
AB40	20	6C	A0	JSR \$A06C
AB43	6B			PLA
AB44	10	03		BPL \$AB49
AB46	4C	27	A6	JMP \$A627
AB49	60			RTS
AB4A	0B			???
AB4B	76	B3		ROR \$B3,X
AB4D	B3			???
AB4E	BD	D3	79	LDA \$79D3,X

ABBF; Perform [RENUMBER]

ABBE	D5	20		CMP \$20,X
AB90	DE	B6	A9	DEC \$A9B6,X
AB93	00			BRK
AB94	A2	0A		LDX ##0A
AB96	B6	03		STX \$03
AB98	B5	04		STA \$04
AB9A	B6	05		STX \$05
AB9C	B5	06		STA \$06
AB9E	B5	5A		STA \$5A
ABA0	B5	5B		STA \$5B
ABA2	20	79	04	JSR \$0479
ABA5	F0	66		BEQ \$AC00
ABA7	20	3E	BE	JSR \$BE3E
ABAA	A5	08		LDA \$08
ABAC	F0	08		BEQ \$ABB6
ABAE	A5	14		LDA \$14
ABB0	A6	15		LDX \$15
ABB2	B5	03		STA \$03
ABB4	B6	04		STX \$04
ABB6	20	79	04	JSR \$0479
ABB9	F0	52		BEQ \$AC00
ABBB	20	91	94	JSR \$9491
ABBE	20	3E	BE	JSR \$BE3E
ABC1	A5	08		LDA \$08
ABC3	F0	10		BEQ \$ABD5
ABC5	A5	14		LDA \$14
ABC7	A6	15		LDX \$15

ABC9	85	05	STA	#05	AC65	F0	A9	BEQ	#AC10		
ABCB	86	06	STX	#06	AC67	C9	22	CMP	##22		
ABCD	D0	06	BNE	#ABD5	AC69	D0	F7	BNE	#AC62		
ABCF	AA		TAX		AC6B	F0	EE	BEQ	#AC5B		
ABD0	D0	03	BNE	#ABD5	AC6D	AA		TAX			
ABD2	4C	1C	99	JMP	#991C	AC6E	F0	A0	BEQ	#AC10	
ABD5	20	79	04	JSR	#0479	AC70	10	E9	BPL	#AC5B	
ABD8	F0	33		BEQ	#AC0D	AC72	A2	08	LDX	##08	
ABDA	20	91	94	JSR	#9491	AC74	DD	86	AB	CMP	#ABB6, X
ABDD	20	3E	8E	JSR	#8E3E	AC77	F0	10		BEQ	#AC09
ABE0	A5	14		LDA	#14	AC79	CA			DEX	
ABE2	A6	15		LDX	#15	AC7A	D0	F8		BNE	#AC74
ABE4	85	5A		STA	#5A	AC7C	C9	CB		CMP	##CB
ABE6	86	5B		STX	#5B	AC7E	D0	DB		BNE	#AC5B
ABE8	20	3D	8A	JSR	#8A3D	AC80	20	73	04	JSR	#0473
ABEB	A5	5F		LDA	#5F	AC83	F0	88		BEQ	#AC10
ABED	A6	60		LDX	#60	AC85	C9	A4		CMP	##A4
ABEF	85	58		STA	#58	AC87	D0	D2		BNE	#AC5B
ABF1	86	59		STX	#59	AC89	A5	3B		LDA	#3B
ABF3	A5	03		LDA	#03	AC8B	8D	59	02	STA	#0259
ABF5	A6	04		LDX	#04	AC8E	A5	3C		LDA	#3C
ABF7	85	14		STA	#14	AC90	8D	5A	02	STA	#025A
ABF9	86	15		STX	#15	AC93	20	73	04	JSR	#0473
ABFB	20	3D	8A	JSR	#8A3D	AC96	B0	C6		BCS	#AC5E
ABFE	A5	6D		LDA	#6D	AC98	20	3E	8E	JSR	#8E3E
AC00	38			SEC		AC9B	20	EE	AC	JBR	#ACEE
AC01	E5	59		SBC	#59	AC9E	AD	59	02	LDA	#0259
AC03	90	CD		BCC	#ABD2	ACA1	85	3B		STA	#3B
AC05	D0	06		BNE	#AC0D	ACA3	AD	5A	02	LDA	#025A
AC07	A5	5F		LDA	#5F	ACA6	85	3C		STA	#3C
AC09	E5	58		SBC	#58	ACA8	A0	00		LDY	##00
AC0B	90	C5		BCC	#ABD2	ACA9	A2	00		LDX	##00
AC0D	20	F1	8A	JSR	#8AF1	ACAC	BD	01	01	LDA	#0101, X
AC10	20	86	AD	JSR	#AD86	ACAF	F0	1C		BEQ	#ACCD
AC13	20	86	AD	JSR	#AD86	ACB1	48			PHA	
AC16	D0	3D		BNE	#AC55	ACB2	20	73	04	JSR	#0473
AC18	20	59	AD	JSR	#AD59	ACB5	90	0E		BCC	#ACCS
AC1B	20	86	AD	JSR	#AD86	ACB7	20	42	AD	JSR	#AD42
AC1E	20	86	AD	JSR	#AD86	ACBA	E6	6C		INC	#6C
AC21	D0	03		BNE	#AC26	ACBC	20	BB	AD	JSR	#ADBB
AC23	4C	B3	AE	JMP	#AEB3	ACBF	E6	2D		INC	#2D
AC26	20	86	AD	JSR	#AD86	ACC1	D0	02		BNE	#ACCS
AC29	85	14		STA	#14	ACC3	E6	2E		INC	#2E
AC2B	C8			INY		ACC5	68			PLA	
AC2C	20	A5	04	JSR	#04A5	ACC6	A0	00		LDY	##00
AC2F	38			SEC		ACCB	91	3B		STA	(#3B), Y
AC30	E5	58		SBC	#58	ACCA	E8			INX	
AC32	90	19		BCC	#AC4D	ACCB	D0	DF		BNE	#ACAC
AC34	D0	06		BNE	#AC3C	ACCD	20	73	04	JSR	#0473
AC36	A5	14		LDA	#14	ACD0	B0	15		BCS	#ACE7
AC38	E5	5A		SBC	#5A	ACD2	20	42	AD	JSR	#AD42
AC3A	90	11		BCC	#AC4D	ACD5	C6	6C		DEC	#6C
AC3C	A5	62		LDA	#62	ACD7	20	A2	AD	JSR	#ADA2
AC3E	91	3B		STA	(#3B), Y	ACDA	A5	2D		LDA	#2D
AC40	88			DEY		ACDC	D0	02		BNE	#ACE0
AC41	A5	63		LDA	#63	ACDE	C6	2E		DEC	#2E
AC43	91	3B		STA	(#3B), Y	ACE0	C6	2D		DEC	#2D
AC45	20	86	AD	JSR	#AD86	ACE2	20	79	04	JSR	#0479
AC48	20	73	AD	JSR	#AD73	ACE5	90	EB		BCC	#ACD2
AC4B	F0	CE		BEQ	#AC1B	ACE7	C9	2C		CMP	##2C
AC4D	20	86	AD	JSR	#AD86	ACE9	F0	9E		BEQ	#ACB9
AC50	20	80	AD	JSR	#AD80	ACEB	4C	5E	AC	JMP	#AC5E
AC53	F0	C6		BEQ	#AC1B	ACEE	20	59	AD	JSR	#AD59
AC55	20	86	AD	JSR	#AD86	ACF1	20	86	AD	JSR	#AD86
AC58	20	86	AD	JSR	#AD86	ACF4	D0	0D		BNE	#AD03
AC5B	20	86	AD	JSR	#AD86	ACF6	20	86	AD	JSR	#AD86
AC5E	C9	22		CMP	##22	ACF9	D0	0B		BNE	#AD06
AC60	D0	08		BNE	#AC6D	ACFB	A9	FF		LDA	##FF
AC62	20	86	AD	JSR	#AD86	ACFD	85	62		STA	#62

ACFF 85 63 STA #63
 AD01 30 2A BMI #AD2D
 AD03 20 86 AD JSR #AD86
 AD06 20 86 AD JSR #AD86
 AD09 85 58 STA #58
 AD0B C5 14 CMP #14
 AD0D D0 27 BNE #AD36
 AD0F 20 86 AD JSR #AD86
 AD12 85 59 STA #59
 AD14 C5 15 CMP #15
 AD16 D0 23 BNE #AD3B
 AD18 38 SEC
 AD19 E5 5B SBC #5B
 AD1B 90 08 BCC #AD25
 AD1D D0 0E BNE #AD2D
 AD1F A5 14 LDA #14
 AD21 E5 5A SBC #5A
 AD23 B0 08 BCS #AD2D
 AD25 A5 14 LDA #14
 AD27 85 63 STA #63
 AD29 A5 15 LDA #15
 AD2B 85 62 STA #62
 AD2D A2 90 LDX #90
 AD2F 38 SEC
 AD30 20 CE A2 JSR #A2CE
 AD33 4C 6F A4 JMP #A46F
 AD36 20 86 AD JSR #AD86
 AD39 85 59 STA #59
 AD3B 20 64 AD JSR #AD64
 AD3E F0 B1 BEQ #ACF1
 AD40 D9 EA A5 CMP #A5EA, Y
 AD43 3B ???
 AD44 85 22 STA #22
 AD46 A5 3C LDA #3C
 AD48 85 23 STA #23
 AD4A A5 2D LDA #2D
 AD4C 85 24 STA #24
 AD4E A5 2E LDA #2E
 AD50 85 25 STA #25
 AD52 A0 00 LDY #00
 AD54 84 0B STY #0B
 AD56 84 6C STY #6C
 AD58 60 RTS
 AD59 A5 03 LDA #03
 AD5B 85 63 STA #63
 AD5D A5 04 LDA #04
 AD5F 85 62 STA #62
 AD61 4C F1 BA JMP #BAF1
 AD64 A5 59 LDA #59
 AD66 38 SEC
 AD67 E5 5B SBC #5B
 AD69 90 15 BCC #AD80
 AD6B D0 06 BNE #AD73
 AD6D A5 58 LDA #58
 AD6F E5 5A SBC #5A
 AD71 90 0D BCC #AD80
 AD73 A5 63 LDA #63
 AD75 18 CLC
 AD76 65 05 ADC #05
 AD78 85 63 STA #63
 AD7A A5 62 LDA #62
 AD7C 65 06 ADC #06
 AD7E 85 62 STA #62
 AD80 20 86 AD JSR #AD86
 AD83 D0 FB BNE #AD80
 AD85 60 RTS
 AD86 A0 00 LDY #00
 AD88 E6 3B INC #3B
 AD8A D0 02 BNE #AD8E

AD8C E6 3C INC #3C
 AD8E 4C A5 04 JMP #04A5
 AD91 A5 22 LDA #22
 AD93 C5 24 CMP #24
 AD95 D0 04 BNE #AD9B
 AD97 A5 23 LDA #23
 AD99 C5 25 CMP #25
 AD9B 60 RTS
 AD9C E6 22 INC #22
 AD9E D0 02 BNE #ADA2
 ADA0 E6 23 INC #23
 ADA2 A4 0B LDY #0B
 ADA4 C8 INY
 ADA5 20 B0 04 JSR #04B0
 ADA8 A4 6C LDY #6C
 ADAA C8 INY
 ADAB 91 22 STA (#22), Y
 ADAD 20 91 AD JSR #AD91
 ADB0 D0 EA BNE #AD9C
 ADB2 60 RTS
 ADB3 A5 24 LDA #24
 ADB5 D0 02 BNE #ADB9
 ADB7 C6 25 DEC #25
 ADB9 C6 24 DEC #24
 ADBB A4 0B LDY #0B
 ADBD 20 BB 04 JSR #04BB
 ADC0 A4 6C LDY #6C
 ADC2 91 24 STA (#24), Y
 ADC4 20 91 AD JSR #AD91
 ADC7 D0 EA BNE #ADB3
 ADC9 60 RTS

ADCA; Perform [FOR]

ADCA A9 80 LDA #80
 ADCC 85 10 STA #10
 ADCE 20 7C 8E JSR #8E7C
 ADD1 A9 81 LDA #81
 ADD3 85 02 STA #02
 ADD5 20 71 88 JSR #8871
 ADD8 F0 08 BEQ #ADE2
 ADDA A0 12 LDY #12
 ADDC 20 05 89 JSR #8905
 ADDF 20 60 A7 JSR #A760
 ADE2 20 69 A7 JSR #A769
 ADE5 20 BE 8D JSR #8DBE
 ADE8 98 TYA
 ADE9 A0 11 LDY #11
 ADEB 18 CLC
 ADEC 65 3B ADC #3B
 ADEE 91 7C STA (#7C), Y
 ADF0 A5 3C LDA #3C
 ADF2 69 00 ADC #00
 ADF4 88 DEY
 ADF5 91 7C STA (#7C), Y
 ADF7 A5 3A LDA #3A
 ADF9 88 DEY
 ADFA 91 7C STA (#7C), Y
 ADFC A5 39 LDA #39
 ADFE 88 DEY
 ADFF 91 7C STA (#7C), Y
 AE01 A9 A4 LDA #A4
 AE03 20 93 94 JSR #9493
 AE06 20 17 93 JSR #9317
 AE09 20 14 93 JSR #9314
 AE0C A5 66 LDA #66
 AE0E 09 7F ORA #7F
 AE10 25 62 AND #62
 AE12 85 62 STA #62
 AE14 A2 04 LDX #04

AE16 A0 0D LDY ##0D
 AE18 B5 61 LDA #61,X
 AE1A 91 7C STA (#7C),Y
 AE1C CA DEX
 AE1D 8B DEY
 AE1E 10 F8 BPL \$AE18
 AE20 A9 F0 LDA #\$F0
 AE22 A0 9F LDY ##9F
 AE24 20 21 A2 JSR \$A221
 AE27 20 79 04 JSR \$0479
 AE2A C9 A9 CMP ##A9
 AE2C D0 06 BNE \$AE34
 AE2E 20 73 04 JSR \$0473
 AE31 20 14 93 JSR \$9314
 AE34 20 B0 A2 JSR \$A2B0
 AE37 4B PHA
 AE38 20 A0 A2 JSR \$A2A0
 AE3B 6B PLA
 AE3C A0 0B LDY ##0B
 AE3E A2 05 LDX ##05
 AE40 91 7C STA (#7C),Y
 AE42 B5 60 LDA \$60,X
 AE44 8B DEY
 AE45 CA DEX
 AE46 10 F8 BPL \$AE40
 AE48 A5 4A LDA \$4A
 AE4A 91 7C STA (#7C),Y
 AE4C A5 49 LDA \$49
 AE4E 8B DEY
 AE4F 91 7C STA (#7C),Y
 AE51 A9 B1 LDA ##B1
 AE53 8B DEY
 AE54 91 7C STA (#7C),Y
 AE56 60 RTS

AE57; Print using

AE57 4C A1 94 JMP \$94A1

AE5A; Perform [DELETE]

AE5A 20 DE B6 JSR \$B6DE
 AE5D 20 79 04 JSR \$0479
 AE60 F0 F3 BEQ \$AE57
 AE62 20 CA AE JSR \$AECA
 AE65 A5 5F LDA \$5F
 AE67 A6 60 LDX \$60
 AE69 85 24 STA \$24
 AE6B 86 25 STX \$25
 AE6D 20 3D 8A JSR \$8A3D
 AE70 90 15 BCC \$AE87
 AE72 A0 01 LDY ##01
 AE74 20 D1 04 JSR \$04D1
 AE77 8B DEY
 AE78 AA TAX
 AE79 D0 05 BNE \$AE80
 AE7B 20 D1 04 JSR \$04D1
 AE7E F0 07 BEQ \$AE87
 AE80 20 D1 04 JSR \$04D1
 AE83 85 5F STA \$5F
 AE85 86 60 STX \$60
 AE87 A5 24 LDA \$24
 AE89 3B SEC
 AE8A E5 5F SBC \$5F
 AE8C AA TAX
 AE8D A5 25 LDA \$25
 AE8F E5 60 SBC \$60
 AE91 AB TAY
 AE92 B0 1F BCS \$AE83

AE94 BA TXA
 AE95 1B CLC
 AE96 65 2D ADC \$2D
 AE98 85 2D STA \$2D
 AE9A 9B TYA
 AE9B 65 2E ADC \$2E
 AE9D 85 2E STA \$2E
 AE9F A0 00 LDY ##00
 AEA1 20 D1 04 JSR \$04D1
 AEA4 91 24 STA (\$24),Y
 AEA6 C8 INY
 AEA7 D0 F8 BNE \$AEA1
 AEA9 E6 60 INC \$60
 AEA8 E6 25 INC \$25
 AEA9 A5 2E LDA \$2E
 AEA8 C5 25 CMP \$25
 AEB1 B0 EE BCS \$AEA1
 AEB3 20 1B 8B JSR \$8B1B
 AEB6 A5 22 LDA \$22
 AEB8 A6 23 LDX \$23
 AEB9 1B CLC
 AEBB 69 02 ADC ##02
 AEBD 85 2D STA \$2D
 AEBF 90 01 BCC \$AEC2
 AEC1 E8 INX
 AEC2 86 2E STX \$2E
 AEC4 20 93 8A JSR \$8A93
 AEC7 4C 7E 86 JMP \$867E
 AECA F0 06 BEQ \$AED2
 AECC 90 04 BCC \$AED2
 AECE C9 AB CMP ##AB
 AED0 D0 22 BNE \$AEF4
 AED2 20 3E 8E JSR \$8E3E
 AED5 20 3D 8A JSR \$8A3D
 AED8 20 79 04 JSR \$0479
 AEDB F0 0C BEQ \$AEE9
 AEDD C9 AB CMP ##AB
 AEDF D0 13 BNE \$AEF4
 AEE1 20 73 04 JSR \$0473
 AEE4 20 3E 8E JSR \$8E3E
 AEE7 D0 0B BNE \$AEF4
 AEE9 A5 0B LDA \$0B
 AEEB D0 06 BNE \$AEF3
 AEE8 A9 FF LDA \$FF
 AEEF 85 14 STA \$14
 AEF1 85 15 STA \$15
 AEF3 60 RTS
 AEF4 4C A1 94 JMP \$94A1
 AEF7 A2 FF LDX \$FF
 AEF9 8E E0 02 STX \$02E0
 AEF8 20 73 04 JSR \$0473
 AEF9 20 2C 93 JSR \$932C
 AEF2 20 1A 93 JSR \$931A
 AF05 A5 64 LDA \$64
 AF07 4B PHA
 AF08 A5 65 LDA \$65
 AF0A 4B PHA
 AF0B A0 02 LDY ##02
 AF0D 20 DC 04 JSR \$04DC
 AF10 8B DEY
 AF11 99 3D 00 STA \$003D,Y
 AF14 D0 F7 BNE \$AF0D
 AF16 20 DC 04 JSR \$04DC
 AF19 8D DF 02 STA \$02DF
 AF1C AB TAX
 AF1D F0 0B BEQ \$AF2A
 AF1F 8B DEY
 AF20 20 71 81 JSR \$8171
 AF23 C9 23 CMP ##23

AF25	F0	06	BEQ	#AF2D	AFB8	4C	73	04	JMP	#0473	
AF27	98		TYA		AFBB	AD	E7	04	LDA	#04E7	
AF28	D0	F5	BNE	#AF1F	AFBE	8D	DD	02	STA	#02DD	
AF2A	4C	A1	94	JMP	#94A1	AFC1	A9	FF	LDA	#\$FF	
AF2D	A9	3B	LDA	#\$3B	AFC3	8D	DC	02	STA	#02DC	
AF2F	20	93	94	JSR	#9493	AFC6	4C	CB	AF	JMP	#AFCB
AF32	84	76	STY	#76	AFC9	86	82		STX	#82	
AF34	8C	CD	02	STY	#02CD	AFCB	C4	77	CPY	#77	
AF37	20	2C	93	JSR	#932C	AFCF	F0	33	BEQ	#B002	
AF3A	24	0D	BIT	#0D	AFCF	B9	00	01	LDA	#0100,Y	
AF3C	10	39	BPL	#AF77	AFD2	C8			INY		
AF3E	20	70	B1	JMP	#B170	AFD3	C9	20	CMP	##20	
AF41	20	B7	B2	JSR	#B2B7	AFD5	F0	F4	BEQ	#AFCB	
AF44	AE	D5	02	LDX	#02D5	AFD7	C9	2D	CMP	##2D	
AF47	F0	15	BEQ	#AF5E	AFD9	F0	E8	BEQ	#AFC3		
AF49	A2	00	LDX	##00	AFDB	C9	2E	CMP	##2E		
AF4B	38		SEC		AFDD	F0	EA	BEQ	#AFC9		
AF4C	AD	DB	02	LDA	#02DB	AFDF	C9	45	CMP	##45	
AF4F	E5	77	SBC	#77	AFE1	F0	11	BEQ	#AFF4		
AF51	90	0B	BCC	#AF5E	AFE3	9D	00	01	STA	#0100,X	
AF53	A2	3D	LDX	##3D	AFE6	8E	CE	02	STX	#02CE	
AF55	EC	D5	02	CPX	#02D5	AFE9	EB		INX		
AF58	D0	03	BNE	#AF5D	AFEA	24	82	BIT	#82		
AF5A	4A		LSR		AFEC	10	DD	BPL	#AFCB		
AF5B	69	00	ADC	##00	AFEE	EE	D4	02	INC	#02D4	
AF5D	AA		TAX		AFF1	4C	CB	AF	JMP	#AFCB	
AF5E	A0	00	LDY	##00	AFF4	B9	00	01	LDA	#0100,Y	
AF60	8A		TXA		AFF7	C9	2D	CMP	##2D		
AF61	F0	05	BEQ	#AF68	AFF9	D0	03	BNE	#AFFE		
AF63	CA		DEX		AFFB	6E	D2	02	ROR	#02D2	
AF64	A9	20	LDA	##20	AFFE	C8			INY		
AF66	D0	0B	BNE	#AF70	AFFF	8C	D3	02	STY	#02D3	
AF68	C4	77	CPY	#77	B002	A5	82	LDA	#82		
AF6A	B0	F8	BCS	#AF64	B004	10	02	BPL	#000B		
AF6C	20	B0	04	JSR	#04B0	B006	86	82	STX	#82	
AF6F	C8		INY		B008	20	B7	B2	JSR	#B2B7	
AF70	20	B0	B2	JSR	#B2B0	B00B	AD	D6	02	LDA	#02D6
AF73	D0	EB	BNE	#AF60	B00E	C9	FF	CMP	##FF		
AF75	F0	24	BEQ	#AF9B	B010	F0	29	BEQ	#B03B		
AF77	20	6F	A4	JSR	#A46F	B012	AD	D9	02	LDA	#02D9
AF7A	A0	FF	LDY	##FF	B015	F0	3F	BEQ	#B056		
AF7C	C8		INY		B017	AD	D3	02	LDA	#02D3	
AF7D	B9	00	01	LDA	#0100,Y	B01A	D0	12	BNE	#B02E	
AF80	D0	FA	BNE	#AF7C	B01C	AE	CE	02	LDX	#02CE	
AF82	98		TYA		B01F	20	45	B1	JSR	#B145	
AF83	20	5C	9B	JSR	#9B5C	B022	DE	02	01	DEC	#0102,X
AF86	A0	00	LDY	##00	B025	EB			INX		
AF88	B9	00	01	LDA	#0100,Y	B026	E8	D3	02	STX	#02D3
AF8B	F0	05	BEQ	#AF92	B029	20	CC	B1	JSR	#B1CC	
AF8D	91	62	STA	(\$62),Y	B02C	F0	25	BEQ	#B053		
AF8F	C8		INY		B02E	AC	D8	02	LDY	#02D8	
AF90	D0	F6	BNE	#AF88	B031	D0	17	BNE	#B04A		
AF92	20	B0	9B	JSR	#9B00	B033	AC	DC	02	LDY	#02DC
AF95	20	70	B1	JSR	#B170	B036	30	12	BMI	#B04A	
AF98	20	B8	AF	JSR	#AFB8	B038	AD	D6	02	LDA	#02D6
AF9B	20	79	04	JSR	#0479	B03B	F0	6A	BEQ	#B0A7	
AF9E	C9	2C	CMP	##2C	B03D	CE	D6	02	DEC	#02D6	
AFA0	F0	8D	BEQ	#AF2F	B040	D0	05	BNE	#B047		
AFA2	38		SEC		B042	AD	D7	02	LDA	#02D7	
AFA3	66	76	ROR	#76	B045	F0	60	BEQ	#B0A7		
AFA5	20	B7	B2	JSR	#B2B7	B047	EE	D1	02	INC	#02D1
AFA8	68		PLA		B04A	20	BF	B0	JSR	#B0BF	
AFA9	AB		TAY		B04D	20	8A	B1	JSR	#B18A	
AFAA	68		PLA		B050	20	BF	B0	JSR	#B0BF	
AFAB	20	52	9C	JSR	#9C52	B053	4C	ED	B1	JMP	#B1ED
AFAE	20	79	04	JSR	#0479	B056	AC	D3	02	LDY	#02D3
AFB1	C9	3B	CMP	##3B	B059	F0	16	BEQ	#B071		
AFB3	F0	03	BEQ	#AFB8	B05B	85	77	STA	#77		
AFB5	4C	3E	90	JMP	#903E	B05D	38		SEC		

B05E	6E	DA	02	ROR	#02DA	B0FD	D0	E9	BNE	#B0E8	
B061	A4	82		LDY	#82	B0FF	84	82	STY	#82	
B063	AD	D2	02	LDA	#02D2	B101	60		RTS		
B066	10	06		BPL	#B06E	B102	D0	39	BNE	#B13D	
B068	20	F8	B0	JSR	#B0F8	B104	49	09	EOR	##09	
B06B	4C	7A	B0	JMP	#B07A	B106	9D	00	01	STA	#0100,X
B06E	20	D9	B0	JSR	#B0D9	B109	7A		DEX		
B071	A4	82		LDY	#82	B10A	EC	D3	02	CPX	#02D3
B073	F0	05		BEQ	#B07A	B10D	60		RTS		
B075	20	D0	B1	JSR	#B1D0	B10E	A9	00	LDA	##00	
B078	F0	06		BEQ	#B080	B110	AE	D3	02	LDX	#02D3
B07A	20	8A	B1	JSR	#B18A	B113	EB		INX		
B07D	4C	83	B0	JMP	#B083	B114	2C	DA	02	BIT	#02DA
B080	CE	D4	02	DEC	#02D4	B117	30	10	BMI	#B129	
B083	38			SEC		B119	4D	D2	02	EOR	#02D2
B084	AD	D6	02	LDA	#02D6	B11C	F0	0B	BEQ	#B129	
B087	ED	D4	02	SBC	#02D4	B11E	20	53	B1	JSR	#B153
B08A	90	1B		BCC	#B0A7	B121	20	02	B1	JSR	#B102
B08C	8D	D1	02	STA	#02D1	B124	B0	F8	BCS	#B11E	
B08F	AC	D8	02	LDY	#02D8	B126	4C	B2	9F	JMP	#9FB2
B092	D0	1B		BNE	#B0AF	B129	BD	00	01	LDA	#0100,X
B094	AC	DC	02	LDY	#02DC	B12C	DE	00	01	DEC	#0100,X
B097	30	16		BMI	#B0AF	B12F	C9	30	CMP	##30	
B099	A8			TAY		B131	20	02	B1	JSR	#B102
B09A	F0	0B		BEQ	#B0A7	B134	B0	F3	BCS	#B129	
B09C	88			DEY		B136	2C	DA	02	BIT	#02DA
B09D	D0	13		BNE	#B0B2	B139	10	05	BPL	#B140	
B09F	AD	D7	02	LDA	#02D7	B13B	84	82	STY	#82	
B0A2	0D	D4	02	ORA	#02D4	B13D	68		PLA		
B0A5	D0	AC		BNE	#B053	B13E	68		PLA		
B0A7	A9	2A		LDA	##2A	B13F	60		RTS		
B0A9	20	B0	B2	JSR	#B2B0	B140	AD	D2	02	LDA	#02D2
B0AC	D0	FB		BNE	#B0A9	B143	49	80	EOR	##80	
B0AE	60			RTS		B145	8D	D2	02	STA	#02D2
B0AF	A8			TAY		B148	A9	30	LDA	#*30	
B0B0	F0	A1		BEQ	#B053	B14A	9D	01	01	STA	#0101,X
B0B2	AD	D4	02	LDA	#02D4	B14D	A9	31	LDA	#*31	
B0B5	D0	9C		BNE	#B053	B14F	9D	02	01	STA	#0102,X
B0B7	CE	D1	02	DEC	#02D1	B152	60		RTS		
B0BA	E6	76		INC	#76	B153	BD	00	01	LDA	#0100,X
B0BC	4C	53	B0	JMP	#B053	B156	FE	00	01	INC	#0100,X
B0BF	38			SEC		B159	C9	39	CMP	##39	
B0C0	AD	D6	02	LDA	#02D6	B15B	60		RTS		
B0C3	ED	D4	02	SBC	#02D4	B15C	18		CLC		
B0C6	F0	39		BEQ	#B101	B15D	C8		INY		
B0C8	A4	82		LDY	#82	B15E	F0	05	BEQ	#B165	
B0CA	90	16		BCC	#B0E2	B160	CC	DF	02	CPY	#02DF
B0CC	85	77		STA	#77	B163	90	04	BCC	#B169	
B0CE	CC	CE	02	CPY	#02CE	B165	A4	76	LDY	#76	
B0D1	F0	02		BEQ	#B0D5	B167	D0	D4	BNE	#B13D	
B0D3	B0	01		BCS	#B0D6	B169	20	71	81	JSR	#B171
B0D5	C8			INY		B16C	EE	DB	02	INC	#02DB
B0D6	EE	D4	02	INC	#02D4	B16F	60		RTS		
B0D9	20	0E	B1	JSR	#B10E	B170	20	4E	9C	JSR	#9C4E
B0DC	C6	77		DEC	#77	B173	85	77	STA	#77	
B0DE	D0	EE		BNE	#B0CE	B175	A2	0A	LDX	##0A	
B0E0	F0	1D		BEQ	#B0FF	B177	A9	00	LDA	##00	
B0E2	49	FF		EOR	##FF	B179	9D	D1	02	STA	#02D1,X
B0E4	69	01		ADC	##01	B17C	CA		DEX		
B0E6	85	77		STA	#77	B17D	10	FA	BPL	#B179	
B0E8	CC	CD	02	CPY	#02CD	B17F	8E	D0	02	STX	#02D0
B0EB	F0	07		BEQ	#B0F4	B182	86	82	STX	#82	
B0ED	88			DEY		B184	8E	CF	02	STX	#02CF
B0EE	CE	D4	02	DEC	#02D4	B187	AA		TAX		
B0F1	4C	F6	B0	JMP	#B0F6	B188	A8		TAY		
B0F4	E6	76		INC	#76	B189	60		RTS		
B0F6	A9	80		LDA	##80	B18A	18		CLC		
B0F8	20	18	B1	JSR	#B110	B18B	A5	82	LDA	#82	
B0FB	C6	77		DEC	#77	B18D	6D	D7	02	ADC	#02D7

B190	B0	39	BCS	#B1CB	B228	D0	63	BNE	#B28D		
B192	38		SEC		B22A	A9	45	LDA	##45		
B193	E5	76	SBC	#76	B22C	20	B0	B2	JSR	#B2B0	
B195	90	34	BCC	#B1CB	B22F	AC	D3	02	LDY	#02D3	
B197	CD	CE	02	CMP	#02CE	B232	20	D3	B1	JSR	#B1D3
B19A	F0	02	BEQ	#B19E	B235	D0	06	BNE	#B23D		
B19C	B0	2D	BCS	#B1CB	B237	C8		INY			
B19E	CD	CD	02	CMP	#02CD	B238	20	D3	B1	JSR	#B1D3
B1A1	90	28	BCC	#B1CB	B23B	F0	07	BEQ	#B244		
B1A3	AA		TAX		B23D	A9	2D	LDA	##2D		
B1A4	BD	00	01	LDA	#0100,X	B23F	2C	D2	02	BIT	#02D2
B1A7	C9	35	CMP	##35	B242	30	02	BMI	#B246		
B1A9	90	20	BCC	#B1CB	B244	A9	2B	LDA	##2B		
B1AB	EC	CD	02	CPX	#02CD	B246	20	B0	B2	JSR	#B2B0
B1AE	F0	0A	BEQ	#B1BA	B249	AE	D3	02	LDX	#02D3	
B1B0	CA		DEX		B24C	BD	00	01	LDA	#0100,X	
B1B1	20	53	B1	JSR	#B153	B24F	20	B0	B2	JSR	#B2B0
B1B4	8E	CE	02	STX	#02CE	B252	AC	E0	02	LDY	#02E0
B1B7	F0	F2	BEQ	#B1AB	B255	4C	6C	B2	JMP	#B26C	
B1B9	60		RTS		B258	AD	DC	02	LDA	#02DC	
B1BA	A9	31	LDA	##31	B25B	30	B1	BMI	#B20E		
B1BC	9D	00	01	STA	#0100,X	B25D	AD	DC	02	LDA	#02DC
B1BF	EB		INX		B260	4C	76	B2	JMP	#B276	
B1C0	86	82	STX	#82	B263	A5	76	LDA	#76		
B1C2	C6	76	DEC	#76	B265	D0	15	BNE	#B27C		
B1C4	10	05	BPL	#B1CB	B267	EC	CE	02	CPX	#02CE	
B1C6	E6	76	INC	#76	B26A	F0	05	BEQ	#B271		
B1C8	EE	D4	02	INC	#02D4	B26C	E8		INX		
B1CB	60		RTS		B26D	BD	00	01	LDA	#0100,X	
B1CC	A4	82	LDY	#82	B270	2C	A9	30	BIT	#30A9	
B1CE	F0	17	BEQ	#B1E7	B273	4E	D0	02	LSR	#02D0	
B1D0	AC	CD	02	LDY	#02CD	B276	20	B0	B2	JSR	#B2B0
B1D3	B9	00	01	LDA	#0100,Y	B279	D0	80	BNE	#B1FB	
B1D6	C9	30	CMP	##30	B27B	60		RTS			
B1D8	60		RTS		B27C	C6	76	DEC	#76		
B1D9	E6	82	INC	#82	B27E	AD	CF	02	LDA	#02CF	
B1DB	20	0E	B1	JSR	#B10E	B281	30	EE	BMI	#B271	
B1DE	EE	CD	02	INC	#02CD	B283	38		SEC		
B1E1	CC	CE	02	CPY	#02CE	B284	6E	CF	02	ROR	#02CF
B1E4	F0	E5	BEQ	#B1CB	B287	AD	EA	04	LDA	#04EA	
B1E6	CB		INY		B28A	4C	73	B2	JMP	#B273	
B1E7	20	D3	B1	JSR	#B1D3	B28D	AD	D1	02	LDA	#02D1
B1EA	F0	ED	BEQ	#B1D9	B290	F0	D1	BEQ	#B263		
B1EC	60		RTS		B292	CE	D1	02	DEC	#02D1	
B1ED	AD	CF	02	LDA	#02CF	B295	F0	03	BEQ	#B29A	
B1F0	30	02	BMI	#B1F4	B297	4C	0E	B2	JMP	#B20E	
B1F2	E6	76	INC	#76	B29A	AD	D8	02	LDA	#02D8	
B1F4	AE	CD	02	LDX	#02CD	B29D	30	F6	BMI	#B295	
B1F7	CA		DEX		B29F	20	71	B1	JSR	#B171	
B1F8	AC	DE	02	LDY	#02DE	B2A2	C9	2C	CMP	##2C	
B1FB	20	71	B1	JSR	#B171	B2A4	D0	B2	BNE	#B258	
B1FE	CB		INY		B2A6	AD	DD	02	LDA	#02DD	
B1FF	C9	2C	CMP	##2C	B2A9	20	B0	B2	JSR	#B2B0	
B201	D0	11	BNE	#B214	B2AC	CB		INY			
B203	2C	D0	02	BIT	#02D0	B2AD	4C	9F	B2	JMP	#B29F
B206	30	06	BMI	#B20E	B2B0	20	B2	90	JSR	#90B2	
B208	AD	E8	04	LDA	#04E8	B2B3	CE	DB	02	DEC	#02DB
B20B	4C	76	B2	JMP	#B276	B2B6	60		RTS		
B20E	AD	DD	02	LDA	#02DD	B2B7	AC	E8	02	LDY	#02E0
B211	4C	76	B2	JMP	#B276	B2BA	20	5C	B1	JSR	#B15C
B214	C9	2E	CMP	##2E	B2BD	20	6C	B3	JSR	#B36C	
B216	D0	06	BNE	#B21E	B2C0	D0	14	BNE	#B2D6		
B218	AD	E9	04	LDA	#04E9	B2C2	8C	DE	02	STY	#02DE
B21B	4C	76	B2	JMP	#B276	B2C5	90	1A	BCC	#B2E1	
B21E	C9	2B	CMP	##2B	B2C7	AA		TAX			
B220	F0	3B	BEQ	#B25D	B2C8	20	5C	B1	JSR	#B15C	
B222	C9	2D	CMP	##2D	B2CB	B0	05	BCS	#B2D2		
B224	F0	32	BEQ	#B258	B2CD	20	74	B3	JSR	#B374	
B226	C9	5E	CMP	##5E	B2D0	F0	0A	BEQ	#B2DC		

B2D2	AC	DE	02	LDY	#02DE	B370	C9	2D	CMP	##2D	
B2D5	8A			TXA		B372	F0	11	BEQ	#B385	
B2D6	20	B2	90	JBR	#90B2	B374	C9	2E	CMP	##2E	
B2D9	4C	BA	B2	JMP	#B2BA	B376	F0	0D	BEQ	#B385	
B2DC	B0	EA		BCS	#B2C8	B378	C9	3D	CMP	##3D	
B2DE	AC	DE	02	LDY	#02DE	B37A	F0	09	BEQ	#B385	
B2E1	A6	76		LDX	#76	B37C	C9	3E	CMP	##3E	
B2E3	D0	7A		BNE	#B35F	B37E	F0	05	BEQ	#B385	
B2E5	8E	DB	02	STX	#02DB	B380	C9	23	CMP	##23	
B2E8	88			DEY		B382	D0	01	BNE	#B385	
B2E9	CE	DB	02	DEC	#02DB	B384	18		CLC		
B2EC	20	5C	B1	JBR	#B15C	B385	60		RTS		
B2EF	B0	74		BCS	#B365	B386	A5	64	LDA	#64	
B2F1	C9	2C		CMP	##2C	B388	8D	EB	04	STA	#04EB
B2F3	F0	F7		BEQ	#B2EC	B38B	A5	65	LDA	#65	
B2F5	20	43	B3	JBR	#B343	B38D	8D	EC	04	STA	#04EC
B2FB	90	EF		BCC	#B2E9	B390	20	2C	93	JSR	#932C
B2FA	C9	2E		CMP	##2E	B393	20	1A	93	JSR	#931A
B2FC	D0	08		BNE	#B306	B396	A5	64	LDA	#64	
B2FE	E8			INX		B398	8D	ED	04	STA	#04ED
B2FF	E0	02		CPX	##02	B39B	A5	65	LDA	#65	
B301	90	E9		BCC	#B2EC	B39D	8D	EE	04	STA	#04EE
B303	4C	A1	94	JMP	#94A1	B3A0	A2	01	LDX	##01	
B306	20	78	B3	JBR	#B378	B3A2	86	65	STX	#65	
B309	D0	0B		BNE	#B316	B3A4	20	79	04	JSR	#0479
B30B	90	03		BCC	#B310	B3A7	C9	29	CMP	##29	
B30D	8D	05	02	STA	#02D5	B3A9	F0	03	BEQ	#B3AE	
B310	FE	D6	02	INC	#02D6, X	B3AB	20	DB	9D	JSR	#9DDB
B313	4C	EC	B2	JMP	#B2EC	B3AE	20	8B	94	JSR	#948B
B316	C9	24		CMP	##24	B3B1	A6	65	LDX	#65	
B318	D0	0F		BNE	#B329	B3B3	D0	03	BNE	#B3BB	
B31A	2C	CF	02	BIT	#02CF	B3B5	4C	1C	99	JMP	#991C
B31D	10	F1		BPL	#B310	B3B8	CA		DEX		
B31F	18			CLC		B3B9	86	61	STX	#61	
B320	6E	CF	02	ROR	#02CF	B3BB	A2	03	LDX	##03	
B323	CE	D6	02	DEC	#02D6	B3BD	8D	EB	04	LDA	#04EB, X
B326	4C	10	B3	JMP	#B310	B3C0	95	57	STA	#57, X	
B329	C9	5E		CMP	##5E	B3C2	CA		DEX		
B32B	D0	16		BNE	#B343	B3C3	10	F8	BPL	#B3BD	
B32D	A2	02		LDX	##02	B3C5	A0	02	LDY	##02	
B32F	20	5C	B1	JBR	#B15C	B3C7	20	75	81	JSR	#8175
B332	B0	CF		BCS	#B303	B3CA	99	5B	00	STA	#005B, Y
B334	C9	5E		CMP	##5E	B3CD	20	79	81	JSR	#8179
B336	D0	CB		BNE	#B303	B3D0	99	5E	00	STA	#005E, Y
B338	CA			DEX		B3D3	88		DEY		
B339	10	F4		BPL	#B32F	B3D4	18	F1	BPL	#B3C7	
B33B	EE	D9	02	INC	#02D9	B3D6	A5	5E	LDA	#5E	
B33E	20	5C	B1	JBR	#B15C	B3D8	F0	37	BEQ	#B411	
B341	B0	22		BCS	#B365	B3DA	A9	00	LDA	##00	
B343	C9	2B		CMP	##2B	B3DC	85	62	STA	#62	
B345	D0	19		BNE	#B360	B3DE	18		CLC		
B347	AD	0C	02	LDA	#02DC	B3DF	A5	5E	LDA	#5E	
B34A	10	05		BPL	#B351	B3E1	65	61	ADC	#61	
B34C	A9	2B		LDA	##2B	B3E3	B0	2C	BCS	#B411	
B34E	8D	DC	02	STA	#02DC	B3E5	C5	5B	CMP	#5B	
B351	AD	DB	02	LDA	#02DB	B3E7	90	02	BCC	#B3EB	
B354	D0	AD		BNE	#B303	B3E9	D0	26	BNE	#B411	
B356	6E	DB	02	ROR	#02DB	B3EB	A4	62	LDY	#62	
B359	8C	E0	02	STY	#02E0	B3ED	C4	5E	CPY	#5E	
B35C	EE	DB	02	INC	#02DB	B3EF	F0	1B	BEQ	#B40C	
B35F	60			RTB		B3F1	98		TYA		
B360	C9	2D		CMP	##2D	B3F2	18		CLC		
B362	F0	ED		BEQ	#B351	B3F3	65	61	ADC	#61	
B364	38			SEC		B3F5	A8		TAY		
B365	8C	E0	02	STY	#02E0	B3F6	20	69	81	JSR	#8169
B368	CE	E0	02	DEC	#02E0	B3F9	85	78	STA	#78	
B36B	60			RTS		B3FB	A4	62	LDY	#62	
B36C	C9	2B		CMP	##2B	B3FD	20	6D	81	JSR	#816D
B36E	F0	15		BEQ	#B385	B400	C5	78	CMP	#78	

B402 F0 04 BEQ #B408
 B404 E6 61 INC #61
 B406 D0 D2 BNE #B3DA
 B408 E6 62 INC #62
 B40A D0 DF BNE #B3EB
 B40C E6 61 INC #61
 B40E A5 61 LDA #61
 B410 2C A9 00 BIT #00A9
 B413 48 PHA
 B414 AD ED 04 LDA #04ED
 B417 AC EE 04 LDY #04EE
 B41A 20 52 9C JSR #9C52
 B41D AD EB 04 LDA #04EB
 B420 AC EC 04 LDY #04EC
 B423 20 52 9C JSR #9C52
 B426 68 PLA
 B427 AB TAY
 B428 4C 81 9A JMP #9A81

B42B; Perform [TRAP]

B42B 20 86 9A JSR #9A86
 B42E 20 79 04 JSR #0479
 B431 F0 07 BEQ #B43A
 B433 20 E1 9D JSR #9DE1
 B436 BC F2 04 STY #04F2
 B439 2C A9 FF BIT #FFA9
 B43C 8D F3 04 STA #04F3
 B43F 60 RTS

B440; Perform [RESUME]

B440 20 86 9A JSR #9A86
 B443 AE F1 04 LDX #04F1
 B446 EB INX
 B447 F0 70 BEQ #B4B9
 B449 20 79 04 JSR #0479
 B44C F0 47 BEQ #B495
 B44E 90 3A BCC #B48A
 B450 C9 82 CMP ##82
 B452 D0 62 BNE #B4B6
 B454 20 95 B4 JSR #B495
 B457 A0 00 LDY #00
 B459 20 A5 04 JSR #04A5
 B45C D0 26 BNE #B484
 B45E C8 INY
 B45F 20 A5 04 JSR #04A5
 B462 D0 09 BNE #B46D
 B464 C8 INY
 B465 20 A5 04 JSR #04A5
 B468 D0 03 BNE #B46D
 B46A 4C 7E 86 JMP #B67E
 B46D A0 03 LDY #03
 B46F 20 A5 04 JSR #04A5
 B472 85 39 STA \$39
 B474 C8 INY
 B475 20 A5 04 JSR #04A5
 B478 85 3A STA \$3A
 B47A 98 TYA
 B47B 18 CLC
 B47C 65 3B ADC #3B
 B47E 85 3B STA #3B
 B480 90 02 BCC #B484
 B482 E6 3C INC #3C
 B484 20 73 04 JSR #0473
 B487 4C 80 8D JMP #8DB0
 B48A 20 E1 9D JSR #9DE1

B48D 85 15 STA #15
 B48F 20 A4 B4 JSR #B4A4
 B492 4C 69 8D JMP #8D69
 B495 A2 01 LDX #01
 B497 8D F0 04 LDA #04F0,X
 B49A 95 39 STA #39,X
 B49C 8D F5 04 LDA #04F5,X
 B49F 95 3B STA #3B,X
 B4A1 CA DEX
 B4A2 10 F3 BPL #B497
 B4A4 A2 FF LDX ##FF
 B4A6 8E EF 04 STX #04EF
 B4A9 8E F0 04 STX #04F0
 B4AC 8E F1 04 STX #04F1
 B4AF AE F4 04 LDX #04F4
 B4B2 8E F3 04 STX #04F3
 B4B5 60 RTS
 B4B6 4C A1 94 JMP #94A1
 B4B9 A2 1F LDX #1F
 B4BB 4C 83 86 JMP #8683

B4BE; Perform [ERR\$]

B4BE 20 87 9D JSR #9DB7
 B4C1 CA DEX
 B4C2 8A TXA
 B4C3 C9 24 CMP ##24
 B4C5 80 34 BCS #B4FB
 B4C7 20 53 86 JSR #B653
 B4CA A0 FF LDY ##FF
 B4CC A2 00 LDX #00
 B4CE EB INX
 B4CF C8 INY
 B4D0 81 24 LDA (#24),Y
 B4D2 30 06 BMI #B4DA
 B4D4 C9 20 CMP #20
 B4D6 90 F7 BCC #B4CF
 B4D8 80 F4 BCS #B4CE
 B4DA 8A TXA
 B4DB 20 5C 9B JSR #9B5C
 B4DE A2 00 LDX #00
 B4E0 A0 FF LDY ##FF
 B4E2 C8 INY
 B4E3 81 24 LDA (#24),Y
 B4E5 C9 20 CMP #20
 B4E7 90 F9 BCC #B4E2
 B4E9 20 FE B4 JSR #B4FE
 B4EC 48 PHA
 B4ED 29 7F AND #7F
 B4EF 91 62 STA (#62),Y
 B4F1 20 FE B4 JSR #B4FE
 B4F4 E8 INX
 B4F5 68 PLA
 B4F6 10 EA BPL #B4E2
 B4F8 4C CA 9C JMP #9CCA
 B4FB 4C 1C 99 JMP #991C
 B4FE 48 PHA
 B4FF 8A TXA
 B500 48 PHA
 B501 98 TYA
 B502 AA TAX
 B503 68 PLA
 B504 AB TAY
 B505 68 PLA
 B506 60 RTS

B507; Perform [HEX#]

B507 20 17 93 J8R #9317
 B50A A5 14 LDA #14
 B50C 40 PHA
 B50D A5 15 LDA #15
 B50F 40 PHA
 B510 20 E4 9D J8R #9DE4
 B513 A9 04 LDA ##04
 B515 20 5C 9B J8R #9B5C
 B518 A0 00 LDY ##00
 B51A A5 15 LDA #15
 B51C 20 2D B5 J8R #B52D
 B51F A5 14 LDA #14
 B521 20 2D B5 J8R #B52D
 B524 60 PLA
 B525 05 15 STA #15
 B527 60 PLA
 B528 05 14 STA #14
 B52A 4C CA 9C JMP #9CCA
 B52D 40 PHA
 B52E 4A LBR
 B52F 4A LBR
 B530 4A LBR
 B531 4A LBR
 B532 20 36 B5 J8R #B536
 B535 60 PLA
 B536 29 0F AND ##0F
 B538 C9 0A CMP ##0A
 B53A 90 02 BCC #B53E
 B53C 69 06 ADC ##06
 B53E 69 30 ADC ##30
 B540 91 62 STA (#62),Y
 B542 C0 INY
 B543 60 RTS

B544; Perform [PUDEF]

B544 20 48 9C J8R #9C48
 B547 A0 TAY
 B548 00 DEY
 B549 C0 04 BCS ##04
 B54B 90 AE BPS #B4FB
 B54D 20 B0 04 J8R #B4B0
 B550 99 E7 04 STA #04E7,Y
 B553 00 DEY
 B554 10 F7 BPL #B54D
 B556 60 RTS

B557; Perform [DO]

B557 A0 01 LDY ##01
 B559 B9 3B 00 LDA #003B,Y
 B55C 99 FB 04 STA #04FB,Y
 B55F B9 39 00 LDA #0039,Y
 B562 99 FA 04 STA #04FA,Y
 B565 00 DEY
 B566 10 F1 BPL #B559
 B568 20 79 04 J8R #0479
 B56B F0 1C BEQ #B569
 B56D C9 FC CMP #FC
 B56F F0 11 BEQ #B562
 B571 C9 FD CMP #FD
 B573 D0 3F BNE #B5B4
 B575 20 4C B6 J8R #B64C

B578 A5 61 LDA #61
 B57A D0 00 BNE #B589
 B57C 20 79 04 J8R #0479
 B57F 4C BA B5 JMP #B5BA
 B582 20 4C B6 J8R #B64C
 B585 A5 61 LDA #61
 B587 D0 F3 BNE #B57C
 B589 A0 05 LDY ##05
 B58B 20 05 09 J8R #B905
 B58E 00 DEY
 B58F AD F9 04 LDA #04F9
 B592 91 7C STA (#7C),Y
 B594 00 DEY
 B595 AD FB 04 LDA #04FB
 B598 91 7C STA (#7C),Y
 B59A 00 DEY
 B59B AD FB 04 LDA #04FB
 B59E 91 7C STA (#7C),Y
 B5A0 00 DEY
 B5A1 AD FA 04 LDA #04FA
 B5A4 91 7C STA (#7C),Y
 B5A6 00 DEY
 B5A7 A9 EB LDA ##EB
 B5A9 91 7C STA (#7C),Y
 B5AB 60 RTS

B5AC; Perform [EXIT]

