

6809

fig-FORTH

ASSEMBLY SOURCE LISTING

RELEASE 1

WITH COMPILER SECURITY

AND

VARIABLE LENGTH NAMES

V 1.0

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FORTH INTEREST GROUP P.O. Box 1105 San Carlos, Ca. 94070

TTL (C)1980 TALBOT MICROSYSTEMS
STTL 68'FORTH for 6809 : FIG MODEL
OPT PAG,NOC,MAC,NOE

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*** FORTH FOR 6809 by R. J. Talbot, Jr. 80.03.20

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*** TALBOT MICROSYSTEMS

* This version of FORTH follows the model created by the

* The FORTH Interest Group (FIG)

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* The model is described in a document which may be obtained from
* them for \$15.00 entitled "fig-FORTH Installation Manual"

*

* This version was developed for a SWTPC 6809 system with FLEX, but
* all terminal I/O is done by internal code, so it is independent
* of the rom monitor or operating system such as FLEX.

* The only system dependent terminal I/O code which might need

* changing is the location of the control ACIA port in memory

* space - - the present assignment is to E004 and the data word is
* the control address + 1.

*

* All terminal I/O is done in three assembly language subroutines:

* Pemit - emits a character to terminal

* PKEY - reads a character from terminal (no echo)

* PQTERM - tests terminal for a character having been typed

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* The FORTH words for disk I/O follow the model of the FORTH

* Interest Group - there are both a RAM simulation of disk I/O and real

* disk I/O of standard FORTH SCREENS. Also, there is an interface

* which allows input or output using DOS format TEXT files, and

* there is a link to the DOS command structure so that

* DOS commands may be executed from FORTH, including read into

* or write from RAM simulated disk using TAPE or DISK SAVE or LOAD.

*

* This 68'FORTH Vers 1.1 assembled machine code program is available on

* a FLEX 9.0 soft-sectored 5-1/4 " diskette or

* on a 300 baud KCS cassette from TALBOT MICROSYSTEMS.

* The cassette version may be used in conjunction with the

* RAM simulation of disk to implement a cassette-only version or to

* modify the DOS interface to something other than FLEX.

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* Advanced versions are available (in

* diskette form only) which contains a full 6809 assembler in FORTH,

* a screen oriented FORTH source text editor, and many other

* useful vocabularies -- contact TALBOT Microsystems.

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* This assembly source code is available (on FLEX 9.0 soft sectored

* 5 1/4" diskette only) -- contact TALBOT Microsystems.

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*          MEMORY MAP
* addr      contents                      pointer      init by
* ****      ****
* 0000      COLD start entry point
* 0003      Warm start entry point
*
* 0006      start of FORTH KERNEL
*          COLD startup parameters, WARM startup parameters
*          common system variables
*          start of FORTH code
*
*          register Y          <== IP          ABORT
*          (W = X after LDX ,Y++ at NEXT) <== W
*
* 1BEF      end of FORTH KERNEL          dict links to FORTH further up.
* 2000      -NBLK*(BUFSIZ+4)                      FIRST,VIRBGN
*          NBLK buffer sectors of VIRTUAL MEMORY
*          initialized with NBLK=4 so VIRBGN = 1BFO
* 2000
*          registers and pointers for FORTH
* 2020      USER #1 table of variables          <== UP          UPINT
*
* 2050      "FORTH" ( a word )          <=          <==CONTEXT
*          "TASK" ( a word marking end of dict.)          <=====CURRENT
* 207E
* 2xxx      dictionary grows |
*          up |
*          |
*          towards higher memory
*          |
*          towards lower memory
*          down |
* 2F30      DATA stack grows |          register U          <== SP          SPO,SINIT
* 2F30
*          INPUT LINE BUFFER
*          holds up to 132 characters and
*          is scanned upward by IN starting
*          at TIB
* 2FB4
* 3000      RETURN stack base          register S          <== RP          RINIT
*          LO,DSMBGN
*          space to simulate a disk mass memory
* 4000
*          HI,MENTOP
*          TOPMEM

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0004 NBLK    SET    4          # of disc buffer blocks for virtual memory
0100 BUFSIZ  EQU    256        # of bytes per disk sector
0000 PRGBGN  EQU    $0000      beginning of FORTH program, COLD entry point,
*                                WARM entry point is PRGBGN + 3
1BF0 VIRBGN  SET    VIREND-NBLK*(BUFSIZ+4) assigns space for 4 BUFFERS
2000 VIREND  EQU    $2000      end of virtual memory buffers
* each block is BUFSIZ+4 bytes in size, holding BUFSIZ characters
* plus 4 bytes of control info
2000 USREGN  EQU    $2000      beginning of user space
3000 USREND  EQU    $3000      end of user space, above is for disc sim
3000 DSMBGN  EQU    $3000      begin of space available for disc simulation
4000 DSMEND  EQU    $4000      end of memory available for disc simulation
3000 MEMEND  EQU    DSMBGN
4000 MENTOP  EQU    DSMEND
*
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*** * * *

* CONVENTIONS USED IN THIS PROGRAM ARE -

*

* IP = register Y points towards the next word to execute

* SP = register U points to LAST BYTE on the data stack

* RP = register S points to LAST WORD on return stack

* register X is used as a general index register for pointing
* at things. For some indexing purposes, Y, U, or S are
* saved so X and Y, U, or S may be used at same time.

* W upon entry to a word, X = W = location of word containing
* address of code to execute.