B5AC 20 14 B6 J8R #B614
 B5AF 20 79 04 J8R #0479
 B5B2 F0 06 BEQ #B5BA
 B5B4 4C A1 94 JMP #94A1
 B5B7 20 73 04 J8R #0473
 B5BA F0 1D BEQ #B5D9
 B5BC C9 EC CMP #EC
 B5BE F0 40 BEQ #B600
 B5C0 C9 22 CMP #22
 B5C2 F0 0A BEQ #B5CE
 B5C4 C9 EB CMP #EB
 B5C6 D0 EF BNE #B5B7
 B5C8 20 B7 B5 J8R #B5B7
 B5CB 4C 7C B5 JMP #B57C
 B5CE 20 73 04 J8R #0473
 B5D1 F0 06 BEQ #B5D9
 B5D3 C9 22 CMP #22
 B5D5 D0 F7 BNE #B5CE
 B5D7 F0 DE BEQ #B5B7
 B5D9 C9 3A CMP #3A
 B5DB F0 DA BEQ #B5B7
 B5DD 24 81 BIT #81
 B5DF 10 44 BPL #B625
 B5E1 A0 02 LDY ##02
 B5E3 20 A5 04 J8R #04A5
 B5E6 F0 3D BEQ #B625
 B5E8 C0 INY
 B5E9 20 A5 04 J8R #04A5
 B5EC 85 39 STA #39
 B5EE C0 INY
 B5EF 20 A5 04 J8R #04A5
 B5F2 85 3A STA #3A
 B5F4 90 TYA
 B5F5 18 CLC
 B5F6 65 3B ADC #3B
 B5F8 85 3B STA #3B
 B5FA 90 BB BCC #B5B7
 B5FC E6 3C INC #3C
 B5FE D0 B7 BNE #B5B7
 B600 4C B0 8D JMP #BDB0

B603; Perform [LOOP]

B603 F0 2D BEQ #B632
 B605 C9 FD CMP #*FD
 B607 F0 24 BEQ #B62D
 B609 C9 FC CMP #*FC
 B60B D0 A7 BNE #B5B4
 B60D 20 4C B6 JSR #B64C
 B610 A5 61 LDA #61
 B612 F0 1E BEQ #B632
 B614 A9 EB LDA #*EB
 B616 B5 02 STA #02
 B618 20 71 88 JSR #8871
 B61B D0 0B BNE #B62B
 B61D 20 69 A7 JSR #A769
 B620 A0 05 LDY #*05
 B622 4C 72 A7 JMP #A772
 B625 A2 20 LDX #*20
 B627 2C A2 21 BIT #21A2
 B62A 4C 83 B6 BEQ #B683
 B62D 20 4C B6 JSR #B64C
 B630 F0 E2 BEQ #B614
 B632 20 14 B6 JSR #B614
 B635 88 DEY
 B636 B1 3D LDA (#3D),Y
 B638 B5 3C STA #3C
 B63A 88 DEY
 B63B B1 3D LDA (#3D),Y
 B63D B5 3B STA #3B
 B63F 88 DEY
 B640 B1 3D LDA (#3D),Y
 B642 20 7F CD JSR #CD7F
 B645 B1 3D LDA (#3D),Y
 B647 B5 39 STA #39
 B649 4C 57 B5 JMP #B557
 B64C 20 73 04 JSR #0473
 B64F 4C 2C 93 JMP #932C

B652; Perform [TRON]

B652 A9 FF LDA #*FF
 B654 2C A9 00 BIT #00A9

B655; Perform [TROFF]

B657 8D EB 02 STA #02EB
 B65A 60 RTS
 B65B 20 8E 94 JSR #948E
 B65E 20 A5 96 JSR #96A5
 B661 B5 49 STA #49
 B663 84 4A STY #4A
 B665 20 1A 93 JSR #931A
 B668 20 D8 9D JSR #9DD8
 B66B CA DEX
 B66C B6 77 STX #77
 B66E C9 29 CMP #*29
 B670 F0 04 BEQ #B676
 B672 20 D8 9D JSR #9DD8
 B675 2C A2 FF BIT #FFA2
 B678 B6 78 STX #78
 B67A 20 8B 94 JSR #948B
 B67D A9 B2 LDA #*B2
 B67F 20 93 94 JSR #9493
 B682 20 2C 93 JSR #932C
 B685 20 1A 93 JSR #931A
 B688 A0 02 LDY #*02

B68A A9 49 LDA #*49
 B68C 20 94 04 JSR #0494
 B68F 99 5B 00 STA #005B,Y
 B692 20 DC 04 JSR #04DC
 B695 99 5E 00 STA #005E,Y
 B698 B8 DEY
 B699 10 EF BPL #B68A
 B69B 38 SEC
 B69C A5 5F LDA #5F
 B69E E5 77 SBC #77
 B6A0 B5 5F STA #5F
 B6A2 B0 02 BCS #B6A6
 B6A4 C6 60 DEC #60
 B6A6 A5 78 LDA #78
 B6A8 C5 5E CMP #5E
 B6AA 90 02 BCC #B6AE
 B6AC A5 5E LDA #5E
 B6AE AA TAX
 B6AF F0 16 BEQ #B6C7
 B6B1 18 CLC
 B6B2 65 77 ADC #77
 B6B4 B0 14 BCS #B6CA
 B6B6 C5 5B CMP #5B
 B6B8 90 02 BCC #B6BC
 B6BA D0 0E BNE #B6CA
 B6BC A4 77 LDY #77
 B6BE 20 6D B1 JSR #B16D
 B6C1 91 5C STA (#5C),Y
 B6C3 C8 INY
 B6C4 CA DEX
 B6C5 D0 F7 BNE #B6BE
 B6C7 4C 4E 9C JMP #9C4E
 B6CA 4C 1C 99 JMP #991C

B6CD; Perform [AUTO]

B6CD 20 DE B6 JSR #B6DE
 B6D0 20 3E 8E JSR #8E3E
 B6D3 A5 14 LDA #14
 B6D5 B5 73 STA #73
 B6D7 A5 15 LDA #15
 B6D9 B5 74 STA #74
 B6DB 4C 7E B6 JMP #B67E
 B6DE 24 B1 BIT #B1
 B6E0 30 01 BMI #B6E3
 B6E2 60 RTS
 B6E3 A2 22 LDX #*22
 B6E5 4C B3 B6 JMP #B6B3

B6E8; Perform [HELP]

B6E8 AE EF 04 LDX #04EF
 B6EB E8 INX
 B6EC F0 1B BEQ #B709
 B6EE AD F0 04 LDA #04F0
 B6F1 AC F1 04 LDY #04F1
 B6F4 B5 14 STA #14
 B6F6 B4 15 STY #15
 B6F8 20 3D BA JSR #BA3D
 B6FB 90 0C BCC #B709
 B6FD 66 53 ROR #53
 B6FF 20 3E 90 JSR #903E
 B702 A6 14 LDX #14
 B704 A5 15 LDA #15
 B706 20 40 8B JSR #8B40
 B709 4C 3E 90 JMP #903E
 B70C A6 60 LDX #60

B70E 98 TYA
 B70F 18 CLC
 B710 65 5F ADC \$5F
 B712 90 01 BCC \$B715
 B714 E8 INX
 B715 EC F6 04 CPX \$04F6
 B718 D0 0E BNE \$B728
 B71A CD F5 04 CMP \$04F5
 B71D 90 09 BCC \$B728
 B71F F0 07 BEQ \$B728
 B721 46 53 LBR \$53
 B723 A9 82 LDA ##82
 B725 4C B2 90 JMP \$90B2
 B728 60 RTS

B729; Perform [KEY]

B729 D0 7C BNE \$B7A7
 B72B A2 00 LDX ##00
 B72D A0 00 LDY ##00
 B72F E8 INX
 B730 BD 5E 05 LDA \$055E,X
 B733 F0 53 BEQ \$B788
 B735 85 77 STA \$77
 B737 86 76 STX \$76
 B739 A2 05 LDX ##05
 B73B BD 6E CD LDA \$CD6E,X
 B73E CA DEX
 B73F D0 02 BNE \$B743
 B741 05 76 ORA \$76
 B743 20 D2 FF JSR \$FFD2
 B746 8A TXA
 B747 10 F2 BPL \$B73B
 B749 A2 07 LDX ##07
 B74B B9 67 05 LDA \$0567,Y
 B74E C8 INY
 B74F 48 PHA
 B750 86 80 STX \$80
 B752 A2 04 LDX ##04
 B754 DD 39 B8 CMP \$B839,X
 B757 F0 34 BEQ \$B78D
 B759 CA DEX
 B75A D0 F8 BNE \$B754
 B75C A6 80 LDX \$80
 B75E E0 08 CPX ##08
 B760 90 07 BCC \$B769
 B762 D0 0A BNE \$B76E
 B764 A9 2B LDA ##2B
 B766 20 D2 FF JSR \$FFD2
 B769 A9 22 LDA ##22
 B76B 20 D2 FF JSR \$FFD2
 B76E 68 PLA
 B76F 20 D2 FF JSR \$FFD2
 B772 A2 09 LDX ##09
 B774 C6 77 DEC \$77
 B776 D0 D3 BNE \$B74B
 B778 E0 09 CPX ##09
 B77A 90 05 BCC \$B781
 B77C A9 22 LDA ##22
 B77E 20 D2 FF JSR \$FFD2
 B781 A9 8D LDA ##8D
 B783 20 D2 FF JSR \$FFD2
 B786 A6 76 LDX \$76
 B788 E0 08 CPX ##08
 B78A D0 A3 BNE \$B72F
 B78C 60 RTS
 B78D A6 80 LDX \$80
 B78F BD 30 B8 LDA \$B830,X

B792 20 D2 FF JSR \$FFD2
 B795 CA DEX
 B796 E0 03 CPX ##03
 B798 B0 F5 BCS \$B78F
 B79A 68 PLA
 B79B 20 74 CD JSR \$CD74
 B79E A9 29 LDA ##29
 B7A0 20 D2 FF JSR \$FFD2
 B7A3 A2 08 LDX ##08
 B7A5 D0 CD BNE \$B774
 B7A7 20 84 9D JSR \$9D84
 B7AA CA DEX
 B7AB E0 08 CPX ##08
 B7AD 90 03 BCC \$B7B2
 B7AF 4C 1C 99 JMP \$991C
 B7B2 86 76 STX \$76
 B7B4 20 91 94 JSR \$9491
 B7B7 20 48 9C JSR \$9C48
 B7BA 20 C2 87 JSR \$B7C2
 B7BD 90 72 BCC \$B831
 B7BF 4C 81 86 JMP \$8681

B7C2; Key redefinition

B7C2 85 77 STA \$77
 B7C4 A2 08 LDX ##08
 B7C6 20 3E B8 JSR \$B83E
 B7C9 8D CD 02 STA \$02CD
 B7CC A6 76 LDX \$76
 B7CE E8 INX
 B7CF 20 3E B8 JSR \$B83E
 B7D2 8D CE 02 STA \$02CE
 B7D5 A6 76 LDX \$76
 B7D7 A5 77 LDA \$77
 B7D9 38 SEC
 B7DA FD 5F 05 SBC \$055F,X
 B7DD F0 35 BEQ \$B814
 B7DF 90 1D BCC \$B7FE
 B7E1 18 CLC
 B7E2 6D CD 02 ADC \$02CD
 B7E5 B0 48 BCS \$B832
 B7E7 C9 81 CMP ##81
 B7E9 B0 47 BCS \$B832
 B7EB AA TAX
 B7EC AC CD 02 LDY \$02CD
 B7EF CC CE 02 CPY \$02CE
 B7F2 F0 20 BEQ \$B814
 B7F4 88 DEY
 B7F5 CA DEX
 B7F6 B9 67 05 LDA \$0567,Y
 B7F9 9D 67 05 STA \$0567,X
 B7FC B0 F1 BCS \$B7EF
 B7FE 6D CE 02 ADC \$02CE
 B801 AA TAX
 B802 AC CE 02 LDY \$02CE
 B805 CC CD 02 CPY \$02CD
 B808 B0 0A BCS \$B814
 B80A B9 67 05 LDA \$0567,Y
 B80D 9D 67 05 STA \$0567,X
 B810 C8 INY
 B811 E8 INX
 B812 90 F1 BCC \$B805
 B814 A6 76 LDX \$76
 B816 20 3E B8 JSR \$B83E
 B819 AA TAX
 B81A A4 76 LDY \$76
 B81C A5 77 LDA \$77
 B81E 99 5F 05 STA \$055F,Y

B821 A0 00 LDY #*00
 B823 20 B0 04 JSR \$04B0
 B826 C6 77 DEC \$77
 B828 30 07 BMI \$B831
 B82A 9D 67 05 STA \$0567,X
 B82D E8 INX
 B82E C8 INY
 B82F D0 F2 BNE \$B823
 B831 18 CLC
 B832 60 RTS
 B833 28 PLP
 B834 24 52 BIT #52
 B836 48 PHA
 B837 43 ???
 B838 2B ???
 B839 22 ???
 B83A 0D 8D 22 ORA \$228D
 B83D 1B ???
 B83E A9 00 LDA #*00
 B840 18 CLC
 B841 CA DEX
 B842 30 EE BMI \$B832
 B844 7D 5F 05 ADC \$055F,X
 B847 90 FB BCC \$B841

B849; Perform [SOUND]

B849 20 84 9D JSR \$9D84
 B84C CA DEX
 B84D E0 03 CPX #*03
 B84F B0 64 BCS \$B8B5
 B851 86 80 STX #80
 B853 20 DE 9D JSR \$9DDE
 B856 C9 04 CMP #*04
 B858 B0 5B BCS \$B8B5
 B85A 84 7E STY \$7E
 B85C 85 7F STA \$7F
 B85E 20 DE 9D JSR \$9DDE
 B861 A6 80 LDX #80
 B863 E0 02 CPX #*02
 B865 D0 01 BNE \$B868
 B867 CA DEX
 B868 48 PHA
 B869 C0 00 CPX #*00
 B86B D0 07 BNE \$B874
 B86D C9 00 CMP #*00
 B86F D0 03 BNE \$B874
 B871 C8 INY
 B872 D0 0F BNE \$B883
 B874 98 TYA
 B875 48 PHA
 B876 20 C0 8C JSR \$8CC0
 B879 BD FE 04 LDA \$04FE,X
 B87C 1D FC 04 ORA \$04FC,X
 B87F D0 F5 BNE \$B876
 B881 68 PLA
 B882 A8 TAY
 B883 98 TYA
 B884 49 FF EOR #*FF
 B886 18 CLC
 B887 69 01 ADC #*01
 B889 78 SEI
 B88A 9D FC 04 STA \$04FC,X
 B88D 68 PLA
 B88E 49 FF EOR #*FF
 B890 69 00 ADC #*00
 B892 9D FE 04 STA \$04FE,X
 B895 A5 7E LDA \$7E

B897 9D 0E FF STA \$FF0E,X
 B89A 8D B8 B8 LDA \$B8B8,X
 B89D AA TAX
 B89E 8D 10 FF LDA \$FF10,X
 B8A1 29 FC AND #*FC
 B8A3 05 7F ORA \$7F
 B8A5 9D 10 FF STA \$FF10,X
 B8A8 A6 80 LDX #80
 B8AA 8D BA B8 LDA \$B8BA,X
 B8AD 0D 11 FF ORA \$FF11
 B8B0 8D 11 FF STA \$FF11
 B8B3 58 STX
 B8B4 60 RTS
 B8B5 4C 1C 99 JMP \$991C
 B8B8 02 ???
 B8B9 00 BRK
 B8BA 10 20 BPL \$B8DC
 B8BC 40 RTI

B8BD; Perform [VOL]

B8BD 20 84 9D JSR \$9D84
 B8C0 E0 09 CPX #*09
 B8C2 B0 F1 BCS \$B8B5
 B8C4 86 80 STX #80
 B8C6 AD 11 FF LDA \$FF11
 B8C9 29 F0 AND #*F0
 B8CB 05 80 ORA #80
 B8CD 8D 11 FF STA \$FF11
 B8D0 60 RTS

B8D1; Perform [PAINT]

B8D1 20 B6 C3 JSR \$C3B6
 B8D4 A2 04 LDX #*04
 B8D6 20 D9 C3 JSR \$C3D9
 B8D9 20 7B C3 JSR \$C37B
 B8DC 20 A5 C3 JSR \$C3A5
 B8DF E0 02 CPX #*02
 B8E1 90 03 BCC \$B8E6
 B8E3 4C 1C 99 JMP \$991C
 B8E6 8A TXA
 B8E7 4A LSR
 B8E8 6A ROR
 B8E9 85 8B STA \$8B
 B8EB 10 04 BPL \$B8F1
 B8ED A5 84 LDA \$84
 B8EF F0 07 BEQ \$B8FB
 B8F1 20 F3 C1 JSR \$C1F3
 B8F4 B0 02 BCS \$B8FB
 B8F6 D0 01 BNE \$B8F9
 B8F8 60 RTS
 B8F9 20 54 A9 JSR \$A954
 B8FC A5 31 LDA \$31
 B8FE 85 22 STA \$22
 B900 A5 32 LDA \$32
 B902 85 23 STA \$23
 B904 38 SEC
 B905 A5 33 LDA \$33
 B907 E9 03 SBC #*03
 B909 85 19 STA \$19
 B90B A5 34 LDA \$34
 B90D E9 00 SBC #*00
 B90F 85 1A STA \$1A
 B911 A2 00 LDX #*00
 B913 86 89 STX \$89
 B915 86 8A STX \$8A

B917 AE AF 02 LDX #02AF
 B91A D0 03 BNE #B91F
 B91C CE B0 02 DEC #02B0
 B91F CE AF 02 DEC #02AF
 B922 20 F3 C1 JSR #C1F3
 B925 B0 02 BCS #B929
 B927 D0 EE BNE #B917
 B929 EE AF 02 INC #02AF
 B92C D0 03 BNE #B931
 B92E EE B0 02 INC #02B0
 B931 20 C3 C1 JSR #C1C3
 B934 AE AD 02 LDX #02AD
 B937 D0 03 BNE #B93C
 B939 CE AE 02 DEC #02AE
 B93C CE AD 02 DEC #02AD
 B93F A5 B9 LDA #B9
 B941 20 9F B9 JSR #B99F
 B944 B5 B9 STA #B9
 B946 18 CLC
 B947 AD AD 02 LDA #02AD
 B94A 69 02 ADC #02
 B94C 8D AD 02 STA #02AD
 B94F 90 03 BCC #B954
 B951 EE AE 02 INC #02AE
 B954 A5 BA LDA #BA
 B956 20 9F B9 JSR #B99F
 B959 B5 BA STA #BA
 B95B AE AD 02 LDX #02AD
 B95E D0 03 BNE #B963
 B960 CE AE 02 DEC #02AE
 B963 CE AD 02 DEC #02AD
 B966 EE AF 02 INC #02AF
 B969 D0 03 BNE #B96E
 B96B EE B0 02 INC #02B0
 B96E 20 F3 C1 JSR #C1F3
 B971 B0 02 BCS #B975
 B973 D0 BC BNE #B931
 B975 A2 03 LDX #03
 B977 A0 00 LDY #00
 B979 A5 23 LDA #23
 B97B C5 32 CMP #32
 B97D D0 06 BNE #B9B5
 B97F A5 22 LDA #22
 B981 C5 31 CMP #31
 B983 F0 17 BEQ #B99C
 B985 A5 22 LDA #22
 B987 D0 02 BNE #B98B
 B989 C6 23 DEC #23
 B98B C6 22 DEC #22
 B98D 20 B0 04 JSR #04B0
 B990 9D AD 02 STA #02AD, X
 B993 CA DEX
 B994 10 EF BPL #B9B5
 B996 20 C0 BC JSR #BCC0
 B999 4C 11 B9 JMP #B911
 B99C 4C 7B C3 JMP #C37B
 B99F 4B PHA
 B9A0 20 F3 C1 JSR #C1F3
 B9A3 B0 2B BCS #B9D0
 B9A5 F0 29 BEQ #B9D0
 B9A7 6B PLA
 B9A8 D0 29 BNE #B9D3
 B9AA AA TAX
 B9AB AB TAY
 B9AC A5 23 LDA #23
 B9AE C5 1A CMP #1A
 B9B0 90 0B BCC #B9BD
 B9B2 D0 06 BNE #B9BA
 B9B4 A5 22 LDA #22

B9B6 C5 19 CMP #19
 B9B8 90 03 BCC #B9BD
 B9BA 4C 81 B6 JMP #B6B1
 B9BD BD AD 02 LDA #02AD, X
 B9C0 91 22 STA (#22), Y
 B9C2 E6 22 INC #22
 B9C4 D0 02 BNE #B9CB
 B9C6 E6 23 INC #23
 B9C8 EB INX
 B9C9 E0 04 CPX #04
 B9CB D0 F0 BNE #B9BD
 B9CD A9 80 LDA #80
 B9CF 60 RTS
 B9D0 6B PLA
 B9D1 A9 00 LDA #00
 B9D3 60 RTS

B9D4; Perform [CHAR]

B9D4 20 B9 C3 JSR #C3B9
 B9D7 20 D8 9D JSR #9DD8
 B9DA E0 28 CPX #28
 B9DC B0 0A BCS #B9EB
 B9DE 8E DA 02 STX #02DA
 B9E1 20 D8 9D JSR #9DD8
 B9E4 E0 19 CPX #19
 B9E6 90 03 BCC #B9EB
 B9E8 4C 1C 99 JMP #991C
 B9EB 8E DB 02 STX #02DB
 B9EE 20 91 94 JSR #9491
 B9F1 20 4B 9C JSR #9C4B
 B9F4 8D EA 02 STA #02EA
 B9F7 9B TYA
 B9F8 4B PHA
 B9F9 8A TXA
 B9FA 4B PHA
 B9FB 20 A5 C3 JSR #C3A5
 B9FE 8A TXA
 B9FF 6A ROR
 BA00 6E B9 02 ROR #02B9
 BA03 6B PLA
 BA04 85 22 STA #22
 BA06 6B PLA
 BA07 85 23 STA #23
 BA09 A5 B3 LDA #B3
 BA0B D0 1B BNE #BA2B
 BA0D AE DB 02 LDX #02DB
 BA10 AC DA 02 LDY #02DA
 BA13 1B CLC
 BA14 20 F0 FF JSR #FFF0
 BA17 A0 00 LDY #00
 BA19 CC EA 02 CPY #02EA
 BA1C F0 09 BEQ #BA27
 BA1E 20 B0 04 JSR #04B0
 BA21 20 4C FF JSR #FF4C
 BA24 C8 INY
 BA25 D0 F2 BNE #BA19
 BA27 60 RTS
 BA28 20 BF C7 JSR #C7BF
 BA2B A5 B6 LDA #B6
 BA2D 4B PHA
 BA2E A5 B4 LDA #B4
 BA30 4B PHA
 BA31 24 B3 BIT #B3
 BA33 10 0F BPL #BA44
 BA35 6B PLA
 BA36 F0 12 BEQ #BA4A
 BA38 4A LSR

BA39 F0 0F BEQ \$BA4A
 BA3B A6 85 LDX \$85
 BA3D 90 0D BCC \$BA4C
 BA3F AE 16 FF LDX \$FF16
 BA42 B0 08 BCS \$BA4C
 BA44 AE 15 FD LDX \$FF15
 BA47 68 PLA
 BA48 F0 02 BEQ \$BA4C
 BA4A A6 86 LDX \$86
 BA4C B6 86 STX \$86
 BA4E AE DB 02 LDX \$02DB
 BA51 A0 00 LDY ##00
 BA53 8C DC 02 STY \$02DC
 BA56 AC DC 02 LDY \$02DC
 BA59 EE DC 02 INC \$02DC
 BA5C 20 B0 04 JSR \$04B0
 BA5F CE EA 02 DEC \$02EA
 BA62 30 17 BMI \$BA7B
 BA64 AC DA 02 LDY \$02DA
 BA67 20 7F BA JSR \$BA7F
 BA6A EE DA 02 INC \$02DA
 BA6D A0 27 CPY ##27
 BA6F 90 E5 BCC \$BA56
 BA71 A0 00 LDY ##00
 BA73 8C DA 02 STY \$02DA
 BA76 E8 INX
 BA77 E0 18 CPX ##18
 BA79 90 DB BCC \$BA56
 BA7B 68 PLA
 BA7C 85 86 STA \$86
 BA7E 60 RTS
 BA7F 48 PHA
 BA80 20 1A C2 JSR \$C21A
 BA83 20 91 C2 JSR \$C291
 BA86 A9 00 LDA \$A900
 BA88 85 7E STA \$7E
 BA8A 68 PLA
 BA8B 48 PHA
 BA8C 0A ASL
 BA8D 26 7E ROL \$7E
 BA8F 0A ASL
 BA90 0A ASL
 BA91 26 7E ROL \$7E
 BA93 85 24 STA \$24
 BA95 A5 7E LDA \$7E
 BA97 6D E4 02 ADC \$02E4
 BA9A 85 25 STA \$25
 BA9C 98 TYA
 BA9D 48 PHA
 BA9E A0 07 LDY ##07
 BAA0 AD B9 02 LDA \$02B9
 BAA3 0A ASL
 BAA4 B1 24 LDA (\$24),Y
 BAA6 90 02 BCC \$BAAA
 BAA8 49 FF EOR ##FF
 BAAA 24 83 BIT #83
 BAAC 10 2B BPL \$BAD9
 BAAE 29 AA AND \$AA
 BAB0 85 7E STA \$7E
 BAB2 A5 84 LDA \$84
 BAB4 D0 0F BNE \$BAC5
 BAB6 A5 7E LDA \$7E
 BAB8 B0 07 BCS \$BAC1
 BABA 4A LSR
 BABB 45 7E EOR \$7E
 BABD 49 AA EOR \$AA
 BABF D0 18 BNE \$BAD9
 BAC1 09 55 ORA ##55
 BAC3 D0 14 BNE \$BAD9

BAC5 C9 02 CMP ##02
 BAC7 D0 04 BNE \$BACD
 BAC9 A5 7E LDA \$7E
 BACB B0 0C BCS \$BAD9
 BACD 90 07 BCC \$BAD6
 BACF A5 7E LDA \$7E
 BAD1 4A LSR
 BAD2 45 7E EOR \$7E
 BAD4 90 03 BCC \$BAD9
 BAD6 A5 7E LDA \$7E
 BAD8 4A LSR
 BAD9 91 8C STA (\$8C),Y
 BADB 88 DEY
 BADC 10 C2 BPL \$BAA0
 BADE 68 PLA
 BADF A8 TAY
 BAE0 68 PLA
 BAE1 60 RTS

BAE2; Perform [BOX]

BAE2 20 B6 C3 JSR \$C3B6
 BAE5 A2 1F LDX ##1F
 BAE7 20 F4 C3 JSR \$C3F4
 BAEA A2 2B LDX ##2B
 BAEC D0 D9 C3 JSR \$C3D9
 BAEF 20 BF C3 JSR \$C3BF
 BAF2 8C D0 02 STY \$02D0
 BAF5 8D D1 02 STA \$02D1
 BAF8 20 A5 C3 JSR \$C3A5
 BAFB E0 02 CPX ##02
 BAFD 90 03 BCC \$BB02
 BAFF 4C 1C 99 JMP \$991C
 BB02 8E E8 02 STX \$02E8
 BB05 8A TXA
 BB06 48 PHA
 BB07 20 B4 BB JSR \$BBB4
 BB0A 68 PLA
 BB0B 80 1C BNE \$BB29
 BB0D F0 03 BEQ \$BB12
 BB0F 20 36 BC JSR \$BC36
 BB12 20 DA C0 JSR \$C0DA
 BB15 AD CA 02 LDA \$02CA
 BB18 D0 F5 BNE \$BB0F
 BB1A A2 04 LDX ##04
 BB1C BD D7 02 LDA \$02D7,X
 BB1F 9D AC 02 STA \$02AC,X
 BB22 CA DEX
 BB23 D0 F7 BNE \$BB1C
 BB25 8E E8 02 STX \$02E8
 BB28 60 RTS
 BB29 A2 00 LDX ##00
 BB2B AD C5 02 LDA \$02C5
 BB2E 4A LSR
 BB2F 90 02 BCC \$BB33
 BB31 A2 02 LDX ##02
 BB33 BD DC 02 LDA \$02DC,X
 BB36 8D D6 02 STA \$02D6
 BB39 BD DD 02 LDA \$02DD,X
 BB3C 8D D7 02 STA \$02D7,X
 BB3F A9 00 LDA ##00
 BB41 9D 03 LDX ##03
 BB43 9D D2 02 STA \$02D2,X
 BB46 CA DEX
 BB47 10 FA BPL \$BB43
 BB49 A2 07 LDX ##07
 BB4B BD AD 02 LDA \$02AD,X
 BB4E 48 PHA

BB4F CA DEX
 BB50 10 F9 BPL \$BB4B
 BB52 20 DA C0 JSR \$C0DA
 BB55 A2 00 LDX **\$00
 BB57 68 PLA
 BB58 9D AD 02 STA \$02AD, X
 BB5B EB INX
 BB5C E0 00 CPX **\$00
 BB5E D0 F7 BNE \$BB57
 BB60 AD D6 02 LDA \$02D6
 BB63 D0 05 BNE \$BB6A
 BB65 CE D7 02 DEC \$02D7
 BB68 30 B0 BMI \$BB1A
 BB6A CE D6 02 DEC \$02D6
 BB6D A2 25 LDX **\$25
 BB6F A0 1B LDY **\$1B
 BB71 AD C5 02 LDA \$02C5
 BB74 4A LSR
 BB75 90 02 BCC \$BB79
 BB77 A0 19 LDY **\$19
 BB79 A9 00 LDA **\$00
 BB7B 4A LSR
 BB7C 48 PHA
 BB7D 20 F6 C2 JSR \$C2F6
 BB80 9D AD 02 STA \$02AD, X
 BB83 98 TYA
 BB84 9D AE 02 STA \$02AE, X
 BB87 68 PLA
 BB88 90 02 BCC \$BB8C
 BB8A 09 A0 ORA **\$A0
 BB8C EB INX
 BB8D EB INX
 BB8E A0 19 LDY **\$19
 BB90 4E C5 02 LSR \$02C5
 BB93 90 02 BCC \$BB97
 BB95 A0 1B LDY **\$1B
 BB97 2E C5 02 ROL \$02C5
 BB9A E0 27 CPX **\$27
 BB9C F0 D0 BEQ \$BB7B
 BB9E A2 06 LDX **\$06
 BBA0 0A ASL
 BBA1 F0 D0 BEQ \$BB60
 BBA3 90 08 BCC \$BBAD
 BBA5 FE AD 02 INC \$02AD, X
 BBA8 D0 03 BNE \$BBAD
 BBA A FE AE 02 INC \$02AE, X
 BBAD 0A ASL
 BBAE CA DEX
 BBAF CA DEX
 BBB0 10 F1 BPL \$BBA3
 BBB2 30 95 BMI \$BB49
 BBB4 A0 23 LDY **\$23
 BBB6 20 56 BC JSR \$BC56
 BBB9 A2 1F LDX **\$1F
 BBBB A0 2B LDY **\$2B
 BBBD 98 TYA
 BBBE 48 PHA
 BBBF 20 22 C3 JSR \$C322
 BBC2 9D B1 02 STA \$02B1, X
 BBC5 9D B5 02 STA \$02B5, X
 BBC8 9D BD 02 STA \$02BD, X
 BBCB 98 TYA
 BBCC 9D B2 02 STA \$02B2, X
 BBCE 9D B6 02 STA \$02B6, X
 BBD2 9D BE 02 STA \$02BE, X
 BBD5 68 PLA
 BBD6 AB TAY
 BBD7 20 F6 C2 JSR \$C2F6
 BBDA 9D AD 02 STA \$02AD, X

BBDD 98 TYA
 BBDE 9D AE 02 STA \$02AE, X
 BBE1 A0 2D LDY **\$2D
 BBE3 EB INX
 BBE4 EB INX
 BBE5 E0 21 CPX **\$21
 BBE7 F0 D4 BEQ \$BBBD
 BBE9 A9 90 LDA **\$90
 BBEB 20 D5 BC JSR \$BCD5
 BBEE AD C5 02 LDA \$02C5
 BBF1 29 03 AND **\$03
 BBF3 8D C5 02 STA \$02C5
 BBF6 AA TAX
 BBF7 BD 18 BC LDA \$BC18, X
 BBFA 20 36 BC JSR \$BC36
 BBFD 20 7B C3 JSR \$C37B
 BC00 AD CA 02 LDA \$02CA
 BC03 20 36 BC JSR \$BC36
 BC06 AE C5 02 LDX \$02C5
 BC09 BD 18 BC LDA \$BC18, X
 BC0C 29 F0 AND **\$F0
 BC0E BD CB 02 STA \$02CB
 BC11 BD 1C BC LDA \$BC1C, X
 BC14 8D CA 02 STA \$02CA
 BC17 60 RTS
 BC18 BE E4 41 LDX \$41E4, Y
 BC1B 1B ???
 BC1C 41 1B EOR (\$1B, X)
 BC1E BE E4 46 LDX \$46E4, Y
 BC21 52 ???
 BC22 45 44 EOR \$44
 BC24 20 42 0D JSR \$0D42
 BC27 54 ???
 BC28 45 52 EOR \$52
 BC2A 52 ???
 BC2B 59 20 52 EOR \$5220, Y
 BC2E 0D 4D 49 ORA \$494D
 BC31 48 ???
 BC32 45 20 EOR \$20
 BC34 49 0D EOR \$0D
 BC36 20 05 BD JSR \$BD05
 BC39 A2 04 LDX **\$04
 BC3B BD AE 02 LDA \$02AE, X
 BC3E 0A ASL
 BC3F 7E AE 02 ROR \$02AE, X
 BC42 7E AD 02 ROR \$02AD, X
 BC45 90 08 BCC \$BC4F
 BC47 FE AD 02 INC \$02AD, X
 BC4A D0 03 BNE \$BC4F
 BC4C FE AE 02 INC \$02AE, X
 BC4F EB INX
 BC50 EB INX
 BC51 E0 06 CPX **\$06
 BC53 F0 E6 BEQ \$BC3B
 BC55 60 RTS
 BC56 20 18 C3 JSR \$C318
 BC59 A2 00 LDX **\$00
 BC5B EB INX
 BC5C 38 SEC
 BC5D E9 5A SBC **\$5A
 BC5F B0 FA BCS \$BC5B
 BC61 8B DEY
 BC62 10 F7 BPL \$BC5B
 BC64 BE C5 02 STX \$02C5
 BC67 48 PHA
 BC68 69 5A ADC **\$5A
 BC6A 20 76 BC JSR \$BC76
 BC6D 68 PLA
 BC6E 18 CLC

BC6F 49 FF EOR ##FF
 BC71 69 01 ADC ##01
 BC73 CE C5 02 DEC #02C5
 BC76 A2 FF LDX ##FF
 BC78 E8 INX
 BC79 38 SEC
 BC7A E9 0A SBC ##0A
 BC7C B0 FA BCS #BC7B
 BC7E 69 0A ADC ##0A
 BC80 B5 8E STA #8E
 BC82 8A TXA
 BC83 0A ASL
 BC84 AA TAX
 BC85 BD B4 C4 LDA #C4B4, X
 BC88 BC B3 C4 LDY #C4B3, X
 BC8B 18 CLC
 BC8C C6 8E DEC #8E
 BC8E 30 0C BMI #BC9C
 BC90 7D CB C4 ADC #C4CB, X
 BC93 48 PHA
 BC94 98 TYA
 BC95 7D C7 C4 ADC #C4C7, X
 BC98 A8 TAY
 BC99 68 PLA
 BC9A 90 EF BCC #BC8B
 BC9C 48 PHA
 BC9D A2 00 LDX ##00
 BC9F AD C5 02 LDA #02C5
 BCA2 4A LSR
 BCA3 B0 02 BCS #BCA7
 BCA5 A2 02 LDX ##02
 BCA7 68 STA
 BCAB 9D C6 02 STA #02C6, X
 BCAB 98 TYA
 BCAC 9D C7 02 STA #02C7, X
 BCAF 60 RTS
 BCBB A0 19 LDY ##19
 BCB2 90 02 BCC #BCB6
 BCB4 A0 1B LDY ##1B
 BCB6 AD C5 02 LDA #02C5
 BCB9 69 02 ADC ##02
 BCBB 4A LSR
 BCB8 4A LSR
 BCB0 08 PHP
 BCBE 20 18 C3 JSR #C318
 BCC1 C0 FF CPY ##FF
 BCC3 90 07 BCC #BCCC
 BCC5 8A TXA
 BCC6 A8 TAY
 BCC7 20 18 C3 JSR #C318
 BCCA B0 03 BCS #BCCF
 BCCC 20 37 C3 JSR #C337
 BCCF 28 PLP
 BCD0 B0 1B BCS #BCED
 BCD2 4C 27 C3 JMP #C327
 BCD5 8D CA 02 STA #02CA
 BCD8 A2 23 LDX ##23
 BCD9 0E CA 02 ASL #02CA
 BCDD 20 B0 BC JSR #BCD0
 BCE0 9D AD 02 STA #02AD, X
 BCE3 98 TYA
 BCE4 9D AE 02 STA #02AE, X
 BCE7 E8 INX
 BCE8 E8 INX
 BCE9 E0 2B CPX ##2B
 BCEB 90 ED BCC #BCDA
 BCED 60 RTS
 BCEE A0 2B LDY ##2B
 BCF0 20 56 BC JSR #BC56

BCF3 A2 07 LDX ##07
 BCF5 BD DC 02 LDA #02DC, X
 BCF8 9D D0 02 STA #02D0, X
 BCFB CA DEX
 BCFD 10 F7 BPL #BCF5
 BCFF A9 50 LDA #*50
 BD00 20 D5 BC JSR #BCD5
 BD03 A9 10 LDA #*10
 BD05 8D CA 02 STA #02CA
 BD08 A0 1F LDY #*1F
 BD0A A2 23 LDX ##*23
 BD0C 0E CB 02 ASL #02CB
 BD0F 2E CA 02 ROL #02CA
 BD12 20 F4 C2 JSR #C2F4
 BD15 E8 INX
 BD16 E8 INX
 BD17 0E CB 02 ASL #02CB
 BD1A 2E CA 02 ROL #02CA
 BD1D 20 F0 C2 JSR #C2F0
 BD20 48 PHA
 BD21 98 TYA
 BD22 48 PHA
 BD23 A0 21 LDY ##*21
 BD25 E8 INX
 BD26 E8 INX
 BD27 E0 27 CPX ##*27
 BD29 F0 E1 BEX #BD0C
 BD2B A2 03 LDX ##*03
 BD2D 68 PLA
 BD2E 9D B1 02 STA #02B1, X
 BD31 CA DEX
 BD32 10 F9 BPL #BD2D
 BD34 60 RTS

BD35; Perform [GSHAPE]

BD35 20 BF C7 JSR #C7BF
 BD38 20 48 9C JSR #9C48
 BD3B 8D CF 02 STA #02CF
 BD3E 86 24 STX #24
 BD40 84 25 STY #25
 BD42 A2 04 LDX ##*04
 BD44 20 D9 C3 JSR #C3D9
 BD47 20 A5 C3 JSR #C3A5
 BD4A E0 05 CPX ##*05
 BD4C 90 03 BCC #BD51
 BD4E 4C 1C 99 JMP #991C
 BD51 8E D0 02 STX #02D0
 BD54 AC 03 LDX ##*03
 BD56 A2 CF 02 LDY #02CF
 BD59 C0 05 CPY ##*05
 BD5B B0 01 BCS #BD5E
 BD5D 60 RTS
 BD5E 88 DEY
 BD5F 20 BB 04 JSR #04BB
 BD62 9D D5 02 STA #02D5, X
 BD65 CA DEX
 BD66 10 F6 BPL #BD5E
 BD68 8E D1 02 STX #02D1
 BD6B 20 7B C3 JSR #C37B
 BD6E AD D5 02 LDA #02D5
 BD71 8D D9 02 STA #02D9
 BD74 AD D6 02 LDA #02D6
 BD77 8D DA 02 STA #02DA
 BD7A A9 08 LDA #*08
 BD7C 8D E5 02 STA #02E5
 BD7F EE D1 02 INC #02D1
 BD82 AC D1 02 LDY #02D1

BD85 20 B8 04 JSR #048B
 BD88 8D D3 02 STA #02D3
 BD8B 20 F3 C1 JSR #C1F3
 BD8E 8D D2 02 STA #02D2
 BD91 0E D3 02 ABL #02D3
 BD94 2A ROL
 BD95 CE E5 02 DEC #02E5
 BD98 24 83 BIT #83
 BD9A 10 07 BPL #BDA3
 BD9C 0E D3 02 ABL #02D3
 BD9F 2A ROL
 BDA0 CE E5 02 DEC #02E5
 BDA3 AE D0 02 LDX #02D0
 BDA6 E0 03 CPX ##03
 BDA8 90 0C BCC #BDB6
 BDA A F0 05 BEQ #BDB1
 BDAC 4D D2 02 EOR #02D2
 BDAF 80 11 BCS #BDC2
 BDB1 2D D2 02 AND #02D2
 BDB4 80 0C BCS #BDC2
 BDB6 E0 01 CPX ##01
 BDB8 90 08 BCC #BDC2
 BDBA F0 04 BEQ #BDC0
 BDBC 0D D2 02 ORA #02D2
 BDBF 2C 49 FF BIT #FF49
 BDC2 29 03 AND ##03
 BDC4 24 83 BIT #83
 BDC6 30 02 BMI #BDCA
 BDC8 29 01 AND ##01
 BDCA 85 84 STA #84
 BDCC 20 C3 C1 JSR #C1C3
 BDCF EE AD 02 INC #02AD
 BDD2 D0 03 BNE #BDD7
 BDD4 EE AE 02 INC #02AE
 BDD7 38 SEC
 BDD8 AD D9 02 LDA #02D9
 BDD8 24 83 BIT #83
 BDDD 10 03 BPL #BDE2
 BDDF E9 02 SBC ##02
 BDE1 2C E9 01 BIT #01E9
 BDE4 8D D9 02 STA #02D9
 BDE7 AD DA 02 LDA #02DA
 BDEA E9 00 SBC ##00
 BDEC 8D DA 02 STA #02DA
 BDEF 80 2D BCS #BE1E
 BDF1 A2 01 LDX ##01
 BDF3 8D D5 02 LDA #02D5, X
 BDF6 9D D9 02 STA #02D9, X
 BDF9 8D B1 02 LDA #02B1, X
 BDFC 9D AD 02 STA #02AD, X
 BDFE CA DEX
 BE00 10 F1 BPL #BDF3
 BE02 EE AF 02 INC #02AF
 BE05 D0 03 BNE #BE0A
 BE07 EE B0 02 INC #02B0
 BE0A 38 SEC
 BE0B AD D7 02 LDA #02D7
 BE0E E9 01 SBC ##01
 BE10 8D D7 02 STA #02D7
 BE13 AD D8 02 LDA #02D8
 BE16 E9 00 SBC ##00
 BE18 8D D8 02 STA #02D8
 BE1B 80 09 BCS #BE26
 BE1D 60 RTS
 BE1E AD E5 02 LDA #02E5
 BE21 F0 03 BEQ #BE26
 BE23 4C 88 BD JMP #BDB8
 BE26 4C 7A BD JMP #BD7A

BE29; Perform [SSHAPE]

BE29 20 BF C7 JSR #C7BF
 BE2C 20 A5 96 JSR #96A5
 BE2F 8D D8 02 STA #02D8
 BE32 8C DC 02 STY #02DC
 BE35 24 80 BIT #0D
 BE37 30 03 BMI #BE3C
 BE39 4C 24 93 JMP #9324
 BE3C A2 28 LDX ##28
 BE3E 20 F4 C3 JSR #C3F4
 BE41 A2 04 LDX ##04
 BE43 20 D9 C3 JSR #C3D9
 BE46 A2 2A LDX ##2A
 BE48 A0 06 LDY #06
 BE4A A9 02 LDA ##02
 BE4C 85 8E STA #8E
 BE4E 20 22 C3 JSR #C322
 BE51 AA TAX
 BE52 98 TYA
 BE53 48 PHA
 BE54 A4 8E LDY #8E
 BE56 20 82 C3 JSR #C382
 BE59 90 0C BCC #BE67
 BE5B B9 D5 02 LDA #02D5, Y
 BE5E 99 AD 02 STA #02AD, Y
 BE61 B9 D6 02 LDA #02D6, Y
 BE64 99 AE 02 STA #02AE, Y
 BE67 8A TXA
 BE68 99 D5 02 STA #02D5, Y
 BE68 99 DE 02 STA #02DE, Y
 BE6E 68 PLA
 BE6F 99 D6 02 STA #02D6, Y
 BE72 99 DF 02 STA #02DF, Y
 BE75 A2 28 LDX ##28
 BE77 A0 04 LDY #04
 BE79 C6 8E DEC #8E
 BE7B C6 8E DEC #8E
 BE7D F0 CF BEQ #BE4E
 BE7F A0 FF LDY ##FF
 BE81 8C D1 02 STY #02D1
 BE84 AD AD 02 LDA #02AD
 BE87 8D D9 02 STA #02D9
 BE8A AD AE 02 LDA #02AE
 BE8D 8D DA 02 STA #02DA
 BE90 98 TYA
 BE91 20 5C 9B JSR #9B5C
 BE94 20 64 C2 JSR #C264
 BE97 B1 8C LDA (#8C), Y
 BE99 90 0E BCC #BEA9
 BE9B AD AD 02 LDA #02AD
 BE9E 24 83 BIT #83
 BEA0 10 02 BPL #BEA4
 BEA2 38 SEC
 BEA3 2A ROL
 BEA4 29 07 AND ##07
 BEA6 AA TAX
 BEA7 A9 00 LDA ##00
 BEA9 24 83 BIT #83
 BEAB 10 01 BPL #BEAE
 BEAD CA DEX
 BEAE 8E DD 02 STX #02DD
 BEB1 0A ABL
 BEB2 CA DEX
 BEB3 10 FC BPL #BEB1
 BEB5 6A ROR
 BEB6 85 8E STA #8E

BEB8 A9 08 LDA ##08
 BEBA 24 83 BIT #83
 BEBC 10 01 BPL \$BE8F
 BEBE 4A LSR
 BEBF 18 CLC
 BEC0 6D AD 02 ADC #02AD
 BEC3 8D AD 02 STA #02AD
 BEC6 90 03 BCC \$BECB
 BEC8 EE AE 02 INC #02AE
 BECB 20 64 C2 JSR #C264
 BECE A9 00 LDA ##00
 BED0 80 02 BCS \$BED4
 BED2 B1 8C LDA (\$8C),Y
 BED4 85 8F STA #8F
 BED6 AE DD 02 LDX #02DD
 BED9 4A LSR
 BEDA E8 INX
 BEDB E0 08 CPX ##08
 BEDD D0 FA BNE \$BED9
 BEDF 05 8E ORA #8E
 BEE1 EE D1 02 INC #02D1
 BEE4 AC D1 02 LDY #02D1
 BEE7 C0 FC CPY ##FC
 BEE9 90 03 BCC \$BEEE
 BEEB 4C 4C CC JMP \$CC4C
 BEEE 91 62 STA (\$62),Y
 BEF0 AE DD 02 LDX #02DD
 BEF3 AD D5 02 LDA #02D5
 BEF6 38 SEC
 BEF7 24 83 BIT #83
 BEF9 10 03 BPL \$BEFE
 BEFB E9 04 SBC #04
 BEFD 2C E9 08 BIT #08E9
 BF00 8D D5 02 STA #02D5
 BF03 A5 8F LDA #8F
 BF05 B0 A6 BCS \$BE81
 BF07 CE D6 02 DEC #02D6
 BF0A 10 A5 BPL \$BE81
 BF0C AE D7 02 LDX #02D7
 BF0F D0 42 BNE \$BF53
 BF11 CE D8 02 DEC #02D8
 BF14 10 3D BPL \$BF53
 BF16 24 83 BIT #83
 BF18 10 06 BPL \$BF20
 BF1A 0E DE 02 ASL #02DE
 BF1D 2E DF 02 ROL #02DF
 BF20 A2 00 LDA ##00
 BF22 BD DE 02 LDA #02DE,X
 BF25 C8 INY
 BF26 91 62 STA (\$62),Y
 BF28 E8 INX
 BF29 E0 04 CPX ##04
 BF2B D0 F5 BNE \$BF22
 BF2D C8 INY
 BF2E 8C DE 02 STY #02DE
 BF31 A5 62 LDA #62
 BF33 8D DF 02 STA #02DF
 BF36 A5 63 LDA #63
 BF38 8D E0 02 STA #02E0
 BF3B A9 DE LDA #\$DE
 BF3D 85 64 STA #64
 BF3F A9 02 LDA #02
 BF41 85 65 STA #65
 BF43 AD DB 02 LDA #02DB
 BF46 85 49 STA #49
 BF48 AD DC 02 LDA #02DC
 BF4B 85 4A STA #4A
 BF4D 20 40 8F JSR #8F40
 BF50 4C 7B C3 JMP #C37B

BF53 CE D7 02 DEC #02D7
 BF56 EE AF 02 INC #02AF
 BF59 D0 03 BNE \$BF5E
 BF5B EE B0 02 INC #02B0
 BF5E AD D9 02 LDA #02D9
 BF61 8D AD 02 STA #02AD
 BF64 AD DA 02 LDA #02DA
 BF67 8D AE 02 STA #02AE
 BF6A AD DE 02 LDA #02DE
 BF6D 8D D5 02 STA #02D5
 BF70 AD DF 02 LDA #02DF
 BF73 8D D6 02 STA #02D6
 BF76 4C 94 BE JMP \$BE94

BF79; Perform [RGR]

BF79 A5 83 LDA #83
 BF7B 18 CLC
 BF7C 2A ROL
 BF7D 2A ROL
 BF7E 2A ROL
 BF7F 69 00 ADC ##00
 BF81 A8 TAY
 BF82 4C 81 9A JMP #9A81

BF85; Perform [RCLR]

BF85 38 SEC
 BF86 24 18 BIT #18

BF87; Perform [RLUM]

BF88 08 PHP
 BF89 20 87 9D JSR #9D87
 BF8C AD 19 FF LDA \$FF19
 BF8F 29 7F AND #7F
 BF91 E0 04 CPX ##04
 BF93 F0 19 BEQ \$BFAE
 BF95 B0 27 BCS \$BFBE
 BF97 AD 15 FF LDA \$FF15
 BF9A 29 7F AND #7F
 BF9C CA DEX
 BF9D 30 0F BMI \$BFAE
 BF9F A5 86 LDA #86
 BFA1 CA DEX
 BFA2 30 0A BMI \$BFAE
 BFA4 A5 85 LDA #85
 BFA6 CA DEX
 BFA7 30 05 BMI \$BFAE
 BFA9 AD 16 FF LDA \$FF16
 BFAC 29 7F AND #7F
 BFAE 28 PLP
 BFAF B0 05 BCS \$BF86
 BFB1 4A LSR
 BFB2 4A LSR
 BFB3 4A LSR
 BFB4 4A LSR
 BFB5 18 CLC
 BFB6 69 00 ADC ##00
 BFB8 29 0F AND #0F
 BFB8 A8 TAY
 BFB8 4C 81 9A JMP #9A81
 BFB8 4C 1C 99 JMP #991C

BFC1; Perform [RJOY]

BFC1 20 87 9D JSR \$9D87
 BFC4 CA DEX
 BFC5 E0 02 CPX ##02
 BFC7 80 F5 BCS \$BFBE
 BFC9 8D FB BF LDA \$BFFB,X
 BFCC AA TAX
 BFCD 7B SEI
 BFCE 8E 08 FF STX \$FF08
 BFD1 AD 08 FF LDA \$FF08
 BFD4 8E 08 FF STX \$FF08
 BFD7 CD 08 FF CMP \$FF08
 BFDA D0 F2 BNE \$BFCE
 BFDC 5B CLI
 BFDD 49 FF EOR ##FF
 BFDf AB TAY
 BFE0 29 0F AND ##0F
 BFE2 AA TAX
 BFE3 8D F0 BF LDA \$BFF0,X
 BFE6 C0 0F CPY ##0F
 BFE8 90 02 BCC \$BFEC
 BFEA 09 80 ORA ##80
 BFEC AB TAY
 BFED 4C 81 9A JMP \$9A81
 BFF0 00 BRK
 BFF1 01 05 ORA (\$05,X)
 BFF3 00 BRK
 BFF4 07 ???
 BFF5 08 PHP
 BFF6 06 00 ASL \$00
 BFF8 03 ???
 BFF9 02 ???
 BFFA 04 ???
 BFFB FA ???
 BFFC FD ???

BFFD; Perform [RDOT]

BFFD 20 87 9D JSR \$9D87
 C000 E0 02 CPX ##02
 C002 90 80 BCC \$C011
 C004 D0 8B BNE \$BFBE
 C006 20 F3 C1 JSR \$C1F3
 C009 AB TAY
 C00A 90 02 BCC \$C00E
 C00C A0 80 LDY ##00
 C00E 4C 81 9A JMP \$9A81
 C011 8A TXA
 C012 0A ASL
 C013 0A TAX
 C014 8D AD 02 LDA \$02AD,X
 C017 AB TAY
 C018 8D AE 02 LDA \$02AE,X
 C01B 4C 71 94 JMP \$9471

C01E; Perform [CIRCLE]

C01E 20 B6 C3 JSR \$C3B6
 C021 A2 1F LDY ##1F
 C023 20 D9 C3 JSR \$C3D9
 C026 20 8F C3 JSR \$C38F
 C029 8C D0 02 STY \$02D0
 C02C 8D D1 02 STA \$02D1
 C02F 20 8F C3 JSR \$C38F
 C032 8C D2 02 STY \$02D2

C035 8D D3 02 STA \$02D3
 C038 08 PHP
 C039 A2 23 LDY ##23
 C03B 28 D3 C2 JSR \$C2D3
 C03E 28 PLP
 C03F 80 11 BCS \$C052
 C041 AD D0 02 LDA \$02D0
 C044 8D D2 02 STA \$02D2
 C047 AD D1 02 LDA \$02D1
 C04A 24 83 BIT #83
 C04C 10 04 BPL \$C052
 C04E 0E D2 02 ASL \$02D2
 C051 2A ROL
 C052 8D D3 02 STA \$02D3
 C055 20 8F C3 JSR \$C38F
 C058 8C D8 02 STY \$02D8
 C05B 8D D9 02 STA \$02D9
 C05E 20 8F C3 JSR \$C38F
 C061 8C DA 02 STA \$02DA
 C064 8D D8 02 STY \$02D8
 C067 20 8F C3 JSR \$C38F
 C06A 85 80 STA \$80
 C06C 98 TYA
 C06D A4 80 LDY \$80
 C06F 20 59 BC JSR \$BC59
 C072 A2 2D LDY ##2D
 C074 A0 2B LDY ##2B
 C076 20 05 C3 JSR \$C305
 C079 90 0E BCC \$C089
 C07B A9 68 LDA \$#68
 C07D A0 01 LDY ##01
 C07F 20 F9 C2 JSR \$C2F9
 C082 9D AD 02 STA \$02AD,X
 C085 98 TYA
 C086 9D AE 02 STA \$02AE,X
 C089 A2 03 LDY ##03
 C08B BD D0 02 LDA \$02D0,X
 C08E 9D D4 02 STA \$02D4,X
 C091 CA DEX
 C092 10 F7 BPL \$C08B
 C094 A9 90 LDA \$#90
 C096 20 D5 BC JSR \$BCD5
 C099 A2 07 LDY ##07
 C09B BD D0 02 LDA \$02D0,X
 C09E 9D DC 02 STA \$02DC,X
 C0A1 CA DEX
 C0A2 10 F7 BPL \$C09B
 C0A4 20 EE BC JSR \$BCEE
 C0A7 20 7B C3 JSR \$C37B
 C0AA A2 02 LDY ##02
 C0AC 20 A7 C3 JSR \$C3A7
 C0AF 86 E9 STX \$E9
 C0B1 18 CLC
 C0B2 A5 E9 LDA \$E9
 C0B4 D0 03 BNE \$C0B9
 C0B6 4C 1C 99 JMP \$991C
 C0B9 6D D8 02 ADC \$02D8
 C0BC 8D D8 02 STA \$02D8
 C0BF 90 03 BCC \$C0C4
 C0C1 EE D9 02 INC \$02D9
 C0C4 A2 2D LDY ##2D
 C0C6 A0 2B LDY ##2B
 C0C8 20 05 C3 JSR \$C305
 C0CB 80 08 BCS \$C0D5
 C0CD 20 EE BC JSR \$BCEE
 C0D0 20 DA C0 JSR \$C0DA
 C0D3 90 DD BCC \$C0B2
 C0D5 A0 2D LDY ##2D
 C0D7 20 F0 BC JSR \$BCF0

C0DA A2 02 LDX ##02
 C0DC A0 06 LDY ##06
 C0DE A9 00 LDA ##00
 C0E0 9D B9 02 STA \$02B9,X
 C0E3 9D BA 02 STA \$02BA,X
 C0E6 20 22 C3 JSR \$C322
 C0E9 10 08 BPL \$C0F3
 C0EB DE B9 02 DEC \$02B9,X
 C0EE DE BA 02 DEC \$02BA,X
 C0F1 D0 08 BNE \$C0FE
 C0F3 C9 00 CMP ##00
 C0F5 D0 04 BNE \$C0FB
 C0F7 C0 00 CPY ##00
 C0F9 F0 03 BEQ \$C0FE
 C0FB FE B9 02 INC \$02B9,X
 C0FE 9D B5 02 STA \$02B5,X
 C101 D0 01 ASL
 C102 9D BD 02 STA \$02BD,X
 C105 98 TYA
 C106 9D B6 02 STA \$02B6,X
 C109 2A ROL
 C10A 9D BE 02 STA \$02BE,X
 C10D CA DEX
 C10E CA DEX
 C10F A0 04 LDY ##04
 C111 E0 00 CPX ##00
 C113 F0 C9 BEQ \$C0DE
 C115 A2 0A LDX ##0A
 C117 A0 08 LDY ##08
 C119 20 05 C3 JSR \$C305
 C11C A9 00 LDA ##00
 C11E 2A ROL
 C11F 2A ROL
 C120 8D C3 02 STA \$02C3
 C123 49 02 EOR ##02
 C125 8D C4 02 STA \$02C4
 C128 18 CLC
 C129 A9 10 LDA ##10
 C12B 6D C3 02 ADC \$02C3
 C12E AB TAY
 C12F 48 PHA
 C130 49 02 EOR ##02
 C132 AA TAX
 C133 20 05 C3 JSR \$C305
 C136 9D AD 02 STA \$02AD,X
 C139 98 TYA
 C13A 9D AE 02 STA \$02AE,X
 C13D 68 PLA
 C13E AB TAY
 C13F 18 CLC
 C140 A9 08 LDA ##08
 C142 6D C4 02 ADC \$02C4
 C145 AA TAX
 C146 20 05 C3 JSR \$C305
 C149 8D C1 02 STA \$02C1
 C14C 8C C2 02 STY \$02C2
 C14F 20 A5 C1 JSR \$C1A5
 C152 AC C4 02 LDY \$02C4
 C155 38 SEC
 C156 B9 B5 02 LDA \$02B5,Y
 C159 E9 01 SBC ##01
 C15B 99 B5 02 STA \$02B5,Y
 C15E B0 0B BCS \$C16B
 C160 B9 B6 02 LDA \$02B6,Y
 C163 E9 00 SBC ##00
 C165 99 B6 02 STA \$02B6,Y
 C168 B0 01 BCS \$C16B
 C16A 60 RTS
 C16B AE C3 02 LDX \$02C3

C16E AD C2 02 LDA \$02C2
 C171 30 06 BMI \$C179
 C173 20 94 C1 JSR \$C194
 C176 AE C4 02 LDX \$02C4
 C179 18 CLC
 C17A AD C1 02 LDA \$02C1
 C17D 7D BD 02 ADC \$02BD,X
 C180 8D C1 02 STA \$02C1
 C183 AD C2 02 LDA \$02C2
 C186 7D BE 02 ADC \$02BE,X
 C189 8D C2 02 STA \$02C2
 C18C AE C4 02 LDX \$02C4
 C18F 20 94 C1 JSR \$C194
 C192 F0 BB BEQ \$C14F
 C194 A0 02 LDY ##02
 C196 18 CLC
 C197 BD AD 02 LDA \$02AD,X
 C19A 7D B9 02 ADC \$02B9,X
 C19D 7D AD 02 STA \$02AD,X
 C1A0 EB INX
 C1A1 88 DEY
 C1A2 D0 F3 BNE \$C197
 C1A4 60 RTS
 C1A5 AD E8 02 LDA \$02E8
 C1A8 0D E7 02 ORA \$02E7
 C1AB F0 16 BEQ \$C1C3
 C1AD EE AD 02 INC \$02AD
 C1B0 D0 03 BNE \$C1B5
 C1B2 EE AE 02 INC \$02AE
 C1B5 20 C3 C1 JSR \$C1C3
 C1B8 AE AD 02 LDX \$02AD
 C1BB D0 03 BNE \$C1C0
 C1BD CE AE 02 DEC \$02AE
 C1C0 CE AD 02 DEC \$02AD
 C1C3 20 AD C2 JSR \$C2AD
 C1C6 B0 24 BCB \$C1EC
 C1C8 20 1A C2 JSR \$C21A
 C1CB 20 69 C2 JSR \$C269
 C1CE 8D E9 02 STA \$02E9
 C1D1 B1 8C LDA (\$8C),Y
 C1D3 0D E9 02 ORA \$02E9
 C1D6 24 83 BIT \$83
 C1D8 10 13 BPL \$C1ED
 C1DA 48 PHA
 C1DB A6 B4 LDX \$84
 C1DD AD E9 02 LDA \$02E9
 C1E0 3D AF C4 AND \$C4AF,X
 C1E3 8D E9 02 STA \$02E9
 C1E6 68 PLA
 C1E7 4D E9 02 EOR \$02E9
 C1EA 91 8C STA (\$8C),Y
 C1EC 60 RTS
 C1ED A6 B4 LDX \$84
 C1EF D0 F9 BNE \$C1EA
 C1F1 F0 F4 BEQ \$C1E7
 C1F3 20 64 C2 JSR \$C264
 C1F6 B0 21 BCS \$C219
 C1FB 8D E9 02 STA \$02E9
 C1FB B1 8C LDA (\$8C),Y
 C1FD 2D E9 02 AND \$02E9
 C200 2A ROL
 C201 CA DEX
 C202 10 FC BPL \$C200
 C204 2A ROL
 C205 24 8B BIT \$8B
 C207 30 06 BMI \$C20F
 C209 29 03 AND ##03
 C20B C5 B4 CMP \$84
 C20D 18 CLC

C20E	60		RTS			C28B	20	10	00	JSR	#0010
C20F	18		CLC			C28E	04			???	
C210	29	03	AND	#*03		C28F	02			???	
C212	F0	03	BEQ	#C217		C290	01	98		ORA	(#98,X)
C214	A2	00	LDX	#*00		C292	18			CLC	
C216	60		RTS			C293	7D	02	D8	ADC	#D802,X
C217	A2	FF	LDX	#*FF		C296	85	8C		STA	#8C
C219	60		RTS			C298	BD	1B	D8	LDA	#DB1B,X
C21A	BD	02	D8	LDA	#D802,X	C29B	29	03		AND	#*03
C21D	85	8C		STA	#8C	C29D	69	00		ADC	#*00
C21F	BD	1B	D8	LDA	#DB1B,X	C29F	06	8C		ASL	#8C
C222	29	03		AND	#*03	C2A1	2A			ROL	
C224	48		PHA			C2A2	06	8C		ASL	#8C
C225	09	1C		ORA	#*1C	C2A4	2A			ROL	
C227	85	8D		STA	#8D	C2A5	06	8C		ASL	#8C
C229	20	38	C2	JSR	#C238	C2A7	2A			ROL	
C22C	91	8C		STA	(#8C),Y	C2A8	09	20		ORA	#*20
C22E	68		PLA			C2AA	85	8D		STA	#8D
C22F	09	1B		ORA	#*1B	C2AC	60			RTS	
C231	85	8D		STA	#8D	C2AD	AD	AE	02	LDA	#02AE
C233	20	4E	C2	JSR	#C24E	C2B0	4A			LSR	
C236	91	8C		STA	(#8C),Y	C2B1	D0	1E		BNE	#C2D1
C238	A5	86		LDA	#86	C2B3	AD	AD	02	LDA	#02AD
C23A	0A			ASL		C2B6	6A			ROR	
C23B	0A			ASL		C2B7	4A			LSR	
C23C	0A			ASL		C2B8	24	83		BIT	#83
C23D	0A			ASL		C2BA	30	01		BMI	#C2BD
C23E	85	7E		STA	#7E	C2BC	4A			LSR	
C240	AD	15	FF	LDA	#FF15	C2BD	AB			TAY	
C243	24	83		BIT	#83	C2BE	C0	28		CPY	#*28
C245	10	02		BPL	#C249	C2C0	B0	0F		BCS	#C2D1
C247	A5	85		LDA	#85	C2C2	AD	B0	02	LDA	#02B0
C249	29	0F		AND	#*0F	C2C5	D0	0A		BNE	#C2D1
C24B	05	7E		ORA	#7E	C2C7	AD	AF	02	LDA	#02AF
C24D	60			RTS		C2CA	4A			LSR	
C24E	A5	86		LDA	#86	C2CB	4A			LSR	
C250	4A			LSR		C2CC	4A			LSR	
C251	4A			LSR		C2CD	AA			TAX	
C252	4A			LSR		C2CE	C5	88		CMP	#88
C253	4A			LSR		C2D0	60			RTS	
C254	85	7E		STA	#7E	C2D1	38			SEC	
C256	AD	15	FF	LDA	#FF15	C2D2	60			RTS	
C259	24	83		BIT	#83	C2D3	AD	E6	02	LDA	#02E6
C25B	10	02		BPL	#C25F	C2D6	F0	17		BEQ	#C2EF
C25D	A5	85		LDA	#85	C2D8	A5	87		LDA	#87
C25F	29	F0		AND	#*F0	C2DA	20	DF	C2	JSR	#C2DF
C261	05	7E		ORA	#7E	C2DD	A5	88		LDA	#88
C263	60			RTS		C2DF	0A			ASL	
C264	20	AD	C2	JSR	#C2AD	C2E0	AB			TAY	
C267	B0	1F		BCS	#C288	C2E1	A9	00		LDA	#*00
C269	20	91	C2	JSR	#C291	C2E3	20	37	C3	JSR	#C337
C26C	AD	AF	02	LDA	#02AF	C2E6	9D	AD	02	STA	#02AD,X
C26F	29	07		AND	#*07	C2E9	98			TYA	
C271	AB			TAY		C2EA	EB			INX	
C272	AD	AD	02	LDA	#02AD	C2EB	9D	AD	02	STA	#02AD,X
C275	24	83		BIT	#83	C2EE	EB			INX	
C277	08			PHP		C2EF	60			RTS	
C278	10	01		BPL	#C27B	C2F0	90	07		BCC	#C2F9
C27A	0A			ASL		C2F2	B0	14		BCS	#C308
C27B	29	07		AND	#*07	C2F4	B0	0F		BCS	#C305
C27D	AA			TAX		C2F6	20	18	C3	JSR	#C318
C27E	BD	89	C2	LDA	#C289,X	C2F9	1B			CLC	
C281	28			PLP		C2FA	7D	AD	02	ADC	#02AD,X
C282	10	04		BPL	#C288	C2FD	48			PHA	
C284	EB			INX		C2FE	98			TYA	
C285	1D	89	C2	ORA	#C289,X	C2FF	7D	AE	02	ADC	#02AE,X
C288	60			RTS		C302	AB			TAY	
C289	80			???		C303	68			PLA	
C28A	40			RTI		C304	60			RTS	

C305 20 18 C3 JSR #C318
 C308 38 SEC
 C309 FD AD 02 STA #02AD,X
 C30C 85 57 STB #57
 C30E 98 TYA
 C30F FD AE 02 SBC #02AE,X
 C312 A8 TAY
 C313 08 PHP
 C314 A5 57 LDA #57
 C316 28 PLP
 C317 60 RTS
 C318 B9 AD 02 LDA #02AD,Y
 C31B 48 PHA
 C31C B9 AE 02 LDA #02AE,Y
 C31F A8 TAY
 C320 68 PLA
 C321 60 RTS
 C322 20 05 C3 JSR #C305
 C325 10 0F BPL #C336
 C327 08 PHP
 C328 18 CLC
 C329 49 FF EOR ##FF
 C32B 69 01 ADC ##01
 C32D 48 PHA
 C32E 98 TYA
 C32F 49 FF EOR ##FF
 C331 69 00 ADC ##00
 C333 A8 TAY
 C334 68 PLA
 C335 28 PLP
 C336 60 RTS
 C337 84 8E STY #8E
 C339 85 8F STA #8F
 C33B BD AD 02 LDA #02AD,X
 C33E BC AE 02 LDY #02AE,X
 C341 08 PHP
 C342 20 25 C3 JSR #C325
 C345 9D AD 02 STA #02AD,X
 C348 98 TYA
 C349 9D AE 02 STA #02AE,X
 C34C A9 00 LDA ##00
 C34E BD EF 02 STA #02EF
 C351 A0 10 LDY ##10
 C353 46 8E LSR #8E
 C355 66 8F ROR #8F
 C357 90 0F BCC #C368
 C359 18 CLC
 C35A 7D AD 02 ADC #02AD,X
 C35D 48 PHA
 C35E AD EF 02 LDA #02EF
 C361 7D AE 02 ADC #02AE,X
 C364 BD EF 02 STA #02EF
 C367 68 PLA
 C368 4E EF 02 LSR #02EF
 C36B 6A ROR
 C36C 88 DEY
 C36D D0 E4 BNE #C353
 C36F 69 00 ADC ##00
 C371 AC EF 02 LDY #02EF
 C374 90 01 BCC #C377
 C376 C8 INY
 C377 28 PLP
 C378 4C 25 C3 JMP #C325

C37B; Set graphics cursor

C37B A0 00 LDY ##00
 C37D 20 B2 C3 JSR #C382
 C380 A0 02 LDY ##02
 C382 B9 B1 02 LDA #02B1,Y

C385 99 AD 02 STA #02AD,Y
 C388 B9 B2 02 LDA #02B2,Y
 C38B 99 AE 02 STA #02AE,Y
 C38E 60 RTS
 C38F 20 79 04 JSR #0479
 C392 F0 0C BEQ #C3A0
 C394 20 91 94 JSR #9491
 C397 C9 2C CMP ##2C
 C399 F0 05 BEQ #C3A0
 C39B 20 E1 9D JSR #9DE1
 C39E 38 SEC
 C39F 60 RTS
 C3A0 A9 00 LDA ##00
 C3A2 A8 TAY
 C3A3 18 CLC
 C3A4 60 RTS
 C3A5 A2 00 LDX ##00
 C3A7 20 79 04 JSR #0479
 C3AA F0 F8 BEQ #C3A4
 C3AC 20 91 94 JSR #9491
 C3AF C9 2C CMP ##2C
 C3B1 F0 F1 BEQ #C3A4
 C3B3 4C B4 9D JMP #9DB4
 C3B6 20 BF C7 JSR #C7BF
 C3B9 A2 01 LDX ##01
 C3BB 20 79 04 JSR #0479
 C3BE F0 13 BEQ #C3D3
 C3C0 C9 2C CMP ##2C
 C3C2 F0 0F BEQ #C3D3
 C3C4 20 B4 9D JSR #9DB4
 C3C7 E0 04 CPX ##04
 C3C9 B0 0B BCS #C3D6
 C3CB E0 02 CPX ##02
 C3CD 24 B3 BIT #B3
 C3CF 30 02 BMI #C3D3
 C3D1 B0 03 BCS #C3D6
 C3D3 86 B4 STX #B4
 C3D5 60 RTS
 C3D6 4C 1C 99 JMP #991C
 C3D9 20 79 04 JSR #0479
 C3DC F0 07 BEQ #C3E5
 C3DE 20 91 94 JSR #9491
 C3E1 C9 2C CMP ##2C
 C3E3 D0 12 BNE #C3F7
 C3E5 A0 00 LDY ##00
 C3E7 B9 AD 02 LDA #02AD,Y
 C3EA 9D AD 02 STA #02AD,X
 C3ED EB INX
 C3EE C8 INY
 C3EF C0 04 CPY ##04
 C3F1 D0 F4 BNE #C3E7
 C3F3 60 RTS
 C3F4 20 91 94 JSR #9491

C3F7; Parse graphics commands

C3F7 8E F0 02 STX #02F0
 C3FA 20 BF C4 JSR #C4BF
 C3FD 20 79 04 JSR #0479
 C400 C9 2C CMP ##2C
 C402 F0 56 BEQ #C45A
 C404 C9 3B CMP ##3B
 C406 F0 03 BEQ #C40B
 C408 4C A1 94 JMP #94A1
 C40B 20 73 04 JSR #0473
 C40E 20 E1 9D JSR #9DE1
 C411 85 B0 STA #B0
 C413 98 TYA
 C414 A4 B0 LDY #B0

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C416 20 59 BC JSR $B0C59
C419 AE F0 02 LDX $02F0
C41C 8D AD 02 LDA $02AD,X
C41F 9D AF 02 STA $02AF,X
C422 8D AE 02 LDA $02AE,X
C425 9D B0 02 STA $02B0,X
C428 20 D3 C2 JSR $C2D3
C42B A9 0E LDA #$0E
C42D 8D F1 02 STA $02F1
C430 18 CLC
C431 AE F0 02 LDX $02F0
C434 20 B0 BC JSR $B0B0
C437 9D AD 02 STA $02AD,X
C43A 9B TYA
C43B 9D AE 02 STA $02AE,X
C43E A0 00 LDY #$00
C440 4E F1 02 LSR $02F1
C443 90 02 BCC $C447
C445 A0 02 LDY #$02
C447 20 F4 C2 JSR $C2F4
C44A 9D AD 02 STA $02AD,X
C44D 9B TYA
C44E 9D AE 02 STA $02AE,X
C451 EB INX
C452 EB INX
C453 4E F1 02 LSR $02F1
C456 D0 DC BNE $C434
C458 18 CLC
C459 60 RTS
C45A 20 73 04 JSR $0473
C45D EE F0 02 INC $02F0
C460 EE F0 02 INC $02F0
C463 20 BF C4 JSR $C4BF
C466 AE F0 02 LDX $02F0
C469 CA DEX
C46A CA DEX
C46B 20 D3 C2 JSR $C2D3
C46E A0 02 LDY #$02
C470 AE F0 02 LDX $02F0
C473 EB INX
C474 EB INX
C475 CA DEX
C476 CA DEX
C477 4E F1 02 LSR $02F1
C47A 90 0A BCC $C486
C47C 20 F6 C2 JSR $C2F6
C47F 9D AD 02 STA $02AD,X
C482 9B TYA
C483 9D AE 02 STA $02AE,X
C486 A0 00 LDY #$00
C488 EC F0 02 CPX $02F0
C48B F0 E8 BEQ $C475
C48D 18 CLC
C48E 60 RTS

C48F; Get graphics
      parameters

C48F 20 79 04 JSR $0479
C492 C9 AA CMP #$AA
C494 F0 05 BEQ $C49B
C496 C9 AB CMP #$AB
C498 F0 01 BEQ $C49B
C49A 18 CLC
C49B 2E F1 02 ROL $02F1
C49E 20 14 93 JSR $9314
C4A1 20 E8 9D JSR $9DE8
C4A4 AE F0 02 LDX $02F0
C4A7 9D AE 02 STA $02AE,X
C4AA 9B TYA

C4AB 9D AD 02 STA $02AD,X
C4AE 60 RTS
C4AF FF ???
C4B0 AA TAX
C4B1 55 00 EOR $00,X
C4B3 00 BRK
C4B4 00 BRK
C4B5 2C 71 57 BIT $5771
C4B8 8D 00 0A STA $0080
C4BB A4 8F LDY $8F
C4BD C4 19 CPY $19
C4BF DD B2 F0 CMP $F0B2,X
C4C2 90 FC BCC $C4C0
C4C4 1C ???
C4C5 FF ???
C4C6 FF ???
C4C7 04 ???
C4C8 72 ???
C4C9 04 ???
C4CA 50 04 BVC $C4D0
C4CC 0B ???
C4CD 03 ???
C4CE AB TAY
C4CF 03 ???
C4D0 28 PLP
C4D1 02 ???
C4D2 90 01 BCC $C4D5
C4D4 E3 ???
C4D5 01 28 ORA ($28,X)
C4D7 00 BRK
C4D8 63 ???

C4D9; Perform [DRAW]

C4D9 20 BF C7 JSR $C7BF
C4DC 20 79 04 JSR $0479
C4DF F0 12 BEQ $C4F3
C4E1 A2 01 LDX #$01
C4E3 C9 A4 CMP #$A4
C4E5 20 BE C3 JSR $C3BE
C4E8 20 79 04 JSR $0479
C4EB C9 2C CMP #$2C
C4ED F0 05 BEQ $C4F4
C4EF C9 A4 CMP #$A4
C4F1 F0 01 BEQ $C4F4
C4F3 60 RTS
C4F4 48 PHA
C4F5 20 73 04 JSR $0473
C4F8 A2 04 LDX #$04
C4FA 20 F7 C3 JSR $C3F7
C4FD 68 PLA
C4FE 10 06 BPL $C506
C500 20 DA C0 JSR $C0DA
C503 4C E8 C4 JMP $C4E8
C506 20 7B C3 JSR $C37B
C509 20 A5 C1 JSR $C1A5
C50C 4C E8 C4 JMP $C4E8

C50F; Perform [LOCATE]

C50F 20 BF C7 JSR $C7BF
C512 A2 04 LDX #$04
C514 20 F7 C3 JSR $C3F7
C517 4C 7B C3 JMP $C37B

C51A; Perform [COLOR]

C51A 20 84 9D JSR $9D84
C51D E0 05 CPX #$05
C51F B0 43 BCS $C564

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C521 86 7E STX #7E
 C523 20 D8 9D JSR #9DD8
 C526 CA DEX
 C527 E0 10 CPX ##10
 C529 B0 39 BCS #C564
 C52B 86 7F STX #7F
 C52D A2 07 LDX ##07
 C52F 20 A7 C3 JSR #C3A7
 C532 E0 08 CPX ##08
 C534 B0 2E BCS #C564
 C536 BA TXA
 C537 0A ASL
 C538 0A ASL
 C539 0A ASL
 C53A 0A ASL
 C53B 05 7F ORA #7F
 C53D A6 7E LDX #7E
 C53F E0 01 CPX ##01
 C541 F0 07 BEQ #C54A
 C543 B0 0C BCS #C551
 C545 8D 15 FF STA #FF15
 C548 D0 19 BNE #C563
 C54A 85 86 STA #86
 C54C 8D 3B 05 STA #053B
 C54F F0 12 BEQ #C563
 C551 E0 03 CPX ##03
 C553 F0 06 BEQ #C55B
 C555 B0 09 BCS #C560
 C557 85 85 STA #85
 C559 D0 08 BNE #C563
 C55B 8D 16 FF STA #FF16
 C55E F0 03 BEQ #C563
 C560 8D 19 FF STA #FF19
 C563 60 RTS
 C564 4C 1C 99 JMP #991C

C567; Perform [SCNCLR]

C567 A5 83 LDA #83
 C569 D0 05 BNE #C570
 C56B A9 93 LDA ##93
 C56D 4C D2 FF JMP #FFD2
 C570 29 40 AND ##40
 C572 F0 0B BEQ #C57F
 C574 20 6B C5 JSR #C56B
 C577 A2 14 LDX ##14
 C579 A0 00 LDY ##00
 C57B 18 CLC
 C57C 20 F0 FF JSR #FFF0
 C57F A9 00 LDA ##00
 C581 A0 20 LDY ##20
 C583 A2 20 LDX ##20
 C585 20 A7 C5 JSR #C5A7
 C588 20 38 C2 JSR #C238
 C58B A0 1C LDY ##1C
 C58D A2 04 LDX ##04
 C58F 20 A7 C5 JSR #C5A7
 C592 20 4E C2 JSR #C24E
 C595 A0 18 LDY ##18
 C597 A2 04 LDX ##04
 C599 20 A7 C5 JSR #C5A7
 C59C A9 00 LDA ##00
 C59E A2 03 LDX ##03
 C5A0 9D AD 02 STA #02AD, X
 C5A3 CA DEX
 C5A4 10 FA BPL #C5A0
 C5A6 60 RTS
 C5A7 84 8D STY #8D
 C5A9 A0 00 LDY ##00
 C5AB 84 8C STY #8C

C5AD 91 8C STA (#8C), Y
 C5AF 88 DEY
 C5B0 D0 FB BNE #C5AD
 C5B2 E6 8D INC #8D
 C5B4 CA DEX
 C5B5 D0 F6 BNE #C5AD
 C5B7 60 RTS

C5B8; Perform [SCALE]

C5B8 20 84 9D JSR #9D84
 C5BB E0 02 CPX ##02
 C5BD B0 A5 BCS #C564
 C5BF 8E E6 02 STX #02E6
 C5C2 60 RTS

C5C3; Perform [GRAPHIC]

C5C3 C9 9C CMP ##9C
 C5C5 D0 0A BNE #C5D1
 C5C7 20 38 C7 JSR #C738
 C5CA 20 73 04 JSR #0473
 C5CD A9 00 LDA ##00
 C5CF F0 0A BEQ #C5DB
 C5D1 20 84 9D JSR #9D84
 C5D4 E0 05 CPX ##05
 C5D6 B0 15 BCS #C5ED
 C5D8 8D 37 C6 LDA #C637, X
 C5DB C5 83 CMP #83
 C5DD F0 4B BEQ #C62A
 C5DF 85 83 STA #83
 C5E1 AA TXA
 C5E2 D0 0C BNE #C5F0
 C5E4 20 C9 C7 JSR #C7C9
 C5E7 A9 28 LDA #28
 C5E9 A2 19 LDX ##19
 C5EB D0 39 BNE #C626
 C5ED 4C 1C 99 JMP #991C
 C5F0 20 3C C6 JSR #C63C
 C5F3 AD 06 FF LDA #FF06
 C5F6 09 20 ORA ##20
 C5F8 8D 06 FF STA #FF06
 C5FB AD 07 FF LDA #FF07
 C5FE 29 EF AND #EF
 C600 24 83 BIT #83
 C602 10 02 BPL #C606
 C604 09 10 ORA #10
 C606 8D 07 FF STA #FF07
 C609 AD 12 FF LDA #FF12
 C60C 29 C3 AND #C3
 C60E 09 08 ORA ##08
 C610 8D 12 FF STA #FF12
 C613 AD 14 FF LDA #FF14
 C616 29 03 AND #03
 C618 09 18 ORA #18
 C61A 8D 14 FF STA #FF14
 C61D A9 28 LDA #28
 C61F A2 19 LDX ##19
 C621 24 83 BIT #83
 C623 10 01 BPL #C626
 C625 4A LSR
 C626 85 87 STA #87
 C628 86 88 STX #88
 C62A 20 A5 C3 JSR #C3A5
 C62D 8A TXA
 C62E 4A LSR
 C62F D0 BC BNE #C5ED
 C631 90 03 BCC #C636
 C633 4C 67 C5 JMP #C567

C636	60		RTS					C6C0	A5	30	LDA	*30	
C637	00		BRK					C6C2	69	30	ADC	##30	
C638	20	60	A0	JSR	*A060			C6C4	85	30	STA	*30	
C639	E0	A5		CPX	##A5			C6C6	A5	2E	LDA	*2E	
C63D	75	F0		ADC	*F0,X			C6C8	69	30	ADC	##30	
C63F	01	60		ORA	(*60,X)			C6CA	85	2E	STA	*2E	
C641	A5	38		LDA	*38			C6CC	A5	2C	LDA	*2C	
C643	C9	40		CMP	##40			C6CE	69	30	ADC	##30	
C645	B0	34		BCS	*C67B			C6D0	85	2C	STA	*2C	
C647	20	54	A9	JSR	*A954			C6D2	A5	42	LDA	*42	
C64A	20	68	C8	JSR	*C86B			C6D4	69	30	ADC	##30	
C64D	8A			TXA				C6D6	85	42	STA	*42	
C64E	18			CLC				C6D8	20	18	88	JSR	*8818
C64F	65	31		ADC	*31			C6DB	20	48	88	JSR	*8848
C651	98			TYA				C6DE	24	81		BIT	*81
C652	65	32		ADC	*32			C6E0	10	2D		BPL	*C70F
C654	C9	18		CMP	##18			C6E2	A2	30	LDX	##30	
C656	B0	20		BCS	*C67B			C6E4	24	75		BIT	*75
C658	C6	75		DEC	*75			C6E6	30	02		BMI	*C6EA
C65A	A9	00		LDA	##00			C6E8	A2	D0		LDX	##D0
C65C	85	22		STA	*22			C6EA	8A			TXA	
C65E	A9	18		LDA	##18			C6EB	18			CLC	
C660	85	23		STA	*23			C6EC	65	3C		ADC	*3C
C662	20	F0	C7	JSR	*C7F0			C6EE	85	3C		STA	*3C
C665	A5	22		LDA	*22			C6F0	8A			TXA	
C667	85	33		STA	*33			C6F1	18			CLC	
C669	A5	23		LDA	*23			C6F2	6D	5C	02	ADC	*025C
C66B	85	34		STA	*34			C6F5	8D	5C	02	STA	*025C
C66D	A9	00		LDA	##00			C6F8	8A			TXA	
C66F	85	37		STA	*37			C6F9	18			CLC	
C671	A9	18		LDA	##18			C6FA	6D	F6	04	ADC	*04F6
C673	85	38		STA	*38			C6FD	8D	F6	04	STA	*04F6
C675	4C	25	C8	JMP	*C825			C700	20	60	A7	JSR	*A760
C678	4C	81	86	JMP	*8681			C703	A5	3D		LDA	*3D
C67B	20	54	A9	JSR	*A954			C705	C9	B0		CMP	##B0
C67E	A4	31		LDY	*31			C707	D0	07		BNE	*C710
C680	84	5F		STY	*5F			C709	A5	3E		LDA	*3E
C682	A5	32		LDA	*32			C70B	C9	07		CMP	##07
C684	18			CLC				C70D	D0	01		BNE	*C710
C685	69	30		ADC	##30			C70F	60			RTS	
C687	B0	EF		BCS	*C67B			C710	A0	00		LDY	##00
C689	85	60		STA	*60			C712	B1	3D		LDA	(*3D),Y
C68B	C5	34		CMP	*34			C714	C9	81		CMP	##81
C68D	90	06		BCC	*C695			C716	D0	0E		BNE	*C726
C68F	D0	E7		BNE	*C67B			C718	A0	02		LDY	##02
C691	C4	33		CPY	*33			C71A	20	AD	C7	JSR	*C7AD
C693	B0	E3		BCS	*C67B			C71D	A0	10		LDY	##10
C695	C6	75		DEC	*75			C71F	20	AD	C7	JSR	*C7AD
C697	A9	00		LDA	##00			C722	A9	12		LDA	##12
C699	85	4E		STA	*4E			C724	D0	07		BNE	*C72D
C69B	A9	30		LDA	##30			C726	A0	04		LDY	##04
C69D	85	4F		STA	*4F			C728	20	AD	C7	JSR	*C7AD
C69F	20	77	C8	JSR	*C877			C72B	A9	05		LDA	##05
C6A2	A5	5F		LDA	*5F			C72D	18			CLC	
C6A4	85	22		STA	*22			C72E	65	3D		ADC	*3D
C6A6	A5	60		LDA	*60			C730	85	3D		STA	*3D
C6A8	85	23		STA	*23			C732	90	CF		BCC	*C703
C6AA	A6	31		LDX	*31			C734	E6	3E		INC	*3E
C6AC	86	24		STX	*24			C736	D0	CB		BNE	*C703
C6AE	A5	32		LDA	*32			C738	A5	75		LDA	*75
C6B0	85	25		STA	*25			C73A	D0	01		BNE	*C73D
C6B2	38			SEC				C73C	60			RTS	
C6B3	E9	10		SBC	##10			C73D	A0	00		LDY	##00
C6B5	A8			TAY				C73F	84	75		STY	*75
C6B6	20	F8	C7	JSR	*C7FB			C741	A5	38		LDA	*38
C6B9	18			CLC				C743	C0	24		BMI	*C769
C6BA	A5	32		LDA	*32			C745	20	54	A9	JSR	*A954
C6BC	69	30		ADC	##30			C748	20	68	C8	JSR	*C86B
C6BE	85	32		STA	*32			C74B	AD	33	05	LDA	*0533

C74E	85	22	STA	#22	C7D6	8D	07	FF	STA	##FF07	
C750	AD	34	05	LDA	#0534	C7D9	AD	14	FF	LDA	##FF14
C753	85	23	STA	#23	C7DC	29	07	AND	##\$07		
C755	20	F0	C7	JSR	#C7F0	C7DE	09	08	ORA	##\$08	
C758	A2	01	LDX	##\$01	C7E0	8D	14	FF	STA	##FF14	
C75A	BD	33	05	LDA	#0533,X	C7E3	AD	12	FF	LDA	##FF12
C75D	95	37	STA	#37,X	C7E6	09	04	ORA	##\$04		
C75F	B5	22	LDA	#22,X	C7E8	8D	12	FF	STA	##FF12	
C761	95	33	STA	#33,X	C7EB	A9	00	LDA	##\$00		
C763	CA		DEX		C7ED	85	83	STA	#83		
C764	10	F4	BPL	#C75A	C7EF	60		RTS			
C766	4C	25	C8	JMP	#C825	C7F0	A5	37	LDA	#37	
C769	A0	00	LDY	##\$00	C7F2	85	24	STA	#24		
C76B	84	75	STY	#75	C7F4	A5	38	LDA	#38		
C76D	84	22	STY	#22	C7F6	85	25	STA	#25		
C76F	84	24	STY	#24	C7F8	8A		TXA			
C771	A9	10	LDA	##\$10	C7F9	49	FF	EOR	##\$FF		
C773	85	23	STA	#23	C7FB	85	4E	STA	#4E		
C775	A9	40	LDA	##\$40	C7FD	98		TYA			
C777	85	25	STA	#25	C7FE	49	FF	EOR	##\$FF		
C779	20	BB	04	JSR	#04BB	C800	85	4F	STA	#4F	
C77C	91	22	STA	(\$22),Y	C802	A0	00	LDY	##\$00		
C77E	C8		INY		C804	E6	4E	INC	#4E		
C77F	D0	F8	BNE	#C779	C806	D0	04	BNE	#C80C		
C781	E6	23	INC	#23	C808	E6	4F	INC	#4F		
C783	E6	25	INC	#25	C80A	F0	18	BEQ	#C824		
C785	A5	32	LDA	#32	C80C	A5	22	LDA	#22		
C787	C5	25	CMP	#25	C80E	D0	02	BNE	#C812		
C789	B0	EE	BCS	#C779	C810	C6	23	DEC	#23		
C78B	A5	32	LDA	#32	C812	C6	22	DEC	#22		
C78D	38		SEC		C814	A5	24	LDA	#24		
C78E	E9	30	SBC	##\$30	C816	D0	02	BNE	#C81A		
C790	85	32	STA	#32	C818	C6	25	DEC	#25		
C792	A5	2C	LDA	#2C	C81A	C6	24	DEC	#24		
C794	E9	30	SBC	##\$30	C81C	20	BB	04	JSR	#04BB	
C796	85	2C	STA	#2C	C81F	91	22	STA	(\$22),Y		
C798	A5	2E	LDA	#2E	C821	4C	04	C8	JMP	#C804	
C79A	E9	30	SBC	##\$30	C824	60		RTS			
C79C	85	2E	STA	#2E	C825	A5	37	LDA	#37		
C79E	A5	30	LDA	#30	C827	A4	38	LDY	#38		
C7A0	E9	30	SBC	##\$30	C829	85	22	STA	#22		
C7A2	85	30	STA	#30	C82B	84	23	STY	#23		
C7A4	A5	42	LDA	#42	C82D	38		SEC			
C7A6	E9	30	SBC	##\$30	C82E	A5	33	LDA	#33		
C7A8	85	42	STA	#42	C830	E5	22	SBC	#22		
C7AA	4C	D8	C6	JMP	#C6D8	C832	A5	34	LDA	#34	
C7AD	B1	3D	LDA	(\$3D),Y	C834	E5	23	SBC	#23		
C7AF	24	75	BIT	#75	C836	B0	EC	BCS	#C824		
C7B1	D0	06	BNE	#C7B9	C838	38		SEC			
C7B3	38		SEC		C839	A5	22	LDA	#22		
C7B4	E9	30	SBC	##\$30	C83B	E9	02	SBC	##\$02		
C7B6	91	3D	STA	(\$3D),Y	C83D	85	22	STA	#22		
C7B8	60		RTS		C83F	B0	02	BCS	#C843		
C7B9	18		CLC		C841	C6	23	DEC	#23		
C7BA	69	30	ADC	##\$30	C843	A0	01	LDY	##\$01		
C7BC	91	3D	STA	(\$3D),Y	C845	20	B0	04	JSR	#04B0	
C7BE	60		RTS		C848	99	24	00	STA	#0024,Y	
					C84B	88		DEY			
					C84C	10	F7	BPL	#C845		
					C84E	C8		INY			
C7BF;	Confirm graphics				C84F	20	BB	04	JSR	#04BB	
C7BF	A5	75	LDA	#75	C852	85	80	STA	#80		
C7C1	F0	01	BEQ	#C7C4	C854	A5	22	LDA	#22		
C7C3	60		RTS		C856	38		SEC			
C7C4	A2	23	LDX	##\$23	C857	E5	80	SBC	#80		
C7C6	4C	83	B6	JMP	#0683	C859	85	22	STA	#22	
C7C9	AD	06	FF	LDA	##FF06	C85B	B0	02	BCS	#C85F	
C7CC	29	DF	AND	##\$DF	C85D	C6	23	DEC	#23		
C7CE	8D	06	FF	STA	##FF06	C85F	A0	02	LDY	##\$02	
C7D1	AD	07	FF	LDA	##FF07	C861	B9	21	00	LDA	#0021,Y
C7D4	29	EF	AND	##\$EF							

C864 91 24 STA (*24),Y
 C866 88 DEY
 C867 D0 F8 BNE *C861
 C869 F0 C2 BEQ *C82D
 C86B 38 SEC
 C86C A5 37 LDA *37
 C86E E5 33 SBC *33
 C870 AA TAX
 C871 A5 38 LDA *38
 C873 E5 34 SBC *34
 C875 A8 TAY
 C876 60 RTS
 C877 A5 37 LDA *37
 C879 85 22 STA *22
 C87B A5 38 LDA *38
 C87D 85 23 STA *23
 C87F 38 SEC
 C880 A5 33 LDA *33
 C882 E5 22 SBC *22
 C884 A5 34 LDA *34
 C886 E5 23 SBC *23
 C888 B0 31 BCS *C8BB
 C88A 38 SEC
 C88B A5 22 LDA *22
 C88D E9 02 SBC *#02
 C88F 85 22 STA *22
 C891 B0 02 BCS *C895
 C893 C6 23 DEC *23
 C895 18 CLC
 C896 A0 00 LDY *#00
 C898 20 B0 04 JSR *04B0
 C89B 99 24 00 STA *0024,Y
 C89E 79 4E 00 ADC *004E,Y
 C8A1 91 22 STA (*22),Y
 C8A3 C8 INY
 C8A4 C0 01 CPY *#01
 C8A6 D0 F0 BNE *C898
 C8AB 88 DEY
 C8A9 20 B8 04 JSR *04B8
 C8AC 85 80 STA *80
 C8AE A5 22 LDA *22
 C8B0 38 SEC
 C8B1 E5 80 SBC *80
 C8B3 85 22 STA *22
 C8B5 B0 C8 BCS *C87F
 C8B7 C6 23 DEC *23
 C8B9 90 C4 BCC *C87F
 C8BB 60 RTS

C8BC; Perform [DIRECTORY]

C8BC 20 1F CB JSR *CB1F
 C8BF 29 E6 AND *#E6
 C8C1 D0 78 BNE *C93E
 C8C3 A0 00 LDY *#00
 C8C5 20 3F CA JSR *CA3F
 C8C8 A9 00 LDA *#00
 C8CA AE 77 02 LDX *0277
 C8CD A0 60 LDY *#60
 C8CF 20 BA FF JSR *FFBA
 C8D2 38 SEC
 C8D3 20 C0 FF JSR *FFC0
 C8D6 90 09 BCC *C8E1
 C8D8 48 PHA
 C8D9 20 35 C9 JSR *C935
 C8DC 68 PLA
 C8DD AA TAX
 C8DE 4C 83 86 JMP *8683
 C8E1 A2 00 LDX *#00

C8E3 20 C6 FF JSR *FFC6
 C8E6 A0 03 LDY *#03
 C8E8 8C EC 02 STY *02EC
 C8EB 20 CF FF JSR *FFCF
 C8EE 8D ED 02 STA *02ED
 C8F1 20 B7 FF JSR *FFB7
 C8F4 D0 3F BNE *C935
 C8F6 20 CF FF JSR *FFCF
 C8F9 8D EE 02 STA *02EE
 C8FC 20 B7 FF JSR *FFB7
 C8FF D0 34 BNE *C935
 C901 CE EC 02 DEC *02EC
 C904 D0 E5 BNE *C8EB
 C906 AE ED 02 LDX *02ED
 C909 AD EE 02 LDA *02EE
 C90C 20 5F A4 JSR *A45F
 C90F A9 20 LDA *#20
 C911 20 D2 FF JSR *FFD2
 C914 20 CF FF JSR *FFCF
 C917 48 PHA
 C918 20 B7 FF JSR *FFB7
 C91B D0 17 BNE *C934
 C91D 68 PLA
 C91E F0 06 BEQ *C926
 C920 20 D2 FF JSR *FFD2
 C923 4C 14 C9 JMP *C914
 C926 A9 00 LDA *#00
 C928 20 D2 FF JSR *FFD2
 C92B 20 E1 FF JSR *FFE1
 C92E F0 05 BEQ *C935
 C930 A0 02 LDY *#02
 C932 D0 B4 BNE *C8EB
 C934 68 PLA
 C935 20 CC FF JSR *FFCC
 C938 A9 00 LDA *#00
 C93A 18 CLC
 C93B 4C C3 FF JMP *FFC3
 C93E 4C A1 94 JMP *94A1

C941; Perform [DSAVE]

C941 A9 66 LDA *#66
 C943 20 21 CB JSR *CB21
 C946 20 B5 CC JSR *CCB5
 C949 A0 04 LDY *#04
 C94B 20 3F CA JSR *CA3F
 C94E 4C E1 A7 JMP *A7E1

C951; Perform [DLOAD]

C951 A9 E6 LDA *#E6
 C953 20 21 CB JSR *CB21
 C956 20 B5 CC JSR *CCB5
 C959 A9 00 LDA *#00
 C95B 8D 78 02 STA *0278
 C95E 85 0A STA *0A
 C960 A0 05 LDY *#05
 C962 20 3F CA JSR *CA3F
 C965 4C FA A7 JMP *A7FA

C968; Perform [HEADER]

C968 20 1F CB JSR *CB1F
 C96B 20 AF CC JSR *CCAF
 C96E 29 11 AND *#11
 C970 C9 11 CMP *#11

C972 F0 03 BEQ #C977
 C974 4C A1 94 JMP #94A1
 C977 20 E7 FF JSR \$FFE7
 C97A 20 2B CD JSR #CD2B
 C97D D0 17 BNE #C996
 C97F A0 09 LDY ##09
 C981 20 3F CA JSR #CA3F
 C984 20 CF CC JSR #CCCF
 C987 24 81 BIT #81
 C989 30 0B BMI #C996
 C98B A0 00 LDY ##00
 C98D A9 7A LDA #7A
 C98F 20 94 04 JSR #0494
 C992 C9 32 CMP ##32
 C994 B0 01 BCS #C997
 C996 60
 C997 A2 24 RTS ##24
 C999 4C 83 86 JMP #8683

C99C; Perform [SCRATCH]

C99C 20 1F CB JSR #CB1F
 C99F 20 AF CC JSR #CCAF
 C9A2 20 2B CD JSR #CD2B
 C9A5 D0 EF BNE #C996
 C9A7 A0 0F LDY ##0F
 C9A9 20 3F CA JSR #CA3F
 C9AC 20 CF CC JSR #CCCF
 C9AF 24 81 BIT #81
 C9B1 30 E3 BMI #C996
 C9B3 A9 0D LDA #0D
 C9B5 20 D2 FF JSR #FFD2
 C9B8 A0 00 LDY ##00
 C9BA A9 7A LDA #7A
 C9BC 20 94 04 JSR #0494
 C9BF F0 06 BEQ #C9C7
 C9C1 20 D2 FF JSR #FFD2
 C9C4 C8 INY
 C9C5 D0 F3 BNE #C9BA
 C9C7 A9 0D LDA #0D
 C9C9 4C D2 FF JMP #FFD2

C9CC; Perform [COLLECT]

C9CC 20 1F CB JSR #CB1F
 C9CF 29 E7 AND ##E7
 C9D1 D0 A1 BNE #C974
 C9D3 20 E7 FF JSR \$FFE7
 C9D6 A0 14 LDY ##14
 C9D8 D0 65 BNE #CA3F

C9DA; Perform [COPY]

C9DA 20 1F CB JSR #CB1F
 C9DD 29 30 AND ##30
 C9DF C9 30 CMP ##30
 C9E1 D0 06 BNE #C9E9
 C9E3 A5 82 LDA #82
 C9E5 29 C7 AND ##C7
 C9E7 F0 07 BEQ #C9F0
 C9E9 A5 82 LDA #82
 C9EB 20 C0 CC JSR #CCCF
 C9EE A5 82 LDA #82
 C9F0 A0 17 LDY ##17
 C9F2 D0 4B BNE #CA3F

C9F4; Perform [RENAME]

C9F4 A9 E4 LDA ##E4
 C9F6 20 21 CB JSR #CB21
 C9F9 20 C6 CC JSR #CCCF
 C9FC A0 1E LDY ##1E
 C9FE D0 3F BNE #CA3F

CA00; Perform [BACKUP]

CA00 A9 C7 LDA ##C7
 CA02 20 21 CB JSR #CB21
 CA05 29 30 AND ##30
 CA07 C9 30 CMP ##30
 CA09 F0 03 BEQ #CA0E
 CA0B 4C A1 94 JMP #94A1
 CA0E 20 E7 FF JSR \$FFE7
 CA11 A0 25 LDY ##25
 CA13 4C 3F CA JMP #CA3F
 CA16 4B PHA
 CA17 AD 5D 02 LDA #025D
 CA1A A2 7C LDX ##7C
 CA1C A0 02 LDY ##02
 CA1E 20 BD FF JSR #FFBD
 CA21 AD 76 02 LDA #0276
 CA24 AE 77 02 LDX #0277
 CA27 AC 78 02 LDY #0278
 CA2A 20 BA FF JSR #FFBA
 CA2D 68 PLA
 CA2E F0 0E BEQ #CA3E
 CA30 AE 5D 02 LDX #025D
 CA33 38 SEC
 CA34 20 C0 FF JSR #FFC0
 CA37 AD 76 02 LDA #0276
 CA3A 38 SEC
 CA3B 4C C3 FF JMP #FFC3
 CA3E 60 RTS
 CA3F 20 57 CD JSR #CD57
 CA42 A2 00 LDX ##00
 CA44 BE 5D 02 STX #025D
 CA47 B9 F5 CA LDA #CAF5, Y
 CA4A F0 CA BEQ #CA16
 CA4C C9 80 CMP ##80
 CA4E F0 C6 BEQ #CA16
 CA50 AA TAX
 CA51 CA DEX
 CA52 F0 1E BEQ #CA72
 CA54 CA DEX
 CA55 F0 21 BEQ #CA78
 CA57 CA DEX
 CA58 F0 24 BEQ #CA7E
 CA5A CA DEX
 CA5B F0 28 BEQ #CA85
 CA5D CA DEX
 CA5E F0 2D BEQ #CA8D
 CA60 CA DEX
 CA61 F0 34 BEQ #CA97
 CA63 CA DEX
 CA64 F0 3F BEQ #CAA5
 CA66 CA DEX
 CA67 F0 46 BEQ #CAAF
 CA69 CA DEX
 CA6A F0 66 BEQ #CAD2
 CA6C 20 EB CA JSR #CAEB
 CA6F C8 INY
 CA70 D0 D5 BNE #CA47
 CA72 A5 82 LDA #82

CA74 29 10 AND ##10
 CA76 F0 F7 BEQ #CA6F
 CA7B AD 6F 02 LDA #026F
 CA7B 4C 81 CA JMP #CAB1
 CA7E AD 73 02 LDA #0273
 CAB1 09 30 ORA ##30
 CAB3 D0 E7 BNE #CA6C
 CAB5 A9 40 LDA #82
 CAB7 24 82 BIT #82
 CAB9 30 E1 BMI #CA6C
 CABB 10 E2 BPL #CA6F
 CABD AD 6E 02 LDA #026E
 CA90 F0 DD BEQ #CA6F
 CA92 A9 3A LDA ##3A
 CA94 20 EB CA JSR #CAEB
 CA97 98 TYA
 CA98 48 PHA
 CA99 AD 70 02 LDA #0270
 CA9C AC 71 02 LDY #0271
 CA9F AE 6E 02 LDX #026E
 CA2 4C BA CA JMP #CABA
 CA5 AD 72 02 LDA #0272
 CA8 F0 C5 BEQ #CA6F
 CAAA A9 3A LDA ##3A
 CAAC 20 EB CA JSR #CAEB
 CAF 98 TYA
 CAB0 48 PHA
 CAB1 AD 74 02 LDA #0274
 CAB4 AC 75 02 LDY #0275
 CAB7 AE 72 02 LDX #0272
 CABA 85 22 STA #22
 CAB 84 23 STY #23
 CABE 86 80 STX #80
 CAC0 A0 00 LDY ##00
 CAC2 20 B0 04 JSR #04B0
 CAC5 20 EB CA JSR #CAEB
 CACB C8 INY
 CAC9 C4 80 CPY #80
 CACB D0 F5 BNE #CAC2
 CACD 68 PLA
 CACE AB TAY
 CACF 4C 6F CA JMP #CA6F
 CAD2 AD 79 02 LDA #0279
 CAD5 F0 98 BEQ #CA6F
 CAD7 A9 2C LDA #2C
 CAD9 20 EB CA JSR #CAEB
 CADC AD 79 02 LDA #0279
 CADF 20 EB CA JSR #CAEB
 CAE2 AD 7A 02 LDA #027A
 CAE5 20 EB CA JSR #CAEB
 CAEB 4C 6F CA JMP #CA6F
 CAEB AE 5D 02 LDX #025D
 CAEE 9D 7C 02 STA #027C, X
 CAF 1 EE 5D 02 INC #025D
 CAF4 60 RTS
 CAF5 24 07 BIT #07
 CAF7 05 00 ORA #00
 CAF9 04 ???
 CAFA 02 ???
 CAFB 3A ???
 CAFC 06 00 ASL #00
 CAFE 4E 02 3A LSR #3A02
 CB01 06 09 ASL #09
 CB03 80 ???
 CB04 53 ???
 CB05 02 ???
 CB06 3A ???
 CB07 06 80 ASL #80
 CB09 56 02 LSR #02, X
 CB0B 80 ???