*

*

* When A and B are used seperately, in order to maintain compatibility
* with D register, A contains high byte, B the low byte.

*

*** * * *

***** MACRO for creating dictionary headers *****

0000 LASTNM SET 0

*

WORDM MACRO

NEXTNM SET *

IFC &4,IMMEDIATE

FCB &1+\$C0

* 1st byte is no of char with sign and immed bit on if IMMEDIATE

ELSE

FCB &1+\$80

ENDIF

IFNC &1,1

FCC '&2'

ENDIF

* if more than one char, then all but last in here

* then last has sign bit set

FCB \$80+'&3

FDB LASTNM

LASTNM SET NEXTNM

IFC &5,USER

&6 FDB DOUSER TSC assembler gives error message -- IGNORE

*** ILLEGAL LABEL

FDB &7-UORIG

ENDIF

ENDM

*

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2000          ORG      USRBGN      variables
2000          N        RMB      10      used as scratch
200A          UP      RMB      2        the pointer to base of current user's
*                                     USER table ( for multi-tasking)
*      This system is shown for one user, but additional ones
*      may be added by allocating additional user tables and
*      words for switching the pointer between them.
*      Alternatively, with SWTP SBUG dynamic memory assignment, it would
*      be possible to have a memory management procedure in KERNAL which
*      switches various USER 4k blocks in and out of this low space.
*
*      Some of the next stuff is initialized during COLD and WARM starts.
*      Names correspond to FORTH words of similar (no X) name.
*
200C          UORIG    RMB      6        3 reserved variables
*      INIT ON COLD START
2012          XFENCE  RMB      2        fence for FORGET
2014          XDP      RMB      2        dictionary pointer
2016          XVOCL    RMB      2        vocaabulary linking
2018          XACIA    RMB      2        address of acia port
201A          XDELAY   RMB      2        carriage return delay count (# of nulls)
201C          XCOLUM   RMB      2        carriage width
201E          XBKSP    RMB      1        backspace character
201F          XBKSP    RMB      1        backspace echo
2020          XLINDL   RMB      1        line delete character
2021          XLINDE   RMB      1        line delete echo
*      INIT BELOW ON COLD OR WARM
2022          XSPZER   RMB      2        initial top of data stack for this user
2024          XTIB     RMB      2        start of terminal input buffer
2026          XRZERO   RMB      2        initial top of return stack
2028          XFINA    RMB      2        address of input file FCB
202A          XFOUTA   RMB      2        address of output file FCB
202C          XWIDTH   RMB      2        name field width
202E          XMSGBS   RMB      2        Base SCReen number for messages and GO
2030          KWARN    RMB      2        warning message mode ( 0 = no disk)
*      END OF INITIALIZED PARAMETERS
2032 0000      XBLK    FDB      0        disc block being accessed
2034 0000      XIN     FDB      0        scan pointer into the block
2036 0002      XOUT    FDB      2        cursor position
2038 0000      XSCR    FDB      0        disc screen being accessed (0 = terminal)
203A 0000      XOFSET   FDB      0        disc sector offset for multi-disc
203C 207E      XCONT   FDB      TASK-7   last word in primary search vocabulary
203E 207E      XCURR   FDB      TASK-7   last word in extensible vocabulary
2040 0000      XSTATE  FDB      0        flag for 'interpret' or 'compile' modes
2042 000A      XBASE   FDB      10       number base for I/O numeric conversions
2044 0002      XDPL    FDB      2        decimal point place
2046 0000      XFLD    FDB      0
2048 0000      XCSP    FDB      0        current stack position, for compile checks
204A 0000      XRNUM   FDB      0
204C 0000      XHLD    FDB      0
204E 0000      IOSTAT  FDB      0        last acia status from write/read