CB0C 43 ???
 CB0D 03 ???
 CB0E 07 ???
 CB0F 3D 02 05 AND #0502, X
 CB12 80 ???
 CB13 52 ???
 CB14 02 ???
 CB15 3A ???
 CB16 08 PHP
 CB17 3D 06 80 AND #8006, X
 CB1A 44 ???
 CB1B 03 ???
 CB1C 3D 02 80 AND #8002, X

CB1F; Parse DOS command

CB1F A9 00 LDA ##00
 CB21 48 PHA
 CB22 A9 00 LDA ##00
 CB24 85 82 STA #82
 CB26 A2 1E LDX ##1E
 CB28 9D 5E 02 STA #025E, X
 CB2B CA DEX
 CB2C D0 FA BNE #CB2B
 CB2E A2 08 LDX #08
 CB30 BE 77 02 STX #0277
 CB33 A2 6F LDX ##6F
 CB35 BE 78 02 STX #0278
 CB38 A2 00 LDX ##00
 CB3A BE 76 02 STX #0276
 CB3D 20 79 04 JSR #0479
 CB40 D0 07 BNE #CB49
 CB42 68 PLA
 CB43 20 AA CC JSR #CCAA
 CB46 A5 82 LDA #82
 CB48 60 RTS
 CB49 C9 44 CMP ##44
 CB4B F0 1D BEQ #CB6A
 CB4D C9 91 CMP ##91
 CB4F F0 4E BEQ #CB9F
 CB51 C9 55 CMP ##55
 CB53 F0 0F BEQ #CB64
 CB55 C9 49 CMP ##49
 CB57 F0 2A BEQ #CB83
 CB59 C9 22 CMP ##22
 CB5B F0 48 BEQ #CBA5
 CB5D C9 28 CMP ##28
 CB5F F0 44 BEQ #CBA5
 CB61 4C A1 94 JMP #94A1
 CB64 20 58 CC JSR #CC58
 CB67 4C CD CB JMP #CBCD
 CB6A A9 10 LDA #10
 CB6C 20 AA CC JSR #CCAA
 CB6F 20 97 CC JSR #CC97
 CB72 E0 02 CPX ##02
 CB74 B0 0A BCS #CB80
 CB76 BE 6F 02 STX #026F
 CB79 BE 73 02 STX #0273
 CB7C A9 10 LDA #10
 CB7E D0 4D BNE #CBED
 CB80 4C 49 CC JMP #CC49
 CB83 AD 7B 02 LDA #027B
 CB86 D0 D9 BNE #CB61
 CB88 20 73 04 JSR #0473
 CB8B 8D 79 02 STA #0279
 CB8E 20 73 04 JSR #0473
 CB91 8D 7A 02 STA #027A
 CB94 A9 FF LDA #FF
 CB96 8D 7B 02 STA #027B
 CB99 20 73 04 JSR #0473

CB9C	4C	D1	CB	JMP	#CBD1	CC40	F0	D3	BEQ	#CC15	
CB9F	20	51	CC	JSR	#CC51	CC42	C9	55	CMP	#*55	
CBA2	4C	CD	CB	JMP	#CBCD	CC44	F0	D5	BEQ	#CC1B	
CBA5	A9	01		LDA	#*01	CC46	A2	0B	LDX	#*0B	
CBA7	20	69	CC	JSR	#CC69	CC48	2C	A2	0E	BIT	#0EA2
CBAA	8D	6E	02	STA	#026E	CC48	2C	A2	17	BIT	#17A2
CBAD	8D	5D	02	STA	#025D	CC4E	4C	83	86	JMP	#8683
CB80	A9	5E		LDA	#*5E	CC51	20	73	04	JSR	#0473
CB82	8D	70	02	STA	#0270	CC54	C9	55	CMP	#*55	
CB85	85	24		STA	#24	CC56	D0	EE	BNE	#CC46	
CB87	A9	02		LDA	#*02	CC58	20	97	CC	JSR	#CC97
CB89	8D	71	02	STA	#0271	CC58	E0	20	CPX	#*20	
CB8C	85	25		STA	#25	CC5D	B0	EA	BCS	#CC49	
CB8E	A0	00		LDY	#*00	CC5F	E0	03	CPX	#*03	
CB80	20	B0	04	JSR	#04B0	CC61	90	E6	BCC	#CC49	
CB83	91	24		STA	(\$24),Y	CC63	8E	77	02	STX	#0277
CB85	C8			INY		CC66	A9	0B	LDA	#*0B	
CB86	CC	5D	02	CPY	#025D	CC68	60		RTS		
CB89	90	F5		BCC	#CB80	CC69	20	AA	CC	JSR	#CCAA
CB8B	A9	01		LDA	#*01	CC6C	20	48	9C	JSR	#9C48
CB8D	05	82		ORA	#82	CC6F	AA		TAX		
CB8F	85	82		STA	#82	CC70	F0	D7	BEQ	#CC49	
CB81	20	79	04	JSR	#0479	CC72	A0	00	LDY	#*00	
CB84	D0	03		BNE	#CB8D	CC74	20	B0	04	JSR	#04B0
CB86	4C	42	CB	JMP	#CB42	CC77	C9	40	CMP	#*40	
CB89	C9	2C		CMP	#*2C	CC79	D0	12	BNE	#CC8D	
CB8B	D0	06		BNE	#CBE3	CC7B	A9	80	LDA	#*80	
CB8D	20	73	04	JSR	#0473	CC7D	20	AA	CC	JSR	#CCAA
CB8E	4C	49	CB	JMP	#CB49	CC80	A5	82	LDA	#82	
CB83	C9	91		CMP	#*91	CC82	09	80	ORA	#*80	
CB85	F0	B8		BEQ	#CB9F	CC84	85	82	STA	#82	
CB87	C9	A4		CMP	#*A4	CC86	CA		DEX		
CB89	D0	5B		BNE	#CC46	CC87	E6	22	INC	#22	
CB8E	20	73	04	JSR	#0473	CC89	D0	02	BNE	#CC8D	
CB8E	C9	44		CMP	#*44	CC8B	E6	23	INC	#23	
CBF0	F0	10		BEQ	#CC02	CC8D	8A		TXA		
CBF2	C9	91		CMP	#*91	CC8E	C9	11	CMP	#*11	
CBF4	F0	1F		BEQ	#CC15	CC90	B0	BA	BCS	#CC4C	
CBF6	C9	55		CMP	#*55	CC92	A6	22	LDX	#22	
CBF8	F0	21		BEQ	#CC1B	CC94	A4	23	LDY	#23	
CBFA	C9	22		CMP	#*22	CC96	60		RTS		
CBFC	F0	23		BEQ	#CC21	CC97	20	73	04	JSR	#0473
CBFE	C9	28		CMP	#*28	CC9A	F0	AA	BEQ	#CC46	
CC00	F0	1F		BEQ	#CC21	CC9C	90	09	BCC	#CCA7	
CC02	A9	20		LDA	#*20	CC9E	20	8E	94	JSR	#948E
CC04	20	AA	CC	JSR	#CCAA	CCA1	20	84	9D	JSR	#9D84
CC07	20	97	CC	JSR	#CC97	CCA4	4C	8B	94	JMP	#948B
CC0A	E0	02		CPX	#*02	CCA7	4C	84	9D	JMP	#9D84
CC0C	B0	3B		BCS	#CC49	CCAA	25	82	AND	#82	
CC0E	8E	73	02	STX	#0273	CCAC	D0	9B	BNE	#CC46	
CC11	A9	20		LDA	#*20	CCAE	60		RTS		
CC13	D0	1C		BNE	#CC31	CCAF	29	E6	AND	#*E6	
CC15	20	51	CC	JSR	#CC51	CCB1	F0	02	BEQ	#CCB5	
CC18	4C	31	CC	JMP	#CC31	CCB3	D0	91	BNE	#CC46	
CC18	20	58	CC	JSR	#CC58	CCB5	A5	82	LDA	#82	
CC1E	4C	31	CC	JMP	#CC31	CCB7	29	01	AND	#*01	
CC21	A9	02		LDA	#*02	CCB9	C9	01	CMP	#*01	
CC23	20	69	CC	JSR	#CC69	CCBB	D0	F6	BNE	#CCB3	
CC26	8D	72	02	STA	#0272	CCBD	A5	82	LDA	#82	
CC29	8E	74	02	STX	#0274	CCBF	60		RTS		
CC2C	8C	75	02	STY	#0275	CCC0	29	C4	AND	#*C4	
CC2F	A9	02		LDA	#*02	CCC2	D0	EF	BNE	#CCB3	
CC31	05	82		ORA	#82	CCC4	A5	82	LDA	#82	
CC33	85	82		STA	#82	CCC6	29	03	AND	#*03	
CC35	20	79	04	JSR	#0479	CCC8	C9	03	CMP	#*03	
CC38	F0	9C		BEQ	#CBD6	CCCA	D0	E7	BNE	#CCB3	
CC3A	C9	2C		CMP	#*2C	CCCE	A5	82	LDA	#82	
CC3C	F0	AD		BEQ	#CBEB	CCCE	60		RTS		
CC3E	C9	91		CMP	#*91	CCCF	A5	79	LDA	#79	

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CCD1 D0 11 BNE $CCE4
CCD3 A9 28 LDA ##28
CCD5 85 79 STA $79
CCD7 20 06 A9 JSR $A906
CCDA 86 7A STX $7A
CCDC 84 7B STY $7B
CCDE A0 28 LDY ##28
CCE0 A9 0D LDA ##0D
CCE2 91 7A STA ($7A),Y
CCE4 AE 77 02 LDA $0277
CCE7 D0 05 BNE $CCEE
CCE9 A2 08 LDX ##08
CCEB 8E 77 02 STX $0277
CCEE A9 0D LDA ##0D
CCF0 A0 6F LDY ##6F
CCF2 20 BA FF JSR $FFBA
CCF5 A9 00 LDA ##00
CCF7 20 BD FF JSR $FFBD
CCFA 20 C0 FF JSR $FFC0
CCFD A2 00 LDX ##00
CCFF 20 C6 FF JSR $FFC6
CD02 B0 1B BCS $CD1F
CD04 A0 FF LDY ##FF
CD06 C8 INY
CD07 20 CF FF JSR $FFCF
CD0A C9 0D CMP ##0D
CD0C F0 04 BEQ $CD12
CD0E 91 7A STA ($7A),Y
CD10 D0 F4 BNE $CD06
CD12 A9 00 LDA ##00
CD14 91 7A STA ($7A),Y
CD16 20 CC FF JSR $FFCC
CD19 A9 00 LDA ##00
CD1B 38 SEC
CD1C 4C C3 FF JMP $FFC3
CD1F 48 PHA
CD20 20 12 CD JSR $CD12
CD23 20 57 CD JSR $CD57
CD26 68 PLA
CD27 AA TAX
CD28 4C 83 86 JMP $8683
CD2B 24 81 BIT $81
CD2D 30 25 BMI $CD54
CD2F 20 4F FF JSR $FF4F
CD32 41 52 EOR ($52,X) :ARE YOU
CD34 45 20 EOR $20 :SURE?. L
CD36 59 4F 55 EOR $554F,Y
CD39 20 53 55 JSR $5553
CD3C 52 ???
CD3D 45 3F EOR $3F
CD3F 00 BRK
CD40 20 CC FF JSR $FFCC
CD43 20 CF FF JSR $FFCF
CD46 48 PHA
CD47 C9 0D CMP ##0D
CD49 F0 05 BEQ $CD50
CD4B 20 CF FF JSR $FFCF
CD4E D0 F7 BNE $CD47
CD50 68 PLA
CD51 C9 59 CMP ##59
CD53 60 RTS
CD54 A9 00 LDA ##00
CD56 60 RTS
CD57 98 TYA
CD58 48 PHA
CD59 A5 79 LDA $79
CD5B F0 0A BEQ $CD67
CD5D A0 28 LDY ##28
CD5F 98 TYA

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CD60 91 7A STA ($7A),Y
CD62 C8 INY
CD63 A9 FF LDA ##FF
CD65 91 7A STA ($7A),Y
CD67 A9 00 LDA ##00
CD69 85 79 STA $79
CD6B 68 PLA
CD6C A8 TAY
CD6D 60 RTS
CD6E 2C 30 20 BIT $2030
CD71 59 45 4B EOR $4B45,Y
CD74 AA TAX
CD75 98 TYA
CD76 48 PHA
CD77 A9 00 LDA ##00
CD79 20 5F A4 JSR $A45F
CD7C 68 PLA
CD7D A8 TAY
CD7E 60 RTS
CD7F 85 3A STA $3A
CD81 88 DEY
CD82 AA TAX
CD83 E8 INX
CD84 D0 02 BNE $CD88
CD86 86 81 STX $81
CD88 60 RTS
CD89 D8 CLD
CD8A 1B ???
CD8B 14 ???
CD8C 0C ???
CD8D 07 ???
CD8E 7B ???
CD8F 01 D7 ORA ($D7,X)
CD91 D8 CLD
CD92 11 07 ORA ($07),Y
CD94 10 1D BPL $CDB3
CD96 7B ???
CD97 17 ???
CD98 D8 CLD
CD99 07 ???
CD9A 10 05 BPL $CDA1
CD9C 1A ???
CD9D 1A ???
CD9E 16 7B ASL $7B,X
CDA0 1F ???
CDA1 D8 CLD
CDA2 1B ???
CDA3 10 02 BPL $CDA7
CDA5 1A ???
CDA6 17 ???
CDA7 7B ???
CDA8 13 ???
CDA9 47 ???
CDA A D8 CLD

```

CDAB; List of names!

```

CDAB A0 21 LDY ##21
CDAD B9 89 CD LDA $CDB9,Y
CDB0 49 55 EOR ##55
CDB2 20 D2 FF JSR $FFD2
CDB5 88 DEY
CDB6 10 F5 BPL $CDAD
CDB8 60 RTS
CDB9 00 BRK
CDBA FF ???
CDBB FF ???
CDBC FF ???

```

CDBD FF ???
 CDBE FF ???
 CDBF FF ???
 CDC0 FF ???
 CDC1 FF ???
 CDC2 FF ???
 CDC3 FF ???
 CDC4 FF ???
 CDC5 FF ???
 CDC6 FF ???
 CDC7 FF ???
 CDC8 FF ???
 CDC9 FF ???
 CDCA FF ???
 CDCB FF ???
 CDCC FF ???
 CDCE FF ???
 CDCF FF ???
 CDD0 FF ???
 CDD1 FF ???
 CDD2 FF ???
 CDD3 FF ???
 CDD4 FF ???
 CDD5 FF ???
 CDD6 FF ???
 CDD7 FF ???
 CDD8 FF ???
 CDD9 FF ???
 CDDA FF ???
 CDDB FF ???
 CDDC FF ???
 CDDD FF ???
 CDDF FF ???
 CDE0 FF ???
 CDE1 FF ???
 CDE2 FF ???
 CDE3 FF ???
 CDE4 FF ???
 CDE5 FF ???
 CDE6 FF ???
 CDE7 FF ???
 CDE8 FF ???
 CDE9 FF ???
 CDEA FF ???
 CDEB FF ???
 CDEC FF ???
 CDED FF ???
 CDEE FF ???
 CDEF FF ???
 CDF0 FF ???
 CDF1 FF ???
 CDF2 FF ???
 CDF3 FF ???
 CDF4 FF ???
 CDF5 FF ???
 CDF6 FF ???
 CDF7 FF ???
 CDF8 FF ???
 CDF9 FF ???
 CDFB FF ???
 CDFC FF ???
 CDFD FF ???
 CDFE FF ???
 CDFE FF ???
 CDFE FF ???

CE00; Interrupt entry

CE00 BA TSX
 CE01 BD 04 01 LDA #0104,X
 CE04 29 10 AND #*10
 CE06 D0 03 BNE #CE0B
 CE08 6C 14 03 JMP (#0314)
 CE0B 6C 16 03 JMP (#0316)

CE0E; IRQ sequence

CE0E AD 09 FF LDA \$FF09
 CE11 29 02 AND #*02
 CE13 F0 03 BEQ #CE18
 CE15 20 60 CE JSR #CE60
 CE18 2C D8 07 BIT #07D8
 CE1B 10 0E BPL #CE2B
 CE1D AD 01 FD LDA #FD01
 CE20 8D D4 07 STA #07D4
 CE23 10 06 BPL #CE2B
 CE25 20 95 EA JSR #EA95
 CE28 20 5B EA JSR #EA5B
 CE2B 20 E4 E3 JSR #E3E4
 CE2E AD 09 FF LDA \$FF09
 CE31 29 02 AND #*02
 CE33 F0 28 BEQ #CE5D
 CE35 8D 09 FF STA \$FF09
 CE38 2C 0B FF BIT \$FF0B
 CE3B A9 CC LDA #*CC
 CE3D 50 1B BVC #CE5A
 CE3F 6C 12 03 JMP (#0312)
 CE42 20 BF CF JSR #CFBF
 CE45 20 CD CE JSR #CECD
 CE48 A5 FB LDA #FB
 CE4A 48 PHA
 CE4B A9 00 LDA #*00
 CE4D 85 FB STA #FB
 CE4F 08 PHP
 CE50 58 CLI
 CE51 20 11 DB JSR #DB11
 CE54 28 PLP
 CE55 68 PLA
 CE56 85 FB STA #FB
 CE58 A9 A1 LDA #*A1
 CE5A 8D 0B FF STA \$FF0B
 CE5D 4C BE FC JMP #FCBE

CE60; Do split screen

CE60 AD 1C FF LDA \$FF1C
 CE63 29 01 AND #*01
 CE65 D0 39 BNE #CEA0
 CE67 AD 1D FF LDA \$FF1D
 CE6A C9 A3 CMP #*A3
 CE6C B0 2E BCS #CE9C
 CE6E 24 83 BIT #83
 CE70 50 52 BVC #CEC4
 CE72 A9 08 LDA #*08
 CE74 8D 14 FF STA \$FF14
 CE77 AD 06 FF LDA \$FF06
 CE7A 29 DF AND #*DF
 CE7C A8 TAY
 CE7D AD 07 FF LDA \$FF07
 CE80 29 EF AND #*EF
 CE82 AA TAX
 CE83 AD 12 FF LDA \$FF12
 CE86 0D FA 07 ORA #07FA
 CE89 48 PHA
 CE8A AD 1D FF LDA \$FF1D

```

CE0D C9 A3 CMP ##A3
CE0F 90 F9 BCC $CEBA
CE91 68 PLA
CE92 8D 12 FF STA $FF12
CE95 8C 06 FF STY $FF06
CE98 8E 07 FF STX $FF07
CE9B 60 RTS
CE9C C9 CC CMP ##CC
CE9E 90 24 BCC $CEC4
CEA0 A6 83 LDX $83
CEA2 F0 20 BEQ $CEC4
CEA4 10 08 BPL $CEAE
CEA6 AD 07 FF LDA $FF07
CEA9 09 10 ORA ##10
CEAB 8D 07 FF STA $FF07
CEAE AD 06 FF LDA $FF06
CEB1 09 20 ORA ##20
CEB3 8D 06 FF STA $FF06
CEB6 AD 12 FF LDA $FF12
CEB9 29 FB AND ##FB
CEBB 8D 12 FF STA $FF12
CEBE AD FB 07 LDA $07FB
CEC1 8D 14 FF STA $FF14
CEC4 60 RTS
CEC5 EA NOP
CEC6 EA NOP
CEC7 EA NOP
CEC8 EA NOP
CEC9 EA NOP
CECA EA NOP
CECB EA NOP
CECC EA NOP
CECD A2 01 LDX ##01
CECF 8D FC 04 LDA $04FC,X
CED2 1D FE 04 ORA $04FE,X
CED5 F0 13 BEQ $CEEA
CED7 FE FC 04 INC $04FC,X
CEDA D0 0E BNE $CEEA
CEDC FE FE 04 INC $04FE,X
CEDF D0 09 BNE $CEEA
CEE1 8D EE CE LDA $CEEE,X
CEE4 2D 11 FF AND $FF11
CEE7 8D 11 FF STA $FF11
CEEA CA DEX
CEEB 10 E2 BPL $CECF
CEED 60 RTS
EEEE EF ???
CEEF 9F ???

```

CEFO; Kernal UDTIM

```

CEF0 E6 A5 INC $A5
CEF2 D0 06 BNE $CEFA
CEF4 E6 A4 INC $A4
CEF6 D0 02 BNE $CEFA
CEF8 E6 A3 INC $A3
CEFA 38 SEC
CEFB A5 A5 LDA $A5
CEFD E9 01 SBC ##01
CEFF A5 A4 LDA $A4
CF01 E9 1A SBC $1A
CF03 A5 A3 LDA $A3
CF05 E9 4F SBC $4F
CF07 90 08 BCC $CF11
CF09 A2 00 LDX ##00
CF0B 86 A3 STX $A3
CF0D 86 A4 STX $A4
CF0F 86 A5 STX $A5

```

CF11; Log PIA key reading

```

CF11 A9 7F LDA ##7F
CF13 20 70 DB JSR $DB70
CF16 85 EE STA $EE
CF18 A9 7F LDA $7F
CF1A 20 70 DB JSR $DB70
CF1D C5 EE CMP $EE
CF1F D0 F0 BNE $CF11
CF21 09 7F ORA ##7F
CF23 85 91 STA $91
CF25 60 RTS

```

CF26; Get time

```

CF26 78 SEI
CF27 A5 A5 LDA $A5
CF29 A6 A4 LDX $A4
CF2B A4 A3 LDY $A3

```

CF2D; Set time

```

CF2D 78 SEI
CF2E 85 A5 STA $A5
CF30 86 A4 STX $A4
CF32 84 A3 STY $A3
CF34 58 CLI
CF35 60 RTS
CF36 0D 4D 4F ORA $4F4D : MONITOR.
CF39 4E 49 54 LSR $5449 : .BREAK.
CF3C 4F ??? : PC SR
CF3D 52 ??? : AC XR Y
CF3E 8D 0D 42 STA $420D : R SP.: A
CF41 52 ??? : ERROR=
CF42 45 41 EOR $41
CF44 CB ???
CF45 0D 20 20 ORA $2020
CF48 20 50 43 JSR $4350
CF4B 20 20 53 JSR $5320
CF4E 52 ???
CF4F 20 41 43 JSR $4341
CF52 20 58 52 JSR $5258
CF55 20 59 52 JSR $5259
CF58 20 53 50 JSR $5053
CF5B 0D 3B A0 ORA $A03B
CF5E 41 A0 EOR ($A0,X)
CF60 20 45 52 JSR $5245
CF63 52 ???
CF64 4F ???
CF65 D2 ???

```

CF66; Print monitor messages

```

CF66 8D 36 CF LDA $CF36,X
CF69 08 PHP
CF6A 29 7F AND ##7F
CF6C 20 D2 FF JSR $FFD2
CF6F E8 INX
CF70 28 PLP
CF71 10 F3 BPL $CF66
CF73 60 RTS
CF74 A9 0D LDA ##0D
CF76 A6 98 LDX $98
CF78 E0 03 CPX ##03

```

CF7A F0 06 BEQ \$CF82
 CF7C A6 99 LDX \$99
 CF7E E0 03 CPX ##03
 CF80 F0 03 BEQ \$CF85
 CF82 20 49 DC JSR \$DC49
 CF85 A9 0D LDA ##0D
 CF87 4C R0 D9 JMP \$D9B0

Handwritten:
 handle
 1234

CFFE FF ???
 D800 06 05 ABL #05
 D802 00 BRK
 D803 2B PLP
 D804 50 78 BVC \$D87E
 D806 A0 C8 LDY ##C8
 D808 F0 18 BEQ \$D822
 D80A 40 RTI

CF8A; Get colour code

CF8A 8D 13 01 LDA \$0113,X
 CF8D 2C F9 07 BIT \$07F9
 CF90 10 03 BPL \$CF95
 CF92 8D 43 E1 LDA \$E143,X
 CF95 60 RTS

D80B; Screen in address low

D80B 68 PLA
 D80C 90 B8 BCC \$D7C6
 D80E E0 08 CPX ##08
 D810 30 58 BMI \$D86A
 D812 00 ???
 D813 AB TAY
 D814 D0 F8 BNE \$D80E
 D816 20 48 70 JSR \$70A8
 D819 98 TYA
 D81A C0 0C CPY ##0C
 D81C 00 ???
 D81D 0C ???
 D81E 0C ???
 D81F 0C ???
 D820 0C ???
 D821 0C ???
 D822 0D 0D 0D ORA \$0D0D
 D825 0D 0D 0D ORA \$0D0D
 D828 0E 0E 0E ASL \$0E0E
 D82B 0E 0E 0E ASL \$0E0E
 D82E 0E 0F 0F ASL \$0F0F
 D831 0F ???
 D832 0F ???
 D833 0F ???

CF96; Fetch memory

CF96 2C F8 07 BIT \$07F8
 CF99 30 03 BMI \$CF9E
 CF9B B1 A1 LDA (\$A1),Y
 CF9D 60 RTS
 CF9E A9 A1 LDA ##A1
 CFA0 8D DF 07 STA \$07DF
 CFA3 4C D9 07 JMP \$07D9
 CFA6 A9 09 LDA ##09
 CFA8 8D 20 FD STA \$FD20
 CFAB 09 80 ORA ##80
 CFAD 8D 20 FD STA \$FD20
 CFB0 4C 1E FC JMP \$FC1E
 CFB3 08 PHP
 CFB4 78 SEI
 CFB5 8D 3F FF STA \$FF3F
 CFB6 B1 00 LDA (\$00),Y
 CFB8 8D 3E FF STA \$FF3E
 CFBD 28 PLP
 CFBE 60 RTS

D834; Get screen size

D834 A2 28 LDX ##28
 D836 A0 19 LDY ##19
 D838 60 RTS

CFBF; Handle tape motor

CFBF AD 10 FD LDA \$FD10
 CFC2 29 04 AND ##04
 CFC4 D0 18 BNE \$CFE1
 CFC6 2C FC 07 BIT \$07FC
 CFC9 30 06 BMI \$CFD1
 CFCB A5 01 LDA \$01
 CFCD 29 F7 AND ##F7
 CFCF 85 01 STA \$01
 CFD1 CE FD 07 DEC \$07FD
 CFD4 10 08 BPL \$CFDE
 CFD6 A9 04 LDA ##04
 CFD8 8D FD 07 STA \$07FD
 CFDB 20 F0 CE JSR \$CEF0
 CFDE 4C F0 CE JMP \$CEF0
 CFE1 8D FC 07 STA \$07FC
 CFE4 20 B0 E3 JSR \$E3B0
 CFE7 4C D1 CF JMP \$CFD1
 CFEA EB INX
 CFEB 8E C4 FE STX \$FEC4
 CFEE 8E C0 FE STX \$FEC0
 CFF1 A9 80 LDA ##80
 CFF3 8D 11 FF STA \$FF11
 CFF6 60 RTS
 CFF7 FF ???
 CFF8 FF ???
 CFF9 FF ???
 CFFA FF ???
 CFFB FF ???
 CFFC FF ???
 CFFD FF ???

D839; Put/get row/column

D839 B0 0E BCS \$D849
 D83B 86 CD STX \$CD
 D83D 86 C4 STX \$C4
 D83F 84 CA STY \$CA
 D841 84 C5 STY \$C5
 D843 20 70 DE JSR \$DE70
 D846 20 AB DB JSR \$D8AB

D849; Get I/O address

D849 A6 CD LDX \$CD
 D84B A4 CA LDY \$CA
 D84D 60 RTS

D84E; Initialize I/O

D84E A9 0C LDA ##0C
 D850 8D 3E 05 STA \$053E
 D853 A9 03 LDA ##03
 D855 85 99 STA \$99
 D857 A9 00 LDA ##00
 D859 85 98 STA \$98
 D85B 8D 47 05 STA \$0547
 D85E 85 83 STA \$83
 D860 85 EF STA \$EF
 D862 85 F0 STA \$F0

D864	A9 7A	LDA	##7A	D8E2	D0 F5	BNE	##D8D9				
D866	8D 45 05	STA	##0545	D8E4	C6 EF	DEC	##EF				
D869	A9 DB	LDA	##DB	D8E6	98	TYA					
D86B	8D 46 05	STA	##0546	D8E7	58	CLI					
D86E	A9 0A	LDA	##0A	D8E8	18	CLC					
D870	8D 3F 05	STA	##053F	D8E9	60	RTS					
D873	8D 4A 05	STA	##054A	D8EA	20 49 DC	JSR	##DC49				
D876	8D 42 05	STA	##0542	D8ED	20 B4 D8	JSR	##D8B4				
D879	A9 80	LDA	##80	D8F0	A4 CA	LDY	##CA				
D87B	8D 40 05	STA	##0540	D8F2	B1 EA	LDA	##(EA),Y				
D87E	A9 10	LDA	##10	D8F4	48	PHA					
D880	8D 3B 05	STA	##053B	D8F5	AD 3B 05	LDA	##053B				
D883	A9 04	LDA	##04	D8F8	91 EA	STA	##(EA),Y				
D885	8D 41 05	STA	##0541	D8FA	98	TYA					
				D8FB	18	CLC					
D888;	ESC-n normal screen										
				D8FC	65 C8	ADC	##C8				
D88B	20 70 DE	JSR	##DE70	D8FE	8D 0D FF	STA	##FF0D				
D88D	20 9A D8	JSR	##D89A	D901	A5 C9	LDA	##C9				
D88E	20 AA D8	JSR	##D8AA	D903	69 00	ADC	##00				
				D905	E9 08	SBC	##08				
D891;	Clear screen							D907	8D 0C FF	STA	##FF0C
				D90A	A5 EF	LDA	##EF				
D891	20 F7 DA	JSR	##DAF7	D90C	0D 5D 05	ORA	##055D				
D894	EC E5 07	CPX	##07E5	D90F	F0 F9	BEQ	##D90A				
D897	E8	INX		D911	68	PLA					
D898	90 F4	BCC	##D88E	D912	91 EA	STA	##(EA),Y				
				D914	A9 FF	LDA	##FF				
D89A;	Home cursor							D916	8D 0C FF	STA	##FF0C
				D919	8D 0D FF	STA	##FF0D				
D89A	AE E6 07	LDX	##07E6	D91C	20 C1 D8	JSR	##D8C1				
D89D	86 CD	STX	##CD	D91F	C9 83	CMP	##83				
D89F	86 C4	STX	##C4	D921	D0 10	BNE	##D933				
				D923	A2 09	LDX	##09				
D8A1;	Set screen pointers							D925	78	SEI	
				D926	86 EF	STX	##EF				
D8A1	AC E7 07	LDY	##07E7	D928	BD 29 E1	LDA	##E129,X				
D8A4	84 CA	STY	##CA	D92B	9D 26 05	STA	##0526,X				
D8A6	84 C5	STY	##C5	D92E	CA	DEX					
D8AB	A6 CD	LDX	##CD	D92F	D0 F7	BNE	##D928				
D8AA	BD 02 D8	LDA	##D802,X	D931	F0 BA	BEQ	##D8ED				
D8AD	85 C8	STA	##C8	D933	C9 0D	CMP	##0D				
D8AF	BD 1B D8	LDA	##D81B,X	D935	D0 B3	BNE	##D8EA				
D8B2	85 C9	STA	##C9	D937	85 C7	STA	##C7				
D8B4	A5 C8	LDA	##C8	D939	20 95 DF	JSR	##DF95				
D8B6	85 EA	STA	##EA	D93C	8E 49 05	STX	##0549				
D8B8	A5 C9	LDA	##C9	D93F	20 87 DF	JSR	##DF87				
D8BA	29 03	AND	##03	D942	A9 00	LDA	##00				
D8BC	09 08	ORA	##08	D944	85 CB	STA	##CB				
D8BE	85 EB	STA	##EB	D946	AC E7 07	LDY	##07E7				
D8C0	60	RTS		D949	A5 C4	LDA	##C4				
D8C1	AC 5D 05	LDY	##055D	D94B	30 13	BMI	##D960				
D8C4	F0 0E	BEQ	##D8D4	D94D	C5 CD	CMP	##CD				
D8C6	AC 5E 05	LDY	##055E	D94F	90 0F	BCC	##D960				
D8C9	B9 67 05	LDA	##0567,Y	D951	A4 C5	LDY	##C5				
D8CC	CE 5D 05	DEC	##055D	D953	CD 49 05	CMP	##0549				
D8CF	EE 5E 05	INC	##055E	D956	D0 04	BNE	##D95C				
D8D2	58	CLI		D958	C4 C3	CPY	##C3				
D8D3	60	RTS		D95A	F0 02	BEQ	##D95E				
				D95C	B0 11	BCS	##D96F				
D8D4;	Input from keyboard							D95E	85 CD	STA	##CD
				D960	84 CA	STY	##CA				
D8D4	AC 27 05	LDY	##0527	D962	4C 77 D9	JMP	##D977				
D8D7	A2 00	LDX	##00								
D8D9	BD 28 05	LDA	##0528,X	D965;	Input from screen						
D8DC	9D 27 05	STA	##0527,X	D965	98	TYA					
D8DF	E8	INX		D966	48	PHA					
D8E0	E4 EF	CPX	##EF	D967	8A	TXA					

D968 48 PHA
 D969 A5 C7 LDA #C7
 D96B F0 C4 BEQ #D931
 D96D 10 08 BPL #D977
 D96F A9 00 LDA ##00
 D971 85 C7 STA #C7
 D973 4C 74 CF JMP #CF74
 D976 EA NOP
 D977 20 A8 DB JSR #DBA8
 D97A 20 2F DF JSR #DF2F
 D97D 85 CE STA #CE
 D97F 29 3F AND ##3F
 D981 06 CE ASL #CE
 D983 24 CE BIT #CE
 D985 10 02 BPL #D989
 D987 09 80 ORA ##80
 D989 90 04 BCC #D98F
 D98B A6 CB LDX #CB
 D98D D0 04 BNE #D993
 D98F 70 02 BVS #D993
 D991 09 40 ORA ##40
 D993 20 BA D9 JSR #D9BA
 D996 A4 CD LDY #CD
 D998 CC 49 05 CPY #0549
 D99B 90 0A BCC #D9A7
 D99D A4 CA LDY #CA
 D99F C4 C3 CPY #C3
 D9A1 90 04 BCC #D9A7
 D9A3 66 C7 ROR #C7
 D9A5 30 03 BMI #D9AA
 D9A7 20 BF DF JSR #DFBF
 D9AA C9 DE CMP ##DE
 D9AC D0 02 BNE #D9B0
 D9AE A9 FF LDA ##FF
 D9B0 85 CE STA #CE
 D9B2 68 PLA
 D9B3 AA TAX
 D9B4 68 PLA
 D9B5 A8 TAY
 D9B6 A5 CE LDA #CE
 D9B8 18 CLC
 D9B9 60 RTS

D9BA; Quote test

D9BA C9 22 CMP ##22
 D9BC D0 08 BNE #D9C6
 D9BE A5 CB LDA #CB
 D9C0 49 01 EOR ##01
 D9C2 85 CB STA #CB
 D9C4 A9 22 LDA ##22
 D9C6 60 RTS

D9C7; Setup screen print

D9C7 A5 CE LDA #CE
 D9C9 8D EB 07 STA #07EB
 D9CC 68 PLA
 D9CD A8 TAY
 D9CE A5 CF LDA #CF
 D9D0 F0 02 BEQ #D9D4
 D9D2 46 CB LSR #CB
 D9D4 68 PLA
 D9D5 AA TAX
 D9D6 68 PLA
 D9D7 18 CLC
 D9D8 60 RTS

D9D9 09 40 ORA ##40
 D9DB A6 C2 LDX #C2
 D9DD F0 02 BEQ #D9E1
 D9DF 09 80 ORA ##80
 D9E1 A6 CF LDX #CF
 D9E3 F0 02 BEQ #D9E7
 D9E5 C6 CF DEC #CF
 D9E7 2C EA 07 BIT #07EA
 D9EA 10 09 BPL #D9F5
 D9EC 48 PHA
 D9ED 20 CE DD JSR #DDCE
 D9F0 A2 00 LDX ##00
 D9F2 86 CF STX #CF
 D9F4 68 PLA
 D9F5 20 01 E0 JSR #E001
 D9FB CC E8 07 CPY #07EB
 D9FB 90 0C BCC #DA09
 D9FD A6 CD LDX #CD
 D9FF EC E5 07 CPX #07E5
 DA02 90 05 BCC #DA09
 DA04 2C E9 07 BIT #07E9
 DA07 30 17 BMI #DA20
 DA09 20 A8 DB JSR #DBA8
 DA0C 20 BF DF JSR #DFBF
 DA0F 90 0F BCC #DA20
 DA11 20 39 DF JSR #DF39
 DA14 B0 09 BCS #DA1F
 DA16 38 SEC
 DA17 2C E9 07 BIT #07E9
 DA1A 70 04 BVS #DA20
 DA1C 20 5E DA JSR #DA5E
 DA1F 18 CLC
 DA20 60 RTS

DA21; Check line increment

DA21 A6 CD LDX #CD
 DA23 EC E5 07 CPX #07E5
 DA26 90 10 BCC #DA38
 DA28 2C E9 07 BIT #07E9
 DA2B 10 07 BPL #DA34
 DA2D AD E6 07 LDA #07E6
 DA30 85 CD STA #CD
 DA32 B0 06 BCS #DA3A
 DA34 20 89 DA JSR #DAB9
 DA37 18 CLC
 DA38 E6 CD INC #CD
 DA3A 4C A8 DB JMP #DBA8
 DA3D BD 02 DB LDA #DB02,X
 DA40 85 A9 STA #A9
 DA42 85 C0 STA #C0
 DA44 BD 1B DB LDA #DB1B,X
 DA47 85 C1 STA #C1
 DA49 29 03 AND ##03
 DA4B 09 08 ORA ##08
 DA4D 85 AA STA #AA
 DA4F B1 C0 LDA (#C0),Y
 DA51 91 C8 STA (#C8),Y
 DA53 B1 A9 LDA (#A9),Y
 DA55 91 EA STA (#EA),Y
 DA57 CC E8 07 CPY #07EB
 DA5A C8 INY
 DA5B 90 F2 BCC #DA4F
 DA5D 60 RTS
 DA5E A6 C4 LDX #C4
 DA60 30 06 BMI #DA68
 DA62 E4 CD CPX #CD

DA64 90 02 BCC #DA68
 DA66 E6 C4 INC #C4
 DA68 AE E5 07 LDX #07E5
 DA6B 20 AA D8 JSR #DBAA
 DA6E AC E7 07 LDY #07E7
 DA71 E4 CD CPX #CD
 DA73 F0 0E BEQ #DAB3
 DA75 CA DEX
 DA76 20 3B DF JSR #DF3B
 DA79 EB INX
 DA7A 20 4B DF JSR #DF4B
 DA7D CA DEX
 DA7E 20 3D DA JSR #DA3D
 DAB1 B0 E8 BCS #DA6B
 DAB3 20 F7 DA JSR #DAF7
 DAB6 4C 59 DF JMP #DF59
 DAB9 AE E6 07 LDX #07E6
 DAB8 EB INX
 DABD 20 3B DF JSR #DF3B
 DA90 90 0C BCC #DA9E
 DA92 EC E5 07 CPX #07E5
 DA95 90 F5 BCC #DABC
 DA97 AE E6 07 LDX #07E6
 DA9A EB INX
 DA9B 20 4A DF JSR #DF4A
 DA9E C6 CD DEC #CD
 DAA0 24 C4 BIT #C4
 DAA2 30 02 BMI #DAA6
 DAA4 C6 C4 DEC #C4
 DAA6 AE E6 07 LDX #07E6
 DAA9 E4 FE CPX #FE
 DAAB B0 02 BCS #DAAF
 DAAD C6 FE DEC #FE
 DAAF 20 C5 DA JSR #DAC5
 DAB2 AE E6 07 LDX #07E6
 DAB5 20 3B DF JSR #DF3B
 DAB8 0B PHP
 DAB9 20 4A DF JSR #DF4A
 DABC 2B PLP
 DABD 90 05 BCC #DAC4
 DABF 2C EC 07 BIT #07EC
 DAC2 30 C5 BMI #DAB9
 DAC4 60 RTS
 DAC5 20 AA D8 JSR #DBAA
 DAC8 AC E7 07 LDY #07E7
 DACB EC E5 07 CPX #07E5
 DACE B0 0E BCS #DADE
 DAD0 EB INX
 DAD1 20 3B DF JSR #DF3B
 DAD4 CA DEX
 DAD5 20 4B DF JSR #DF4B
 DADB EB INX
 DAD9 20 3D DA JSR #DA3D
 DADC B0 E7 BCS #DAC5
 DADE 20 F7 DA JSR #DAF7
 DAE1 A9 7F LDA ##7F
 DAE3 20 70 DB JSR #DB70
 DAE6 C9 DF CMP #DF
 DAE8 D0 09 BNE #DAF3
 DAEA A0 00 LDY ##00
 DAEC EA NOP
 DAED CA DEX
 DAEE D0 FC BNE #DAEC
 DAF0 B8 DEY
 DAF1 D0 F9 BNE #DAEC
 DAF3 60 RTS
 DAF4 EA NOP
 DAF5 EA NOP
 DAF6 EA NOP

DAF7 AC E7 07 LDY #07E7
 DAFA 20 4A DF JSR #DF4A
 DAFD 20 AA D8 JSR #DBAA
 DB00 88 DEY
 DB01 C8 INY
 DB02 A9 20 LDA ##20
 DB04 91 C8 STA (#C8),Y
 DB06 AD 3B 05 LDA #053B
 DB09 91 EA STA (#EA),Y
 DB0B CC EB 07 CPY #07EB
 DB0E D0 F1 BNE #DB01
 DB10 60 RTS

DB11; Read keyboard

DB11 A9 00 LDA ##00
 DB13 B0 43 05 STA #0543
 DB16 A0 40 LDY ##40
 DB18 B4 C6 STY #C6
 DB1A 20 70 DB JSR #DB70
 DB1D AA TAX
 DB1E E0 FF CPX ##FF
 DB20 D0 03 BNE #DB25
 DB22 4C 01 DC JMP #DC01
 DB25 A0 00 LDY ##00
 DB27 A9 26 LDA ##26
 DB29 B5 EC STA #EC
 DB2B A9 E0 LDA #E0
 DB2D B5 ED STA #ED
 DB2F A9 FE LDA #FE
 DB31 A2 08 LDX ##08
 DB33 48 PHA
 DB34 68 PLA
 DB35 48 PHA
 DB36 20 70 DB JSR #DB70
 DB39 B5 EE STA #EE
 DB3B 68 PLA
 DB3C 48 PHA
 DB3D 20 70 DB JSR #DB70
 DB40 C5 EE CMP #EE
 DB42 D0 F0 BNE #DB34
 DB44 4A LSR
 DB45 B0 16 BCS #DB5D
 DB47 48 PHA
 DB48 B1 EC LDA (#EC),Y
 DB4A C9 05 CMP ##05
 DB4C B0 0C BCS #DB5A
 DB4E C9 03 CMP ##03
 DB50 F0 08 BEQ #DB5A
 DB52 0D 43 05 ORA #0543
 DB55 B0 43 05 STA #0543
 DB58 10 02 BPL #DB5C
 DB5A B4 C6 STY #C6
 DB5C 68 PLA
 DB5D C8 INY
 DB5E C0 41 CPY ##41
 DB60 B0 08 BCS #DB6A
 DB62 CA DEX
 DB63 D0 DF BNE #DB44
 DB65 38 SEC
 DB66 68 PLA
 DB67 2A ROL
 DB68 D0 C7 BNE #DB31
 DB6A 68 PLA
 DB6B A5 C6 LDA #C6
 DB6D 6C 45 05 JMP (#0545)
 DB70 B0 30 FD STA #FD30
 DB73 B0 08 FF STA #FF08

DB76 AD 08 FF LDA \$FF08
 DB79 60 RTS
 DB7A AD 43 05 LDA \$0543
 DB7D C9 03 CMP ##03
 DB7F D0 19 BNE \$DB9A
 DB81 AD 47 05 LDA \$0547
 DB84 30 34 BMI \$DB8A
 DB86 AD 44 05 LDA \$0544
 DB89 D0 2F BNE \$DB8A
 DB8B AD 13 FF LDA \$FF13
 DB8E 49 04 EOR ##04
 DB90 8D 13 FF STA \$FF13
 DB93 A9 08 LDA ##08
 DB95 8D 44 05 STA \$0544
 DB98 D0 20 BNE \$DB8A
 DB9A 0A ASL
 DB9B C9 08 CMP ##08
 DB9D 90 10 BCC \$DBAF
 DB9F A9 06 LDA ##06
 DBA1 AE F7 07 LDX \$07F7
 DBA4 D0 09 BNE \$DBAF
 DBA6 A6 C6 LDX \$C6
 DBA8 E0 0D CPX ##0D
 DBAA D0 03 BNE \$DBAF
 DBAC 86 F0 STX \$F0
 DBAE 60 RTS
 DBAF AA TAX
 DBB0 BD 1E E0 LDA \$E01E,X
 DBB3 85 EC STA \$EC
 DBB5 BD 1F E0 LDA \$E01F,X
 DBB8 85 ED STA \$ED
 DBBA A4 C6 LDY \$C6
 DBBC B1 EC LDA (\$EC),Y
 DBBE AA TAX
 DBBF CC F6 07 CPY \$07F6
 DBC2 F0 07 BEQ \$DBCB
 DBC4 A0 10 LDY ##10
 DBC6 8C 42 05 STY \$0542
 DBC9 D0 36 BNE \$DC01
 DBCB 29 7F AND ##7F
 DBCD 2C 40 05 BIT \$0540
 DBD0 30 16 BMI \$DBE8
 DBD2 70 57 BVS \$DC2B
 DBD4 C9 7F CMP ##7F
 DBD6 F0 29 BEQ \$DC01
 DBD8 C9 14 CMP ##14
 DBDA F0 0C BEQ \$DBE8
 DBDC C9 20 CMP ##20
 DBDE F0 08 BEQ \$DBE8
 DBE0 C9 1D CMP ##1D
 DBE2 F0 04 BEQ \$DBE8
 DBE4 C9 11 CMP ##11
 DBE6 D0 43 BNE \$DC2B
 DBE8 AC 42 05 LDY \$0542
 DBEB F0 05 BEQ \$DBF2
 DBED CE 42 05 DEC \$0542
 DBF0 D0 39 BNE \$DC2B
 DBF2 CE 41 05 DEC \$0541
 DBF5 D0 34 BNE \$DC2B
 DBF7 A0 04 LDY ##04
 DBF9 8C 41 05 STY \$0541
 DBFC A4 EF LDY \$EF
 DBFE 88 DEY
 DBFF 10 2A BPL \$DC2B
 DC01 EA NOP
 DC02 EA NOP
 DC03 4E 44 05 LSR \$0544
 DC06 A4 C6 LDY \$C6
 DC08 BC F6 07 STY \$07F6

DC0B E0 FF CPX ##FF
 DC0D F0 1C BEQ \$DC2B
 DC0F 8A TXA
 DC10 A2 00 LDX ##00
 DC12 86 F0 STX \$F0
 DC14 AD 07 LDX ##07
 DC16 DD 41 DC CMP \$DC41,X
 DC19 F0 11 BEQ \$DC2C
 DC1B CA DEX
 DC1C 10 F8 BPL \$DC16
 DC1E A6 EF LDX \$EF
 DC20 EC 3F 05 CPX \$053F
 DC23 80 06 BCS \$DC2B
 DC25 9D 27 05 STA \$0527,X
 DC28 EB INX
 DC29 86 EF STX \$EF
 DC2B 60 RTS
 DC2C BD 5F 05 LDA \$055F,X
 DC2F 8D 5D 05 STA \$055D
 DC32 A9 00 LDA ##00
 DC34 CA DEX
 DC35 C0 06 BMI \$DC3D
 DC37 18 CLC
 DC38 7D 5F 05 ADC \$055F,X
 DC3B 90 F7 BCC \$DC34
 DC3D 8D 5E 05 STA \$055E
 DC40 60 RTS
 DC41 85 89 STA \$89
 DC43 86 8A STX \$8A
 DC45 87 ???
 DC46 88 ???
 DC47 88 DEY

DC49; Output to screen

DC48 8C 85 CE STY \$CE85
 DC4B 48 PHA
 DC4C 8A TXA
 DC4D 48 PHA
 DC4E 98 TYA
 DC4F 48 PHA
 DC50 A5 F0 LDA \$F0
 DC52 D0 FC BNE \$DC50
 DC54 85 C7 STA \$C7
 DC56 A9 D9 LDA \$D9
 DC58 48 PHA
 DC59 A9 C6 LDA \$C6
 DC5B 48 PHA
 DC5C AA CA LDY \$CA
 DC5E A5 CE LDA \$CE
 DC60 C9 0D CMP ##0D
 DC62 F0 28 BEQ \$DC8C
 DC64 C9 8D CMP ##8D
 DC66 F0 24 BEQ \$DC8C
 DC68 AE EB 07 LDX \$07EB
 DC6B E0 1B CPX ##1B
 DC6D D0 03 BNE \$DC72
 DC6F 4C 06 DE JMP \$DE06
 DC72 AA TAX
 DC73 30 14 BMI \$DC89
 DC75 C9 20 CMP ##20
 DC77 90 2E BCC \$DCA7
 DC79 C9 60 CMP ##60
 DC7B 90 04 BCC \$DC81
 DC7D 29 DF AND ##DF
 DC7F D0 02 BNE \$DC83
 DC81 29 3F AND ##3F
 DC83 20 BA D9 JSR \$D9BA

DC86 4C DB D9 JMP #D9DB
 DC89 4C 47 DD JMP #DD47
 DC8C 20 95 DF JSR #DF95
 DC8F EB INX
 DC90 20 4A DF JSR #DF4A
 DC93 AC E7 07 LDY #07E7
 DC96 84 CA STY #CA
 DC98 20 21 DA JSR #DA21
 DC9B A9 00 LDA #00
 DC9D 85 CF STA #CF
 DC9F 85 C2 STA #C2
 DCA1 85 CB STA #CB
 DCA3 8D 3C 05 STA #053C
 DCA6 60 RTS
 DCA7 C9 1B CMP #1B
 DCA9 F0 4E BEQ #DCF9
 DCAB A6 CF LDX #CF
 DCAD F0 03 BEQ #DCB2
 DCAF 4C DF D9 JMP #D9DF
 DCB2 C9 14 CMP #14
 DCB4 D0 03 BNE #DCB9
 DCB6 4C 99 DD JMP #DD99
 DCB9 A6 CB LDX #CB
 DCBB D0 F2 BNE #DCAF
 DCBD C9 12 CMP #12
 DCBF D0 02 BNE #DCC3
 DCC1 85 C2 STA #C2
 DCC3 C9 13 CMP #13
 DCC5 D0 0B BNE #DCD2
 DCC7 CD EB 07 CMP #07EB
 DCCA D0 03 BNE #DCCF
 DCCC 20 70 DE JSR #DE70
 DCCF 4C 9A D8 JMP #DB9A
 DCD2 C9 1D CMP #1D
 DCD4 F0 24 BEQ #DCFA
 DCD6 C9 11 CMP #11
 DCD8 F0 26 BEQ #DD00

DCDA; Graphics/text control

DCDA C9 0E CMP #0E
 DCDC F0 49 BEQ #DD27
 DCDE C9 08 CMP #08
 DCE0 F0 4C BEQ #DD2E
 DCE2 C9 09 CMP #09
 DCE4 F0 4F BEQ #DD35

DCE6; Set colour code

DCE6 A2 0F LDX #0F
 DCE8 DD 33 E1 CMP #E133,X
 DCEB F0 04 BEQ #DCF1
 DCED CA DEX
 DCEE 10 F8 BPL #DCEB
 DCF0 60 RTS
 DCF1 48 PHA
 DCF2 20 8A CF JSR #CF8A
 DCF5 8D 3B 05 STA #053B
 DCF8 68 PLA
 DCF9 60 RTS
 DCFA 20 BF DF JSR #DFBF
 DCFD B0 04 BCS #DD03
 DCFE 60 RTS
 DD00 20 21 DA JSR #DA21
 DD03 20 39 DF JSR #DF39
 DD06 B0 03 BCS #DD0B

DD08 38 SEC
 DD09 66 C4 ROR #C4
 DD0B 18 CLC
 DD0C 60 RTS

DD0D; Check line decrement

DD0D AE E6 07 LDX #07E6
 DD10 E4 CD CPX #CD
 DD12 B0 F8 BCS #DD0C
 DD14 20 03 DD JSR #DD03
 DD17 C6 CD DEC #CD
 DD19 4C AB DB JMP #DBAB
 DD1C 20 D4 DF JSR #DFD4
 DD1F B0 EB BCS #DD0C
 DD21 D0 E8 BNE #DD0B
 DD23 E6 CD INC #CD
 DD25 D0 ED BNE #DD14
 DD27 AD 13 FF LDA #FF13
 DD2A 09 04 ORA #04
 DD2C D0 15 BNE #DD43

DD2E; Lock shift

DD2E A9 80 LDA #80
 DD30 0D 47 05 ORA #0547
 DD33 30 05 BMI #DD3A

DD35; Unlock shift

DD35 A9 7F LDA #7F
 DD37 2D 47 05 AND #0547
 DD3A 8D 47 05 STA #0547
 DD3D 60 RTS
 DD3E AD 13 FF LDA #FF13
 DD41 29 FB AND #FB
 DD43 8D 13 FF STA #FF13
 DD46 60 RTS
 DD47 29 7F AND #7F
 DD49 C9 7F CMP #7F
 DD4B D0 02 BNE #DD4F
 DD4D A9 5E LDA #5E
 DD4F C9 20 CMP #20
 DD51 90 03 BCC #DD56
 DD53 4C D9 D9 JMP #D9D9
 DD56 A6 CB LDX #CB
 DD58 F0 05 BEQ #DD5F
 DD5A 09 40 ORA #40
 DD5C 4C DF D9 JMP #D9DF
 DD5F C9 14 CMP #14
 DD61 F0 68 BEQ #DDCE
 DD63 A6 CF LDX #CF
 DD65 D0 F3 BNE #DD5A
 DD67 C9 11 CMP #11
 DD69 F0 A2 BEQ #DD0D
 DD6B C9 12 CMP #12
 DD6D D0 04 BNE #DD73
 DD6F A9 00 LDA #00
 DD71 B5 C2 STA #C2
 DD73 C9 1D CMP #1D
 DD75 F0 A5 BEQ #DD1C
 DD77 C9 13 CMP #13
 DD79 D0 03 BNE #DD7E
 DD7B 4C 8B D8 JMP #DB8B
 DD7E C9 02 CMP #02
 DD80 D0 05 BNE #DD87
 DD82 A9 80 LDA #80
 DD84 8D 3C 05 STA #053C

DD87 C9 04 CMP #04
 DD89 D0 05 BNE \$DD90
 DD8B A9 00 LDA #00
 DD8D 8D 3C 05 STA \$DD1C
 DD90 C9 0E CMP #0E
 DD92 F0 AA BEQ \$DD3E
 DD94 09 80 ORA #80
 DD96 4C E6 DC JMP \$DCE6
 DD99 20 1C DD JSR \$DD1C
 DD9C 20 F6 DF JSR \$DFF6
 DD9F B0 10 BCS \$DD81
 DDA1 CC E8 07 CPY \$07E8
 DDA4 90 16 BCC \$DD8C
 DDA6 A6 CD LDX \$CD
 DDA8 E8 INX
 DDA9 20 3B DF JSR \$DF3B
 DDAC B0 0E BCS \$DD8C
 DDAE 20 FF DF JSR \$DFFF
 DDB1 A5 CC LDA \$CC
 DDB3 85 CA STA \$CA
 DDB5 A5 FE LDA \$FE
 DDB7 85 CD STA \$CD
 DDB9 4C AB DB JMP \$DBAB
 DDBC 20 BF DF JSR \$DFBF
 DDBF 20 2F DF JSR \$DF2F
 DDC2 20 D4 DF JSR \$DFD4
 DDC5 20 11 E0 JSR \$E011
 DDC8 20 BF DF JSR \$DFBF
 DDCB 4C A1 DD JMP \$DDA1
 DDCE 20 F6 DF JSR \$DFF6
 DDD1 20 95 DF JSR \$DF95
 DDD4 E4 FE CPY \$FE
 DDD6 D0 02 BNE \$DDDA
 DDD8 C4 CC CPY \$CC
 DDDA 90 21 BCC \$DDFD
 DDDC 20 F8 D9 JSR \$D9F8
 DDDF B0 22 BCS \$DE03
 DDE1 20 D4 DF JSR \$DFD4
 DDE4 20 2F DF JSR \$DF2F
 DDE7 20 BF DF JSR \$DFBF
 DDEA 20 11 E0 JSR \$E011
 DDED 20 D4 DF JSR \$DFD4
 DDF0 A6 CD LDX \$CD
 DDF2 E4 FE CPY \$FE
 DDF4 D0 EB BNE \$DDE1
 DDF6 C4 CC CPY \$CC
 DDF8 D0 E7 BNE \$DDE1
 DDFA 20 FF DF JSR \$DFFF
 DDFD E6 CF INC \$CF
 DDFE D0 02 BNE \$DE03
 DE01 C6 CF DEC \$CF
 DE03 4C B1 DD JMP \$DD81

DE06; Decode escapes

DE06 29 7F AND #7F
 DE08 38 SEC
 DE09 E9 41 SBC #41
 DE0B C9 17 CMP #17
 DE0D B0 0A BCL \$DE19
 DE0F 0A ASL
 DE10 AA TAX
 DE11 BD 1B DE LDA \$DE1B,X
 DE14 48 PHA
 DE15 BD 1A DE LDA \$DE1A,X
 DE18 48 PHA
 DE19 60 RTS

DE1A; ESC vectors

DE1A 28 PLP
 DE1B DF ???
 DE1C 5F ???
 DE1D DE 25 DF DEC \$DF25,X
 DE20 9F ???
 DE21 DE 18 DE DEC \$DE18,X
 DE24 18 CLC
 DE25 DE 18 DE DEC \$DE18,X
 DE28 18 CLC
 DE29 DE 8A DE DEC \$DE8A,X
 DE2C 81 DF STA (\$DF,X)
 DE2E 94 DF STY \$DF,X
 DE30 1C ???
 DE31 DF ???
 DE32 1F ???
 DE33 DF ???
 DE34 87 ???
 DE35 D8 CLD
 DE36 9A TXS
 DE37 DC ???
 DE38 E0 DE CPX ##DE
 DE3A CA DEX
 DE3B DE 47 DE DEC \$DE47,X
 DE3E 18 CLC
 DE3F DE 5D DE DEC \$DE5D,X
 DE42 18 CLC
 DE43 DE F5 DE DEC \$DEF5,X
 DE46 03 ???
 DE47 DF ???
 DE48 20 70 DE JSR \$DE70
 DE4B 20 8B DB JSR \$D88B
 DE4E A9 01 LDA \$01
 DE50 AA TAX
 DE51 20 7A DE JSR \$DE7A
 DE54 A9 17 LDA #17
 DE56 A2 26 LDX #26
 DE58 20 67 DE JSR \$DE67
 DE5B 4C 9A DB JMP \$D89A
 DE5E 18 CLC
 DE5F 24 38 BIT \$38
 DE61 A6 CA LDX \$CA
 DE63 A5 CD LDA \$CD
 DE65 90 13 BCC \$DE7A
 DE67 8D E5 07 STA \$07E5
 DE6A 8E E8 07 STX \$07E8
 DE6D 4C 80 DE JMP \$DE80
 DE70 A9 18 LDA #18
 DE72 A2 27 LDX #27
 DE74 20 67 DE JSR \$DE67
 DE77 A9 00 LDA #00
 DE79 AA TAX
 DE7A 8D E6 07 STA \$07E6
 DE7D 8E E7 07 STX \$07E7
 DE80 A9 00 LDA #00
 DE82 A2 04 LDX #04
 DE84 9D ED 07 STA \$07ED,X
 DE87 CA DEX
 DE88 D0 FA BNE \$DE84
 DE8A 60 RTS

DE8B; ESC-I; Insert line

DE8B 20 5E DA JSR \$DA5E
 DE8E 20 A1 DB JSR \$DBA1
 DE91 E8 INX
 DE92 20 3B DF JSR \$DF3B
 DE95 08 PHP
 DE96 20 46 DF JSR \$DF46
 DE99 28 PLP
 DE9A B0 03 BCS \$DE9F

DE9C	38		SEC		
DE9D	66	C4	ROR	#C4	
DE9F	60		RTS		
DEA0	20	87	DF JSR	\$DFB7	
DEA3	AD	E6	07 LDA	\$07E6	
DEA6	48		PHA		
DEA7	A5	CD	LDA	#CD	
DEA9	8D	E6	07 STA	\$07E6	
DEAC	AD	EC	07 LDA	\$07EC	
DEAF	48		PHA		
DEB0	A9	80	LDA	##80	
DEB2	8D	EC	07 STA	\$07EC	
DEB5	20	9E	DA JSR	\$DA9E	
DEB8	68		PLA		
DEB9	8D	EC	07 STA	\$07EC	
DEBC	AD	E6	07 LDA	\$07E6	
DEBF	85	CD	STA	#CD	
DEC1	68		PLA		
DEC2	8D	E6	07 STA	\$07E6	
DEC5	38		SEC		
DEC6	66	C4	ROR	#C4	
DEC8	4C	A1	D8 JMP	\$D8A1	
DEC8	20	F6	DF JSR	\$DFF6	
DECE	20	FD	DA JSR	\$DAFD	
DED1	E6	CD	INC	#CD	
DED3	20	A8	D8 JSR	\$D8A8	
DED6	AC	E7	07 LDY	\$07E7	
DED9	20	39	DF JSR	\$DF39	
DEDC	80	F0	BCS	\$DECE	
DEDE	4C	B1	DD JMP	\$DDB1	
DEE1	20	F6	DF JSR	\$DFF6	
DEE4	20	FF	DF JSR	\$DFFF	
DEE7	CC	E7	07 CPY	\$07E7	
DEEA	D0	05	BNE	\$DEF1	
DEEC	20	39	DF JSR	\$DF39	
DEEF	90	ED	BCC	\$DEDE	
DEF1	20	D4	DF JSR	\$DFD4	
DEF4	90	EE	BCC	\$DEE4	
DEF6	20	F6	DF JSR	\$DFF6	
DEF9	8A		TXA		
DEFA	48		PHA		
DEFB	20	89	DA JSR	\$DAB9	
DEFE	68		PLA		
DEFF	85	FE	STA	#FE	
DF01	4C	DE	DE JMP	\$DEDE	
DF04	20	F6	DF JSR	\$DFF6	
DF07	20	39	DF JSR	\$DF39	
DF0A	80	03	BCS	\$DF0F	
DF0C	38		SEC		
DF0D	66	C4	ROR	#C4	
DF0F	AD	E6	07 LDA	\$07E6	
DF12	85	CD	STA	#CD	
DF14	20	5E	DA JSR	\$DA5E	
DF17	20	4A	DF JSR	\$DF4A	
DF1A	4C	DE	DE JMP	\$DEDE	
DF1D	A9	00	LDA	##00	
DF1F	2C	A9	80 BIT	\$80A9	
DF22	8D	E9	07 STA	\$07E9	
DF25	60		RTS		
DF26	A9	00	LDA	##00	
DF28	2C	A9	FF BIT	\$FFA9	
DF2B	8D	EA	07 STA	\$07EA	
DF2E	60		RTS		
DF2F	A4	CA	LDY	#CA	
DF31	B1	EA	LDA	(\$EA),Y	
DF33	8D	ED	07 STA	\$07ED	
DF36	B1	CB	LDA	(\$CB),Y	
DF38	60		RTS		
DF39	A6	CD	LDX	#CD	
DF3B	20	66	DF JSR	\$DF66	
DF3E	3D	EE	07 AND	\$07EE,X	
DF41	C9	01	CMP	##01	
DF43	4C	55	DF JMP	\$DF55	
DF46	A6	CD	LDX	#CD	
DF48	80	0F	BCS	\$DF59	
DF4A	20	66	DF JSR	\$DF66	
DF4D	49	FF	EOR	##FF	
DF4F	3D	EE	07 AND	\$07EE,X	
DF52	9D	EE	07 STA	\$07EE,X	
DF55	AE	E9	02 LDX	\$02E9	
DF58	60		RTS		
DF59	2C	E9	07 BIT	\$07E9	
DF5E	70	DD	BVS	\$DF3B	
DF5E	20	66	DF JSR	\$DF66	
DF61	1D	EE	07 ORA	\$07EE,X	
DF64	D0	EC	BNE	\$DF52	
DF66	8E	E9	02 STX	\$02E9	
DF69	8A		TXA		
DF6A	29	07	AND	##07	
DF6C	AA		TAX		
DF6D	8D	7A	DF LDA	\$DF7A,X	
DF70	48		PHA		
DF71	AD	E9	02 LDA	\$02E9	
DF74	4A		LSR		
DF75	4A		LSR		
DF76	4A		LSR		
DF77	AA		TAX		
DF78	68		PLA		
DF79	60		RTS		
DF7A	80		???		
DF7B	40		RTI		
DF7C	20	10	08 JSR	\$0810	
DF7F	04		???		
DF80	02		???		
DF81	01	AC	ORA	(\$AC,X)	
DF83	E7		???		
DF84	07		???		
DF85	84	CA	STY	#CA	
DF87	20	39	DF JSR	\$DF39	
DF8A	90	06	BCC	\$DF92	
DF8C	C6	CD	DEC	#CD	
DF8E	10	F7	BPL	\$DF87	
DF90	E6	CD	INC	#CD	
DF92	4C	A8	D8 JMP	\$D8A8	
DF95	E6	CD	INC	#CD	
DF97	20	39	DF JSR	\$DF39	
DF9A	80	F9	BCS	\$DF95	
DF9C	C6	CD	DEC	#CD	
DF9E	20	A8	D8 JSR	\$D8A8	
DFA1	AC	E8	07 LDY	\$07E8	
DFA4	84	CA	STY	#CA	
DFA6	20	2F	DF JSR	\$DF2F	
DFA9	C9	20	CMP	##20	
DFAB	D0	0F	BNE	\$DFBC	
DFAD	CC	E7	07 CPY	\$07E7	
DFB0	D0	05	BNE	\$DFB7	
DFB2	20	39	DF JSR	\$DF39	
DFB5	90	05	BCC	\$DFBC	
DFB7	20	D4	DF JSR	\$DFD4	
DFBA	90	EA	BCC	\$DFA6	
DFBC	84	C3	STY	#C3	
DFBE	60		RTS		
DFBF	48		PHA		
DFC0	A4	CA	LDY	#CA	
DFC2	CC	E8	07 CPY	\$07E8	
DFC5	90	08	BCC	\$DFCF	
DFC7	20	21	DA JSR	\$DA21	
DFCA	AC	E7	07 LDY	\$07E7	

DFCD	88	DEY		E03B	46 54	LSR	\$54
DFCE	38	SEC		E03D	58	CLI	
DFCF	C8	INY		E03E	37	???	
DFD0	84 CA	STY	*CA	E03F	59 47 38	EOR	\$3847,Y
DFD2	68	PLA		E042	42	???	
DFD3	60	RTS		E043	48	PHA	
DFD4	A4 CA	LDY	*CA	E044	55 56	EOR	\$56,X
DFD6	88	DEY		E046	39 49 4A	AND	\$4A49,Y
DFD7	30 05	BMI	\$DFDE	E049	30 4D	BMI	\$E078
DFD9	CC E7 07	CPY	\$07E7	E04B	4B	???	
DFDC	B0 11	BCS	\$DFEF	E04C	4F	???	
DFDE	AC E6 07	LDY	\$07E6	E04D	4E 11 50	LSR	\$5011
DFF1	C4 CD	CPY	*CD	E050	4C 91 2E	JMP	\$2E91
DFF3	B0 10	BCS	\$DFF5	E053	3A	???	
DFF5	C6 CD	DEC	*CD	E054	2D 2C 9D	AND	\$9D2C
DFF7	48	PHA		E057	2A	ROL	
DFF8	20 A8 D8	JSR	\$D8A8	E058	3B	???	
DFFB	68	PLA		E059	1D 1B 3D	ORA	\$3D1B,X
DFEC	AC E8 07	LDY	\$07E8	E05C	2B	???	
DFEF	84 CA	STY	*CA	E05D	2F	???	
DFF1	CC E8 07	CPY	\$07E8	E05E	31 13	AND	(\$13),Y
DFF4	18	CLC		E060	04	???	
DFF5	60	RTS		E061	32	???	
DFF6	A4 CA	LDY	*CA	E062	20 02 51	JSR	\$5102
DFF8	84 CC	STY	*CC	E065	03	???	
DFFA	A6 CD	LDX	*CD	E066	FF	???	
DFFC	86 FE	STX	*FE				
DFFE	60	RTS					
DFFF	A9 20	LDA	**20	E067;		Keyboard 2 -	
E001	A4 CA	LDY	*CA			shifted	
E003	91 C8	STA	(\$C8),Y	E067	94 8D	STY	\$8D,X
E005	20 B4 D8	JSR	\$D8B4	E069	A9 88	LDA	**88
E008	AD 3B 05	LDA	\$053B	E06B	8A	TXA	
E00B	0D 3C 05	ORA	\$053C	E06C	87	???	
E00E	91 EA	STA	(\$EA),Y	E06D	8B	???	
E010	60	RTS		E06E	8A	TSX	
E011	A4 CA	LDY	*CA	E06F	23	???	
E013	91 C8	STA	(\$C8),Y	E070	D7	???	
E015	20 B4 D8	JSR	\$D8B4	E071	C1 24	CMP	(\$24,X)
E018	AD ED 07	LDA	\$07ED	E073	DA	???	
E01B	91 EA	STA	(\$EA),Y	E074	D3	???	
E01D	60	RTS		E075	C5 01	CMP	\$01
				E077	25 D2	AND	\$D2
E01E;		Keyboard select		E079	C4 26	CPY	\$26
		vectors		E07B	C3	???	
E01E	26 E0	ROL	\$E0	E07C	C6 D4	DEC	\$D4
E020	67	???		E07E	D8	CLD	
E021	E0 A8	CPX	**A8	E07F	27	???	
E023	E0 E9	CPX	**E9	E080	D9 C7 28	CMP	\$28C7,Y
				E083	C2	???	
E026;		Keyboard 1 -		E084	C8	INY	
		unshifted		E085	D5 D6	CMP	\$D6,X
E025	E0 14	CPX	**14	E087	29 C9	AND	**C9
E027	0D 5C 8C	ORA	\$8C5C	E089	CA	DEX	
E02A	85 89	STA	\$89	E08A	5E CD CB	LSR	\$CBCD,X
E02C	86 40	STX	\$40	E08D	CF	???	
E02E	33	???		E08E	CE 11 D0	DEC	\$D011
E02F	57	???		E091	CC 91 3E	CPY	\$3E91
E030	41 34	EOR	(\$34,X)	E094	5B	???	
E032	5A	???		E095	DD 3C 9D	CMP	\$9D3C,X
E033	53	???		E098	C0 5D	CPY	**5D
E034	45 01	EOR	\$01	E09A	1D 1B 5F	ORA	\$5F1B,X
E036	35 52	AND	\$52,X	E09D	DB	???	
E038	44	???		E09E	3F	???	
E039	36 43	ROL	\$43,X	E09F	21 93	AND	(\$93,X)
				E0A1	04	???	
				E0A2	22	???	
				E0A3	A0 02	LDY	**02

E0A5 D1 B3 CMP (\$B3),Y
E0A7 FF ???

E0A8; Keyboard 3 - 'comm'

E0AB 94 B0 STY \$B0,X
E0AA A8 TAY
E0AB 88 DEY
E0AC 8A TXA
E0AD 87 ???
E0AE 8B ???
E0AF A4 96 LDY \$96
E0B1 B3 ???
E0B2 B0 97 BCS \$E04B
E0B4 AD AE B1 LDA \$B1AE
E0B7 01 98 ORA (\$98,X)
E0B9 B2 ???
E0BA AC 99 BC LDY \$BC99
E0BD BB ???
E0BE A3 ???
E0BF BD 9A B7 LDA \$B79A,X
E0C2 A5 9B LDA \$9B
E0C4 BF ???
E0C5 B4 BB LDY \$BB,X
E0C7 BE 29 A2 LDX \$A229,Y
E0CA B5 30 LDA \$30,X
E0CC A7 ???
E0CD A1 B9 LDA (\$B9,X)
E0CF AA TAX
E0D0 11 AF ORA (\$AF),Y
E0D2 B6 91 LDA \$91,Y
E0D4 3E 5B DC ROL \$DC5B,X
E0D7 3C ???
E0DB 9D DF 5D STA \$5DDF,X
E0DB 1D 1B DE ORA \$DE1B,X
E0DE A6 3F LDX \$3F
E0E0 81 93 STA (\$93,X)
E0E2 04 ???
E0E3 95 A0 STA \$A0,X
E0E5 02 ???
E0E6 AB ???
E0E7 83 ???
E0E8 FF ???

E0E9; Keyboard 4

E0E9 FF ???
E0EA FF ???
E0EB 1C ???
E0EC FF ???
E0ED FF ???
E0EE FF ???
E0EF FF ???
E0F0 FF ???
E0F1 1C ???
E0F2 17 ???
E0F3 01 9F ORA (\$9F,X)
E0F5 1A ???
E0F6 13 ???
E0F7 05 FF ORA \$FF
E0F9 9C ???
E0FA 12 ???
E0FB 04 ???
E0FC 1E 03 06 ASL \$0603,X
E0FF 14 ???
E100 18 CLC
E101 1F ???

E102 19 07 9E ORA \$9E07,Y
E105 02 ???
E106 08 PHP
E107 15 16 ORA \$16,X
E109 12 ???
E10A 09 0A ORA \$\$0A
E10C 92 ???
E10D 0D 0B 0F ORA \$0F0B
E110 0E FF 10 ASL \$10FF
E113 0C ???
E114 FF ???
E115 04 1B STY \$1B
E117 FF ???
E118 82 ???
E119 FF ???
E11A FF ???
E11B 1D FF 1B ORA \$1BFF,X
E11E 06 FF ASL \$FF
E120 FF ???
E121 90 FF BCC \$E122
E123 FF ???
E124 05 FF ORA \$FF
E126 FF ???
E127 11 FF ORA (\$FF),Y
E129 FF ???

E12A; Shift/run
equivalent

E12A 44 ??? :DL"*.RUN
E12B CC 22 2A CPY \$2A22
E12E 0D 52 55 ORA \$5552
E131 4E 0D 90 LSR \$900D

E133; Colour code table

E134 05 1C ORA \$1C
E136 9F ???
E137 9C ???
E138 1E 1F 9E ASL \$9E1F,X
E13B 81 95 STA (\$95,X)
E13D 96 97 STX \$97,Y
E13F 98 TYA
E140 99 9A 9B STA \$9B9A,Y
E143 00 BRK
E144 71 32 ADC (\$32),Y
E146 63 ???
E147 44 ???
E148 35 46 AND \$46,X
E14A 77 ???
E14B 48 PHA
E14C 29 5A AND \$\$5A
E14E 6B ???
E14F 5C ???
E150 6D 2E 5F ADC \$5F2E
E153 09 40 ORA \$40
E155 2C 09 20 BIT \$2009

E158; Send 'listen'

E158 48 PHA
E159 24 94 BIT \$94
E15B 10 0A BPL \$E167
E15D 38 SEC
E15E 66 A6 ROR \$A6
E160 20 B1 E1 JSR \$E1B1

E163 46 94 LSR \$94
 E165 46 A6 LSR \$A6
 E167 68 PLA
 E168 85 95 STA \$95
 E16A 78 SEI
 E16B 20 C6 E2 JSR \$E2C6
 E16E 20 BF E2 JSR \$E2BF
 E171 A5 01 LDA \$01
 E173 09 04 ORA #\$04
 E175 85 01 STA \$01
 E177 78 SEI
 E178 20 BF E2 JSR \$E2BF
 E17B 20 C6 E2 JSR \$E2C6
 E17E 20 DC E2 JSR \$E2DC

E181; Send to serial bus

E181 78 SEI
 E182 20 C6 E2 JSR \$E2C6
 E185 20 D4 E2 JSR \$E2D4
 E188 80 5F BCS \$E1E9
 E18A 20 B8 E2 JSR \$E2B8
 E18D 24 A6 BIT \$A6
 E18F 10 0E BPL \$E19F
 E191 20 D4 E2 JSR \$E2D4
 E194 90 FB BCC \$E191
 E196 A5 01 LDA \$01
 E198 C5 01 CMP \$01
 E19A D0 FA BNE \$E196
 E19C 0A ASL
 E19D B0 F7 BCS \$E196
 E19F 20 D4 E2 JSR \$E2D4
 E1A2 90 FB BCC \$E19F
 E1A4 20 BF E2 JSR \$E2BF
 E1A7 A9 08 LDA #\$08
 E1A9 85 AA STA \$AA
 E1AB 20 D4 E2 JSR \$E2D4
 E1AE 90 3E BCC \$E1EE
 E1B0 66 95 ROR \$95
 E1B2 B0 05 BCS \$E1B9
 E1B4 20 CD E2 JSR \$E2CD
 E1B7 D0 03 BNE \$E1BC
 E1B9 20 C6 E2 JSR \$E2C6
 E1BC 20 11 E3 JSR \$E311
 E1BF 20 B8 E2 JSR \$E2B8
 E1C2 20 11 E3 JSR \$E311
 E1C5 A5 01 LDA \$01
 E1C7 29 FE AND #\$FE
 E1C9 09 02 ORA #\$02
 E1CB 85 01 STA \$01
 E1CD C6 AA DEC \$AA
 E1CF D0 DA BNE \$E1AB
 E1D1 8A TXA
 E1D2 48 PHA
 E1D3 A2 78 LDX #\$78
 E1D5 A5 01 LDA \$01
 E1D7 C5 01 CMP \$01
 E1D9 D0 FA BNE \$E1D5
 E1DB 0A ASL
 E1DC 90 07 BCC \$E1E5
 E1DE CA DEX
 E1DF D0 F4 BNE \$E1D5
 E1E1 68 PLA
 E1E2 AA TAX
 E1E3 B0 09 BCS \$E1EE
 E1E5 68 PLA
 E1E6 AA TAX
 E1E7 58 CLI

E1E8 60 RTS
 E1E9 A9 80 LDA ##80
 E1EB 4C F0 E1 JMP \$E1F0

E1EE; Serial timeout

E1EE A9 03 LDA ##03
 E1F0 20 1E F4 JSR \$F41E
 E1F3 58 CLI
 E1F4 18 CLC
 E1F5 90 4B BCC \$E242

E1F7; Send listen SA

E1F7 85 95 STA \$95
 E1F9 20 77 E1 JSR \$E177

E1FC; Clear ATN

E1FC A5 01 LDA \$01
 E1FE 29 FB AND ##FB
 E200 85 01 STA \$01
 E202 60 RTS

E203; Send talk SA

E203 85 95 STA \$95
 E205 20 77 E1 JSR \$E177

E208; Wait for clock

E208 24 90 BIT \$90
 E20A 30 36 BMI \$E242
 E20C 78 SEI
 E20D 20 CD E2 JSR \$E2CD
 E210 20 FC E1 JSR \$E1FC
 E213 20 B8 E2 JSR \$E2B8
 E216 24 01 BIT \$01
 E218 70 FC BVS \$E216
 E21A 58 CLI
 E21B 60 RTS
 E21C FF ???

E21D; Send serial deferred

E21D 24 94 BIT \$94
 E21F 30 05 BMI \$E226
 E221 38 SEC
 E222 66 94 ROR \$94
 E224 D0 05 BNE \$E22B
 E226 48 PHA
 E227 20 81 E1 JSR \$E181
 E22A 68 PLA
 E22B 85 95 STA \$95
 E22D 18 CLC
 E22E 60 RTS

E22F; Send 'untalk'

E22F 78 SEI
 E230 20 BF E2 JSR \$E2BF

E233 A5 01 LDA #01
 E235 09 04 ORA ##04
 E237 85 01 STA #01
 E239 A9 5F LDA ##5F
 E23B D0 02 BNE \$E23F
 E23D A9 3F LDA ##3F
 E23F 20 58 E1 JSR \$E158

E242; Send 'unlisten

E242 20 FC E1 JSR \$E1FC
 E245 8A TXA
 E246 A2 14 LDX ##14
 E248 CA DEX
 E249 D0 FD BNE \$E248
 E24B AA TAX
 E24C 20 B8 E2 JSR \$E2B8
 E24F 4C C6 E2 JMP \$E2C6

E252; Receive from serial bus

E252 78 SEI
 E253 A9 00 LDA ##00
 E255 85 AA STA \$AA
 E257 20 B8 E2 JSR \$E2B8
 E25A 8A TXA
 E25B 48 PHA
 E25C 20 D4 E2 JSR \$E2D4
 E25F 10 FB BPL \$E25C
 E261 A2 20 LDX ##20
 E263 20 C6 E2 JSR \$E2C6
 E266 A5 01 LDA #01
 E268 C5 01 CMP #01
 E26A D0 FA BNE \$E266
 E26C 0A ASL
 E26D 10 1F BPL \$E28E
 E26F CA DEX
 E270 D0 F4 BNE \$E266
 E272 A5 AA LDA \$AA
 E274 F0 07 BEQ \$E27D
 E276 68 PLA
 E277 AA TAX
 E278 A9 02 LDA ##02
 E27A 4C F0 E1 JMP \$E1F0
 E27D 20 CD E2 JSR \$E2CD
 E280 A2 40 LDX ##40
 E282 CA DEX
 E283 D0 FD BNE \$E282
 E285 A9 40 LDA ##40
 E287 20 1E F4 JSR \$F41E
 E28A E6 AA INC \$AA
 E28C D0 D3 BNE \$E261
 E28E A2 08 LDX ##08
 E290 A5 01 LDA #01
 E292 0A ASL
 E293 10 FB BPL \$E290
 E295 66 A8 ROR \$A8
 E297 A5 01 LDA #01
 E299 C5 01 CMP #01
 E29B D0 FA BNE \$E297
 E29D 0A ASL
 E29E 30 F7 BMI \$E297
 E2A0 CA DEX
 E2A1 D0 ED BNE \$E290
 E2A3 86 AA STX \$AA
 E2A5 68 PLA

E2A6 AA TAX
 E2A7 20 CD E2 JSR \$E2CD
 E2AA A9 40 LDA ##40
 E2AC 24 90 BIT #90
 E2AE 50 03 BVC \$E2B3
 E2B0 20 45 E2 JSR \$E245
 E2B3 A5 A8 LDA \$A8
 E2B5 58 CLI
 E2B6 18 CLC
 E2B7 60 RTS

E2B8; Serial clock on

E2B8 A5 01 LDA #01
 E2BA 29 FD AND ##FD
 E2BC 85 01 STA #01
 E2BE 60 RTS
 E2BF A5 01 LDA #01
 E2C1 09 02 ORA ##02
 E2C3 85 01 STA #01
 E2C5 60 RTS
 E2C6 A5 01 LDA #01
 E2C8 29 FE AND ##FE
 E2CA 85 01 STA #01
 E2CC 60 RTS

E2CD; Serial clock off

E2CD A5 01 LDA #01
 E2CF 09 01 ORA ##01
 E2D1 85 01 STA #01
 E2D3 60 RTS

E2D4; Get serial in & clock

E2D4 A5 01 LDA #01
 E2D6 C5 01 CMP #01
 E2D8 D0 FA BNE \$E2D4
 E2DA 0A ASL
 E2DB 60 RTS
 E2DC 20 FB E2 JSR \$E2FB
 E2DF A9 10 LDA ##10
 E2E1 2C 09 FF BIT \$FF09
 E2E4 F0 FB BEQ \$E2E1
 E2E6 8D 09 FF STA \$FF09
 E2E9 60 RTS
 E2EA 20 FC E2 JSR \$E2FC
 E2ED A9 10 LDA ##10
 E2EF 2C 09 FF BIT \$FF09
 E2F2 F0 FB BEQ \$E2EF
 E2F4 8D 09 FF STA \$FF09
 E2F7 60 RTS
 E2F8 A9 04 LDA ##04
 E2FA D0 02 BNE \$E2FE
 E2FC A9 40 LDA ##40
 E2FE 08 PHP
 E2FF 48 PHA
 E300 78 SEI
 E301 A9 00 LDA ##00
 E303 8D 02 FF STA \$FF02
 E306 68 PLA
 E307 8D 03 FF STA \$FF03
 E30A A9 10 LDA ##10
 E30C 8D 09 FF STA \$FF09
 E30F 28 PLP

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E310 60      RTS

E311; Delay 1 ms.

E311 8A      TXA
E312 A2 05   LDX ##05
E314 CA      DEX
E315 D0 FD   BNE $E314
E317 AA      TAX
E318 60      RTS

E319; 'press record'

E319 38      SEC
E31A 24 18   BIT #18

E31B; 'press play'

E31C AD 10 FD LDA $FD10

E31F 29 04   AND ##04
E321 F0 3F   BEQ $E362
E323 08      PHP
E324 20 D8 FB JSR $FBD8

E327; Tape message

E327 0D 50 52 ORA $5250 :PRESS PL
E32A 45 53   EOR $53      :AY .(..
E32C 53      ???         :X(& RECO
E32D 20 50 4C JSR $4C50  :RD . X(O
E330 41 59   EOR ($59,X) :N TAPE.
E332 20 00 2B JSR $2B00
E335 90 0D   BCC $E344
E337 20 D8 FB JSR $FBD8
E33A 26 20   ROL $20
E33C 52      ???
E33D 45 43   EOR $43
E33F 4F      ???
E340 52      ???
E341 44      ???
E342 20 00 20 JSR $2000
E345 D8      CLD
E346 FB      ???
E347 4F      ???
E348 4E 20 54 LSR $5420
E349 41 50   EOR ($50,X)
E34D 45 00   EOR $00
E34F 20 CB FB JSR $FBCB
E352 B0 0F   BCS $E363
E354 AD 10 FD LDA $FD10
E357 29 04   AND ##04
E359 D0 F4   BNE $E34F
E35B 20 D8 FB JSR $FBD8
E35E 0D 4F 4B ORA $4B4F
E361 00      BRK
E362 18      CLC
E363 60      RTS

E364; Blank screen

E364 78      SEI
E365 AD 06 FF LDA $FF06
E368 29 EF   AND ##EF
E36A BD 06 FF STA $FF06
E36D AD 0A FF LDA $FF0A
E370 29 FD   AND ##FD
E372 09 08   ORA ##08
E374 BD 0A FF STA $FF0A
E377 60      RTS

E378; Screen on

E378 78      SEI
E379 AD 06 FF LDA $FF06
E37C 09 10   ORA ##10
E37E 8D 06 FF STA $FF06
E381 AD 0A FF LDA $FF0A
E384 29 F7   AND ##F7
E386 09 02   ORA ##02
E388 8D 0A FF STA $FF0A
E38B 58      CLI
E38C 60      RTS

E38D; Start tape

E38D 08      PHP
E38E 38      SEC
E38F 6E FC 07 ROR $07FC
E392 A5 01   LDA $01
E394 29 F5   AND ##F5
E396 85 01   STA $01
E398 A2 1E   LDX ##1E
E39A 20 EA E2 JSR $E2EA
E39D CA      DEX
E39E D0 FA   BNE $E39A
E3A0 28      PLP
E3A1 60      RTS

E3A2; Copyright message

E3A2 43      ???
E3A3 31 39   AND ($39),Y
E3A5 38      SEC
E3A6 34      ???
E3A7 43      ???
E3A8 4F      ???
E3A9 4D 4D 4F EOR $4F4D
E3AC 44      ???
E3AD 4F      ???
E3AE 52      ???
E3AF 45 A5   EOR $A5

E3B0; Kill motor

E3B1 01 09   ORA ($09,X)
E3B3 08      PHP
E3B4 85 01   STA $01
E3B6 60      RTS
E3B7 A0 00   LDY ##00
E3B9 A9 20   LDA ##20
E3BB 91 B6   STA ($B6),Y
E3BD C8      INY
E3BE C0 C0   CPY ##C0
E3C0 D0 F9   BNE $E3BB
E3C2 60      RTS
E3C3 48      PHA
E3C4 A9 33   LDA ##33
E3C6 85 B6   STA $B6
E3C8 A9 03   LDA ##03
E3CA 85 B7   STA $B7
E3CC 68      PLA
E3CD 60      RTS
E3CE 20 CB FB JSR $FBCB
E3D1 90 10   BCC $E3E3
E3D3 20 B0 E3 JSR $E3B0
E3D6 20 78 E3 JSR $E378
E3D9 AE BE 07 LDX $07BE

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E3DC	9A		TXS	
E3DD	A9	00	LDA	##00
E3DF	8D	BE	07	STA \$07BE
E3E2	3B		SEC	
E3E3	60		RTS	
E3E4	AD	09	FF	LDA \$FF09
E3E7	2D	0A	FF	AND \$FF0A
E3EA	29	08		AND ##08
E3EC	D0	01	BNE	\$E3ECF
E3EE	60		RTS	
E3EF	8D	09	FF	STA \$FF09
E3F2	7B		SEI	
E3F3	A9	90		LDA ##90
E3F5	8D	00	FF	STA \$FF00
E3F8	A9	33		LDA ##33
E3FA	8D	01	FF	STA \$FF01
E3FD	AE	BF	07	LDX \$07BF
E400	9A		TXS	
E401	3B		SEC	
E402	60		RTS	
E403	A9	A8		LDA ##A8
E405	8D	00	FF	STA \$FF00
E408	A9	48		LDA ##48
E40A	8D	01	FF	STA \$FF01
E40D	A9	08		LDA ##08
E40F	8D	09	FF	STA \$FF09
E412	60		RTS	
E413	3B		SEC	
E414	B0	01	BCS	\$E417
E416	18		CLC	
E417	8C	CA	07	STY \$07CA
E41A	8E	CB	07	STX \$07CB
E41D	AC	CB	07	LDY \$07CB
E420	AE	C9	07	LDX \$07C9
E423	A9	10		LDA ##10
E425	2C	09	FF	BIT \$FF09
E428	F0	F8		BEQ \$E425
E42A	8C	02	FF	STY \$FF02
E42D	8E	03	FF	STX \$FF03
E430	8D	09	FF	STA \$FF09
E433	A5	01		LDA \$01
E435	49	02	EOR	##02
E437	85	01		STA \$01
E439	08		PHP	
E43A	20	CE	E3	JSR \$E3CE
E43D	28		PLP	
E43E	AC	CA	07	LDY \$07CA
E441	AE	CB	07	LDX \$07CB
E444	B0	D0		BCS \$E416
E446	60		RTS	
E447	A9	4E		LDA ##4E
E449	8D	C8	07	STA \$07C8
E44C	A9	03		LDA ##03
E44E	8D	C9	07	STA \$07C9
E451	60		RTS	
E452	A9	D0		LDA ##D0
E454	8D	C8	07	STA \$07C8
E457	A9	00		LDA ##00
E459	8D	C9	07	STA \$07C9
E45C	60		RTS	
E45D	A9	A4		LDA ##A4
E45F	8D	C8	07	STA \$07C8
E462	A9	01		LDA ##01
E464	8D	C9	07	STA \$07C9
E467	60		RTS	
E468	20	52	E4	JSR \$E452
E46B	20	13	E4	JSR \$E413
E46E	20	5D	E4	JSR \$E45D
E471	4C	13	E4	JMP \$E413
E474	20	5D	E4	JSR \$E45D
E477	20	13	E4	JSR \$E413
E47A	20	52	E4	JSR \$E452
E47D	4C	13	E4	JMP \$E413
E480	20	47	E4	JSR \$E447
E483	20	13	E4	JSR \$E413
E486	20	5D	E4	JSR \$E45D
E489	4C	13	E4	JMP \$E413
E48C	85	A7		STA \$A7
E48E	A9	01		LDA ##01
E490	8D	B1	07	STA \$07B1
E493	20	80	E4	JSR \$E480
E496	A2	08		LDX ##08
E498	66	A7		ROR \$A7
E49A	B0	09		BCS \$E4A5
E49C	EE	B1	07	INC \$07B1
E49F	20	68	E4	JSR \$E468
E4A2	4C	A8	E4	JMP \$E4A8
E4A5	20	74	E4	JSR \$E474
E4A8	CA			DEX
E4A9	D0	ED		BNE \$E498
E4AB	6E	B1	07	ROR \$07B1
E4AE	B0	06		BCS \$E4B6
E4B0	20	68	E4	JSR \$E468
E4B3	4C	B9	E4	JMP \$E4B9
E4B6	20	74	E4	JSR \$E474
E4B9	60			RTS
E4BA	BA			TSX
E4BB	8E	BE	07	STX \$07BE
E4BE	A5	01		LDA \$01
E4C0	09	02		ORA ##02
E4C2	85	01		STA \$01
E4C4	20	52	E4	JSR \$E452
E4C7	A0	01		LDY ##01
E4C9	8C	03	FF	STY \$FF03
E4CC	A9	10		LDA ##10
E4CE	8D	09	FF	STA \$FF09
E4D1	24	F7		BIT \$F7
E4D3	10	04		BPL \$E4D9
E4D5	A0	40		LDY ##40
E4D7	A2	FE		LDX ##FE
E4D9	20	13	E4	JSR \$E413
E4DC	CA			DEX
E4DD	D0	FA		BNE \$E4D9
E4DF	88			DEY
E4E0	D0	F7		BNE \$E4D9
E4E2	A0	09		LDY ##09
E4E4	98			TYA
E4E5	05	F7		ORA \$F7
E4E7	20	8C	E4	JSR \$E48C
E4EA	88			DEY
E4EB	D0	F7		BNE \$E4E4
E4ED	A5	F8		LDA \$F8
E4EF	85	F5		STA \$F5
E4F1	F0	03		BEQ \$E4F6
E4F3	20	8C	E4	JSR \$E48C
E4F6	A0	00		LDY ##00
E4F8	A9	BA		LDA ##BA
E4FA	8D	DF	07	STA \$07DF
E4FD	20	D9	07	JSR \$07D9
E500	48			PHA
E501	45	F5		EOR \$F5
E503	85	F5		STA \$F5
E505	68			PLA
E506	20	8C	E4	JSR \$E48C
E509	E6	BA		INC \$BA
E50B	D0	02		BNE \$E50F
E50D	E6	B8		INC \$B8
E50F	EE	F3	03	INC \$03F3

```

E512 D0 E2 BNE $E4F6
E514 EE F4 03 INC $03F4
E517 D0 DD BNE $E4F6
E519 A5 F5 LDA $F5
E51B 20 8C E4 JSR $E48C
E51E 20 5D E4 JSR $E45D
E521 20 13 E4 JSR $E413
E524 20 52 E4 JSR $E452
E527 A0 01 LDY $#01
E529 A2 C2 LDX ##C2
E52B 20 13 E4 JSR $E413
E52E CA DEX
E52F D0 FA BNE $E52B
E531 88 DEY
E532 D0 F7 BNE $E52B
E534 60 RTS

```

E535; Write tape header

```

E535 20 19 E3 JSR $E319
E538 20 64 E3 JSR $E364
E53B 20 8D E3 JSR $E38D
E53E B0 26 BCS $E566
E540 A9 80 LDA $#80
E542 85 F7 STA $F7
E544 A5 B6 LDA $B6
E546 85 BA STA $BA
E548 A5 B7 LDA $B7
E54A 85 BB STA $BB
E54C A9 41 LDA $#41
E54E 8D F3 03 STA $03F3
E551 A9 FF LDA $#FF
E553 8D F4 03 STA $03F4
E556 20 BA E4 JSR $E4BA
E559 B0 0B BCS $E566
E55B A5 F7 LDA $F7
E55D 10 06 BPL $E565
E55F A9 00 LDA $#00
E561 85 F7 STA $F7
E563 10 DF BPL $E544
E565 18 CLC
E566 20 B0 E3 JSR $E3B0
E569 4C 78 E3 JMP $E378
E56C 20 C3 E3 JSR $E3C3
E56F 20 B7 E3 JSR $E3B7
E572 A0 00 LDY $#00
E574 A5 B2 LDA $B2
E576 91 B6 STA ($B6),Y
E578 C8 INY
E579 A5 B3 LDA $B3
E57B 91 B6 STA ($B6),Y
E57D C8 INY
E57E A5 9D LDA $9D
E580 91 B6 STA ($B6),Y
E582 C8 INY
E583 A5 9E LDA $9E
E585 91 B6 STA ($B6),Y
E587 C8 INY
E588 8C B3 07 STY $07B3
E58B A0 00 LDY $#00
E58D 8C B2 07 STY $07B2
E590 AC B2 07 LDY $07B2
E593 C4 AB CPY $AB
E595 F0 16 BEQ $E5AD
E597 A9 AF LDA $#AF
E599 8D DF 07 STA $07DF
E59C 20 D9 07 JSR $07D9
E59F AC B3 07 LDY $07B3

```

```

E5A2 91 B6 STA ($B6),Y
E5A4 EE B2 07 INC $07B2
E5A7 EE B3 07 INC $07B3
E5AA 4C 90 E5 JMP $E590
E5AD 4C 35 E5 JMP $E535

```

E5B0; Initiate tape write