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* END OF USER TABLE
*
*** Beginning of variable dictionary entries
2050 C5          FCB    $C5      5, IMMEDIATE
2051 46 4F 52 54    FCC    "FORT"
2055 C8          FCB    $80+'H
2056 1A34         FDB    NOOP-7    LINK "BACK"
2058 0700 10BA    FORTH  FDB    DODOES,DOVOC,$81A0,TASKAA
205C 81A0 207E
2060 0000         FDB    0
2062 28 43 29 20    FCC    "(C) Talbot Microsystems 1980"
2066 54 61 6C 62
206A 6F 74 20 4D
206E 69 63 72 6F
2072 73 79 73 74
2076 65 6D 73 20
207A 31 39 38 30
207E 84          TASKAA FCB    $84
207F 54 41 53      FCC    "TAS"
2082 CB          FCB    $80+'K
2083 2050         FDB    FORTH-8    link "back" to FORTH
2085 0073 0080    TASK  FDB    DOCOL,SEMIS
                2089  REFD  EQU    *      ( first empty location in dictionary)
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0000          *      The FORTH program begins here;
                ORG      PRGBGN
0000 16      013F      * First, COLD and WARM entry points
                KERNAL  LBRA  CENT
0003 16      018E      LBRA  WENT
                *****
                *      Startup parameters *****
                *
0006 6809      CPUTYP  FDB      $6809      cpu
0008 0101      VERSION FDB      $0101      version  wxyz print as wx.yz
000A 0000      FDB      $0000
000C 14        FCB      20
000D 52 2E 20 4A      FCC      "R. J. TALBOT, JR.  "
0011 2E 20 54 41
0015 4C 42 4F 54
0019 2C 20 4A 52
001D 2E 20 20 20
0021 200C      UPINIT  FDB      UORIG      initial user area
                * FOLLOWING INITIALIZED ON COLD START ONLY
0023 207E      FENCIN  FDB      TASKAA     initial fence at TASK
0025 2089      DPINIT  FDB      REND       cold start value for DP location in dict.
0027 2060      VOCINT  FDB      FORTH+8    cold start for VOC-LINK
0029 E004      ACIAI   FDB      $E004     initial location of acia port
002B 0008      DELINT  FDB      8          initial carriage return delay
002D 0050      COLINT  FDB      80         initial terminal carriage width
002F 08        BACKSP  FCB      $08       character to indicate backspace
0030 08        BACKEC  FCB      $08       character to echo for backspace
0031 18        LINDEL  FCB      $18       character to indicate line delete
0032 18        LINDEC  FCB      $18       character to echo for line delete
0033 1BF0      XVIRBG  FDB      VIRBGH
0035 2000      XVIREB  FDB      VIREND
0037 3000      XDSMBG  FDB      DSMBGN
0039 4000      XDSHED  FDB      DSMEND
                * END COLD START INITIALIZATION AREA
                *
                * THE FOLLOWING USED TO INITIALIZE USER AREA ON WARM OR COLD START
003B 2F30      SINIT   FDB      USREND-$D0 initial top of data stack
003D 2F30      TIBINT  FDB      USREND-$D0 terminal input buffer
003F 3000      RINIT   FDB      USREND     initial top of return stack
0041 0000      FINA    FDB      0          initialize no input file FCB
0043 0000      FCUTA   FDB      0          "          no output file FCB
0045 001F      WIDINT  FDB      31         init name field width
0047 0028      MSGBAS  FDB      40         init base SCreen number for messages and GO
0049 0001      WRNINT  FDB      1          init warning mode (0= no disc)
                * END WARM+COLD INITIALIZATION AREA
                *
                * system variables
004B          XUSE     RMB      2
004D          XPREV    RMB      2
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*
* Start of FORTH Kernel
*
004F 37 06 PULLDX PULU D 15 cycles to NEXT
0051 ED 84 STOREX STD ,X 8
0053 20 22 BRA NEXT
0055 EC 84 GETX LDD ,X 15 cycles to NEXT
0057 36 06 PUSHU PSNU D 7
0059 20 1C BRA NEXT
*
* Here is the IP pusher for allowing nested words
* ;S is the equivalent unnester
*
005B WORDM 1,,:,IMMEDIATE
005F 0073 0A51 COLON FDB DOCOL,QEXEC,SCSP,CURRENT,AT,CONTEXT,STORE
0063 0A0D 0877
0067 06A7 0869
006B 06BF
006D 0F7D 0AD2 FDB CREATE,RBRAK,PCODE
0071 0E21
0073 34 20 DOCOL PSHS Y save present IP on ret stack RP
0075 31 02 LEAY 2,X kick Y up to first param after CFA in W=X
* LBRA NEXT JUST DROP ON THROUGH T NEXT
*
* NEXT takes 14 cycles
*
**** BEGINNING OF SIMULATION OF VIRTUAL FORTH MACHINE
*
0077 AE A1 NEXT LDX ,Y++ get W to X and then increment Y=IP
* the address of the pointer to the present code is in X now
* if need it at any time, it may be computed by LDX -2,Y
0079 6E 94 NEXT3 JMP [,X] jump indirect to code pointed to by W
*
**** END OF SIMULATION OF THE VIRTUAL FORTH MACHINE
007B WORDM 2,,:,S
0080 0082 SEMIS FDB *+2
0082 10AE E1 PSEMIS LDY ,S++ reset Y=IP to next addr and drop frm S=RP
0085 20 F0 BRA NEXT
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0087		WORDM	7,EXECUT,E	
0091 0093	EXEC	FDB	*+2	
0093 37 10		PULU	X	
0095 20 E2		BRA	NEXT3	
0097		WORDM	3,MO,N	
009D 1A59	MON	FDB	PMON	
009F		WORDM	3,JS,R	
00A5 00A7	JSR	FDB	*+2	
00A7 AD D1		JSR	[,U++]	
>00A9 16 FFCE		LBRA	NEXT	
00AC		WORDM	4,EMI,T	
00B3 0073 00B9	EMIT	FDB	DOCOL,CEMIT,SEMIS	
00B7 0080				
00B9 00BB	CEMIT	FDB	*+2	this is a word with no header
00BB 37 06		PULU	D	
00BD 1F 98		TFR	B,A	
00BF 17 198E		LBSR	PEMIT	
00C2 BE 2036		LDX	XOUT	
00C5 30 01		LEAX	1,X	increment by 1
00C7 BF 2036		STX	XOUT	
>00CA 16 FFAA		LBRA	NEXT	
00CD		WORDM	3,KE,Y	
00D3 0073 00D9	KEY	FDB	DOCOL,CKEY,SEMIS	
00D7 0080				
00D9 00DB	CKEY	FDB	*+2	this is a word with no header
00DB 17 1975		LBSR	PKEY	
00DE 1F 89		TFR	A,B	
00E0 4F		CLRA		
00E1 16 FF73		LBRA	PUSHD	
00E4		WORDM	9,?TERMINA,L	
00F0 00F2	QTERM	FDB	*+2	
00F2 17 1961		LBSR	PQTER	
00F5 1F 89		TFR	A,B	
00F7 4F		CLRA		
00F8 16 FF5C		LBRA	PUSHD	
00FB		WORDM	2,C,R	
0100 0073 00F0	CR	FDB	DOCOL,QTERM,ZERAN	
0104 020B				
0106 0004		FDB	CR1-*	
0108 10F2		FDB	QUIT	
010A 01EE	CRI	FDB	CLITER	
010C 0A		FCB	\$0A	
010D 00B3 01EE		FDB	EMIT,CLITER	
0111 0D		FCB	\$0D LF	
0112 00B3 076B		FDB	EMIT,ZERO,OUT,STORE	
0116 0844 06BF				
011A 01E7 201A		FDB	LIT,XDELAY,AT,ZERAN	
011E 06A7 020B				
0122 0014		FDB	CRE-*	
0124 01E7 201A		FDB	LIT,XDELAY,AT,ZERO,XDO	
0128 06A7 076B				

012C 0261					
012E 076E 00B3	CR2	FDB	ZERO,EMIT,XLOOP		
0132 0228					
0134 FFFA		FDB	CR2-*		
0136 0080	CRE	FDB	SEMIS		
0138 FF	IFCOLD	FCB	\$FF		
0139		WORDM	4,COL,D		
0140 0142	COLD	FDE	*+2		
0142 DE 25	CENT	LDU	DPINIT	top of destination	
0144 8E 11C9		LDX	#ERAM	top of stuff to move	
0147 A6 82	COLD2	LDA	,-X		
0149 A7 C2		STA	,-U		
014B 8C 1190		CPX	#RAM		
014E 26 F7		BNE	COLD2		
0150 86 FF		LDA	#\$FF		
0152 B7 0138		STA	IFCOLD		
0155 10DE 35		LDS	XVIRED	put stack somewhere safe	
0158 9E 35		LDX	XVIRED		
015A BF 07A6		STX	LIMIT+2		
015D 9E 33		LDX	XVIRBG		
015F 9F 4B		STX	XUSE		
0161 9F 4D		STX	XPREV		
0163 BF 079A		STX	FIRST+2		
0166 86 00		LDA	#0		
0168 A7 80	COLD8	STA	,X+		
016A 9C 35		CMPX	XVIRED		
016C 26 FA		BNE	COLD8		
016E A7 84		STA	,X		
0170 9E 39		LDX	XDSMED		
0172 BF 1862		STX	HI+2		
0175 9E 37		LDX	XDSMBG		
0177 BF 1859		STX	LO+2		
017A CE 2022		LDU	#KLINDE+1		
017D 8E 0033		LDX	#LINDEC+1		
0180 A6 82	COLDZ	LDA	,-X		
0182 A7 C2		STA	,-U		
0184 8C 0023		CPX	#FENCIN		
0187 26 F7		BNE	COLDZ		
0189 20 09		BRA	WENT		
018B		WORDM	4,WAR,M		
0192 0194	WARM	FDB	*+2		
0194 CE 2032	WENT	LDU	#XWARN+2		
0197 8E 004B		LDX	#WRNINT+2		
019A A6 82	WARM2	LDA	,-X		
019C A7 C2		STA	,-U		
019E 8C 003B		CPX	#SINIT		
01A1 26 F7		BNE	WARM2		
01A3 FE 2022		LDU	XSPZER	U is SP	
01A6 9E 21		LDX	UPINIT		
01A8 BF 200A		STX	UP	init user pointer	
01AB 108E 1122		LDY	#ABORT+2	Y is IP, init to first instruc in ABORT	
01AF 12	INTSPC	NOP			

01B0 12		NOP		here is place to jump to special
01B1 12		NOP		initialization routines
>01B2 16	0025	LBRA	RPSTOR+2	
01B5		WORDM	3,SP,@	
01BB 01BD		SPAT	FDB	*+2
01BD 30	C4	LEAX	,U	X = VALUE OF SP
01BF 36	10	PSHU	X	
01C1 16	FEB3	LBRA	NEXT	
01C4		WORDM	3,SP,!	
01CA 01CC		SPSTOR	FDB	*+2
01CC FE	2022	LDU	XSPZER	
01CF 16	FEA5	LBRA	NEXT	
01D2		WORDM	3,RP,!	
01D8 01DA		RPSTOR	FDB	*+2
01DA 10FE	2026	LDS	XRZERO	initialize S=RP from constant
01DE 16	FE96	LBRA	NEXT	
01E1		WORDM	3,LI,T	NOTE: this is different from LITERAL
01E7 01E9		LIT	FDB	*+2
01E9 EC	A1	LDD	,Y++	get word pointed to by Y=IP and increment
01EB 16	FE69	LBRA	PUSHD	push D to data stack and then NEXT
01EE 01F0		CLITER	FDB	*+2
01F0 E6	A0	LDB	,Y+	this is an invisible word with no header
01F2 4F		CLRA		
01F3 16	FE61	LBRA	PUSHD	
01F6		WORDM	6,BRANC,H	
01FF 0211		BRAN	FDB	ZYES
0201		WORDM	7,0BRANC,H	go steal code in ZBRANCH
020B 020D		ZBRAN	FDB	*+2
020D EC	C1	LDD	,U++	get quantity on stack and drop it
020F 26	09	BNE	ZBNO	
0211 1F	20	ZYES	TFR	Y,D
0213 E3	A4	ADDD	,Y	puts IP = Y into D for arithmetic
0215 1F	02	TFR	D,Y	adds offset to which IP is pointing
0217 16	FE5D	LBRA	NEXT	sets new IP
021A 31	22	ZBNO	LEAY	2,Y
021C 16	FE58	LBRA	NEXT	skip over branch
021F		WORDM	6,(LOOP,)	
0228 022A		XLOOP	FDB	*+2
022A CC	0001	LDD	#1	set inc cntr to 1 and steal other code
022D 20	0E	BRA	XPLOP2	
022F		WORDM	7,(+LOOP,)	
0239 023B		XPLOOP	FDB	*+2
023B 37	06	PULU	D	
023D 4D		XPLOP2	TSTA	
023E 2A	0E	BPL	XPLOF	forward loopint
0240 E3	E4	ADDD	,S	add D to counter on RP=S
0242 ED	E4	STD	,S	
0244 1C	01	ANDCC	#\$1	set c bit
0246 E2	63	SBCB	3,S	
0248 A2	62	SBCA	2,S	
024A 2A	C5	BPL	ZYES	
024C 20	08	BRA	XPLONO	fall thru