```

E5B0 20 19 E3 JSR $E319
E5B3 20 64 E3 JSR $E364
E5B6 20 8D E3 JSR $E38D
E5B9 B0 2F BCS $E5EA
E5BB A9 80 LDA $#80
E5BD 85 F7 STA $F7
E5BF A5 B2 LDA $B2
E5C1 85 BA STA $BA
E5C3 A5 B3 LDA $B3
E5C5 85 BB STA $BB
E5C7 18 CLC
E5C8 A5 9D LDA $9D
E5CA E5 B2 SBC $B2
E5CC 49 FF EOR $#FF
E5CE 8D F3 03 STA $03F3
E5D1 A5 9E LDA $9E
E5D3 E5 B3 SBC $B3
E5D5 49 FF EOR $#FF
E5D7 8D F4 03 STA $03F4
E5DA 20 BA E4 JSR $E4BA
E5DD B0 0B BCS $E5EA
E5DF A5 F7 LDA $F7
E5E1 10 06 BPL $E5E9
E5E3 A9 00 LDA $#00
E5E5 85 F7 STA $F7
E5E7 10 D6 BPL $E5BF
E5E9 18 CLC
E5EA 20 B0 E3 JSR $E3B0
E5ED 4C 78 E3 JMP $E378
E5F0 20 B7 E3 JSR $E3B7
E5F3 A9 05 LDA $#05
E5F5 85 F8 STA $F8
E5F7 4C 35 E5 JMP $E535
E5FA 40 RTI
E5FB 00 BRK
E5FC 80 ???
E5FD AE B8 07 LDX $07B8
E600 AC B9 07 LDY $07B9
E603 AD B8 07 LDA $07B8
E606 48 PHA
E607 AD BA 07 LDA $07BA
E60A 48 PHA
E60B A9 10 LDA $#10
E60D 24 01 BIT $01
E60F F0 FC BEQ $E60D
E611 24 01 BIT $01
E613 D0 FC BNE $E611
E615 8E 02 FF STX $FF02
E618 8C 03 FF STY $FF03
E61B 68 PLA
E61C 8D 04 FF STA $FF04
E61F 68 PLA
E620 8D 05 FF STA $FF05
E623 A9 50 LDA $#50
E625 8D 09 FF STA $FF09
E628 A5 01 LDA $01
E62A C5 01 CMP $01
E62C D0 FA BNE $E628
E62E 29 10 AND $#10
E630 D0 D1 BNE $E603

```

E632 20 CE E3 JSR \$E3CE
 E635 A9 10 LDA ##10
 E637 24 01 BIT \$01
 E639 D0 47 BNE \$E682
 E63B 2C 09 FF BIT \$FF09
 E63E F0 F7 BEQ \$E637
 E640 A5 01 LDA \$01
 E642 C5 01 CMP \$01
 E644 D0 FA BNE \$E640
 E646 29 10 AND ##10
 E648 D0 38 BNE \$E682
 E64A A9 40 LDA ##40
 E64C 2C 09 FF BIT \$FF09
 E64F F0 FB BEQ \$E64C
 E651 A5 01 LDA \$01
 E653 C5 01 CMP \$01
 E655 D0 FA BNE \$E651
 E657 29 10 AND ##10
 E659 D0 2C BNE \$E687
 E65B AD BC 07 LDA \$07BC
 E65E 8D 02 FF STA \$FF02
 E661 AD BD 07 LDA \$07BD
 E664 8D 03 FF STA \$FF03
 E667 A9 10 LDA ##10
 E669 8D 09 FF STA \$FF09
 E66C A9 10 LDA ##10
 E66E 2C 09 FF BIT \$FF09
 E671 F0 FB BEQ \$E66E
 E673 A5 01 LDA \$01
 E675 C5 01 CMP \$01
 E677 D0 FA BNE \$E673
 E679 29 10 AND ##10
 E67B F0 0F BEQ \$E68C
 E67D 2C FC E5 BIT \$E5FC
 E680 30 08 BMI \$E68A
 E682 2C FA E5 BIT \$E5FA
 E685 70 03 BVS \$E68A
 E687 2C FB E5 BIT \$E5FB
 E68A 18 CLC
 E68B 60 RTS
 E68C 38 SEC
 E68D 60 RTS
 E68E 40 RTI
 E68F 00 BRK
 E690 80 ???
 E691 20 FD E5 JSR \$E5FD
 E694 B0 3D BCS \$E6D3
 E696 70 12 BVS \$E6AA
 E698 10 02 BPL \$E69C
 E69A 30 27 BMI \$E6C3
 E69C 20 FD E5 JSR \$E5FD
 E69F B0 32 BCS \$E6D3
 E6A1 70 02 BVS \$E6A5
 E6A3 50 2E BVC \$E6D3
 E6A5 2C 8F E6 BIT \$E68F
 E6AB 18 CLC
 E6A9 60 RTS
 E6AA 20 FD E5 JSR \$E5FD
 E6AD 70 04 BVS \$E6B3
 E6AF 10 0D BPL \$E6BE
 E6B1 30 20 BMI \$E6D3
 E6B3 20 FD E5 JSR \$E5FD
 E6B6 B0 18 BCS \$E6D3
 E6B8 70 F9 BVS \$E6B3
 E6BA 10 17 BPL \$E6D3
 E6BC 30 05 BMI \$E6C3
 E6BE 2C 8E E6 BIT \$E68E
 E6C1 18 CLC
 E6C2 60 RTS

E6C3 20 FD E5 JSR \$E5FD
 E6C6 B0 08 BCS \$E6D3
 E6C8 70 09 BVS \$E6D3
 E6CA 10 02 BPL \$E69C
 E6CC 30 05 BMI \$E6D3
 E6CE 2C 90 E6 BIT \$E690
 E6D1 18 CLC
 E6D2 60 RTS
 E6D3 38 SEC
 E6D4 60 RTS
 E6D5 8A TSX
 E6D6 8E BF 07 STX \$07BF
 E6D9 18 CLC
 E6DA 6E CC 07 ROR \$07CC
 E6DD 58 CLI
 E6DE 20 91 E6 JSR \$E691
 E6E1 B0 FB BCS \$E6DE
 E6E3 70 F9 BVS \$E6DE
 E6E5 10 F7 BPL \$E6DE
 E6E7 20 03 E4 JSR \$E403
 E6EA 18 CLC
 E6EB 60 RTS
 E6EC 2C CC 07 BIT \$07CC
 E6EF 30 51 BMI \$E742
 E6F1 20 D5 E6 JSR \$E6D5
 E6F4 B0 4C BCS \$E742
 E6F6 A9 01 LDA ##01
 E6F8 BD B1 07 STA \$07B1
 E6FB A2 08 LDX ##08
 E6FD 8E B5 07 STX \$07B5
 E700 38 SEC
 E701 6E CC 07 ROR \$07CC
 E704 20 91 E6 JSR \$E691
 E707 B0 39 BCS \$E742
 E709 70 04 BVS \$E70F
 E70B 10 0F BPL \$E71C
 E70D 30 33 BMI \$E742
 E70F 18 CLC
 E710 66 A7 ROR \$A7
 E712 EE B1 07 INC \$07B1
 E715 CE B5 07 DEC \$07B5
 E718 D0 EA BNE \$E704
 E71A F0 08 BEQ \$E724
 E71C 38 SEC
 E71D 66 A7 ROR \$A7
 E71F CE B5 07 DEC \$07B5
 E722 D0 E0 BNE \$E704
 E724 20 91 E6 JSR \$E691
 E727 B0 19 BCS \$E742
 E729 70 04 BVS \$E72F
 E72B 10 08 BPL \$E738
 E72D 30 13 BMI \$E742
 E72F AD B1 07 LDA \$07B1
 E732 29 01 AND ##01
 E734 D0 0C BNE \$E742
 E736 F0 07 BEQ \$E73F
 E738 AD B1 07 LDA \$07B1
 E73B 29 01 AND ##01
 E73D F0 03 BEQ \$E742
 E73F 18 CLC
 E740 90 01 BCC \$E743
 E742 38 SEC
 E743 78 SEI
 E744 08 PHP
 E745 18 CLC
 E746 6E CC 07 ROR \$07CC
 E749 28 PLP
 E74A 60 RTS
 E74B BA TSX

E74C	8E	BE	07	STX	#07BE	E7EF	8D	B7	07	STA	#07B7
E74F	A5	93		LDA	#93	E7F2	20	EC	E6	JSR	#E6EC
E751	F0	03		BEQ	#E756	E7F5	AD	B7	07	LDA	#07B7
E753	38			SEC		E7F8	D0	06		BNE	#E800
E754	66	93		ROR	#93	E7FA	A5	A7		LDA	#A7
E756	20	8D	E3	JSR	#E38D	E7FC	C5	F5		CMP	#F5
E759	20	64	E3	JSR	#E364	E7FE	D0	03		BNE	#E803
E75C	AD	C0	07	LDA	#07C0	E800	4C	0A	E8	JMP	#E80A
E75F	85	B6		STA	#B6	E803	A5	F7		LDA	#F7
E761	AD	C1	07	LDA	#07C1	E805	30	03		BMI	#E80A
E764	85	B7		STA	#B7	E807	4C	B7	E8	JMP	#E8B7
E766	AD	C2	07	LDA	#07C2	E80A	A5	F7		LDA	#F7
E769	8D	F5	03	STA	#03F5	E80C	30	0B		BMI	#E819
E76C	AD	C3	07	LDA	#07C3	E80E	AD	B7	07	LDA	#07B7
E76F	8D	F6	03	STA	#03F6	E811	F0	03		BEQ	#E816
E772	20	1D	E9	JSR	#E91D	E813	4C	B7	E8	JMP	#E8B7
E775	A0	00		LDY	#*00	E816	4C	C7	E8	JMP	#E8C7
E777	8C	B6	07	STY	#07B6	E819	A9	00		LDA	#*00
E77A	8C	B7	07	STY	#07B7	E81B	8D	B6	07	STA	#07B6
E77D	84	F5		STY	#F5	E81E	85	F5		STA	#F5
E77F	84	B1		STY	#B1	E820	AD	C0	07	LDA	#07C0
E781	84	F8		STY	#F8	E823	85	B6		STA	#B6
E783	A9	B6		LDA	#*B6	E825	AD	C1	07	LDA	#07C1
E785	8D	DF	07	STA	#07DF	E828	85	B7		STA	#B7
E788	2C	B0	07	BIT	#07B0	E82A	AD	C2	07	LDA	#07C2
E78B	10	13		BPL	#E7A0	E82D	8D	F5	03	STA	#03F5
E78D	20	EC	E6	JSR	#E6EC	E830	AD	C3	07	LDA	#07C3
E790	B0	0B		BCS	#E79D	E833	8D	F6	03	STA	#03F6
E792	A5	A7		LDA	#A7	E836	20	1D	E9	JSR	#E91D
E794	85	F8		STA	#F8	E839	2C	B0	07	BIT	#07B0
E796	45	F5		EOR	#F5	E83C	10	15		BPL	#E853
E798	85	F5		STA	#F5	E83E	20	EC	E6	JSR	#E6EC
E79A	4C	A0	E7	JMP	#E7A0	E841	24	F8		BIT	#F8
E79D	38			SEC		E843	10	0B		BPL	#E84D
E79E	66	F8		ROR	#F8	E845	A5	A7		LDA	#A7
E7A0	20	EC	E6	JSR	#E6EC	E847	85	F8		STA	#F8
E7A3	B0	19		BCS	#E7BE	E849	90	02		BCC	#E84D
E7A5	A0	00		LDY	#*00	E84B	66	F8		ROR	#F8
E7A7	20	D9	07	JSR	#07D9	E84D	A5	F8		LDA	#F8
E7AA	EA			NOP		E84F	45	F5		EOR	#F5
E7AB	24	93		BIT	#93	E851	85	F5		STA	#F5
E7AD	30	02		BMI	#E7B1	E853	20	EC	E6	JSR	#E6EC
E7AF	A5	A7		LDA	#A7	E856	6E	C4	07	ROR	#07C4
E7B1	C5	A7		CMP	#A7	E859	A5	A7		LDA	#A7
E7B3	D0	09		BNE	#E7BE	E85B	45	F5		EOR	#F5
E7B5	91	B6		STA	(#B6),Y	E85D	85	F5		STA	#F5
E7B7	45	F5		EOR	#F5	E85F	2C	B7	07	BIT	#07B7
E7B9	85	F5		STA	#F5	E862	30	32		BMI	#E896
E7BB	4C	DC	E7	JMP	#E7DC	E864	AC	B6	07	LDY	#07B6
E7BE	AC	B6	07	LDY	#07B6	E867	CC	B7	07	CPY	#07B7
E7C1	C0	1E		CPY	#*1E	E86A	F0	2A		BEQ	#E896
E7C3	B0	12		BCS	#E7D7	E86C	B9	37	04	LDA	#0437,Y
E7C5	A5	B6		LDA	#B6	E86F	C5	B6		CMP	#B6
E7C7	99	37	04	STA	#0437,Y	E871	D0	23		BNE	#E896
E7CA	A5	B7		LDA	#B7	E873	B9	55	04	LDA	#0455,Y
E7CC	99	55	04	STA	#0455,Y	E876	C5	B7		CMP	#B7
E7CF	EE	B6	07	INC	#07B6	E878	D0	1C		BNE	#E896
E7D2	E6	B1		INC	#B1	E87A	EE	B6	07	INC	#07B6
E7D4	4C	DC	E7	JMP	#E7DC	E87D	AD	C4	07	LDA	#07C4
E7D7	A9	FF		LDA	#*FF	E880	30	14		BMI	#E896
E7D9	8D	B6	07	STA	#07B6	E882	A0	00		LDY	#*00
E7DC	E6	B6		INC	#B6	E884	20	D9	07	JSR	#07D9
E7DE	D0	02		BNE	#E7E2	E887	EA			NOP	
E7E0	E6	B7		INC	#B7	E888	24	93		BIT	#93
E7E2	EE	F5	03	INC	#03F5	E88A	30	02		BMI	#E88E
E7E5	D0	B9		BNE	#E7A0	E88C	A5	A7		LDA	#A7
E7E7	EE	F6	03	INC	#03F6	E88E	C5	A7		CMP	#A7
E7EA	D0	B4		BNE	#E7A0	E890	D0	04		BNE	#E896
E7EC	AD	B6	07	LDA	#07B6	E892	C6	B1		DEC	#B1

EB94 91 B6 STA (\$B6),Y
 EB96 E6 B6 INC \$B6
 EB98 D0 02 BNE \$EB9C
 EB9A E6 B7 INC \$B7
 EB9C EE F5 03 INC \$03F5
 EB9F D0 B2 BNE \$EB53
 EBA1 EE F6 03 INC \$03F6
 EBA4 D0 AD BNE \$EB53
 EBA6 20 EC E6 JSR \$E6EC
 EBA9 A9 00 LDA ##00
 EBAB 85 90 STA \$90
 EBAD A5 F8 LDA \$F8
 EBAF A6 B1 LDX \$B1
 EBB1 F0 14 BEQ \$EBC7
 EBB3 24 93 BIT \$93
 EBB5 30 08 BMI \$EBBF
 EBB7 A9 60 LDA ##60
 EBB9 85 90 STA \$90
 EBBB 38 SEC
 EBBC 4C C8 E8 JMP \$EBC8
 EBBF A9 10 LDA ##10
 EBC1 85 90 STA \$90
 EBC3 38 SEC
 EBC4 4C C8 E8 JMP \$EBC8
 EBC7 18 CLC
 EBC8 20 B0 E3 JSR \$E3B0
 EBCB 20 78 E3 JSR \$E378
 EBCE 60 RTS
 EBCF 33 ???
 EBD0 03 ???
 EBD1 41 FF EOR (\$FF,X)
 EBD3 A0 03 LDY ##03
 EBD5 B9 CF E8 LDA \$EBCF,Y
 EBD8 99 C0 07 STA \$07C0,Y
 EBD8 88 DEY
 EBD0 10 F7 BPL \$EBD5
 EBDE 8C B0 07 STY \$07B0
 EBE1 A5 93 LDA \$93
 EBE3 48 PHA
 EBE4 C8 INY
 EBE5 84 93 STY \$93
 EBEB 8C 39 05 STY \$0539
 EBEA 20 48 E7 JSR \$E748
 EBED 68 PLA
 EBEF 85 93 STA \$93
 EBF0 4C C3 E3 JMP \$E3C3

EBF3; Initiate tape read

EBF3 A5 B2 LDA \$B2
 EBF5 8D C0 07 STA \$07C0
 EBF8 A5 B3 LDA \$B3
 EBFA 8D C1 07 STA \$07C1
 EBFD 18 CLC
 EBFE A5 9D LDA \$9D
 EQ00 E5 B2 SBC \$B2
 EQ02 49 FF EOR ##FF
 EQ04 8D C2 07 STA \$07C2
 EQ07 A5 9E LDA \$9E
 EQ09 E5 B3 SBC \$B3
 EQ0B 49 FF EOR ##FF
 EQ0D 8D C3 07 STA \$07C3
 EQ10 18 CLC
 EQ11 6E B0 07 ROR \$07B0
 EQ14 4C 48 E7 JMP \$E748
 EQ17 02 ???
 EQ18 01 02 ORA (\$02,X)
 EQ1A 02 ???

EQ1B 0D 02 A2 ORA \$A202
 EQ1E 05 BD ORA \$BD
 EQ20 17 ???
 EQ21 E9 9D SBC ##9D
 EQ23 B8 CLV
 EQ24 07 ???
 EQ25 CA DEX
 EQ26 10 F7 BPL \$EQ1F
 EQ28 A9 0A LDA ##0A
 EQ2A 8D C5 07 STA \$07C5
 EQ2D 20 FD E5 JSR \$E5FD
 EQ30 B0 F6 BCS \$E928
 EQ32 50 F4 BVC \$E928
 EQ34 CE C5 07 DEC \$07C5
 EQ37 D0 F4 BNE \$E92D
 EQ39 A9 00 LDA ##00
 EQ3B 85 BA STA \$BA
 EQ3D 85 BB STA \$BB
 EQ3F A0 10 LDY ##10
 EQ41 A2 00 LDX ##00
 EQ43 A9 10 LDA ##10
 EQ45 24 01 BIT \$01
 EQ47 F0 FC BEQ \$E945
 EQ49 24 01 BIT \$01
 EQ4B D0 FC BNE \$E949
 EQ4D E8 INX
 EQ4E F0 E9 BEQ \$E939
 EQ50 24 01 BIT \$01
 EQ52 F0 F9 BEQ \$E94D
 EQ54 E8 INX
 EQ55 F0 E2 BEQ \$E939
 EQ57 24 01 BIT \$01
 EQ59 D0 F9 BNE \$E954
 EQ5B 8A TXA
 EQ5C 18 CLC
 EQ5D 65 BA ADC \$BA
 EQ5F 85 BA STA \$BA
 EQ61 A9 00 LDA ##00
 EQ63 65 BB ADC \$BB
 EQ65 85 BB STA \$BB
 EQ67 88 DEY
 EQ68 D0 D7 BNE \$E941
 EQ6A 46 BB LSR \$BB
 EQ6C 66 BA ROR \$BA
 EQ6E 46 BB LSR \$BB
 EQ70 66 BA ROR \$BA
 EQ72 A5 BA LDA \$BA
 EQ74 8D BB 07 STA \$07BB
 EQ77 0A ASL
 EQ78 8D BA 07 STA \$07BA
 EQ7B 8D BC 07 STA \$07BC
 EQ7E A5 BB LDA \$BB
 EQ80 8D B9 07 STA \$07B9
 EQ83 2A ROL
 EQ84 8D BB 07 STA \$07BB
 EQ87 8D BD 07 STA \$07BD
 EQ8A 20 FD E5 JSR \$E5FD
 EQ8D B0 FB BCS \$E98A
 EQ8F 70 F9 BVS \$E98A
 EQ91 10 F7 BPL \$E98A
 EQ93 20 FD E5 JSR \$E5FD
 EQ96 B0 F2 BCS \$E98A
 EQ98 70 F0 BVS \$E98A
 EQ9A 30 EE BMI \$E98A
 EQ9C 18 CLC
 EQ9D 6E CC 07 ROR \$07CC
 EQA0 20 03 E4 JSR \$E403
 EQA3 A9 03 LDA ##03
 EQA5 8D C6 07 STA \$07C6

E9A8 20 F6 E6 JSR \$E6F6
 E9AB 90 03 BCC \$E9B0
 E9AD CE C6 07 DEC \$07C6
 E9B0 20 EC E6 JSR \$E6EC
 E9B3 90 08 BCC \$E9BD
 E9B5 CE C6 07 DEC \$07C6
 E9B8 D0 03 BNE \$E9BD
 E9BA 4C 1D E9 JMP \$E91D
 E9BD A5 A7 LDA \$A7
 E9BF 29 0F AND ##0F
 E9C1 C9 01 CMP ##01
 E9C3 D0 EB BNE \$E9B0
 E9C5 A5 A7 LDA \$A7
 E9C7 29 80 AND ##80
 E9C9 85 F7 STA \$F7
 E9CB 60 RTS

E9CC; Find any tape header

E9CC 20 D3 EB JSR \$E8D3 :FOUND
 E9CF B0 4D BCS \$EA1E
 E9D1 A5 F8 LDA \$F8
 E9D3 C9 05 CMP ##05
 E9D5 F0 43 BEQ \$EA1A
 E9D7 C9 01 CMP ##01
 E9D9 F0 08 BEQ \$E9E3
 E9DB C9 03 CMP ##03
 E9DD F0 04 BEQ \$E9E3
 E9DF C9 04 CMP ##04
 E9E1 D0 E9 BNE \$E9CC
 E9E3 AA TAX
 E9E4 24 9A BIT \$9A
 E9E6 10 2F BPL \$EA17
 E9E8 20 D8 FB JSR \$F8DB
 E9EB 0D 46 4F ORA \$4F46
 E9EE 55 4E EOR \$4E,X
 E9F0 44 ???
 E9F1 20 00 A0 JSR \$A000
 E9F4 04 ???
 E9F5 B1 B6 LDA (\$B6),Y
 E9F7 20 D2 FF JSR \$FFD2
 E9FA C8 INY
 E9FB C0 15 CPY ##15
 E9FD D0 F6 BNE \$E9F5
 E9FF A2 FF LDX ##FF
 EA01 20 EA E2 JSR \$E2EA
 EA04 20 EA E2 JSR \$E2EA
 EA07 CA DEX
 EA08 F0 0D BEQ \$EA17
 EA0A A9 7F LDA ##7F
 EA0C 20 70 DB JSR \$DB70
 EA0F C9 7F CMP ##7F
 EA11 F0 0B BEQ \$EA1E
 EA13 C9 DF CMP ##DF
 EA15 D0 EA BNE \$EA01
 EA17 18 CLC
 EA18 A5 F8 LDA \$F8
 EA1A 60 RTS
 EA1B EA NOP
 EA1C EA NOP
 EA1D EA NOP
 EA1E A9 00 LDA ##00
 EA20 60 RTS

EA21; Find specific header

EA21 20 CC E9 JSR \$E9CC
 EA24 B0 2D BCS \$EA53
 EA26 C9 05 CMP ##05
 EA28 F0 2B BEQ \$EA55
 EA2A A0 FF LDY ##FF
 EA2C C8 INY
 EA2D C4 AB CPY \$AB
 EA2F F0 26 BEQ \$EA57
 EA31 A9 AF LDA \$AF
 EA33 8D DF 07 STA \$07DF
 EA36 20 D9 07 JSR \$07D9
 EA39 D9 37 03 CMP \$0337,Y
 EA3C F0 EE BEQ \$EA2C
 EA3E 46 F8 LSR \$F8
 EA40 90 DF BCC \$EA21
 EA42 A0 FF LDY ##FF
 EA44 8C C3 07 STY \$07C3
 EA47 88 DEY
 EA48 8C C2 07 STY \$07C2
 EA4B A0 01 LDY \$01
 EA4D 20 D5 E8 JSR \$E8D5
 EA50 4C 21 EA JMP \$EA21
 EA53 A9 00 LDA \$00
 EA55 38 SEC
 EA56 60 RTS
 EA57 18 CLC
 EA58 A5 F8 LDA \$F8
 EA5A 60 RTS
 EA5B AD D4 07 LDA \$07D4
 EA5E 29 10 AND ##10
 EA60 F0 32 BEQ \$EA94
 EA62 AD 10 FD LDA \$FD10
 EA65 29 02 AND ##02
 EA67 F0 2B BEQ \$EA94
 EA69 A2 00 LDX \$00
 EA6B 2C D0 07 BIT \$07D0
 EA6E 10 09 BPL \$EA79
 EA70 AD CF 07 LDA \$07CF
 EA73 8E D0 07 STX \$07D0
 EA76 4C 89 EA JMP \$EA89
 EA79 2C CE 07 BIT \$07CE
 EA7C 10 16 BPL \$EA94
 EA7E 2C D6 07 BIT \$07D6
 EA81 30 11 BMI \$EA94
 EA83 AD CD 07 LDA \$07CD
 EA86 8E CE 07 STX \$07CE
 EA89 8D 00 FD STA \$FD00
 EA8C AD D4 07 LDA \$07D4
 EA8F 29 EF AND ##EF
 EA91 8D D4 07 STA \$07D4
 EA94 60 RTS
 EA95 AD D4 07 LDA \$07D4
 EA98 29 08 AND ##08
 EA9A F0 54 BEQ \$EAF0
 EA9C AD D4 07 LDA \$07D4
 EA9F 29 F7 AND ##F7
 EAA1 8D D4 07 STA \$07D4
 EAA4 AD 00 FD LDA \$FD00
 EAA7 F0 19 BEQ \$EAC2
 EAA9 8D D5 07 STA \$07D5
 EAAC C5 FC CMP \$FC
 EAAE D0 07 BNE \$EAB7
 EAB0 A9 00 LDA \$00
 EAB2 8D D6 07 STA \$07D6

EBB5	F0	39	BEQ	EAFF0					
EBB7	C5	FD	CMP	FD					
EBB9	D0	07	BNE	EAC2					
EBBB	A9	FF	LDA	FF					
EBBD	8D	D6	07	STA	07D6				
EAC0	D0	2E	BNE	EAFF0					
EAC2	AD	D3	07	LDA	07D3				
EAC5	C9	3F	CMP	3F					
EAC7	F0	27	BEQ	EAFF0					
EAC9	C9	38	CMP	38					
EACB	D0	0F	BNE	EADC					
EACD	A5	FD	LDA	FD					
EACF	F0	0B	BEQ	EADC					
EAD1	8D	CF	07	STA	07CF				
EAD4	A9	FF	LDA	FF					
EAD6	8D	D0	07	STA	07D0				
EAD9	8D	D7	07	STA	07D7				
EADC	AE	D1	07	LDX	07D1				
EADF	EB			INX					
EAE0	8A			TXA					
EAE1	29	3F		AND	3F				
EAE3	8D	D1	07	STA	07D1				
EAE6	AA			TAX					
EAE7	AD	D5	07	LDA	07D5				
EAEA	9D	F7	03	STA	03F7, X				
EAED	EE	D3	07	INC	07D3				
EAF0	60			RTS					
EAF1	AD	D3	07	LDA	07D3				
EAF4	F0	34		BEQ	EB2A				
EAF6	08			PHP					
EAF7	78			SEI					
EAF8	AE	D2	07	LDX	07D2				
EAFB	EB			INX					
EAFD	8A			TXA					
EAFD	29	3F		AND	3F				
EAFD	8D	D2	07	STA	07D2				
EB02	28			PLP					
EB03	AA			TAX					
EB04	BD	F7	03	LDA	03F7, X				
EB07	48			PHA					
EB08	CE	D3	07	DEC	07D3				
EB0B	AD	D3	07	LDA	07D3				
EB0E	C9	08		CMP	08				
EB10	D0	19		BNE	EB2B				
EB12	2C	D7	07	BIT	07D7				
EB15	10	14		BPL	EB2B				
EB17	A5	FC		LDA	FC				
EB19	F0	10		BEQ	EB2B				
EB1B	8D	CF	07	STA	07CF				
EB1E	38			SEC					
EB1F	6E	D0	07	ROR	07D0				
EB22	4E	D7	07	LSR	07D7				
EB25	2C	D8	07	BIT	07D8				
EB28	10	0B		BPL	EB35				
EB2A	48			PHA					
EB2B	AD	D4	07	LDA	07D4				
EB2E	29	4F		AND	4F				
EB30	49	40		EOR	40				
EB32	85	90		STA	90				
EB34	68			PLA					
EB35	18			CLC					
EB36	60			RTS					
EB37	2C	CE	07	BIT	07CE				
EB3A	30	FB		BMI	EB37				
EB3C	8D	CD	07	STA	07CD				
EB3F	38			SEC					
EB40	6E	CE	07	ROR	07CE				
EB43	4C	2A	EB	JMP	EB2A				
EB46	A9	00		LDA	00				
EB48	A2	0B		LDX	0B				
EB4A	9D	CD	07	STA	07CD, X				
EB4D	CA			DEX					
EB4E	10	FA		BFL	EB4A				
EB50	8D	01	FD	STA	FD01				: ERROR #.
EB53	85	FC		STA	FC				: SEARCHIN
EB55	85	FD		STA	FD				: G FOR .P
EB57	60			RTS					: YES PLA
									: Y ON TAP
									: EPRESS R
									: ECORD &
									: PLAY ON
									: TAPE.LOA
									: DING.SAV
									: ING .VER
									: IFYING.F
									: OUND .OK
EB58;	I/O	error							
EB58	0D	49	2F	ORA	2F49				
EB5B	4F			???					
EB5C	20	45	52	JSR	5245				
EB5F	52			???					
EB60	4F			???					
EB61	52			???					
EB62	20	A3	0D	JSR	0DA3				
EB65	53			???					
EB66	45	41		EOR	41				
EB68	52			???					
EB69	43			???					
EB6A	48			PHA					
EB6B	49	4E		EOR	4E				
EB6D	47			???					
EB6E	A0	46		LDY	46				
EB70	4F			???					
EB71	52			???					
EB73;	Tape	messages...							
EB72	A0	0D		LDY	0D				
EB74	50	52		BVC	EB7C				
EB76	45	53		EOR	53				
EB78	53			???					
EB79	20	50	4C	JSR	4C50				
EB7C	41	59		EOR	59, X				
EB7E	20	4F	4E	JSR	4E4F				
EB81	20	54	41	JSR	4154				
EB84	50	C5		BVC	EB4B				
EB86	50	52		BVC	EBDA				
EB88	45	53		EOR	53				
EB8A	53			???					
EB8B	20	52	45	JSR	4552				
EB8E	43			???					
EB8F	4F			???					
EB90	52			???					
EB91	44			???					
EB92	20	26	20	JSR	2026				
EB95	50	4C		BVC	EBE3				
EB97	41	59		EOR	59, X				
EB99	20	4F	4E	JSR	4E4F				
EB9C	20	54	41	JSR	4154				
EB9F	50	C5		BVC	EB66				
EBA1	0D	4C	4F	ORA	4F4C				
EBA4	41	44		EOR	44, X				
EBA6	49	4E		EOR	4E				
EBA8	C7			???					
EBA9	0D	53	41	ORA	4153				
EBAC	56	49		LSR	49, X				
EBAE	4E	47	A0	LSR	A047				
EBB1	0D	56	45	ORA	4556				
EBB4	52			???					
EBB5	49	46		EOR	46				
EBB7	59	49	4E	EOR	4E49, Y				
EBBA	C7			???					
EBBB	0D	46	4F	ORA	4F46				

```

EBBE 55 4E EOR $4E,X
EBC0 44 ???
EBC1 A0 0D LDY ##0D
EBC3 4F ???
EBC4 4B ???

```

EBC6; Print if direct

```

EBC5 0D 24 9A STA $9A24
EBC8 10 0D BPL $EBD7
EBCA B9 58 EB LDA $EB58,Y
EBCD 08 PHP
EBCE 29 7F AND ##7F
EBD0 20 D2 FF JSR $FFD2
EBD3 C8 INY
EBD4 28 PLP
EBD5 10 F3 BPL $EBCA
ERD7 18 CLC
EBD8 60 RTS

```

EBD9; Get...

```

EBD9 A5 98 LDA $98
EBDB D0 1A BNE $EBF7
EBDD A5 EF LDA $EF
EBDF 0D 5D 05 ORA $055D
EBE2 F0 3E BEQ $EC22
EBE4 78 SEI
EBE5 4C C1 D8 JMP $D8C1

```

EBE8; Input

```

EBE8 A5 98 LDA $98
EBEA D0 0B BNE $EBF7
EBEC A5 CA LDA $CA
EBEE 85 C5 STA $C5
EBF0 A5 CD LDA $CD
EBF2 85 C4 STA $C4
EBF4 4C 65 D9 JMP $D965
EBF7 C9 03 CMP ##03
EBF9 D0 1F BNE $EC1A
EBFB 05 C7 ORA $C7
EBFD 85 C7 STA $C7
EBFF AD E8 07 LDA $07E8
EC02 85 C3 STA $C3
EC04 4C 65 D9 JMP $D965
EC07 20 BA FB JSR $FBBA
EC0A C9 01 CMP ##01
EC0C D0 06 BNE $EC14
EC0E 20 24 EC JSR $EC24
EC11 4C C4 FB JMP $FBC4
EC14 20 F1 EA JSR $EAF1
EC17 4C C4 FB JMP $FBC4
EC1A 90 EB BCC $EC07
EC1C A5 90 LDA $90
EC1E F0 6B BEQ $EC8B
EC20 A9 0D LDA ##0D
EC22 18 CLC
EC23 60 RTS
EC24 AC 39 05 LDY $0539
EC27 C0 BF CPY ##BF
EC29 90 06 BCC $EC31
EC2B 20 D3 EB JSR $EBD3
EC2E 90 F4 BCC $EC24
EC30 60 RTS
EC31 AC 39 05 LDY $0539

```

```

EC34 B1 B6 LDA ($B6),Y
EC36 48 PHA
EC37 C8 INY
EC38 C0 BF CPY ##BF
EC3A B0 09 BCS $EC45
EC3C B1 B6 LDA ($B6),Y
EC3E D0 05 BNE $EC45
EC40 A9 40 LDA ##40
EC42 20 1E F4 JSR $F41E
EC45 EE 39 05 INC $0539
EC48 68 PLA
EC49 18 CLC
EC4A 60 RTS

```

EC4B; Output

```

EC4B 48 PHA
EC4C A5 99 LDA $99
EC4E C9 03 CMP ##03
EC50 D0 04 BNE $EC56
EC52 68 PLA
EC53 4C 49 DC JMP $DC49
EC56 90 04 BCC $EC5C
EC58 68 PLA
EC59 4C DF EC JMP $ECDF
EC5C 20 B7 FB JSR $FBB7
EC5F C9 01 CMP ##01
EC61 D0 21 BNE $EC84
EC63 AC 39 05 LDY $0539
EC66 C0 BF CPY ##BF
EC68 90 0B BCC $EC75
EC6A 20 35 E5 JSR $E535
EC6D B0 0F BCS $EC7E
EC6F A9 02 LDA ##02
EC71 85 F8 STA $F8
EC73 A0 00 LDY ##00
EC75 68 PLA
EC76 91 B6 STA ($B6),Y
EC78 C8 INY
EC79 8C 39 05 STY $0539
EC7C 90 0A BCC $EC88
EC7E 68 PLA
EC7F A9 00 LDA ##00
EC81 4C C4 FB JMP $FBC4
EC84 68 PLA
EC85 20 37 EB JSR $EB37
EC88 4C C1 FB JMP $FBC1
EC8B 86 BA STX $BA
EC8D 24 F9 BIT $F9
EC8F 70 05 BVS $EC96
EC91 A6 BA LDX $BA
EC93 4C 52 E2 JMP $E252
EC96 A5 F9 LDA $F9
EC98 29 30 AND ##30
EC9A AA TAX
EC9B A9 04 LDA ##04
EC9D 9D C0 FE STA $FEC0,X
ECA0 BD C2 FE LDA $FEC2,X
ECA3 30 FB BMI $ECA0
ECA5 A9 00 LDA ##00
ECA7 9D C3 FE STA $FEC3,X
ECAA 9D C2 FE STA $FEC2,X
ECAD BD C2 FE LDA $FEC2,X
ECB0 10 FB BPL $ECAD
ECB2 BD C1 FE LDA $FEC1,X
ECB5 29 03 AND ##03
ECB7 C9 03 CMP ##03
ECB9 D0 02 BNE $ECBD

```

ECBB A9 40 LDA ##40
 ECBD 20 1E F4 JSR \$F41E
 ECC0 BD C0 FE LDA \$FEC0,X
 ECC3 48 PHA
 ECC4 A9 40 LDA ##40
 ECC6 9D C2 FE STA \$FEC2,X
 ECC9 BD C2 FE LDA \$FEC2,X
 ECCC 30 FB BMI \$ECC9
 ECCE A9 FF LDA ##FF
 ECD0 9D C3 FE STA \$FEC3,X
 ECD3 A9 00 LDA ##00
 ECD5 9D C0 FE STA \$FEC0,X
 ECD8 9D C2 FE STA \$FEC2,X
 ECDB 4C D4 ED JMP \$EDD4
 ECDE EA NOP
 ECDF 24 F9 BIT \$F9
 ECE1 30 03 BMI \$ECE6
 ECE3 4C 1D E2 JMP \$E21D
 ECE6 48 PHA
 ECE7 8D E8 05 STA \$05E8
 ECEA A9 83 LDA ##83
 ECEC 86 BA STX \$BA
 ECEE 48 PHA
 ECEF A5 F9 LDA \$F9
 ECF1 29 30 AND ##30
 ECF3 AA TAX
 ECF4 68 PLA
 ECF5 9D C0 FE STA \$FEC0,X
 ECF8 BD C2 FE LDA \$FEC2,X
 ECFB 30 FB BMI \$ECFB
 ECFD AD E8 05 LDA \$05E8
 ED00 9D C0 FE STA \$FEC0,X
 ED03 A9 00 LDA ##00
 ED05 9D C2 FE STA \$FEC2,X
 ED08 BD C2 FE LDA \$FEC2,X
 ED0B 10 FB BPL \$ED0B
 ED0D BD C1 FE LDA \$FEC1,X
 ED10 29 03 AND ##03
 ED12 20 1E F4 JSR \$F41E
 ED15 4C DB ED JMP \$EDDB

ED18; Set input device

ED18 20 E8 EE JSR \$EEE8
 ED19 F0 03 BEQ \$ED20
 ED1D 4C 79 F2 JMP \$F279
 ED20 20 F8 EE JSR \$EEF8
 ED23 F0 11 BEQ \$ED36
 ED25 C9 03 CMP ##03
 ED27 F0 0D BEQ \$ED36
 ED29 B0 0F BCS \$ED3A
 ED2B C9 02 CMP ##02
 ED2D D0 28 BNE \$ED57
 ED2F 20 25 EB JSR \$EB25
 ED32 B0 05 BCS \$ED39
 ED34 A5 AE LDA \$AE
 ED36 85 98 STA \$98
 ED38 18 CLC
 ED39 60 RTS
 ED3A AA TAX
 ED3B 20 FA ED JSR \$EDFA
 ED3E 24 90 BIT \$90
 ED40 30 12 BMI \$ED54
 ED42 A5 AD LDA \$AD
 ED44 10 06 BPL \$ED4C
 ED46 20 13 EE JSR \$EE13
 ED49 4C 4F ED JMP \$ED4F
 ED4C 20 1A EE JSR \$EE1A

ED4F BA TXA
 ED50 24 90 BIT \$90
 ED52 10 E2 BPL \$ED36
 ED54 4C 7F F2 JMP \$F27F
 ED57 A6 AD LDX \$AD
 ED59 E0 60 CPX ##60
 ED5B F0 D9 BEQ \$ED36
 ED5D 4C 82 F2 JMP \$F282

ED60; Set output device

ED60 20 E8 EE JSR \$EEE8
 ED63 F0 03 BEQ \$ED68
 ED65 4C 79 F2 JMP \$F279
 ED68 20 F8 EE JSR \$EEF8
 ED6B D0 03 BNE \$ED70
 ED6D 4C 85 F2 JMP \$F285
 ED70 C9 03 CMP ##03
 ED72 F0 0D BEQ \$ED81
 ED74 B0 0F BCS \$ED85
 ED76 C9 02 CMP ##02
 ED78 D0 27 BNE \$EDA1
 ED7A 20 25 EB JSR \$EB25
 ED7D B0 05 BCS \$ED84
 ED7F A5 AE LDA \$AE
 ED81 85 99 STA \$99
 ED83 18 CLC
 ED84 60 RTS
 ED85 AA TAX
 ED86 20 2C EE JSR \$EE2C
 ED89 24 90 BIT \$90
 ED8B 30 11 BMI \$ED9E
 ED8D A5 AD LDA \$AD
 ED8F 10 05 BPL \$ED96
 ED91 20 45 EE JSR \$EE45
 ED94 D0 03 BNE \$ED99
 ED96 20 4D EE JSR \$EE4D
 ED99 BA TXA
 ED9A 24 90 BIT \$90
 ED9C 10 E3 BPL \$ED81
 ED9E 4C 7F F2 JMP \$F27F
 EDA1 A6 AD LDX \$AD
 EDA3 E0 60 CPX ##60
 EDA5 F0 C6 BEQ \$ED6D
 EDA7 D0 D8 BNE \$ED81
 EDA9 48 PHA
 EDAA 86 BA STX \$BA
 EDAC A2 30 LDX ##30
 EDAE A5 AE LDA \$AE
 ED80 C9 08 CMP ##08
 EDB2 F0 06 BEQ \$EDBA
 EDB4 C9 09 CMP ##09
 EDB6 D0 17 BNE \$EDCF
 EDB8 A2 00 LDX ##00
 EDBA A9 55 LDA \$55
 EDBC 9D C0 FE STA \$FEC0,X
 EDBF 5D C0 FE EOR \$FEC0,X
 EDC2 D0 0B BNE \$EDCF
 EDC4 BD C1 FE LDA \$FEC1,X
 EDC7 29 02 AND ##02
 EDC9 D0 04 BNE \$EDCF
 EDCB 86 F9 STX \$F9
 EDCD 18 CLC
 EDCE 24 38 BIT \$38
 EDD0 A6 BA LDX \$BA
 EDD2 68 PLA
 EDD3 60 RTS
 EDD4 BD C2 FE LDA \$FEC2,X

EDD7 10 FB BPL \$EED4
 EDD9 30 05 BMI \$EED0
 EDDB A9 00 LDA ##00
 EDDD 9D C0 FE STA \$FEC0,X
 EDE0 A9 40 LDA ##40
 EDE2 9D C2 FE STA \$FEC2,X
 EDE5 A6 BA LDX \$BA
 EDE7 68 PLA
 EDE8 18 CLC
 EDE9 60 RTS
 EDEA 8D F2 FE STA \$FEF2
 EDED 8D C5 FE STA \$FEC5
 EDF0 8D C2 FE STA \$FEC2
 EDF3 CA DEX
 EDF4 8E C3 FE STX \$FEC3
 EDF7 4C EA CF JMP \$CFEA

EDFA; Send 'talk'

EDFA 20 A9 ED JSR \$EDA9
 EDFD 90 03 BCC \$EE02
 EDFF 4C 53 E1 JMP \$E153
 EE02 48 PHA
 EE03 A9 40 LDA ##40
 EE05 8D E8 05 STA \$05E8
 EE08 A5 F9 LDA \$F9
 EE0A 09 40 ORA ##40
 EE0C 85 F9 STA \$F9
 EE0E A9 81 LDA ##81
 EE10 4C EC EC JMP \$ECEC
 EE13 24 F9 BIT \$F9
 EE15 70 35 BVS \$EE4C
 EE17 4C 0C E2 JMP \$E20C
 EE1A 24 F9 BIT \$F9
 EE1C 70 03 BVS \$EE21
 EE1E 4C 03 E2 JMP \$E203
 EE21 48 PHA
 EE22 A5 AD LDA \$AD
 EE24 8D E8 05 STA \$05E8
 EE27 A9 82 LDA ##82
 EE29 4C EC EC JMP \$ECEC
 EE2C 20 A9 ED JSR \$EDA9
 EE2F 90 03 BCC \$EE34
 EE31 4C 56 E1 JMP \$E156
 EE34 48 PHA
 EE35 A9 20 LDA ##20
 EE37 8D E8 05 STA \$05E8
 EE3A A5 F9 LDA \$F9
 EE3C 09 80 ORA ##80
 EE3E 85 F9 STA \$F9
 EE40 A9 81 LDA ##81
 EE42 4C EC EC JMP \$ECEC
 EE45 24 F9 BIT \$F9
 EE47 30 03 BMI \$EE4C
 EE49 4C FC E1 JMP \$E1FC
 EE4C 60 RTS
 EE4D 24 F9 BIT \$F9
 EE4F 30 03 BMI \$EE54
 EE51 4C F7 E1 JMP \$E1F7
 EE54 48 PHA
 EE55 8D E8 05 STA \$05E8
 EE58 A9 82 LDA ##82
 EE5A 4C EC EC JMP \$ECEC

EE5D; Close file

EE5D 66 BA ROR \$BA

EESF 20 ED EE JSR \$EED
 EE62 F0 02 BEQ \$EE66
 EE64 18 CLC
 EE65 60 RTS
 EE66 20 F8 EE JSR \$EEF8
 EE69 8A TXA
 EE6A 48 PHA
 EE6B A5 AE LDA \$AE
 EE6D F0 5B BEQ \$EECA
 EE6F C9 03 CMP ##03
 EE71 F0 57 BEQ \$EECA
 EE73 B0 40 BCS \$EEB5
 EE75 C9 02 CMP ##02
 EE77 D0 08 BNE \$EEB1
 EE79 08 PHP
 EE7A 78 SEI
 EE7B 20 46 EB JSR \$EB46
 EE7E 28 PLP
 EE7F F0 49 BEQ \$EECA
 EE81 A5 AD LDA \$AD
 EE83 29 0F AND ##0F
 EE85 F0 43 BEQ \$EECA
 EE87 AC 39 05 LDY \$0539
 EE8A C0 BF CPY ##BF
 EE8C 90 0E BCC \$EE9C
 EE8E 20 35 E5 JSR \$E535
 EE91 B0 12 BCS \$EEA5
 EE93 A9 02 LDA ##02
 EE95 85 F8 STA \$F8
 EE97 A0 00 LDY ##00
 EE99 8C 39 05 STY \$0539
 EE9C A9 00 LDA ##00
 EE9E 91 B6 STA (\$B6),Y
 EEA0 20 35 E5 JSR \$E535
 EEA3 90 04 BCC \$EEA9
 EEA5 68 PLA
 EEA6 A9 00 LDA ##00
 EEA8 60 RTS
 EEA9 A5 AD LDA \$AD
 EEAB C9 62 CMP ##62
 EEAD D0 1B BNE \$EECA
 EEAF 20 F0 E5 JSR \$E5F0
 EEB2 4C CA EE JMP \$EECA
 EEB5 24 BA BIT \$BA
 EEB7 10 0E BPL \$EEC7
 EEB9 A5 AE LDA \$AE
 EEBB C9 08 CMP ##08
 EEBD 90 08 BCC \$EEC7
 EEBF A5 AD LDA \$AD
 EEC1 29 0F AND ##0F
 EEC3 C9 0F CMP ##0F
 EEC5 F0 03 BEQ \$EECA
 EEC7 F0 11 F2 JSR \$F211
 EECA 68 PLA
 EECB AA TAX
 EECF 66 97 DEC \$97
 EECE E4 97 CPX \$97
 EED0 F0 14 BEQ \$EEEE6
 EED2 A4 97 LDY \$97
 EED4 B9 09 05 LDA \$0509,Y
 EED7 9D 09 05 STA \$0509,X
 EEDA B9 13 05 LDA \$0513,Y
 EEDD 9D 13 05 STA \$0513,X
 EEE0 B9 1D 05 LDA \$051D,Y
 EEE3 9D 1D 05 STA \$051D,X
 EEE6 18 CLC
 EEE7 60 RTS
 EEE8 A9 00 LDA ##00
 EEEA 85 90 STA \$90

EEEE	8A		TXA		
EEEE	A6	97	LDX	\$97	
EEEE	CA		DEX		
EEF0	30	15	BMI	\$EF07	
EEF2	DD	09	05	CMP	\$0509,X
EEF5	D0	F8	BNE	\$EEEE	
EEF7	60		RTS		
EEF8; Set file values					
EEF8	BD	09	05	LDA	\$0509,X
EEFB	85	AC		STA	\$AC
EEFD	BD	1D	05	LDA	\$051D,X
EF00	85	AD		STA	\$AD
EF02	BD	13	05	LDA	\$0513,X
EF05	85	AE		STA	\$AE
EF07	60		RTS		
EF08; Abort all files					
EF08	A9	00		LDA	##00
EF0A	85	97		STA	\$97
EF0C; Restore default I/O					
EF0C	A2	03		LDX	##03
EF0E	E4	99		CPX	\$99
EF10	B0	03		BCS	\$EF15
EF12	20	23	EF	JSR	\$EF23
EF15	E4	98		CPX	\$98
EF17	B0	03		BCS	\$EF1C
EF19	20	3B	EF	JSR	\$EF3B
EF1C	86	99		STX	\$99
EF1E	A9	00		LDA	##00
EF20	85	98		STA	\$98
EF22	60		RTS		
EF23	24	F9		BIT	\$F9
EF25	30	03		BMI	\$EF2A
EF27	4C	3D	E2	JMP	\$E23D
EF2A	48			PHA	
EF2B	A9	3F		LDA	##3F
EF2D	8D	E8	05	STA	\$05E8
EF30	A5	F9		LDA	\$F9
EF32	29	7F		AND	##7F
EF34	85	F9		STA	\$F9
EF36	A9	81		LDA	##81
EF38	4C	EC	EC	JMP	\$ECEC
EF3B	24	F9		BIT	\$F9
EF3D	70	03		BVS	\$EF42
EF3F	4C	2F	E2	JMP	\$E22F
EF42	48			PHA	
EF43	A9	5F		LDA	##5F
EF45	8D	E8	05	STA	\$05E8
EF48	A5	F9		LDA	\$F9
EF4A	29	BF		AND	##BF
EF4C	85	F9		STA	\$F9
EF4E	A9	81		LDA	##81
EF50	4C	EC	EC	JMP	\$ECEC
EF53; Do open file					
EF53	A6	AC		LDX	\$AC
EF55	20	E8	EE	JSR	\$EEEE
EF58	D0	03		BNE	\$EF5D
EF5A	4C	76	F2	JMP	\$F276
EF5D	A6	97		LDX	\$97
EF5F	E0	0A		CPX	##0A
EF61	90	03		BCC	\$EF66
EF63	4C	73	F2	JMP	\$F273
EF66	E6	97		INC	\$97
EF68	A5	AC		LDA	\$AC
EF6A	9D	09	05	STA	\$0509,X
EF6D	A5	AD		LDA	\$AD
EF6F	09	60		ORA	##60
EF71	85	AD		STA	\$AD
EF73	9D	1D	05	STA	\$051D,X
EF76	A5	AE		LDA	\$AE
EF78	9D	13	05	STA	\$0513,X
EF7B	F0	09		BEQ	\$EF86
EF7D	C9	03		CMP	##03
EF7F	F0	05		BEQ	\$EF86
EF81	90	05		BCC	\$EF88
EF83	20	05	F0	JSR	\$F005
EF86	18			CLC	
EF87	60			RTS	
EF88	C9	02		CMP	##02
EF8A	D0	2C		BNE	\$EF88
EF8C	20	46	EB	JSR	\$EB46
EF8F	AA			TAX	
EF90	E8			INX	
EF91	F0	0B		BEQ	\$EF9E
EF93	8E	03	FD	STX	\$FD03
EF96	EC	03	FD	CPX	\$FD03
EF99	F0	F5		BEQ	\$EF90
EF9B	4C	7F	F2	JMP	\$F27F
EF9E	38			SEC	
EF9F	6E	D8	07	ROR	\$07D8
EFA2	A9	AF		LDA	##AF
EFA4	8D	DF	07	STA	\$07DF
EFA7	A0	00		LDY	##00
EFA9	20	D9	07	JSR	\$07D9
EFAE	8D	03	FD	STA	\$FD03
EFAC	C8			INY	
EFB0	20	D9	07	JSR	\$07D9
EFB3	8D	02	FD	STA	\$FD02
EFB6	18			CLC	
EFB7	60			RTS	
EFB8	A5	AD		LDA	\$AD
EFBA	29	0F		AND	##0F
EFBC	D0	2C		BNE	\$EFAE
EFBE	20	1B	E3	JSR	\$E31B
EFC1	B0	26		BCS	\$EFE9
EFC3	20	60	F1	JSR	\$F160
EFC6	A5	AB		LDA	\$AB
EFC8	F0	0A		BEQ	\$EFD4
EFCB	20	21	EA	JSR	\$EA21
EFD0	90	10		BCC	\$EFD0
EFCF	F0	18		BEQ	\$EFE9
EFD1	4C	7C	F2	JMP	\$F27C
EFD4	20	CC	E9	JSR	\$E9CC
EFD7	F0	10		BEQ	\$EFE9
EFD9	B0	F6		BCS	\$EFD1
EFD8	C9	05		CMP	##05
EFD0	F0	F2		BEQ	\$EFD1
EFD1	A0	BF		LDY	##BF
EFE1	8C	39	05	STY	\$0539
EFE4	A9	02		LDA	##02
EFE6	85	F8		STA	\$F8
EFE8	18			CLC	
EFE9	60			RTS	
EFEA	20	19	E3	JSR	\$E319
EFEF	B0	FA		BCS	\$EFE9
EFEF	A9	04		LDA	##04
EFF1	85	F8		STA	\$F8

EFF3 20 6C E5 JSR \$E56C
 EFF6 B0 0C BCS \$F004
 EFF8 A9 02 LDA #\$02
 EFFA 85 F8 STA \$F8
 EFFC A0 00 LDY #\$00
 EFFE 8C 39 05 STY \$0539
 F001 8C 37 05 STY \$0537
 F004 60 RTS

F005; Send SA

F005 A5 AD LDA \$AD
 F007 30 DF BMI \$EFEB
 F009 A4 AB LDY \$AB
 F00B F0 DB BEQ \$EFEB
 F00D A9 00 LDA #\$00
 F00F 85 90 STA \$90
 F011 A5 AE LDA \$AE
 F013 20 2C EE JSR \$EE2C
 F016 24 90 BIT \$90
 F018 30 0B BMI \$F025
 F01A A5 AD LDA \$AD
 F01C 09 F0 ORA #\$F0
 F01E 20 4D EE JSR \$EE4D
 F021 A5 90 LDA \$90
 F023 10 05 BPL \$F02A
 F025 68 PLA
 F026 68 PLA
 F027 4C 7F F2 JMP \$F27F
 F02A A5 AB LDA \$AB
 F02C F0 12 BEQ \$F040
 F02E A0 00 LDY #\$00
 F030 A9 AF LDY #\$AF
 F032 8D DF 07 STA \$07DF
 F035 20 D9 07 JSR \$07D9
 F038 20 DF EC JSR \$ECD9
 F03B C8 INY
 F03C C4 AB CPY \$AB
 F03E D0 F0 BNE \$F030
 F040 4C 23 F2 JMP \$F223

F043; Load program

F043 86 B4 STX \$B4
 F045 84 B5 STY \$B5
 F047 6C 2E 03 JMP (\$032E)
 F04A 85 93 STA \$93
 F04C A9 00 LDA #\$00
 F04E 85 90 STA \$90
 F050 A5 AE LDA \$AE
 F052 D0 03 BNE \$F057
 F054 4C 8B F2 JMP \$F28B
 F057 C9 03 CMP #\$03
 F059 F0 F9 BEQ \$F054
 F05B B0 07 BCS \$F064
 F05D C9 02 CMP #\$02
 F05F F0 F3 BEQ \$F054
 F061 4C F0 F0 JMP \$F0F0

F064; From serial

F064 A4 AB LDY \$AB
 F066 D0 03 BNE \$F06B
 F068 4C 8B F2 JMP \$F28B
 F06B A6 AD LDX \$AD
 F06D 20 60 F1 JSR \$F160
 F070 A9 60 LDA \$60
 F072 85 AD STA \$AD
 F074 20 05 F0 JSR \$F005
 F077 A5 AE LDA \$AE

F079 20 FA ED JSR \$EDFA
 F07C A5 AD LDA \$AD
 F07E 20 1A EE JSR \$EE1A
 F081 20 8B EC JSR \$EC8B
 F084 85 9D STA \$9D
 F086 A5 90 LDA \$90
 F088 4A
 F089 4A LSR
 F08A B0 5C BCS \$F0EB
 F08C 20 8B EC JSR \$EC8B
 F08F 85 9E STA \$9E
 F091 8A TXA
 F092 D0 0B BNE \$F09C
 F094 A5 B4 LDA \$B4
 F096 85 9D STA \$9D
 F098 A5 B5 LDA \$B5
 F09A 85 9E STA \$9E
 F09C 20 89 F1 JSR \$F189
 F09F A9 FD LDA #\$FD
 F0A1 25 90 AND \$90
 F0A3 85 90 STA \$90
 F0A5 20 E1 FF JSR \$FFE1
 F0A8 D0 03 BNE \$F0AD
 F0AA 4C FF F1 JMP \$F1FF
 F0AD 20 8B EC JSR \$EC8B
 F0B0 AA TAX
 F0B1 A5 90 LDA \$90
 F0B3 4A LSR
 F0B4 4A LSR
 F0B5 B0 EB BCS \$F09F
 F0B7 8A TXA
 F0B8 A4 93 LDY \$93
 F0BA F0 1B BEQ \$F0D4
 F0BC A0 00 LDY #\$00
 F0BE 8D C7 07 STA \$07C7
 F0C1 A9 9D LDA #\$9D
 F0C3 8D DF 07 STA \$07DF
 F0C6 20 D9 07 JSR \$07D9
 F0C9 CD C7 07 CMP \$07C7
 F0CC F0 0B BEQ \$F0D6
 F0CE A9 10 LDA #\$10
 F0D0 20 1E F4 JSR \$F41E
 F0D3 2C 91 9D BIT \$9D91
 F0D6 E6 9D INC \$9D
 F0D8 D0 02 BNE \$F0DC
 F0DA E6 9E INC \$9E
 F0DC 24 90 BIT \$90
 F0DE 50 BF BVC \$F09F
 F0E0 20 3B EF JSR \$EF3B
 F0E3 20 11 F2 JSR \$F211
 F0E6 90 03 BCC \$F0EB
 F0E8 4C 7C F2 JMP \$F27C
 F0EB A6 9D LDX \$9D
 F0ED A4 9E LDY \$9E
 F0EF 60 RTS

F0F0; From tape

F0F0 20 1B E3 JSR \$E31B
 F0F3 B0 FA BCS \$F0EF
 F0F5 20 60 F1 JSR \$F160
 F0F8 A5 AB LDA \$AB
 F0FA F0 09 BEQ \$F105
 F0FC 20 21 EA JSR \$EA21
 F0FF 90 0B BCC \$F10C
 F101 F0 EC BEQ \$F0EF
 F103 B0 E3 BCS \$F0EB
 F105 20 CC E9 JSR \$E9CC
 F108 F0 E5 BEQ \$F0EF
 F10A B0 DC BCS \$F0EB

```

F10C A5 F8 LDA #F8
F10E C9 01 CMP ##01
F110 F0 12 BEQ $F124
F112 C9 03 CMP ##03
F114 D0 E2 BNE $F0FB
F116 A0 00 LDY ##00
F118 B1 B6 LDA ($B6),Y
F11A 85 B4 STA $B4
F11C C8 INY
F11D B1 B6 LDA ($B6),Y
F11F 85 B5 STA $B5
F121 4C 28 F1 JMP $F128
F124 A5 AD LDA $AD
F126 D0 EE BNE $F116
F128 38 SEC
F129 A0 02 LDY ##02
F12B B1 B6 LDA ($B6),Y
F12D A0 00 LDY ##00
F12F F1 B6 SBC ($B6),Y
F131 AA TAX
F132 A0 03 LDY ##03
F134 B1 B6 LDA ($B6),Y
F136 A0 01 LDY ##01
F138 F1 B6 SBC ($B6),Y
F13A A8 TAY
F13B 18 CLC
F13C 8A TXA
F13D 65 B4 ADC $B4
F13F 85 9D STA $9D
F141 98 TYA
F142 65 B5 ADC $B5
F144 85 9E STA $9E
F146 A5 B4 LDA $B4
F148 85 B2 STA $B2
F14A A5 B5 LDA $B5
F14C 85 B3 STA $B3
F14E 20 89 F1 JSR $F189
F151 20 F3 E8 JSR $E8F3
F154 90 95 BCC $F0EB
F156 A9 1D LDA #$1D
F158 24 93 BIT $93
F15A 10 93 BPL $F0EF
F15C A9 1C LDA ##1C
F15E D0 8F BNE $F0EF

F160; 'searching'

F160 A5 9A LDA $9A
F162 10 24 BPL $F188
F164 A0 0C LDY ##0C
F166 20 CA EB JSR $EBCA
F169 A5 AB LDA $AB
F16B F0 1B BEQ $F188
F16D A0 17 LDY ##17
F16F 20 CA EB JSR $EBCA

F172; Print filename

F172 A4 AB LDY $AB
F174 F0 12 BEQ $F188
F176 A0 00 LDY ##00
F178 A9 AF LDA ##AF
F17A 8D DF 07 STA $07DF
F17D 20 D9 07 JSR $07D9
F180 20 D2 FF JSR $FFD2
F183 C8 INY
F184 C4 AB CPY $AB
F186 D0 F0 BNE $F178
F188 60 RTS

F189; Print 'loading/
verifying'

F189 A0 49 LDY ##49
F18B A5 93 LDA $93
F18D F0 02 BEQ $F191
F18F A0 59 LDY ##59
F191 4C C6 EB JMP $EBC6

F194; Save program

F194 86 9D STX $9D
F196 84 9E STY $9E
F198 AA TAX
F199 B5 00 LDA $00,X
F19B 85 B2 STA $B2
F19D B5 01 LDA $01,X
F19F 85 B3 STA $B3
F1A1 6C 30 03 JMP ($0330)

F1A4; Save link

F1A4 A5 AE LDA $AE
F1A6 D0 03 BNE $F1AB
F1A8 4C 8B F2 JMP $F28B
F1AB C9 03 CMP ##03
F1AD F0 F9 BEQ $F1AB
F1AF C9 02 CMP ##02
F1B1 F0 F5 BEQ $F1AB
F1B3 90 7F BCC $F234

F1B5; Save to serial

F1B5 A9 61 LDA ##61
F1B7 85 AD STA $AD
F1B9 A4 AB LDY $AB
F1BB D0 03 BNE $F1C0
F1BD 4C 88 F2 JMP $F28B
F1C0 20 05 F0 JSR $F005
F1C3 20 28 F2 JSR $F228
F1C6 A5 AE LDA $AE
F1C8 20 2C EE JSR $EE2C
F1CB A5 AD LDA $AD
F1CD 20 4D EE JSR $EE4D
F1D0 A0 00 LDY ##00
F1D2 A5 B3 LDA $B3
F1D4 85 9C STA $9C
F1D6 A5 B2 LDA $B2
F1D8 85 9B STA $9B
F1DA A5 9B LDA $9B
F1DC 20 DF EC JSR $ECD F
F1DF A5 9C LDA $9C
F1E1 20 DF EC JSR $ECD F
F1E4 38 SEC
F1E5 A5 9B LDA $9B
F1E7 E5 9D SBC $9D
F1E9 A5 9C LDA $9C
F1EB E5 9E SBC $9E
F1ED B0 1F BCS $F20E
F1EF A9 9B LDA ##9B
F1F1 8D DF 07 STA $07DF
F1F4 20 D9 07 JSR $07D9
F1F7 20 DF EC JSR $ECD F
F1FA 20 E1 FF JSR $FFE1
F1FD D0 07 BNE $F206
F1FF 20 11 F2 JSR $F211
F202 A9 00 LDA ##00
F204 38 SEC

```

F205 60 RTS

F206; Bump r/w pointer

F206 E6 9B INC \$9B
F208 D0 DA BNE \$F1E4
F20A E6 9C INC \$9C
F20C D0 D6 BNE \$F1E4
F20E 20 23 EF JSR \$EF23
F211 24 AD BIT \$AD
F213 30 11 BMI \$F226
F215 A5 AE LDA \$AE
F217 20 2C EE JSR \$EE2C
F21A A5 AD LDA \$AD
F21C 29 EF AND \$\$EF
F21E 09 E0 ORA \$\$E0
F220 20 4D EE JSR \$EE4D
F223 20 23 EF JSR \$EF23
F226 18 CLC
F227 60 RTS

F228; Print 'saving'

F228 A5 9A LDA \$9A
F22A 10 38 BPL \$F264
F22C A0 51 LDY \$\$51
F22E 20 CA EB JSR \$EBCA
F231 4C 72 F1 JMP \$F172

F234; Save to tape

F234 20 19 E3 JSR \$E319
F237 B0 29 BCS \$F262
F239 20 28 F2 JSR \$F228
F23C A2 03 LDX \$\$03
F23E A5 AD LDA \$AD
F240 29 01 AND \$\$01
F242 D0 02 BNE \$F246
F244 A2 01 LDX \$\$01
F246 B6 FB STX \$FB
F248 20 6C E5 JSR \$E56C
F24B B0 15 BCS \$F262
F24D A9 00 LDA \$\$00
F24F B5 FB STA \$FB
F251 20 B0 E5 JSR \$E5B0
F254 B0 0C BCS \$F262
F256 A5 AD LDA \$AD
F258 29 02 AND \$\$02
F25A F0 05 BEQ \$F261
F25C 20 F0 E5 JSR \$E5F0
F25F B0 01 BCS \$F262
F261 18 CLC
F262 A9 00 LDA \$\$00
F264 60 RTS

F265; Check stop key

F265 A5 91 LDA \$91
F267 C9 7F CMP \$\$7F
F269 D0 07 BNE \$F272
F26B 08 PHP
F26C 20 CC FF JSR \$FFCC
F26F B5 EF STA \$EF
F271 28 PLP
F272 60 RTS

F273; Output error messages

F273 A9 01 LDA \$\$01
F275 2C A9 02 BIT \$02A9
F278 2C A9 03 BIT \$03A9
F27B 2C A9 04 BIT \$04A9
F27E 2C A9 05 BIT \$05A9
F281 2C A9 06 BIT \$06A9
F284 2C A9 07 BIT \$07A9
F287 2C A9 08 BIT \$08A9
F28A 2C A9 09 BIT \$09A9
F28D 48 PHA
F28E 20 CC FF JSR \$FFCC
F291 A0 00 LDY \$\$00
F293 24 9A BIT \$9A
F295 50 0A BVC \$F2A1
F297 20 CA EB JSR \$EBCA
F29A 68 PLA
F29B 48 PHA
F29C 09 30 ORA \$\$30
F29E 20 D2 FF JSR \$FFD2
F2A1 68 PLA
F2A2 38 SEC
F2A3 60 RTS

F2A4; Power reset entry

F2A4 A2 FF LDX \$\$FF
F2A6 78 SEI
F2A7 9A TXS
F2A8 D8 CLD
F2A9 20 A6 CF JSR \$CFA6
F2AC 20 0B F3 JSR \$F30B
F2AF 20 11 CF JSR \$CF11
F2B2 08 PHP
F2B3 30 07 BMI \$F2BC
F2B5 A9 A5 LDA \$\$A5
F2B7 CD 08 05 CMP \$0508
F2BA F0 03 BEQ \$F2BF
F2BC 20 52 F3 JSR \$F352
F2BF 20 CE F2 JSR \$F2CE
F2C2 20 4E D8 JSR \$D84E
F2C5 28 PLP
F2C6 30 03 BMI \$F2CB
F2C8 4C 45 F4 JMP \$F445
F2CB 4C 00 B0 JMP \$B000

F2CE; Kernal reset

F2CE A2 EB LDX \$\$EB
F2D0 A0 F2 LDY \$\$F2
F2D2 18 CLC

F2D3; Kernal move

F2D3 B6 B8 STX \$B8
F2D5 B4 B9 STY \$B9
F2D7 A0 1F LDY \$\$1F
F2D9 B9 12 03 LDA \$0312,Y
F2DC B0 02 BCS \$F2E0
F2DE B1 B8 LDA (\$B8),Y
F2E0 99 12 03 STA \$0312,Y
F2E3 90 02 BCC \$F2E7


```

F2E5 91 B8 STA ($B8),Y
F2E7 88 DEY
F2E8 10 EF BPL $F2D9
F2EA 60 RTS

```

F2EB; IRQ vectors

```

F2EB 42 ???
F2EC CE 0E CE DEC $CE0E
F2EF 4C F4 53 JMP $53F4
F2F2 EF ???
F2F3 5D EE 18 EOR $18EE,X
F2F6 ED 60 ED SBC $ED60
F2F9 0C ???
F2FA EF ???
F2FB E8 INX
F2FC EB ???
F2FD 4B ???
F2FE EC 65 F2 CPX $F265
F301 D9 EB 08 CMP $08EB,Y
F304 EF ???
F305 4C F4 4A JMP $4AF4
F308 F0 A4 BEQ $F2AE

```

F30B; Initialize I/O

```

F30A F1 A9 SBC ($A9),Y
F30C 0F ???
F30D 85 00 STA $00
F30F A9 08 LDA #$08
F311 85 01 STA $01
F313 A2 FF LDX #$FF
F315 0E 10 FD STX $FD10
F318 0E F3 FE STX $FEF3
F31B EB INX
F31C 0E F4 FE STX $FEF4
F31F 8E F0 FE STX $FEF0
F322 A9 40 LDA #$40
F324 8D F5 FE STA $FEF5
F327 20 EA ED JSR $EDEA
F32A BD 38 F3 LDA $F338,X
F32D 9D 00 FF STA $FF00,X
F330 EB INX
F331 E0 1A CPX #$1A
F333 D0 F5 BNE $F32A
F335 4C 46 EB JMP $EB46
F338 F1 39 SBC ($39),Y
F33A 00 BRK
F33B 00 BRK
F33C 00 BRK
F33D 00 BRK
F33E 1B ???
F33F 0B PHP
F340 00 BRK
F341 00 BRK
F342 02 ???
F343 CC 00 00 CPY $0000
F344 00 BRK
F347 00 BRK
F348 00 BRK
F349 00 BRK
F34A 04 ???
F34B D0 08 BNE $F355
F34D 71 5B ADC ($5B),Y
F34F 75 77 ADC $77,X

```

F352; Initialize system const.

```

F351 6E A9 00 ROR $00A9
F354 A8 TAY
F355 99 02 00 STA $0002,Y
F358 99 00 02 STA $0200,Y
F35B 99 00 03 STA $0300,Y
F35E 99 00 04 STA $0400,Y
F361 99 00 07 STA $0700,Y
F364 C8 INY
F365 D0 EE BNE $F355
F367 A2 08 LDX #$08
F369 86 9F STX $9F
F36B BD F5 FF LDA $FFF5,X
F36E 9D F5 FF STA $FFF5,X
F371 DD F5 3F CMP $3FF5,X
F374 D0 01 BNE $F377
F376 C8 INY
F377 DD F5 7F CMP $7FF5,X
F37A D0 02 BNE $F37E
F37C C6 9F DEC $9F
F37E CA DEX
F37F D0 EA BNE $F36B
F381 C0 08 CPY #$08
F383 F0 07 BEQ $F38C
F385 A5 9F LDA $9F
F387 D0 08 BNE $F391
F389 A0 7F LDY #$7F
F38B 2C A0 3F BIT $3FA0
F38E A2 F6 LDX #$F6
F390 2C A0 FD BIT $FDA0
F393 18 CLC
F394 20 2F F4 JSR $F42F
F397 A9 10 LDA #$10
F399 8D 32 05 STA $0532
F39C A2 3A LDX #$3A
F39E BD D1 F3 LDA $F3D1,X
F3A1 9D 5E 05 STA $055E,X
F3A4 CA DEX
F3A5 D0 F7 BNE $F39E
F3A7 8E 5D 05 STX $055D
F3AA A2 0B LDX #$0B
F3AC BD B3 CF LDA $CFB3,X
F3AF 9D D9 07 STA $07D9,X
F3B2 CA DEX
F3B3 10 F7 BPL $F3AC
F3B5 A2 0F LDX #$0F
F3B7 BD 43 E1 LDA $E143,X
F3BA 9D 13 01 STA $0113,X
F3BD CA DEX
F3BE 10 F7 BPL $F3B7
F3C0 A9 A5 LDA #$A5
F3C2 BD 08 05 STA $0508
F3C5 A9 04 LDA #$04
F3C7 BD FA 07 STA $07FA
F3CA A9 18 LDA #$18
F3CC BD FB 07 STA $07FB
F3CF 60 RTS

```

F3D0; Function key commands

```

F3D0 EA NOP
F3D1 EA NOP
F3D2 07 ???

```

F3D3	06	0A	ASL	\$0A			
F3D5	07		???				
F3D6	06	04	ASL	\$04	F423;	Set timeout	
F3D8	05	05	ORA	\$05			
F3DA	47		???		:GRAPHICD	F423	8D 35 05 STA \$0535
F3DB	52		???		:LOAD"DIR	F426	60 RTS
F3DC	41	50	EOR	(\$50,X)	:ECTORY.S		
F3DE	48		PHA		:CNCLR.DS		
F3DF	49	43	EOR	##43	:AVE"RUN.	F427;	Read/set top of
F3E1	44		???		:LIST.HEL		memory
F3E2	4C	4F 41	JMP	\$414F	:P...+./.		
F3E5	44		???			F427	90 06 BCC \$F42F
F3E6	22		???				
F3E7	44		???				
F3E8	49	52	EOR	##52		F429;	Read top of memory
F3EA	45	43	EOR	\$43			
F3EC	54		???			F429	AE 33 05 LDX \$0533
F3ED	4F		???			F42C	AC 34 05 LDY \$0534
F3EE	52		???				
F3EF	59	0D 53	EOR	\$530D,Y			
F3F2	43		???			F42F;	Set top of memory
F3F3	4E	43 4C	LSR	\$4C43			
F3F6	52		???			F42F	8E 33 05 STX \$0533
F3F7	0D	44 53	ORA	\$5344		F432	8C 34 05 STY \$0534
F3FA	41	56	EOR	(\$56,X)		F435	60 RTS
F3FC	45	22	EOR	\$22			
F3FE	52		???				
F3FF	55	4E	EOR	\$4E,X		F436;	Read/set bottom of
F401	0D	4C 49	ORA	\$494C			memory
F404	53		???				
F405	54		???			F436	90 06 BCC \$F43E
F406	0D	48 45	ORA	\$4548		F438	AE 31 05 LDX \$0531
F409	4C	50 0D	JMP	\$0D50		F438	AC 32 05 LDY \$0532
						F43E	8E 31 05 STX \$0531
						F441	8C 32 05 STY \$0532
						F444	60 RTS
F40C;	Save filename data						
F40C	85	AB	STA	\$AB			
F40E	86	AF	STX	\$AF	F445;	Perform [MONITOR]	
F410	84	B0	STY	\$B0			
F412	60		RTS			F445	A2 00 LDX ##00
						F447	8E 54 05 STX \$0554
						F44A	F0 0C BEQ \$F458
F413;	Save file details						
F413	85	AC	STA	\$AC	F44C;	BRK/USR entry	
F415	86	AE	STX	\$AE			
F417	84	AD	STY	\$AD			
F419	60		RTS			F44C	D8 CLD
						F44D	A2 05 LDX ##05
						F44F	68 PLA
F41A;	Flag status						
F41A	85	9A	STA	\$9A		F450	9D 52 05 STA \$0552,X
						F453	CA DEX
						F454	10 F9 BPL \$F44F
						F456	A2 09 LDX ##09
						F458	8E F4 07 STX \$07F4
						F45B	A9 C0 LDA ##C0
F41C;	Get status						
F41C	A5	90	LDA	\$90		F45D	85 9A STA \$9A
						F45F	BA TSX
						F460	8E 58 05 STX \$0558
						F463	AE F4 07 LDX \$07F4
F41E;	Set status						
F41E	05	90	ORA	\$90		F466	20 66 CF JSR \$CF66
F420	85	90	STA	\$90		F469	AD 06 FF LDA \$FF06
F422	60		RTS			F46C	09 10 ORA ##10
						F46E	8D 06 FF STA \$FF06
						F471	A9 00 LDA ##00
						F473	85 A1 STA \$A1
						F475	85 A2 STA \$A2
						F477	58 CLI

F47B; Perform ['R']

F47B A2 0F LDX ##0F
 F47A 20 66 CF JSR \$CF66
 F47D AD 52 05 LDA \$0552
 F480 20 10 FB JSR \$FB10
 F483 A0 00 LDY ##00
 F485 B9 53 05 LDA \$0553,Y
 F488 20 05 FB JSR \$FB05
 F48B CB INY
 F48C C0 06 CPY ##06
 F48E 90 F5 BCC \$F485
 F490 B0 03 BCS \$F495
 F492 20 0B FB JSR \$FB0B
 F495 20 3A FB JSR \$FB3A
 F498 A2 00 LDX ##00
 F49A B6 F3 STX \$F3
 F49C 20 CF FF JSR \$FFCF
 F49F 9D 00 02 STA \$0200,X
 F4A2 EB INX
 F4A3 C9 0D CMP ##0D
 F4A5 D0 F5 BNE \$F49C
 F4A7 CA DEX
 F4A8 B6 F4 STX \$F4
 F4AA 20 3F FB JSR \$FB3F
 F4AD F0 E6 BEQ \$F495
 F4AF C9 20 CMP ##20
 F4B1 F0 F7 BEQ \$F4AA
 F4B3 A2 0F LDX ##0F
 F4B5 DD 70 F5 CMP \$F570,X
 F4B8 F0 05 BEQ \$F4BF
 F4BA CA DEX
 F4BB 10 FB BPL \$F4B5
 F4BD 30 D3 BMI \$F492
 F4BF E0 0D CPX ##0D
 F4C1 B0 0E BCS \$F4D1
 F4C3 BA TXA
 F4C4 0A ASL
 F4C5 AA TAX
 F4C6 BD B1 F5 LDA \$F5B1,X
 F4C9 48 PHA
 F4CA BD B0 F5 LDA \$F5B0,X
 F4CD 48 PHA
 F4CE 4C AD FA JMP \$FAAD
 F4D1 BD 5B 05 STA \$055B
 F4D4 4C 6E F6 JMP \$F66E

F4D7; Perform ['M']

F4D7 B0 08 BCS \$F4E1
 F4D9 20 5B FB JSR \$FB5B
 F4DC 20 AD FA JSR \$FAAD
 F4DF 90 06 BCC \$F4E7
 F4E1 A9 0B LDA ##0B
 F4E3 B5 F1 STA \$F1
 F4E5 D0 0E BNE \$F4F5
 F4E7 20 64 FB JSR \$FB64
 F4EA 4A LSR
 F4EB 66 F1 ROR \$F1
 F4ED 4A LSR
 F4EE 66 F1 ROR \$F1
 F4F0 4A LSR
 F4F1 66 F1 ROR \$F1
 F4F3 B5 F2 STA \$F2
 F4F5 20 E1 FF JSR \$FFE1
 F4F8 F0 0D BEQ \$F507

F4FA 20 9A F5 JSR \$F59A
 F4FD A9 08 LDA ##08
 F4FF 20 96 FB JSR \$FB96
 F502 20 72 FB JSR \$FB72
 F505 B0 EE BCS \$F4F5
 F507 4C 95 F4 JMP \$F495
 F50A B0 FB BCS \$F507
 F50C A5 F1 LDA \$F1
 F50E A4 F2 LDY \$F2
 F510 B0 53 05 STA \$0553
 F513 8C 52 05 STY \$0552
 F516 A0 00 LDY ##00
 F518 20 AD FA JSR \$FAAD
 F51B B0 EA BCS \$F507
 F51D A5 F1 LDA \$F1
 F51F 99 54 05 STA \$0554,Y
 F522 C8 INY
 F523 C0 05 CPY ##05
 F525 90 F1 BCC \$F518
 F527 B0 DE BCS \$F507

F529; Perform ['>']

F529 B0 13 BCS \$F53E
 F52B 20 5B FB JSR \$FB5B
 F52E A0 00 LDY ##00
 F530 20 AD FA JSR \$FAAD
 F533 B0 09 BCS \$F53E
 F535 A5 F1 LDA \$F1
 F537 91 A1 STA (\$A1),Y
 F539 C8 INY
 F53A C0 08 CPY ##08
 F53C 90 F2 BCC \$F530
 F53E 20 DB FB JSR \$FBDB
 F541 1B ???
 F542 4F ???
 F543 91 00 STA (\$00),Y
 F545 20 9A F5 JSR \$F59A
 F548 4C 95 F4 JMP \$F495

F54B; Perform ['G']

F54B B0 0A BCS \$F557
 F54D A5 F1 LDA \$F1
 F54F B0 53 05 STA \$0553
 F552 A5 F2 LDA \$F2
 F554 B0 52 05 STA \$0552
 F557 AE 58 05 LDX \$0558
 F55A 9A TXS
 F55B A2 00 LDX ##00
 F55D BD 52 05 LDA \$0552,X
 F560 48 PHA
 F561 E8 INX
 F562 E0 03 CPX ##03
 F564 D0 F7 BNE \$F55D
 F566 AE 56 05 LDX \$0556
 F569 AC 57 05 LDY \$0557
 F56C AD 55 05 LDA \$0555
 F56F 40 RTI

F570; Monitor commands

F570 58 CLI
 F571 4D 52 47 EOR \$4752
 F574 54 ???
 F575 43 ???

F576 44 ???
 F577 41 2E EOR (#2E,X)
 F579 48 PHA
 F57A 46 3E LSR #3E
 F57C 38 ???
 F57D 4C 53 56 JMP #5653
 F580 02 ???
 F581 00 ???

F582; Addresses for
 Monitor commands

F582 D6 F4 DEC #F4,X
 F584 77 ???
 F585 F4 ???
 F586 4A LSR
 F587 F5 D0 SBC #D0,X
 F589 F5 CD SBC #CD,X
 F58B F5 23 SBC #23,X
 F58D F7 ???
 F58E 1E F9 1E ASL #1EF9,X
 F591 F9 0D F6 SBC #F60D,Y
 F594 09 F7 ORA ##F7
 F596 28 PLP
 F597 F5 09 SBC #09,X
 F599 F5 20 SBC #20,X
 F59B 3A ???
 F59C FB ???
 F59D A9 3E LDA ##3E
 F59F 20 D2 FF JSR #FFD2
 F5A2 20 FB FA JSR #FAFB
 F5A5 A0 00 LDY ##00
 F5A7 20 96 CF JSR #CF96
 F5AA 20 05 FB JSR #FB05
 F5AD C8 INY
 F5AE C0 08 CPY ##08
 F5B0 90 F5 BCC #F5A7
 F5B2 20 D8 FB JSR #FBDB
 F5B5 3A ???
 F5B6 12 ???
 F5B7 00 BRK
 F5B8 A0 00 LDY ##00
 F5BA 20 96 CF JSR #CF96
 F5BD 29 7F AND ##7F
 F5BF C9 20 CMP ##20
 F5C1 B0 02 BCS #F5C5
 F5C3 A9 2E LDA ##2E
 F5C5 20 D2 FF JSR #FFD2
 F5C8 C8 INY
 F5C9 C0 08 CPY ##08
 F5CB 90 ED BCC #F5BA
 F5CD 60 RTS

F5CE; Perform ['C']

F5CE A9 00 LDA ##00
 F5D0 2C A9 80 BIT #80A9

F5D1; Perform ['T']

F5D3 85 BB STA #BB
 F5D5 20 A0 FB JSR #FBA0
 F5D8 B0 30 BCS #F60A
 F5DA 20 AD FA JSR #FAAD
 F5DD B0 2B BCS #F60A

F5DF 20 3A FB JSR #FB3A
 F5E2 A0 00 LDY ##00
 F5E4 20 96 CF JSR #CF96
 F5E7 24 BB BIT #BB
 F5E9 10 02 BPL #F5ED
 F5EB 91 F1 STA (#F1),Y
 F5ED D1 F1 CMP (#F1),Y
 F5EF F0 08 BEQ #F5F9
 F5F1 20 E1 FF JSR #FFE1
 F5F4 F0 11 BEQ #F607
 F5F6 20 FB FA JSR #FAFB
 F5F9 E6 F1 INC #F1
 F5FB D0 02 BNE #F5FF
 F5FD E6 F2 INC #F2
 F5FF 20 94 FB JSR #FB94
 F602 20 86 FB JSR #FB86
 F605 B0 DD BCS #F5E4
 F607 4C 95 F4 JMP #F495
 F60A 4C 92 F4 JMP #F492
 F60D EA NOP

F60E; Perform ['H']

F60E 20 A0 FB JSR #FBA0
 F611 B0 F7 BCS #F60A
 F613 A0 00 LDY ##00
 F615 20 3F FB JSR #FB3F
 F618 C9 27 CMP ##27
 F61A D0 12 BNE #F62E
 F61C 20 3F FB JSR #FB3F
 F61F 99 5D 02 STA #025D,Y
 F622 C8 INY
 F623 20 3F FB JSR #FB3F
 F626 F0 1B BEQ #F643
 F628 C0 20 CFY ##20
 F62A D0 F3 BNE #F61F
 F62C F0 15 BEQ #F643
 F62E 8C 5C 05 STY #055C
 F631 20 AB FA JSR #FAAB
 F634 A5 F1 LDA #F1
 F636 99 5D 02 STA #025D,Y
 F639 C8 INY
 F63A 20 AD FA JSR #FAAD
 F63D B0 04 BCS #F643
 F63F C0 20 CPY ##20
 F641 D0 F1 BNE #F634
 F643 8C 5B 05 STY #055B
 F646 20 3A FB JSR #FB3A
 F649 A2 00 LDX ##00
 F64B A0 00 LDY ##00
 F64D 20 96 CF JSR #CF96
 F650 DD 5D 02 CMP #025D,X
 F653 D0 0F BNE #F664
 F655 C8 INY
 F656 EB INX
 F657 EC 5B 05 CPX #055B
 F65A D0 F1 BNE #F64D
 F65C 20 E1 FF JSR #FFE1
 F65F F0 A6 BEQ #F607
 F661 20 FB FA JSR #FAFB
 F664 20 94 FB JSR #FB94
 F667 20 86 FB JSR #FB86
 F66A B0 DD BCS #F649
 F66C 90 99 BCC #F607
 F66E A0 01 LDY ##01
 F670 84 AE STY #AE
 F672 84 AD STY #AD
 F674 88 DEY

```

F675 84 AB STY $AB
F677 84 90 STY $90
F679 84 93 STY $93
F67B A9 02 LDA ##02
F67D 85 80 STA $B0
F67F A9 5D LDA ##5D
F681 85 AF STA $AF
F683 20 3F FB JSR $FB3F
F686 F0 5E BEQ $F6E6
F688 C9 20 CMP ##20
F68A F0 F7 BEQ $F683
F68C C9 22 CMP ##22
F68E D0 17 BNE $F6A7
F690 A6 F3 LDX $F3
F692 E4 F4 CPX $F4
F694 B0 50 BCS $F6E6
F696 BD 00 02 LDA $0200,X
F699 EB INX
F69A C9 22 CMP ##22
F69C F0 0D BEQ $F6AB
F69E 91 AF STA ($AF),Y
F6A0 E6 AB INC $AB
F6A2 C8 INY
F6A3 C0 11 CPY ##11
F6A5 90 EB BCC $F692
F6A7 4C 92 F4 JMP $F492
F6AA EA NOP
F6AB 86 F3 STX $F3
F6AD 20 3F FB JSR $FB3F
F6B0 20 AD FA JSR $FAAD
F6B3 B0 31 BCS $F6E6
F6B5 A5 F1 LDA $F1
F6B7 F0 EE BEQ $F6A7
F6B9 C9 03 CMP ##03
F6BB F0 EA BEQ $F6A7
F6BD 85 AE STA $AE
F6BF 20 AD FA JSR $FAAD
F6C2 B0 22 BCS $F6E6
F6C4 20 5B FB JSR $FB5B
F6C7 20 AD FA JSR $FAAD

```

F6CA; Print '?'

```

F6CA B0 DB BCS $F6A7
F6CC 20 3A FB JSR $FB3A
F6CF A6 F1 LDX $F1
F6D1 A4 F2 LDY $F2
F6D3 AD 5B 05 LDA $055B
F6D6 C9 53 CMP ##53
F6D8 D0 0C BNE $F6A7
F6DA A9 00 LDA ##00
F6DC 85 AD STA $AD
F6DE A9 A1 LDA ##A1

```

F6E0; Perform ['S']

```

F6E0 20 DB FF JSR $FFDB
F6E3 4C 93 F4 JMP $F495
F6E6 AD 5B 05 LDA $055B
F6E9 C9 56 CMP ##56
F6EB F0 06 BEQ $F6F3
F6ED C9 4C CMP ##4C
F6EF D0 B6 BNE $F6A7

```

F6F1; Perform ['L']

```
F6F1 A9 00 LDA ##00
```

F6F3; Perform ['V']

```

F6F3 20 D5 FF JSR $FFD5
F6F6 A5 90 LDA $90
F6F8 29 10 AND ##10
F6FA F0 E7 BEQ $F6E3
F6FC AD 5B 05 LDA $055B
F6FF C9 4C CMP ##4C
F701 F0 A4 BEQ $F6A7
F703 A2 2A LDX ##2A
F705 20 66 CF JSR $CF66
F708 30 D9 BMI $F6E3

```

F70A; Perform ['F']

```

F70A 20 A0 FB JSR $FBA0
F70D B0 98 BCS $F6A7
F70F 20 AD FA JSR $FAAD
F712 B0 93 BCS $F6A7
F714 A0 00 LDY ##00
F716 A5 F1 LDA $F1
F718 91 A1 STA ($A1),Y
F71A 20 94 FB JSR $FB94
F71D 20 86 FB JSR $FB86
F720 B0 F4 BCS $F716
F722 90 BF BCC $F6E3

```

F724; Perform ['D']

```

F724 B0 08 BCS $F72E
F726 20 5B FB JSR $FB5B
F729 20 AD FA JSR $FAAD
F72C 90 06 BCC $F734
F72E A9 14 LDA ##14
F730 85 F1 STA $F1
F732 D0 03 BNE $F737
F734 20 64 FB JSR $FB64
F737 20 3A FB JSR $FB3A
F73A 20 E1 FF JSR $FFE1
F73D F0 A4 BEQ $F6E3
F73F 20 52 F7 JSR $F752
F742 E6 F6 INC $F6
F744 A5 F6 LDA $F6
F746 20 96 FB JSR $FB96
F749 A5 F6 LDA $F6
F74B 20 74 FB JSR $FB74
F74E B0 E7 BCS $F737
F750 90 91 BCC $F6E3
F752 A9 2E LDA ##2E
F754 20 D2 FF JSR $FFD2
F757 20 08 FB JSR $FB08
F75A 20 FB FA JSR $FAFB
F75D 20 08 FB JSR $FB08
F760 A0 00 LDY ##00
F762 20 96 CF JSR $CF96
F765 20 D4 F7 JSR $F7D4
F768 AB PHA
F769 A6 F6 LDX $F6
F76B EB INX
F76C CA DEX

```

F76D	10	0B	BPL	\$F77A	F7F2	A0	80	LDY	##80		
F76F	20	0B	FB	JSR	\$FBDB	F7F4	A9	00	LDA	##00	
F772	20	20	20	JSR	\$2020	F7F6	AA		TAX		
F775	00			BRK		F7F7	BD	81	FB	LDA	\$F8B1, X
F776	4C	80	F7	JMP	\$F780	F7FA	8D	4B	05	STA	\$054B
F779	EA			NOP		F7FD	29	03	AND	##03	
F77A	20	96	CF	JSR	\$CF96	F7FF	85	F6	STA	\$F6	
F77D	20	05	FB	JSR	\$FB05	F801	9B		TYA		
F780	C8			INY		F802	29	8F	AND	##8F	
F781	C0	03	CPY	##03	F804	AA		TAX			
F783	90	E7	BCC	\$F76C	F805	9B		TYA			
F785	68			PLA	F806	A0	03	LDY	##03		
F786	A2	03	LDX	##03	F808	E0	8A	CPX	##8A		
F788	20	1B	FB	JSR	\$F81B	F80A	F0	0B	BEQ	\$F817	
F78B	A2	06	LDX	##06	F80C	4A		LSR			
F78D	E0	03	CPX	##03	F80D	90	0B	BCC	\$F817		
F78F	D0	14	BNE	\$F7A5	F80F	4A		LSR			
F791	A4	F6	LDY	\$F6	F810	4A		LSR			
F793	F0	10	BEQ	\$F7A5	F811	09	20	ORA	##20		
F795	AD	4B	05	LDA	\$054B	F813	8B		DEY		
F798	C9	E8	CMP	##E8	F814	00	FA	BNE	\$F810		
F79A	20	96	CF	JSR	\$CF96	F816	C8		INY		
F79D	B0	1D	BCS	\$F7BC	F817	8B		DEY			
F79F	20	10	FB	JSR	\$FB10	F818	D0	F2	BNE	\$F80C	
F7A2	8B			DEY	F81A	60		RTS			
F7A3	D0	F0	BNE	\$F795	F81B	AB		TAY			
F7A5	0E	4B	05	ASL	\$054B	F81C	B9	9B	FB	LDA	\$F87B, Y
F7A8	90	0E	BCC	\$F7B8	F81F	85	9F	STA	\$9F		
F7AA	BD	8E	FB	LDA	\$F88E, X	F821	B9	DB	FB	LDA	\$F8DB, Y
F7AD	20	D2	FF	JSR	\$FFD2	F824	B5	A0	STA	\$A0	
F7B0	BD	94	FB	LDA	\$F894, X	F826	A9	00	LDA	##00	
F7B3	F0	03	BEQ	\$F7B8	F828	A0	05	LDY	##05		
F7B5	20	D2	FF	JSR	\$FFD2	F82A	06	A0	ASL	\$A0	
F7B8	CA			DEX		F82C	26	9F	ROL	\$9F	
F7B9	D0	D2	BNE	\$F78D	F82E	2A		ROL			
F7BB	60			RTS	F82F	8B		DEY			
F7BC	20	C8	F7	JSR	\$F7C8	F830	D0	F8	BNE	\$F82A	
F7BF	1B			CLC	F832	69	3F	ADC	##3F		
F7C0	69	01	ADC	##01	F834	20	D2	FF	JSR	\$FFD2	
F7C2	D0	01	BNE	\$F7C5	F837	CA		DEX			
F7C4	EB			INX	F838	D0	EC	BNE	\$F826		
F7C5	4C	FF	FA	JMP	\$FAFF	F83A	4C	0B	FB	JMP	\$FB0B
F7C8	A6	A2	LDX	\$A2	F83D	40		RTI			
F7CA	AB			TAY	F83E	02		???			
F7CB	10	01	BPL	\$F7CE	F83F	45	03	EOR	\$03		
F7CD	CA			DEX	F841	D0	0B	BNE	\$F84B		
F7CE	65	A1	ADC	\$A1	F843	40		RTI			
F7D0	90	01	BCC	\$F7D3	F844	09	30	ORA	##30		
F7D2	EB			INX	F846	22		???			
F7D3	60			RTS	F847	45	33	EOR	\$33		
F7D4	AB			TAY	F849	D0	0B	BNE	\$F853		
F7D5	4A			LSR	F84B	40		RTI			
F7D6	90	0B	BCC	\$F7E3	F84C	09	40	ORA	##40		
F7D8	4A			LSR	F84E	02		???			
F7D9	B0	17	BCS	\$F7F2	F84F	45	33	EOR	\$33		
F7DB	C9	22	CMP	##22	F851	D0	0B	BNE	\$F85B		
F7DD	F0	13	BEQ	\$F7F2	F853	40		RTI			
F7DF	29	07	AND	##07	F854	09	40	ORA	##40		
F7E1	09	80	ORA	##80	F856	02		???			
F7E3	4A			LSR	F857	45	B3	EOR	\$B3		
F7E4	AA			TAX	F859	D0	0B	BNE	\$F863		
F7E5	BD	3D	FB	LDA	\$F83D, X	F85B	40	RTI			
F7E8	B0	04	BCS	\$F7EE	F85C	09	00	ORA	##00		
F7EA	4A			LSR	F85E	22		???			
F7EB	4A			LSR	F85F	44		???			
F7EC	4A			LSR	F860	33		???			
F7ED	4A			LSR	F861	D0	8C	BNE	\$F7EF		
F7EE	29	0F	AND	##0F	F863	44		???			
F7F0	D0	04	BNE	\$F7F6	F864	00		BRK			

FB65 11 22 ORA (\$22),Y
 FB67 44 ???
 FB68 33 ???
 FB69 D0 8C BNE \$F7F7
 FB6B 44 ???
 FB6C 9A TXS
 FB6D 10 22 BPL \$FB91
 FB6F 44 ???
 FB70 33 ???
 FB71 D0 08 BNE \$FB7B
 FB73 40 RTI
 FB74 09 10 ORA ##\$10
 FB76 22 ???
 FB77 44 ???
 FB78 33 ???
 FB79 D0 08 BNE \$FB83
 FB7B 40 RTI
 FB7C 09 62 ORA ##\$62
 FB7E 13 ???
 FB7F 78 SEI
 FB80 A9 00 LDA ##\$00
 FB82 21 81 AND (\$B1,X)
 FB84 82 ???
 FB85 00 BRK
 FB86 00 BRK
 FB87 59 4D 91 EOR \$914D,Y
 FB8A 92 ???
 FB8B 86 4A STX \$4A
 FB8D 85 9D STA \$9D
 FB8F 2C 29 2C BIT \$2C29
 FB92 23 ???
 FB93 28 BPL
 FB94 24 59 BIT \$59
 FB96 00 BRK
 FB97 58 CLI
 FB98 24 24 BIT \$24
 FB9A 00 BRK
 FB9B 1C ???
 FB9C 8A TXA
 FB9D 1C ???
 FB9E 23 ???
 FB9F 5D 8B 1B EOR \$18BB,X
 FBA2 A1 9D LDA (\$9D,X)
 FBA4 8A TXA
 FBA5 1D 23 9D ORA \$9D23,X
 FBA8 8B ???
 FBA9 1D A1 00 ORA \$00A1,X
 FBAC 29 19 AND ##\$19
 FBAE AE 69 A8 LDX \$AB69
 FBB1 19 23 24 ORA \$2423,Y
 FBB4 53 ???
 FBB5 1B ???
 FBB6 23 ???
 FBB7 24 53 BIT \$53
 FBB9 19 A1 00 ORA \$00A1,Y
 FBBC 1A ???
 FBBD 5B ???
 FBBE 5B ???
 FBBF A5 69 LDA \$69
 FBC1 24 24 BIT \$24
 FBC3 AE AE A8 LDX \$ABAE
 FBC6 AD 29 00 LDA \$0029
 FBC9 7C ???
 FBCA 00 BRK
 FBCB 15 9C ORA \$9C,X
 FBCC 6D 9C A5 ADC \$A59C
 FBD0 69 29 ADC ##\$29
 FBD2 53 ???
 FBD3 84 13 STY \$13

FBD5 34 ???
 FBD6 11 A5 ORA (\$A5),Y
 FBD8 69 23 ADC ##\$23
 FBDA A0 D8 LDY ##\$DB
 FBDC 62 ???
 FBDD 5A ???
 FBDE 48 PHA
 FBDF 26 62 ROL \$62
 FBE1 94 88 STY \$88,X
 FBE3 54 ???
 FBE4 44 ???
 FBE5 C8 INY
 FBE6 54 ???
 FBE7 68 PLA
 FBE8 44 ???
 FBE9 E8 INX
 FBEA 94 00 STY \$00,X
 FBEC B4 08 LDY \$08,X
 FBEE 84 74 STY \$74
 FBF0 B4 28 LDY \$28,X
 FBF2 6E 74 F4 ROR \$F474
 FBF5 CC 4A 72 CPY \$724A
 FBF8 F2 ???
 FBF9 A4 8A LDY \$8A
 FBFB 00 BRK
 FBFC AA TAX
 FBFD A2 A2 LDX ##\$A2
 FBFF 74 ???
 F900 74 ???
 F901 74 ???
 F902 72 ???
 F903 44 ???
 F904 68 PLA
 F905 B2 ???
 F906 32 ???
 F907 B2 ???
 F908 00 BRK
 F909 22 ???
 F90A 00 BRK
 F90B 1A ???
 F90C 1A ???
 F90D 26 26 ROL \$26
 F90F 72 ???
 F910 72 ???
 F911 88 DEY
 F912 C8 INY
 F913 C4 CA CPY \$CA
 F915 26 48 ROL \$48
 F917 44 ???
 F918 44 ???
 F919 A2 C8 LDX ##\$C8
 F91B 0D 20 20 ORA \$2020

F91F; Perform ['A']

F91E 20 90 03 JSR \$0390
 F921 4C 92 F4 JMP \$F492
 F924 20 5B FB JSR \$FB5B
 F927 A2 00 LDX ##\$00
 F929 86 78 STX \$78
 F92B 20 3F FB JSR \$FB3F
 F92E D0 07 BNE \$F937
 F930 E0 00 CPX ##\$00
 F932 D0 03 BNE \$F937
 F934 4C 95 F4 JMP \$F495
 F937 C9 20 CMP ##\$20
 F939 F0 EC BEQ \$F927
 F93B 9D 4C 05 STA \$054C,X

F93E	E8		INX		F9D2	20	5B	FA	JSR	\$FA5B	
F93F	E0	03	CPX	##03	F9D5	20	5B	FA	JSR	\$FA5B	
F941	D0	E8	BNE	\$F92B	F9D8	A5	9F	LDA	\$9F		
F943	CA		DEX		F9DA	CD	50	05	CMP	\$0550	
F944	30	12	BMI	\$F95B	F9DD	F0	03	BEQ	\$F9E2		
F946	BD	4C	05	LDA	\$054C, X	F9DF	4C	6A	FA	JMP	\$FA6A
F949	38		SEC		F9E2	A4	F6	LDY	\$F6		
F94A	E9	3F	SBC	##3F	F9E4	F0	34	BEQ	\$FA1A		
F94C	A0	05	LDY	##05	F9E6	A5	A0	LDA	\$A0		
F94E	4A		LSR		F9E8	C9	9D	CMP	##9D		
F94F	66	78	ROR	\$78	F9EA	D0	26	BNE	\$FA12		
F951	66	77	ROR	\$77	F9EC	A5	F1	LDA	\$F1		
F953	88		DEY		F9EE	E5	A1	SBC	\$A1		
F954	D0	F8	BNE	\$F94E	F9F0	8D	51	05	STA	\$0551	
F956	F0	EB	BEQ	\$F943	F9F3	A5	F2	LDA	\$F2		
F958	A2	02	LDX	##02	F9F5	E5	A2	SBC	\$A2		
F95A	20	3F	FB	JSR	\$FB3F	F9F7	90	09	BCC	\$FA02	
F95D	F0	1E	BEQ	\$F97D	F9F9	D0	77	BNE	\$FA72		
F95F	C9	20	CMP	##20	F9FB	AE	51	05	LDX	\$0551	
F961	F0	F7	BEQ	\$F95A	F9FE	30	72	BMI	\$FA72		
F963	20	7D	FA	JSR	\$FA7D	FA00	10	09	BPL	\$FA0B	
F966	B0	0E	BCS	\$F976	FA02	A8		TAY			
F968	20	8B	FA	JSR	\$FABB	FA03	C8		INY		
F96B	A4	F1	LDY	\$F1	FA04	D0	6C	BNE	\$FA72		
F96D	84	F2	STY	\$F2	FA06	AE	51	05	LDX	\$0551	
F96F	85	F1	STA	\$F1	FA09	10	67	BPL	\$FA72		
F971	A9	30	LDA	##30	FA0B	CA		DEX			
F973	95	77	STA	\$77, X	FA0C	CA		DEX			
F975	E8		INX		FA0D	8A		TXA			
F976	95	77	STA	\$77, X	FA0E	A4	F6	LDY	\$F6		
F978	E8		INX		FA10	D0	03	BNE	\$FA15		
F979	E0	0A	CPX	##0A	FA12	B9	F0	00	LDA	\$00F0, Y	
F97B	90	DD	BCC	\$F95A	FA15	91	A1	STA	(\$A1), Y		
F97D	86	9F	STX	\$9F	FA17	88		DEY			
F97F	A2	00	LDX	##00	FA18	D0	F8	BNE	\$FA12		
F981	8E	4F	05	STX	\$054F	FA1A	AD	4F	05	LDA	\$054F
F984	A2	00	LDX	##00	FA1D	91	A1	STA	(\$A1), Y		
F986	8E	50	05	STX	\$0550	FA1F	20	35	FB	JSR	\$FB35
F989	AD	4F	05	LDA	\$054F	FA22	A2	28	LDX	##28	
F98C	20	D4	F7	JSR	\$F7D4	FA24	20	66	CF	JSR	\$CF66
F98F	AE	4B	05	LDX	\$054B	FA27	20	5A	F7	JSR	\$F75A
F992	86	A0	STX	\$A0	FA2A	E6	F6	INC	\$F6		
F994	AA		TAX		FA2C	A5	F6	LDA	\$F6		
F995	BD	DB	FB	LDA	\$FBDB, X	FA2E	20	96	FB	JSR	\$FB96
F998	20	5E	FA	JSR	\$FA5E	FA31	A9	41	LDA	##41	
F99B	BD	9B	FB	LDA	\$FB9B, X	FA33	8D	27	05	STA	\$0527
F99E	20	5E	FA	JSR	\$FA5E	FA36	A9	20	LDA	##20	
F9A1	A2	06	LDX	##06	FA38	8D	28	05	STA	\$0528	
F9A3	E0	03	CPX	##03	FA3B	8D	2D	05	STA	\$052D	
F9A5	D0	13	BNE	\$F9BA	FA3E	A5	A2	LDA	\$A2		
F9A7	A4	F6	LDY	\$F6	FA40	20	20	FB	JSR	\$FB20	
F9A9	F0	0F	BEQ	\$F9BA	FA43	8D	29	05	STA	\$0529	
F9AB	AD	4B	05	LDA	\$054B	FA46	8E	2A	05	STX	\$052A
F9AE	C9	E8	CMP	##E8	FA49	A5	A1	LDA	\$A1		
F9B0	A9	30	LDA	##30	FA4B	20	20	FB	JSR	\$FB20	
F9B2	B0	1E	BCS	\$F9D2	FA4E	8D	2B	05	STA	\$052B	
F9B4	20	5B	FA	JSR	\$FA5B	FA51	8E	2C	05	STX	\$052C
F9B7	88		DEY		FA54	A9	07	LDA	##07		
F9B8	D0	F1	BNE	\$F9AB	FA56	85	EF	STA	\$EF		
F9BA	0E	4B	05	ASL	\$054B	FA58	4C	95	F4	JMP	\$F495
F9BD	90	0E	BCC	\$F9CD	FA5B	20	5E	FA	JSR	\$FA5E	
F9BF	BD	8E	FB	LDA	\$FB8E, X	FA5E	8E	F3	07	STX	\$07F3
F9C2	20	5E	FA	JSR	\$FA5E	FA61	AE	50	05	LDX	\$0550
F9C5	BD	94	FB	LDA	\$FB94, X	FA64	D5	77	CMP	\$77, X	
F9CB	F0	03	BEQ	\$F9CD	FA66	F0	0D	BEQ	\$FA75		
F9CA	20	5E	FA	JSR	\$FA5E	FA68	68		PLA		
F9CD	CA		DEX		FA69	68		PLA			
F9CE	D0	D3	BNE	\$F9A3	FA6A	EE	4F	05	INC	\$054F	
F9D0	F0	06	BEQ	\$F9DB	FA6D	F0	03	BEQ	\$FA72		

FA6F 4C 84 F9 JMP \$F984
 FA72 4C 92 F4 JMP \$F492
 FA75 E8 INX
 FA76 8E 50 05 STX \$0550
 FA79 AE F3 07 LDX \$07F3
 FA7C 60 RTS
 FA7D C9 41 CMP ##41
 FA7F 90 03 BCC \$FA84
 FAB1 C9 47 CMP ##47
 FAB3 60 RTS
 FAB4 C9 30 CMP ##30
 FAB6 90 16 BCC \$FA9E
 FAB8 C9 3A CMP ##3A
 FAB8A 60 RTS
 FAB8B 20 A0 FA JSR \$FAA0
 FABE 0A ASL
 FABF 0A ASL
 FA90 0A ASL
 FA91 0A ASL
 FA92 8D 5C 05 STA \$055C
 FA95 20 3F FB JSR \$FB3F
 FA98 20 A0 FA JSR \$FAA0
 FA9B 0D 5C 05 DRA \$055C
 FA9E 38 SEC
 FA9F 60 RTS
 FAA0 C9 3A CMP ##3A
 FAA2 08 PHP
 FAA3 29 0F AND ##0F
 FAA5 28 PLP
 FAA6 90 02 BCC \$FAAA
 FAA8 69 08 ADC ##08
 AAAA 60 RTS
 FAAB C6 F3 DEC \$F3
 FAAD A9 00 LDA ##00
 FAAF 85 F1 STA \$F1
 FAB1 85 F2 STA \$F2
 FAB3 8D F4 07 STA \$07F4
 FAB6 20 3F FB JSR \$FB3F
 FAB9 F0 3A BEQ \$FAF5
 FABB C9 20 CMP ##20
 FABD F0 F7 BEQ \$FAB6
 FABF C9 20 CMP ##20
 FAC1 F0 2E BEQ \$FAF1
 FAC3 C9 2C CMP ##2C
 FAC5 F0 2A BEQ \$FAF1
 FAC7 C9 30 CMP ##30
 FAC9 90 2B BCC \$FAF6
 FACB C9 47 CMP ##47
 FACD 80 27 BCS \$FAF6
 FACF C9 3A CMP ##3A
 FAD1 90 06 BCC \$FAD9
 FAD3 C9 41 CMP ##41
 FAD5 90 1F BCC \$FAF6
 FAD7 E9 08 SBC ##08
 FAD9 E9 2F SBC ##2F
 FADB 0A ASL
 FADC 0A ASL
 FADD 0A ASL
 FADE 0A ASL
 FADF A2 04 LDX ##04
 FAE1 0A ASL
 FAE2 26 F1 ROL \$F1
 FAE4 26 F2 ROL \$F2
 FAE6 CA DEX
 FAE7 D0 FB BNE \$FAE1
 FAE9 EE F4 07 INC \$07F4
 FAEC 20 3F FB JSR \$FB3F
 FAEF D0 CE BNE \$FABF
 FAF1 AD F4 07 LDA \$07F4

FAF4 18 CLC
 FAF5 60 RTS
 FAF6 68 PLA
 FAF7 68 PLA
 FAF8 4C 92 F4 JMP \$F492
 FAFB A5 A1 LDA \$A1
 FAFD A6 A2 LDX \$A2
 FAFF 48 PHA
 FB00 8A TXA
 FB01 20 10 FB JSR \$FB10
 FB04 68 PLA
 FB05 20 10 FB JSR \$FB10
 FB08 A9 20 LDA ##20
 FB0A 2C A9 3F BIT \$3FA9
 FB0D 4C D2 FF JMP \$FFD2
 FB10 8E F3 07 STX \$07F3
 FB13 20 20 FB JSR \$FB20
 FB16 20 D2 FF JSR \$FFD2
 FB19 8A TXA
 FB1A AE F3 07 LDX \$07F3
 FB1D 4C D2 FF JMP \$FFD2
 FB20 48 PHA
 FB21 20 2A FB JSR \$FB2A
 FB24 AA TAX
 FB25 68 PLA
 FB26 4A LSR
 FB27 4A LSR
 FB28 4A LSR
 FB29 4A LSR
 FB2A 29 0F AND ##0F
 FB2C C9 0A CMP ##0A
 FB2E 90 02 BCC \$FB32
 FB30 69 06 ADC ##06
 FB32 69 30 ADC ##30
 FB34 60 RTS
 FB35 A9 91 LDA ##91
 FB37 20 D2 FF JSR \$FFD2
 FB3A A9 0D LDA ##0D
 FB3C 4C D2 FF JMP \$FFD2
 FB3F 8E F3 07 STX \$07F3
 FB42 A6 F3 LDX \$F3
 FB44 E4 F4 CPX \$F4
 FB46 80 0F BCS \$FB5F
 FB48 BD 00 02 LDA \$0200.X
 FB4B C9 3A CMP ##3A
 FB4D F0 08 BEQ \$FB57
 FB4F E6 F3 INC \$F3
 FB51 08 PHP
 FB52 AE F3 07 LDX \$07F3
 FB55 28 PLP
 FB56 60 RTS
 FB57 A9 00 LDA ##00
 FB59 F0 F6 BEQ \$FB51
 FB5B A5 F1 LDA \$F1
 FB5D 85 A1 STA \$A1
 FB5F A5 F2 LDA \$F2
 FB61 85 A2 STA \$A2
 FB63 60 RTS
 FB64 38 SEC
 FB65 A5 F1 LDA \$F1
 FB67 E5 A1 SBC \$A1
 FB69 85 F1 STA \$F1
 FB6B A5 F2 LDA \$F2
 FB6D E5 A2 SBC \$A2
 FB6F 85 F2 STA \$F2
 FB71 60 RTS
 FB72 A9 01 LDA ##01
 FB74 BD F3 07 STA \$07F3
 FB77 38 SEC