024E	E3	E4	XPLOF	ADDD	,S	
0250	ED	E4		STD	,S	
0252	A3	62		SUBD	2,S	
0254	2B	BB		BMI	ZBYES	
0256	32	64	XPLONO	LEAS	4,S	drop 4 bytes of counter and limit
0258	20	C0		BRA	ZBNO	use ZBRAN to skip over unused delta
025A				WORDM	4,(DO,)	
0261	0263		XDO	FDB	*+2	
0263	37	06		PULU	D	counter
0265	37	10		PULU	X	limit
0267	34	16		PSHS	X,D	X goes first, so becomes second on RP=S
0269	16	FE0B		LBRA	NEXT	
026C				WORDM	1,,I	
0270	0272		I	FDB	*+2	
0272	EC	E4		LDD	,S	get counter from RP
0274	16	FDE0		LBRA	PUSHD	
0277				WORDM	1,,J	
027B	027D		J	FDB	*+2	
027D	EC	64		LDD	4,S	get second counter above limit for first
027F	16	FDD5		LBRA	PUSHD	
0282				WORDM	1,,K	
0286	0288		K	FDB	*+2	
0288	EC	68		LDD	8,S	get third counter
028A	16	FDCA		LBRA	PUSHD	
028D				WORDM	5,DIGI,T	
0295	0297		DIGIT	FDB	*+2	
0297	A6	43		LDA	3,U	second item is char of interest
0299	80	30		SUBA	#\$30	ascii zero
029B	2B	1B		BMI	DIGIT2	if less than '0', ILLEGAL
029D	81	0A		CMPA	#\$A	
029F	2B	0A		BMI	DIGIT0	if '9' or less
02A1	81	11		CMPA	#\$11	
02A3	2B	13		BMI	DIGIT2	if less than 'A'
02A5	81	2B		CMPA	#\$2B	
02A7	2A	0F		BPL	DIGIT2	if greater than 'Z'
02A9	80	07		SUBA	#7	translate 'A' thru 'Z'
02AB	A1	41	DIGIT0	CMPA	1,U	
02AD	2A	09		BPL	DIGIT2	if not less than base
02AF	C6	01		LDB	#1	
02B1	A7	43		STA	3,U	
02B3	E7	41	DIGIT1	STAB	1,U	store flag
02B5	16	FDBF		LBRA	NEXT	
02B8	5F		DIGIT2	CLRB		
02B9	33	42		LEAU	2,U	pop top off
02BB	E7	C4		STAB	0,U	make sure both bytes 0
02BD	20	F4		BRA	DIGIT1	
02BF				WORDM	6,(FIND,)	
02C8	02CA		PFIND	FDB	*+2	
		2000	PD	EQU	N	
		2002	PA0	EQU	N+2	
		2004	PA	EQU	N+4	
		2006	PCHR	EQU	N+6	

```

02CA 34 20      PSHS  Y      save Y
02CC 37 30      PFIND0 PULU  X,Y
02CE 10BF 2002  STY    PAO
*      *      *      *      *      X is dict ptr      Y is ptr to word that finding
02D2 E6 80      PFIND1 LDB    ,X+      get count from dict
02D4 F7 2006      STAB  PCHR
02D7 C4 3F      ANDB  #$3F      mask sign and precedence
02D9 10BE 2002  LDY    PAO
02DD E1 A0      CMPB  0,Y+
02DF 26 18      BNE   PFIND4      not equal
02E1 A6 A0      PFIND2 LDA    ,Y+
02E3 6D 84      TST   ,X      is dict entry neg?
02E5 2A 0E      BPL   PFIND8
02E7 8A 80      ORA   #$80      make A neg also
02E9 A1 80      CMPA  ,X+
02EB 27 12      BEQ   FOUND
02ED AE 84      PFIND3 LDX    0,X      get new link in dict
02EF 26 E1      BNE   PFIND1      continue if new link not = 0
*      not found :
02F1 1F 10      TFR   X,D
02F3 20 14      BRA   PFINDE
*
02F5 A1 80      PFIND8 CMPA  ,X+
02F7 27 E8      BEQ   PFIND2
02F9 E6 80      PFIND4 LDE    ,X+      scan forward to end of name
02FB 2A FC      BPL   PFIND4
02FD 20 EE      BRA   PFIND3
*
* found :
02FF 30 04      FOUND  LEAX  4,X      point to parameter field
0301 F6 2006      LDB   PCHR
0304 4F          CLRA
0305 36 16      PSHU  X,D      X goes first
0307 C6 01      LDB   #1
0309 35 20      PFINDE PULS  Y
030B 16 FD49      LBRA  PUSHB
030E          WORDM  7,ENCLOS,E
* NOTE: FC means offset (bytes) to First Character of next word
*      EW " "      to End of next Word
*      NC " "      to Next Character to start next enclose at
0318 031A      ENCLOS FDB   *+2
031A 37 06      PULU  D      get char off stack to use as delim into B
031C AE C4      LDX   ,U      addr to begin
031E 7F 2000      CLR   N
0321 F7 2001      STB   N+1      save delim to use
*      wait for a non-delimiter or NUL
0324 A6 84      ENCL2  LDA   0,X
0326 27 2A      BEQ   ENCL6
0328 B1 2001      CMPA  N+1      check for delim
032B 26 07      BNE   ENCL3
032D 30 01      LEAX  1,X
032F 7C 2000      INC   N

```

```

0332 20  F0          BRA    ENCL2
                * found first character, Push PC
0334 F6  2000      ENCL3  LDB    N          found first character
0337 4F          CLRA
0338 36  06          PSHU    D
                * wait for a delimiter or NUL
033A A6  80          ENCL4  LDA    ,X+
033C 27  1C          BEQ    ENCL7
033E B1  2001        CMPA    N+1          check for delim
0341 27  05          BEQ    ENCL5
0343 7C  2000        INC     N
0346 20  F2          BRA    ENCL4
                * found EW, Push it
0348 F6  2000      ENCL5  LDB    N
034B 4F          CLRA
034C 36  06          PSHU    D
                *advance and push NC
034E 5C          INCB
034F 16  FD05        LBRA    PUSHED
                * found NUL before non delimiter, therefore, no word
0352 F6  2000      ENCL6  LDB    N          A is zero
0355 36  06          PSHU    D
0357 5C          INCB
0358 20  03          BRA    ENCL7P
                * found NUL following word instead of SPACE
035A F6  2000      ENCL7  LDB    N
035D 36  06          ENCL7P PSHU    D          save EW
035F F6  2000      ENCL8  LDB    N          save NC
0362 16  FCF2        LBRA    PUSHED
0365          WORDM    5,CMOV,E  sourcead, destinationad, count
036D 036F          CMOVE  FDB    *+2
036F 8D  03          BSR    PCMOVE
0371 16  FD03        LBRA    NEXT
0374 34  30          PCMOVE  PSHS    X,Y
0376 37  36          PULU    D,X,Y          D=ct, X=dest, Y=source
0378 34  40          PSHS    U
037A 1F  23          TFR     Y,U
037C 1F  02          TFR     D,Y          use Y as COUNTER
037E 31  21          LEAY    1,Y
0380 31  3F          CMOV2  LEAY    -1,Y
0382 27  06          BEQ    CMOV3
0384 A6  C0          LDA     ,U+
0386 A7  80          STA     ,X+
0388 20  F6          BRA    CMOV2
038A 35  40          CMOV3  PULS    U
038C 35  30          PULS    X,Y
038E 39          RTS
                *
038F          WORDM    2,U,*
0394 0396          USTAR  FDB    *+2
0396 8D  05          BSR    USTARS
0398 33  42          LEAU    2,U

```

```

039A 16  FCBA          LBRA  PUSHD
*
* The following is a subroutine which multiplies top
* 2 words on stack, leaving 32-bit result: high order in D
* and low order word in 2ND word of stack.
039D 8E  0011  USTARS  LDX   #17
03A0 CC  0000          LDD   #0
03A3 66  42          USTAR2 ROR   2,U      shift mult
03A5 66  43          ROR   3,U
03A7 30  1F          LEAX  -1,X      done ?
03A9 27  08          BEQ   USTAR4
03AB 24  02          BCC   USTAR3
03AD E3  C4          ADDD  ,U
03AF 46          USTAR3 RORA
03B0 56          RORB
03B1 20  F0          BRA   USTAR2
03B3 39          USTAR4 RTS
03B4          WORDM  2,U,/
03B9 03BB  USLASH  FDB   *+2
03BB EC  42          LDD   2,U
03BD AE  44          LDX   4,U
03BF AF  42          STX   2,U
03C1 ED  44          STD   4,U
03C3 68  43          ASL   3,U
03C5 69  42          ROL   2,U
03C7 8E  0010        LDX   #$10
03CA 69  45          USLL1 ROL   5,U
03CC 69  44          ROL   4,U
03CE EC  44          LDD   4,U
03D0 A3  C4          SUBD  ,U
03D2 1C  FE          ANDCC #$FE      CLC
03D4 2B  04          BMI   USLL2
03D6 ED  44          STD   4,U
03D8 1A  01          ORCC  #1      SEC
03DA 69  43          USLL2 ROL   3,U
03DC 69  42          ROL   2,U
03DE 30  1F          LEAX  -$1,X
03E0 26  E8          BNE   USLL1
03E2 33  42          LEAU  2,U
03E4 16  FC90        LBRA  NEXT
03E7          WORDM  3,AN,D
03ED 03EF          AND   FDB   *+2
03EF 37  06          PULU  D
03F1 E4  41          ANDB  1,U
03F3 A4  C4          ANDA  0,U
03F5 ED  C4          PUTD  STD   ,U
03F7 16  FC7D        LBRA  NEXT
03FA          WORDM  2,O,R
03FF 0401          OR    FDB   *+2
0401 37  06          PULU  D
0403 EA  41          ORB   1,U
0405 AA  C4          ORA   0,U