```

FB78 A5 F1 LDA $F1
FB7A ED F3 07 SBC $07F3
FB7D 85 F1 STA $F1
FB7F A5 F2 LDA $F2
FB81 E9 00 SBC ##00
FB83 85 F2 STA $F2
FB85 60 RTS
FB86 38 SEC
FB87 A5 9F LDA $9F
FB89 E9 01 SBC ##01
FB8B 85 9F STA $9F
FB8D A5 A0 LDA $A0
FB8F E9 00 SBC ##00
FB91 85 A0 STA $A0
FB93 60 RTS
FB94 A9 01 LDA ##01
FB96 18 CLC
FB97 65 A1 ADC $A1
FB99 85 A1 STA $A1
FB9B 90 02 BCC $FB9F
FB9D E6 A2 INC $A2
FB9F 60 RTS
FBA0 B0 14 BCS $FBB6
FBA2 20 5B FB JSR $FB5B
FBA5 20 AD FA JSR $FAAD
FBA8 B0 0C BCS $FBB6
FBA A 20 64 FB JSR $FB64
FBAD A5 F1 LDA $F1
FBAF 85 9F STA $9F
FBB1 A5 F2 LDA $F2
FBB3 85 A0 STA $A0
FBB5 18 CLC
FBB6 60 RTS
FBB7 8D 10 01 STA $0110
FBB A 8E 12 01 STX $0112
FBBD 8C 11 01 STY $0111
FBC0 60 RTS
FBC1 AD 10 01 LDA $0110
FBC4 AE 12 01 LDY $0112
FBC7 AC 11 01 LDY $0111
FBCA 60 RTS
FBCB 86 FA STX $FA
FBCD 20 11 CF JSR $CF11
FBD0 A6 FA LDX $FA
FBD2 49 80 EOR ##80
FBD4 0A ASL
FBD5 A9 00 LDA ##00
FBD7 60 RTS

```

FBDB; Output messages

```

FBD8 48 PHA
FBD9 98 TYA
FDDA 48 PHA
FBD B 84 TXA
FBDC 48 PHA
FBD D BA TSX
FBDE E8 INX
FBD F E8 INX
FBE0 E8 INX
FBE1 E8 INX
FBE2 BD 00 01 LDA $0100,X
FBE5 85 BC STA $BC
FBE7 E8 INX
FBE B BD 00 01 LDA $0100,X
FBE B 85 BD STA $BD
FBED E6 BC INC $BC
FBE F D0 02 BNE $FBF3

```

```

FBF1 E6 BD INC $BD
FBF3 A0 00 LDY ##00
FBF5 B1 BC LDA ($BC),Y
FBF7 F0 06 BEQ $FBFF
FBF9 20 D2 FF JSR $FFD2
FBFC C8 INY
FBFD D0 F6 BNE $FBF5
FBFF 98 TYA
FC00 BA TSX
FC01 E8 INX
FC02 E8 INX
FC03 E8 INX
FC04 E8 INX
FC05 18 CLC
FC06 65 BC ADC $BC
FC08 9D 00 01 STA $0100,X
FC0 B A9 00 LDA ##00
FC0 D 65 BD ADC $BD
FC0 F E8 INX
FC10 9D 00 01 STA $0100,X
FC13 68 PLA
FC14 AA TAX
FC15 68 PLA
FC16 AB TAY
FC17 68 PLA
FC18 60 RTS

```

FC19; Get I/O address

```

FC19 A2 00 LDX ##00
FC1 B A0 FD LDY ##FD
FC1 D 60 RTS

```

FC1E; Check 8-rom

```

FC1E A2 03 LDX ##03
FC20 86 96 STX $96
FC22 A9 00 LDA ##00
FC24 9D EC 05 STA $05EC,X
FC27 CA DEX
FC28 10 FA BPL $FC24
FC2A A6 96 LDX $96
FC2C BD 7B FC LDA $FC7B,X
FC2F AA TAX
FC30 9D D0 FD STA $FDD0,X
FC33 A0 02 LDY ##02
FC35 B9 07 80 LDA $8007,Y
FC38 D9 56 FC CMP $FC56,Y
FC3 B D0 14 BNE $FC51
FC3D 88 DEY
FC3E 10 F5 BPL $FC35
FC40 AD 06 80 LDA $8006
FC43 A6 96 LDX $96
FC45 9D EC 05 STA $05EC,X
FC48 C9 01 CMP ##01
FC4A D0 05 BNE $FC51
FC4C 86 FB STX $FB
FC4E 20 00 80 JSR $8000
FC51 C6 96 DEC $96
FC53 10 D5 BFL $FC2A
FC55 60 RTS

```

FC56; 8-rom mask

```

FC56 43 ???
FC57 42 ???
FC58 4D 7B A2 EOR $A27B

```

FC59; Phoenix routine

FC5B 03 ???
 FC5C 8D EC 05 LDA \$05EC,X
 FC5F F0 10 BEQ \$FC71
 FC61 8A TXA
 FC62 48 PHA
 FC63 8D 7B FC LDA \$FC7B,X
 FC66 AA TAX
 FC67 9D D0 FD STA \$FDD0,X
 FC6A 86 FB STX \$FB
 FC6C 20 00 00 JSR \$8000
 FC6F 68 PLA
 FC70 AA TAX
 FC71 CA DEX
 FC72 D0 E8 BNE \$FC5C
 FC74 8D D0 FD STA \$FDD0
 FC77 86 FB STX \$FB
 FC79 58 CLI
 FC7A 60 RTS
 FC7B 00 BRK
 FC7C 05 0A ORA \$0A
 FC7E 0F ???

FC7F; Long fetch routine

FC7F 9D D0 FD STA \$FDD0,X
 FC82 AA TAX
 FC83 B1 BE LDA (\$BE),Y
 FC85 9D D0 FD STA \$FDD0,X
 FC88 60 RTS

FC89; Long jump routine

FC89 48 PHA
 FC8A 86 FB STX \$FB
 FC8C 9D D0 FD STA \$FDD0,X
 FC8F AE F3 05 LDX \$05F3
 FC92 AD F4 05 LDA \$05F4
 FC95 48 PHA
 FC96 AD F2 05 LDA \$05F2
 FC99 28 PLP
 FC9A 20 B0 FC JSR \$FCB0
 FC9D 8D F2 05 STA \$05F2
 FCA0 08 PHP
 FCA1 68 PLA
 FCA2 8D F4 05 STA \$05F4
 FCA5 8E F3 05 STX \$05F3
 FCA8 68 PLA
 FCA9 85 FB STA \$FB
 FCAB AA TAX
 FCAC 9D D0 FD STA \$FDD0,X
 FCAF 60 RTS
 FCB0 6C F0 05 JMP (\$05F0)

FCB3; IRQ entry

FCB3 48 PHA
 FCB4 8A TXA
 FCB5 48 PHA
 FCB6 98 TYA
 FCB7 48 PHA

FCB8; Long IRQ routine

FCB8 8D D0 FD STA \$FDD0
 FCB9 4C 00 CE JMP \$CE00
 FCBB A6 FB LDX \$FB
 FCC0 9D D0 FD STA \$FDD0,X
 FCC3 68 PLA
 FCC4 A8 TAY

FCC5 68 PLA
 FCC6 AA TAX
 FCC7 68 PLA
 FCC8 40 RTI
 FCC9 A6 FB LDX \$FB
 FCCB 9D D0 FD STA \$FDD0,X
 FCCE 6C FE 02 JMP (\$02FE)

FCD1; ROM banking routines

FCD1 FF ???
 FCD2 FF ???
 FCD3 FF ???
 FCD4 FF ???
 FCD5 FF ???
 FCD6 FF ???
 FCD7 FF ???
 FCD8 FF ???
 FCD9 FF ???
 FCDA FF ???
 FCDB FF ???
 FCDC FF ???
 FCDD FF ???
 FCDE FF ???
 FCDF FF ???
 FCEE FF ???
 FCE1 FF ???
 FCE2 FF ???
 FCE3 FF ???
 FCE4 FF ???
 FCE5 FF ???
 FCE6 FF ???
 FCE7 FF ???
 FCE8 FF ???
 FCE9 FF ???
 FCEA FF ???
 FCEB FF ???
 FCEC FF ???
 FCED FF ???
 FCEE FF ???
 FCEF FF ???
 FCF0 FF ???
 FCF1 4C C9 FC JMP \$FCC9
 FCF4 4C 59 FC JMP \$FC59

FCF7; Long fetch entry

FCF7 4C 7F FC JMP \$FC7F

FCFA; Long jump entry

FCFA 4C 89 FC JMP \$FC89

FCFD; Long IRQ entry

FCFD 4C B8 FC JMP \$FCB8

FD00; ACIA

FD00 00 FF 00 SBC \$FFFF,X
 FD03 FF ???
 FD04 FF ???
 FD05 FF ???
 FD06 FF ???
 FD07 FF ???
 FD08 FF FD 02 DEC \$0200,X
 FD0B 02 ???
 FD0C 02 02 FF SBC \$FD02,X
 FD0F 02 ???

FD10; 6529 Parallel port

FD10 FD FD FD SBC \$FFFD,X
 FD13 FD ???

FD14 FD FD FD SBC \$06FD,X
 FD17 06 ???
 FD18 FD 06 06 SBC \$0606,X
 FD1B 06 FD ASL \$06
 FD1D 06 FD ASL \$FD
 FD1F FF ???
 FD20 00 BRK
 FD21 47 BRK
 FD22 02 BRK
 FD23 02 ???
 FD24 00 BRK
 FD25 FD 02 FF SBC \$FDFF,X
 FD28 00 FF FF SBC \$0002,X
 FD2B 02 ???
 FD2C 00 FF FD SBC \$FFFF,X
 FD2F FF ???
 FD30 00 BRK
 FD31 00 BRK
 FD32 00 BRK
 FD33 00 BRK
 FD34 00 BRK
 FD35 00 BRK
 FD36 00 BRK
 FD37 00 BRK
 FD38 00 BRK
 FD39 00 BRK
 FD3A 00 BRK
 FD3B 00 BRK
 FD3C 00 BRK
 FD3D 00 BRK
 FD3E 00 BRK
 FD3F 00 BRK
 FD40 FF ???
 FD41 FF ???
 FD42 FF ???
 FD43 FF ???
 FD44 02 ???
 FD45 FF ???
 FD46 FF ???
 FD47 FF ???
 FD48 FF ???
 FD49 00 ???
 FD4A FD ???
 FD4B 00 ???
 FD4C 02 ???
 FD4D 02 ???
 FD4E 02 ???
 FD4F 02 FF 02 SBC \$FF00,X
 FD52 02 ???
 FD53 02 FF FF SBC \$FFFF,X
 FD56 FF ???
 FD57 FF ???
 FD58 FF ???
 FD59 FF ???
 FD5A FF ???
 FD5B 02 BRK
 FD5C 02 ???
 FD5D FD ???
 FD5E FF ???
 FD5F FF ???
 FD60 FF ???
 FD61 FF ???
 FD62 FF ???
 FD63 FF ???
 FD64 FF ???
 FD65 FF ???
 FD66 FF ???
 FD67 FF ???
 FD68 00 BRK
 FD69 FF ???

FD6A 02 ???
 FD6B FD ???
 FD6C 02 ???
 FD6D 00 ???
 FD6E 02 02 FF SBC \$FF02,X
 FD71 00 BRK
 FD72 02 ???
 FD73 00 BRK
 FD74 FD FF 02 SBC \$FFFF,X
 FD77 FF ???
 FD78 FF ???
 FD79 02 02 FD SBC \$FD00,X
 FD7C 00 BRK
 FD7D FF ???
 FD7E FF ???
 FD7F FF ???
 FD80 FF ???
 FD81 FF ???
 FD82 FF ???
 FD83 02 ???
 FD84 FF ???
 FD85 FF ???
 FD86 FF ???
 FD87 02 ???
 FD88 02 ???
 FD89 02 ???
 FD8A 0F ???
 FD8B FD ???
 FD8C 02 02 FF SBC \$02FD,X
 FD8F 02 FF 00 SBC \$FFFF,X
 FD92 FF ???
 FD93 FF ???
 FD94 FF ???
 FD95 FF ???
 FD96 FF FD 02 INC \$0202
 FD99 FD ???
 FD9A 02 FD FF SBC \$0002,X
 FD9D 02 ???
 FD9E 02 FF 02 SBC \$FFFF,X
 FDA1 FD ???
 FDA2 B2 ???
 FDA3 FD ???
 FDA4 FD ???
 FDA5 00 FF 02 ASL \$02FF
 FDA8 FF ???
 FDA9 FF ???
 FDAA FF ???
 FDAB FF ???
 FDAC FF ???
 FDAO FF ???
 FDAE FD BRK
 FDAF 02 ???
 FDB0 02 BRK
 FDB1 02 02 FF SBC \$FD02,X
 FDB4 00 BRK
 FDB5 FD FF F7 SBC \$FFFF,X
 FDB8 FF ???
 FDB9 FF FF 02 SBC \$FDFF,X
 FDBC FF ???
 FDBD FF ???
 FDBE FF ???
 FDBF FF ???
 FDC0 02 FF FF SBC \$0023,X
 FDC3 02 ???
 FDC4 02 ???
 FDC5 02 ???
 FDC6 FF ???
 FDC7 02 FF 02 SBC \$FFFF,X
 FDCA FF ???
 FDCB FF ???

FDCC FF ???
 FDCC 02 ???
 FDCE FF ???
 FDCFF FF ???

FDD0; Cartridge Bank port

FDD0 02 00 FF SBC \$0000,X
 FDD3 FD ???
 FDD4 FD FF STX \$FF
 FDD6 FF ???
 FDD7 FF ???
 FDD8 FF ???
 FDD9 FD 00 FD SBC \$0000,X
 FDDC 00 ???
 FDDD 02 02 06 SBC \$0000,X
 FDE0 00 ???
 FDE1 00 FF 02 SBC \$FFFF,X
 FDE4 00 ???
 FDE5 FF ???
 FDE6 FF ???
 FDE7 FF ???
 FDE8 FF ???
 FDE9 FD FD 02 SBC \$0200,X
 FDEC 02 ???
 FDED 02 ???
 FDEE FF ???
 FDEF FF ???
 FDF0 FF ???
 FDF1 FF ???
 FDF2 FF ???
 FDF3 FF ???
 FDF4 00 FD FF SBC \$007F,X
 FDF7 FD ???
 FDF8 FD ???
 FDF9 FD ???
 FDF A 00 FF 00 SBC \$FFFF,X
 FDFD 02 ???
 FDFE FF ???
 FDF F FF ???

FE00; DMA disk system

FE00 FE FE 02 INC \$C2FE,X
 FE03 FE 02 FE INC \$FE02,X
 FE06 02 ???
 FE07 FE FE FE INC \$0202,X
 FE0A FE ???
 FE0B FE FE 02 INC \$FEFE,X
 FE0E FE 02 00 INC \$0202,X
 FE11 FE 00 FE INC \$FE02,X
 FE14 02 ???
 FE15 02 FE FE INC \$0200,X
 FE18 02 ???
 FE19 0F ???
 FE1A 02 ???
 FE1B FE ???
 FE1C 02 ???
 FE1D 02 ???
 FE1E FE FE 02 INC \$FFFE,X
 FE21 FE 00 FE INC \$0202,X
 FE24 02 ???
 FE25 02 02 FE INC \$0202,X
 FE28 FE FE 02 INC \$FEFE,X
 FE2B 02 ???
 FE2C FE 02 00 INC \$FEFE,X
 FE2F FE 02 F7 INC \$0200,X
 FE32 02 ???
 FE33 02 FE FE INC \$FE02,X
 FE36 02 BRK

FE37 02 ???
 FE38 02 ???
 FE39 02 FE 02 INC \$02FE,X
 FE3C FE FE FE INC \$02FE,X
 FE3F FE 02 FE INC \$FE02,X
 FE42 02 02 FE INC \$FEFE,X
 FE45 02 ???
 FE46 02 ???
 FE47 02 ???
 FE48 FE 02 FE INC \$00FE,X
 FE4B 02 ???
 FE4C 02 ???
 FE4D 00 02 FE INC \$0202,X
 FE50 FE FE 02 INC \$02FE,X
 FE53 FE ???
 FE54 FE FE 02 INC \$02FE,X
 FE57 02 02 00 INC \$0202,X
 FE5A 00 ???
 FE5B 02 FE FE INC \$FE02,X
 FE5E FE FE FE INC \$FEFE,X
 FE61 02 RTI
 FE62 FE 00 FE INC \$02FE,X
 FE65 FE 02 02 INC \$FE02,X
 FE68 FE ???
 FE69 02 00 FE INC \$FE00,X
 FE6C 02 ???
 FE6D 00 ???
 FE6E FE FE 00 INC \$FEFE,X
 FE71 FE FE FE INC \$02FE,X
 FE74 FE FE FE INC \$FEFE,X
 FE77 FE 02 FE INC \$0200,X
 FE7A FE FE 02 INC \$FEFE,X
 FE7D FE 1E 02 INC \$02FE,X
 FE80 FE ???
 FE81 00 02 FE INC \$0202,X
 FE84 02 ???
 FE85 00 ???
 FE86 C2 ???
 FE87 FC FE 02 INC \$FEFE,X
 FE8A FE 02 02 INC \$00FE,X
 FE8D FE FE FE INC \$02FE,X
 FE90 02 00 FE INC \$02FE,X
 FE93 02 ???
 FE94 02 ???
 FE95 02 ???
 FE96 02 ???
 FE97 FE ???
 FE98 02 FE FE INC \$FEFE,X
 FE9B DF FE 02 INC \$0202,X
 FE9E FE 02 FE INC \$0202,X
 FE A1 02 ???
 FE A2 02 02 FE INC \$FEFE,X
 FE A5 02 ???
 FE A6 02 FE 02 INC \$FEFE,X
 FE A9 FE 02 02 INC \$0202,X
 FE AC FE FE FE INC \$0202,X
 FE AF 02 ???
 FE B0 DA FE 02 INC \$FEFE,X
 FE B3 FE 02 FE INC \$FEFE,X
 FE B6 02 02 FE INC \$0202,X
 FE B9 FE FE 02 INC \$FEFE,X
 FE BC FE 02 02 INC \$FEFE,X
 FE BF FE 02 FE INC \$4C02,X
 FE C2 00 ???
 FE C3 02 ???
 FE C4 FE ???
 FE C5 02 ???
 FE C6 02 FE FE INC \$FEFE,X
 FE C9 02 ???
 FE CA 02 ???

FECB	02	FE	00	INC	\$FEFE,X
FECE	FE	02	02	INC	\$FE02,X
FED1	02			???	
FED2	FE			BRK	
FED3	FE	FE	FE	INC	\$FEFE,X
FED6	02	FE	02	INC	\$FEFE,X
FED9	02			???	
FEDA	FE			???	
FEDB	02	02	02	INC	\$80FE,X
FEDE	FE	02	FE	INC	\$FEFC,X
FEE1	02			???	
FEE2	02			???	
FEE3	02			???	
FEE4	FE			???	
FEE5	02			BRK	
FEE6	02	FE	FE	INC	\$FEFE,X
FEE9	FE	02	FF	INC	\$FEFE,X
FEEC	FE			???	
FEED	02	00	FE	INC	\$0202,X
FEF0	02			???	
FEF1	00			???	
FEF2	02			???	
FEF3	FE			???	
FEF4	02	FE	FE	INC	\$FEFE,X
FEF7	FE	FE	FE	INC	\$02FE,X
FEFA	FE	FE	FE	INC	\$FEFE,X
FEFD	FE			???	
FEFE	02			???	
FEFF	02	8C	1D	INC	\$05F3,X
FF02	2A			NOP	
FF03	13	52		ORA	\$7E,X
FF05	12			???	
FF06	1B			???	
FF07	0B			PHP	
FF08	FF			???	
FF09	7D	A2	CC	ADC	\$CCA2,X
FF0C	FF			???	
FF0D	FF			???	
FF0E	00			BRK	
FF0F	00			BRK	
FF10	7C			???	
FF11	00			BRK	
FF12	C4	D1		CPY	\$D1
FF14	0F			???	
FF15	F1	DB		SBC	(\$DB),Y
FF17	F5	F7		SBC	\$F7,X
FF19	EE	FC	4B	INC	\$18FC
FF1C	FE	9D	BA	INC	\$A68B,X
FF1F	91	00		STX	\$00,Y
FF21	00			BRK	
FF22	00			BRK	
FF23	00			BRK	
FF24	00			BRK	
FF25	00			BRK	
FF26	00			BRK	
FF27	00			BRK	
FF28	00			BRK	
FF29	00			BRK	
FF2A	00			BRK	
FF2B	00			BRK	
FF2C	00			BRK	
FF2D	00			BRK	
FF2E	00			BRK	
FF2F	00			BRK	

FF30; Ted chip

FF30 00 BRK

FF31	00			BRK	
FF32	00			BRK	
FF33	00			BRK	
FF34	00			BRK	
FF35	00			BRK	
FF36	00			BRK	
FF37	00			BRK	
FF38	00			BRK	
FF39	00			BRK	
FF3A	00			BRK	
FF3B	00			BRK	
FF3C	00			BRK	
FF3D	00			BRK	
FF3E	00			BRK	
FF3F	00			BRK	
FF40	FF			???	
FF41	FF			???	
FF42	FF			???	
FF43	FF			???	
FF44	FF			???	
FF45	FF			???	
FF46	FF			???	
FF47	FF			???	
FF48	FF			???	

FF49; Jump table

FF49	4C	C2	B7	JMP	\$B7C2
FF4C	4C	49	DC	JMP	\$DC49
FF4F	4C	DB	FB	JMP	\$FBD8
FF52	4C	45	F4	JMP	\$F445
FF55	FF			???	
FF56	FF			???	
FF57	FF			???	
FF58	FF			???	
FF59	FF			???	
FF5A	FF			???	
FF5B	FF			???	
FF5C	FF			???	
FF5D	FF			???	
FF5E	FF			???	
FF5F	FF			???	
FF60	FF			???	
FF61	FF			???	
FF62	FF			???	
FF63	FF			???	
FF64	FF			???	
FF65	FF			???	
FF66	FF			???	
FF67	FF			???	
FF68	FF			???	
FF69	FF			???	
FF6A	FF			???	
FF6B	FF			???	
FF6C	FF			???	
FF6D	FF			???	
FF6E	FF			???	
FF6F	FF			???	
FF70	FF			???	
FF71	FF			???	
FF72	FF			???	
FF73	FF			???	
FF74	FF			???	
FF75	FF			???	
FF76	FF			???	
FF77	FF			???	
FF78	FF			???	
FF79	FF			???	

FF7A	FF	???
FF7B	FF	???
FF7C	FF	???
FF7D	FF	???
FF7E	FF	???
FF7F	2A	ROL

FF81; Jumbo jump table

FF80	84	4C	STY	\$4C
FF82	4E	D8	4C	LSR \$4CD8
FF85	0B		???	
FF86	F3		???	
FF87	4C	52	F3	JMP \$F352
FF8A	4C	CE	F2	JMP \$F2CE
FF8D	4C	D3	F2	JMP \$F2D3
FF90	4C	1A	F4	JMP \$F41A
FF93	4C	4D	EE	JMP \$EE4D
FF96	4C	1A	EE	JMP \$EE1A
FF99	4C	27	F4	JMP \$F427
FF9C	4C	36	F4	JMP \$F436
FF9F	4C	11	DB	JMP \$DB11
FFA2	4C	23	F4	JMP \$F423
FFA5	4C	8B	EC	JMP \$EC8B
FFA8	4C	DF	EC	JMP \$ECD8
FFAB	4C	3B	EF	JMP \$EF3B
FFAE	4C	23	EF	JMP \$EF23
FFB1	4C	2C	EE	JMP \$EE2C
FFB4	4C	FA	ED	JMP \$EDFA
FFB7	4C	1C	F4	JMP \$F41C
FFBA	4C	13	F4	JMP \$F413
FFBD	4C	0C	F4	JMP \$F40C
FFC0	6C	18	03	JMP (\$0318)
FFC3	6C	1A	03	JMP (\$031A)
FFC6	6C	1C	03	JMP (\$031C)
FFC9	6C	1E	03	JMP (\$031E)
FFCC	6C	20	03	JMP (\$0320)
FFCF	6C	22	03	JMP (\$0322)
FFD2	6C	24	03	JMP (\$0324)
FFD5	4C	43	F0	JMP \$F043
FFD8	4C	94	F1	JMP \$F194
FFDB	4C	2D	CF	JMP \$CF2D
FFDE	4C	26	CF	JMP \$CF26
FFE1	6C	26	03	JMP (\$0326)
FFE4	6C	28	03	JMP (\$0328)
FFE7	6C	2A	03	JMP (\$032A)
FFEA	4C	F0	CE	JMP \$CEF0
FFED	4C	34	D8	JMP \$D834
FFF0	4C	39	D8	JMP \$D839
FFF3	4C	19	FC	JMP \$FC19

FFF6; Hardware vectors

FFF6	8D	3E	FF	STA \$FF3E
FFF9	4C	A4	F2	JMP \$F2A4
FFFC	F6	FF		INC \$FF,X
FFFE	B3		???	
FFFF	FC		???	

8501 Machine Code Instruction Set

The following notation applies to this summary:

A	Accumulator
X, Y	Index registers
M	Memory
P	Processor status register
S	Stack Pointer
✓	Change
-	No change
+	Add
∧	Logical AND
-	Subtract
V	Logical Exclusive-OR
→, ←	Transfer to
✕	Logical (inclusive) OR
PC	Program counter
PCH	Program counter high
PCL	Program counter low
#dd	8-bit immediate data value (2 hexadecimal digits)
aa	8-bit zero page address (2 hexadecimal digits)
aaaa	16-bit absolute address (4 hexadecimal digits)
↑	Transfer from stack (Pull)
↓	Transfer onto stack (Push)

ADC

Add to Accumulator with Carry

Operation: $A + M + C \rightarrow A, C$

N Z C I D V
✓ ✓ / - - ✓

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Immediate	ADC #dd	69	2	2
Zero Page	ADC aa	65	2	3
Zero Page, X	ADC aa,X	75	2	4
Absolute	ADC aaaa	6D	3	4
Absolute, X	ADC aaaa,X	7D	3	4*
Absolute, Y	ADC aaaa,Y	79	3	4*
(Indirect, X)	ADC (aa,X)	61	2	6
(Indirect), Y	ADC (aa),Y	71	2	5*

*Add 1 if page boundary is crossed.

AND

AND Memory with Accumulator

Logical AND to the accumulator

Operation: $A \wedge M \rightarrow A$

N Z C I D V
✓ / - - - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Immediate	AND #dd	29	2	2
Zero Page	AND aa	25	2	3
Zero Page, X	AND aa,X	35	2	4
Absolute	AND aaaa	2D	3	4
Absolute, X	AND aaaa,X	3D	3	4*
Absolute, Y	AND aaaa,Y	39	3	4*
(Indirect, X)	AND (aa,X)	21	2	6
(Indirect), Y	AND (aa),Y	31	2	5*

*Add 1 if page boundary is crossed.

ASL

Accumulator Shift Left

Operation: C ←

7	6	5	4	3	2	1	0
---	---	---	---	---	---	---	---

 ← 0

N Z C I D V
 ✓ ✓ ✓ - - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Accumulator	ASL A	0A	1	2
Zero Page	ASL aa	06	2	5
Zero Page, X	ASL aa,X	16	2	6
Absolute	ASL aaaa	0E	3	6
Absolute, X	ASL aaaa,X	1E	3	7

BCC

Branch on Carry Clear

Operation: Branch on C = 0

N Z C I D V
 - - - - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Relative	BCC aa	90	2	2*

*Add 1 if branch occurs to same page.

Add 2 if branch occurs to different page.

Note: AIM 65 will accept an absolute address as the operand (instruction format BCC aaaa), and convert it to a relative address.

BCS

Branch on Carry Set

Operation: Branch on C = 1

N Z C I D V
 - - - - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Relative	BCS aa	B0	2	2*

*Add 1 if branch occurs to same page.

Add 2 if branch occurs to next page.

Note: AIM 65 will accept an absolute address as the operand (instruction format BCS aaaa), and convert it to a relative address.

BEQ

Branch on Result Equal to Zero

Operation: Branch on $Z = 1$

N Z C I D V

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Relative	BEQ aa	F0	2	2*

*Add 1 if branch occurs to same page.

Add 2 if branch occurs to next page.

Note: AIM 65 will accept an absolute address as the operand (instruction format BEQ aaaa), and convert it to a relative address.

BIT

Test Bits in Memory with Accumulator

Operation: $A \ M, M_7 \rightarrow N, M_6 \rightarrow V$

Bit 6 and 7 are transferred to the Status Register. If the result of $A \ M$ is zero then $Z = 1$, otherwise $Z = 0$

N Z C I D V

$M_7 \checkmark \quad - - - M_6$

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Zero Page	BIT aa	24	2	3
Absolute	BIT aaaa	2C	3	4

BMI

Branch on Result Minus

Operation: Branch on $N = 1$

N Z C I D V

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Relative	BMI aa	30	2	2*

*Add 1 if branch occurs to same page.

Add 2 if branch occurs to different page.

Note: AIM 65 will accept an absolute address as the operand (instruction format BMI aaaa), and convert it to a relative address.

BNE

Branch on Result Not Equal to Zero

Operation: Branch on $Z = 0$

N Z C I D V

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Relative	BNE aa	D0	2	2*

*Add 1 if branch occurs to same page.

Add 2 if branch occurs to different page.

Note: AIM 65 will accept an absolute address as the operand (instruction format BNE aaaa), and convert it to a relative address.

BPL

Branch on Result Plus

Operation: Branch on $N = 0$

N Z C I D V

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Relative	BPL aa	10	2	2*

*Add 1 if branch occurs to same page.

Add 2 if branch occurs to different page.

Note: AIM 65 will accept an absolute address as the operand (instruction format BPL aaaa), and convert it to a relative address.

BRK

Force Break

Operation: Forced Interrupt $PC + 2 \downarrow P \downarrow$

B N Z C I D V

1 - - - 1 - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Implied	BRK	00	1	7

BVC

Branch on Overflow Clear

Operation: Branch on $V = 0$

N Z C I D V

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Relative	BVC aa	50	2	2*

*Add 1 if branch occurs to same page.

Add 2 if branch occurs to different page.

Note: AIM 65 will accept an absolute address as the operand (instruction format BVC aaaa), and convert it to a relative address.

BVS

Branch on Overflow Set

Operation: Branch on $V = 1$

N Z C I D V

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Relative	BVS aa	70	2	2*

*Add 1 if branch occurs to same page.

Add 2 if branch occurs to different page.

Note: AIM 65 will accept an absolute address as the operand (instruction format BVS aaaa), and convert it to a relative address.

CLC

Clear Carry Flag

Operation: $0 \rightarrow C$

N Z C I D V

-- 0 ---

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Implied	CLC	18	1	2

CLD

Clear Decimal Mode

Operation: 0 → D

N Z C I D V
- - - - 0 -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Implied	CLD	D8	1	2

CLI

Clear Interrupt Disable Bit

Operation: 0 → I

N Z C I D V
- - - 0 - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Implied	CLI	58	1	2

CLV

Clear Overflow Flag

Operation: 0 → V

N Z C I D V
- - - - - 0

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Implied	CLV	B8	1	2

CMP

Compare Memory and Accumulator

Operation: A – M

N Z C I D V
√ √ / - - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Immediate	CMP #dd	C9	2	2
Zero Page	CMP aa	C5	2	3
Zero Page, X	CMP aa,X	D5	2	4
Absolute	CMP aaaa	CD	3	4
Absolute, X	CMP aaaa,X	DD	3	4*
Absolute, Y	CMP aaaa,Y	D9	3	4*
(Indirect, X)	CMP (aa,X)	C1	2	6
(Indirect), Y	CMP (aa),Y	D1	2	5*

*Add 1 if page boundary is crossed.

CPX

Compare Memory and Index X

Operation: X – M

N Z C I D V
√ √ / - - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Immediate	CPX #dd	E0	2	2
Zero Page	CPX aa	E4	2	3
Absolute	CPX aaaa	EC	3	4

CPY

Compare Memory and Index Y

Operation: Y – M

N Z C I D V
√ √ / - - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Immediate	CPY #dd	C0	2	2
Zero Page	CPY aa	C4	2	3
Absolute	CPY aaaa	CC	3	4

DEC

Decrement Memory by One

Operation: $M - 1 \rightarrow M$

N Z C I D V
✓ / - - - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Zero Page	DEC aa	C6	2	5
Zero Page, X	DEC aa,X	D6	2	6
Absolute	DEC aaaa	CE	3	6
Absolute, X	DEC aaaa,X	DE	3	7

DEX

Decrement Index X by One

Operation: $X - 1 \rightarrow X$

N Z C I D V
✓ / - - - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Implied	DEX	CA	1	2

DEY

Decrement Index Y by One

Operation: $Y - 1 \rightarrow Y$

N Z C I D V
✓ / - - - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Implied	DEY	88	1	2

EOR

Exclusive-OR Memory with Accumulator

Operation: $A \vee M \rightarrow A$

N Z C I D V
✓ / - - - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Immediate	EOR #dd	49	2	2
Zero Page	EOR aa	45	2	3
Zero Page, X	EOR aa,X	55	2	4
Absolute	EOR aaaa	4D	3	4
Absolute, X	EOR aaaa,X	5D	3	4*
Absolute, Y	EOR aaaa,Y	59	3	4*
(Indirect, X)	EOR (aa),X	41	2	6
(Indirect), Y	EOR (aa),Y	51	2	5*

*Add 1 if page boundary is crossed.

INC

Increment Memory by One

Operation: $M + 1 \rightarrow M$

N Z C I D V
✓ / - - - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Zero Page	INC aa	E6	2	5
Zero Page, X	INC aa,X	F6	2	6
Absolute	INC aaaa	EE	3	6
Absolute, X	INC aaaa,X	FE	3	7

INX

Increment Index X by One

Operation: $X + 1 \rightarrow X$

N Z C I D V
✓ / - - - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Implied	INX	E8	1	2

INY

Increment Index Y by One

Operation: $Y + 1 \rightarrow Y$

N Z C I D V
✓ / - - - -

Addressing Mode	Assembly Language Form	OP Code	No. Bytes	No. Cycles
Implied	INY	C8	1	2

JMP

Jump

Operation: $(PC + 1) \rightarrow PCL$
 $(PC + 2) \rightarrow PCH$

N Z C I D V
- - - - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Absolute	JMP aaaa	4C	3	3
Indirect	JMP (aaaa)	6C	3	5

JSR

Jump to Subroutine

Operation: $PC + 2 \downarrow, (PC + 1) \rightarrow PCL$
 $(PC + 2) \rightarrow PCH$

N Z C I D V
- - - - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Absolute	JSR aaaa	20	3	6

LDA

Load Accumulator with Memory

Operation: M → A

N Z C I D V
√ √ - - - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Immediate	LDA #dd	A9	2	2
Zero Page	LDA aa	A5	2	3
Zero Page, X	LDA aa,X	B5	2	4
Absolute	LDA aaaa	AD	3	4
Absolute, X	LDA aaaa,X	BD	3	4*
Absolute, Y	LDA aaaa,Y	B9	3	4*
(Indirect, X)	LDA (aa,X)	A1	2	6
(Indirect), Y	LDA (aa),Y	B1	2	5*

*Add 1 if page boundary is crossed.

LDX

Load Index X with Memory

Operation: M → X

N Z C I D V
√ √ - - - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Immediate	LDX #dd	A2	2	2
Zero Page	LDX aa	A6	2	3
Zero Page, Y	LDX aa,Y	B6	2	4
Absolute	LDX aaaa	AE	3	4
Absolute, Y	LDX aaaa,Y	BE	3	4*

*Add 1 when page boundary is crossed.

LDY

Load Index Y with Memory

Operation: M → Y

N Z C I D V
 √ / - - - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Immediate	LDY #dd	A0	2	2
Zero Page	LDY aa	A4	2	3
Zero Page, X	LDY aea,X	B4	2	4
Absolute	LDY aaaa	AC	3	4
Absolute, X	LDY aaaa,X	BC	3	4*

*Add 1 when page boundary is crossed.

LSR

Local Shift Right

Operation: 0 →

7	6	5	4	3	2	1	0
---	---	---	---	---	---	---	---

 → C

N Z C I D V
 0 √ / - - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Accumulator	LSR A	4A	1	2
Zero Page	LSR aa	46	2	5
Zero Page, X	LSR aa,X	56	2	6
Absolute	LSR aaaa	4E	3	6
Absolute, X	LSR aaaa,X	5E	3	7

NOP

No Operation

Operation: No Operation (2 cycles)

N Z C I D V
 - - - - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Implied	NOP	EA	1	2

ORA

OR Memory with Accumulator

Operation: A V M → A

N Z C I D V
 √ / - - - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Immediate	ORA #dd	09	2	2
Zero Page	ORA aa	05	2	3
Zero Page, X	ORA aa,X	15	2	4
Absolute	ORA aaaa	0D	3	4
Absolute, X	ORA aaaa,X	1D	3	4*
Absolute, Y	ORA aaaa,Y	19	3	4*
(Indirect, X)	ORA (aa,X)	01	2	6
(Indirect), Y	ORA (aa),Y	11	2	5*

*Add 1 on page crossing.

PHA

Push Accumulator on Stack

Operation: A ↓

N Z C I D V
 - - - - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Implied	PHA	48	1	3

PHP

Push Processor Status on Stack

Operation: P ↓

N Z C I D V
 - - - - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Implied	PHP	08	1	3

PLA

Pull Accumulator from Stack

Operation: A ↑

N Z C I D V
 √ / - - - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Implied	PLA	68	1	4

PLP

Pull Processor Status from Stack

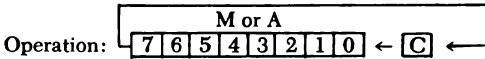
Operation: P ↑

N Z C I D V
 From Stack

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Implied	PLP	28	1	4

ROL

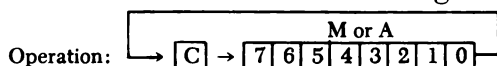
Rotate Left



N Z C I D V
 √ / √ - - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Accumulator	ROL A	2A	1	2
Zero Page	ROL aa	26	2	5
Zero Page, X	ROL aa,X	36	2	6
Absolute	ROL aaaa	2E	3	6
Absolute, X	ROL aaaa,X	3E	3	7

Rotate Right



N Z C I D V
 ✓ ✓ ✓ - - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Accumulator	ROR A	6A	1	2
Zero Page	ROR aa	66	2	5
Zero Page, X	ROR aa,X	76	2	6
Absolute	ROR aaaa	6E	3	6
Absolute, X	ROR aaaa,X	7E	3	7

RTI

Return from Interrupt

Operation: $P \uparrow PC \uparrow$

N Z C I D V
 From Stack

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Implied	RTI	40	1	6

RTS

Return from Subroutine

Operation: $PC \uparrow, PC + 1 \rightarrow PC$

N Z C I D V
 - - - - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Implied	RTS	60	1	6

SBC

Subtract from Accumulator with Carry

Operation: $A - M - \bar{C} \rightarrow A$

Note: \bar{C} = Borrow

N Z C I D V
 ✓ ✓ ✓ - - ✓

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Immediate	SBC #dd	E9	2	2
Zero Page	SBC aa	E5	2	3
Zero Page, X	SBC aa,X	F5	2	4
Absolute	SBC aaaa	ED	3	4
Absolute, X	SBC aaaa,X	FD	3	4*
Absolute, Y	SBC aaaa,Y	F9	3	4*
(Indirect, X)	SBC (aa,X)	E1	2	6
(Indirect), Y	SBC (aa),Y	F1	2	5*

*Add 1 when page boundary is crossed.

SEC

Set Carry Flag

Operation: $1 \rightarrow C$

N Z C I D V
 - - 1 - - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Implied	SEC	38	1	2

SED

Set Decimal Mode

Operation: $1 \rightarrow D$

N Z C I D V
 - - - - 1 -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Implied	SED	F8	1	2

SEI

Set Interrupt Disable Status

Operation: 1 → I

N Z C I D V
- - - 1 - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Implied	SEI	78	1	2

STA

Store Accumulator in Memory

Operation: A → M

N Z C I D V
- - - - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Zero Page	STA aa	85	2	3
Zero Page, X	STA aa,X	95	2	4
Absolute	STA aaaa	8D	3	4
Absolute, X	STA aaaa,X	9D	3	5
Absolute, Y	STA aaaa,Y	99	3	5
(Indirect, X)	STA (aa,X)	81	2	6
(Indirect), Y	STA (aa),Y	91	2	6

STX

Store Index X in Memory

Operation: X → M

N Z C I D V
- - - - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Zero Page	STX aa	86	2	3
Zero Page, Y	STX aa,Y	96	2	4
Absolute	STX aaaa	8E	3	4

STY

Store Index Y in Memory

Operation: Y → M

N Z C I D V

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Zero Page	STY aa	84	2	3
Zero Page, X	STY aa,X	94	2	4
Absolute	STY aaaa	8C	3	4

TAX

Transfer Accumulator to Index X

Operation: A → X

N Z C I D V

✓ ✓ -----

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Implied	TAX	AA	1	2

TAY

Transfer Accumulator to Index Y

Operation: A → Y

N Z C I D V

✓ ✓ -----

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Implied	TAY	A8	1	2

TSX

Transfer Stack Pointer to Index X

Operation: S → X

N Z C I D V
✓ / - - - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Implied	TSX	BA	1	2

TXA

Transfer Index X to Accumulator

Operation: X → A

N Z C I D V
✓ / - - - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Implied	TXA	8A	1	2

TXS

Transfer Index X to Stack Pointer

Operation: X → S

N Z C I D V
- - - - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Implied	TXS	9A	1	2

TYA

Transfer Index Y to Accumulator

Operation: Y → A

N Z C I D V
✓ / - - - -

Addressing Mode	Assembly Language Form	OP CODE	No. Bytes	No. Cycles
Implied	TYA	98	1	2

Key values

The values given below are not the ascii codes for the keys, but are unique values given to each key.

ESC	52	Q	62
1	56	W	9
2	59	E	14
3	8	R	17
4	11	T	22
5	16	Y	25
6	19	U	30
7	24	I	33
8	27	O	38
9	32	P	41
0	35	@	7
Cursor left	48	Plus	54
Cursor right	51	Minus	46
Cursor up	43	Clear home	57
Cursor down	40	RUN STOP	63
Inst del	0	A	10

S	13	X	23
D	18	C	20
F	21	V	31
G	26	B	28
H	29	N	39
J	34	M	36
K	37	Comma	47
L	42	Period	44
Colon	45	Backslash	55
Semi colon	50	Pound	2
Asterisk	49	Equals	53
Return	1	Space	60
Z	12		

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