```


0407	20	EC		BRA	PUTD
0409				WORDM	3,XO,R
040F	0411		XOR	FDB	*+2
0411	37	06		PULU	D
0413	E8	41		EORB	1,U
0415	A8	C4		EORA	0,U
0417	20	DC		BRA	PUTD
0419				WORDM	1.,+
041D	041F		PLUS	FDB	*+2
041F	37	06		PULU	D
0421	E3	C4		ADDD	,U
>0423	16	FFCF		LBRA	PUTD
0426				WORDM	2,D,+
042B	042D		DPLUS	FDB	*+2
042D	EC	42		LDD	2,U
042F	E3	46		ADDD	6,U
0431	ED	46		STD	6,U
0433	EC	C4		LDD	,U
0435	E9	45		ADCB	5,U
0437	A9	44		ADCA	4,U
0439	33	44		LEAU	4,U
043B	ED	C4		STD	,U
043D	16	FC37		LBRA	NEXT
0440				WORDM	5,MINU,S
0448	044A		MINUS	FDB	*+2
044A	60	41		NEG	1,U
044C	25	05		BCS	MINUS2
044E	60	C4		NEG	,U
0450	16	FC24		LBRA	NEXT
0453	63	C4	MINUS2	COM	,U
0455	16	FC1F		LBRA	NEXT
0458				WORDM	6,DMINU,S
0461	0463		DMINUS	FDB	*+2
0463	63	C4		COM	0,U
0465	63	41		COM	1,U
0467	63	42		COM	2,U
0469	60	43		NEG	3,U
046B	26	0A		BNE	DMINX
046D	6C	42		INC	2,U
046F	26	06		BNE	DMINX
0471	6C	41		INC	1,U
0473	26	02		BNE	DMINX
0475	6C	C4		INC	,U
0477	16	FBFD	DMINX	LBRA	NEXT
047A				WORDM	2,1,+
047F	0481		ONEP	FDB	*+2
0481	EC	C4		LDD	,U
0483	C3	0001		ADDD	#1
0486	16	FF6C		LBRA	PUTD
0489				WORDM	2,2,+
048E	0490		TWOP	FDB	*+2
0490	CC	0002		LDD	#2

0493	E3	C4		ADDD	,U
0495	16	FF5D		LBRA	PUTD
0498				WORDM	2,1,-
049D	049F		ONEM	FDB	*+2
049F	EC	C4		LDD	,U
04A1	83	0001		SUBD	#1
04A4	16	FF4E		LBRA	PUTD
04A7				WORDM	2,2,-
04AC	04AE		TWOM	FDB	*+2
04AE	EC	C4		LDD	,U
04B0	83	0002		SUBD	#2
04B3	16	FF3F		LBRA	PUTD
04B6				WORDM	2,M,*
04BB	0073	065D	MSTAR	FDB	DOCOL,OVER,OVER,XOR,TOR,ABS,SWAP,ABS,USTAR
04BF	065D	040F			
04C3	0639	057C			
04C7	0679	057C			
04CE	0394				
04CD	0647	05E8		FDB	FROMR,DSETSN,SEMS
04D1	0080				
04D3				WORDM	1,,*
04D7	0073	04BB	STAR	FDB	DOCOL,MSTAR,DROP,SEMS
04DB	066B	0080			
04DF				WORDM	2,M,/ signed double=-3,-2,signed divisor-1
			*		--> signed rem -2 , quotient -1
04E4	0073	065D	MSLASH	FDB	DOCOL,OVER,TOR,TOR,DABS,R,ABS,USLASH,FROMR,R,XOR
04E8	0639	0639			
04EC	0591	0654			
04F0	057C	03B9			
04F4	0647	0654			
04F8	040F				
04FA	05D6	0679		FDB	SETSN,SWAP,FROMR,SETSN,SWAP,SEMS
04FE	0647	05D6			
0502	0679	0080			
0506				WORDM	4,/MO,D
050D	0073	0639	SLMOD	FDB	DOCOL,TOR,STOD,FROMR,MSLASH,SEMS
0511	05C1	0647			
0515	04E4	0080			
0519				WORDM	1,,/
051D	0073	050D	SLASH	FDB	DOCOL,SLMOD,SWAP,DROP,SEMS
0521	0679	066B			
0525	0080				
0527				WORDM	3,MO,D
052D	0073	050D	MOD	FDB	DOCOL,SLMOD,DROP,SEMS
0531	066B	0080			
0535				WORDM	5,*/MO,D
053D	0073	0639	SSMOD	FDB	DOCOL,TOR,MSTAR,FROMR,MSLASH,SEMS
0541	04BB	0647			
0545	04E4	0080			
0549				WORDM	2,*,/
054E	0073	053D	SSLASH	FDB	DOCOL,SSMOD,SWAP,DROP,SEMS
0552	0679	066B			

0556	0080			
0558			WORDM	5,M/MO,D
0560	0073 0639	MSMOD	FDB	DOCOL,TOR,ZERO,R,USLASH,FROMR,SWAP,TOR
0564	076B 0654			
0568	03B9 0647			
056C	0679 0639			
0570	03B9 0647		FDB	USLASH,FROMR,SEMIS
0574	0080			
0576			WORDM	3,AB,S
057C	0073 068A	ABS	FDB	DOCOL,DUP,ZLESS,ZBRAN
0580	0611 020B			
0584	0004		FDB	ABS2-*
0586	0448		FDB	MINUS
0588	0080	ABS2	FDB	SEMIS
058A			WORDM	4,DAB,S
0591	0073 068A	DAES	FDB	DOCOL,DUP,ZLESS,ZBRAN
0595	0611 020B			
0599	0004		FDB	DABS2-*
059B	0461		FDB	DMINUS
059D	0080	DABS2	FDB	SEMIS
059F			WORDM	1,,<
05A3	05A5	LESS	FDB	*+2
05A5	37 06		PULU	D
05A7	A1 C4		CMPA	0,U
05A9	2E 09		BGT	LESST
05AB	26 04		BNE	LESSF
05AD	E1 41		CMPB	1,U
05AF	22 03		BHI	LESST
05B1	5F	LESSF	CLRB	
05B2	20 02		BRA	LESSX
05B4	C6 01	LESST	LDB	#1
05B6	4F	LESSX	CLRA	
05B7	16 FE3B		LBRA	PUTD
05BA			WORDM	4,S->,D
05C1	05C3	STOD	FDB	*+2
05C3	CC 0000		LDD	#0
05C6	6D C4		TST	,U
05C8	2A 02		BPL	STOD2
05CA	43		COMA	
05CB	53		COMB	
05CC	ED C3	STOD2	STD	,--U
05CE	16 FAA6		LBRA	NEXT
05D1			WORDM	2,+,-
05D6	0073 0611	SETSN	FDB	DOCOL,ZLESS,ZBRAN
05DA	020B			
05DC	0004		FDB	SETSN2-*
05DE	0448		FDB	MINUS
05E0	0080	SETSN2	FDB	SEMIS
05E2			WORDM	3,D+,-
05E8	0073 0611	DSETSN	FDB	DOCOL,ZLESS,ZBRAN
05EC	020B			
05EE	0004		FDB	DSETSN2-*

05F0 0461		FDB	DMINUS	
05F2 0080	DSETS2	FDB	SEMIS	
05F4 33 42		LEAU	2,U	
05F6 16 FA7E		LBRA	NEXT	
05F9		WORDM	2,0,=	
05FE 0600	ZEQU	FDB	*+2	
0600 4F		CLRA		
0601 5F		CLRB		
0602 AE C4		LDX	,U	
0604 26 01		BNE	ZEQU2	
0606 5C		INCB		
0607 ED C4	ZEQU2	STD	,U	
0609 16 FA6B		LBRA	NEXT	
060C		WORDM	2,0,<	
0611 0613	ZLESS	FDB	*+2	
0613 86 80		LDA	#\$80	check sign bit
0615 A4 C4		ANDA	,U	
0617 27 06		BEQ	ZLESS2	
0619 4F		CLRA		
061A C6 01		LDB	#1	
061C 16 FDD6		LBRA	PUTD	
061F 5F	ZLESS2	CLRB		
0620 16 FDD2		LBRA	PUTD	
	*			
0623		WORDM	5,LEAV,E	
062B 062D	LEAVE	FDB	*+2	
062D EC E4		LDD	,S	
062F ED 62		STD	2,S	
0631 16 FA43		LBRA	NEXT	
0634		WORDM	2,>,R	
0639 063B	TOR	FDB	*+2	
063B 37 06		PULU	D	
063D 34 06		PSHS	D	
063F 16 FA35		LBRA	NEXT	
0642		WORDM	2,R,>	
0647 0649	FROMR	FDB	*+2	
0649 35 06		PULS	D	
064B 36 06		PSHU	D	
064D 16 FA27		LBRA	NEXT	
0650		WORDM	1,,R	
0654 0272	R	FDB	I+2	steal code from I
0656		WORDM	4,OVE,R	
065D 065F	OVER	FDB	*+2	
065F EC 42		LDD	2,U	
0661 16 F9F3		LBRA	PUSHD	
0664		WORDM	4,DRO,P	
066B 066D	DROP	FDB	*+2	
066D 33 42		LEAU	2,U	
066F 16 FA05		LBRA	NEXT	
0672		WORDM	4,SWA,P	
0679 067B	SWAP	FDB	*+2	
067B 37 16		PULU	D,X	

067D	1E	01		EXG	D,X	swap order
067F	36	16		PSHU	D,X	
0681	16	F9F3		LBRA	NEXT	
0684				WORDM	3,DU,P	
068A	068C		DUP	FDB	*+2	
068C	EC	C4		LDD	,U	
068E	16	F9C6		LBRA	PUSHD	
0691				WORDM	2,+,!	
0696	0698		PSTORE	FDB	*+2	
0698	AE	C1		LDX	,U++	
069A	EC	C1		LDD	,U++	
069C	E3	84		ADDD	,X	
069E	ED	84		STD	,X	
06A0	16	F9D4		LBRA	NEXT	
06A3				WORDM	1,,@	
06A7	06A9		AT	FDB	*+2	
06A9	EC	D4		LDD	[,U]	U points to address on stack, get # there
06AB	16	FD47		LBRA	PUTD	replace stack add with #
06AE				WORDM	2,C,@	
06B3	06B5		CAT	FDB	*+2	
06B5	E6	D4		LDB	[,U]	
06B7	4F			CLRA		
06B8	16	FD3A		LBRA	PUTD	
06BB				WORDM	1,,!	
06BF	06C1		STORE	FDB	*+2	
06C1	37	10		PULU	X	
06C3	37	06		PULU	D	forced to do this because in wrong order
06C5	ED	84		STD	,X	
06C7	16	F9AD		LBRA	NEXT	
06CA				WORDM	2,C,!	
06CF	06D1		CSTORE	FDB	*+2	
06D1	37	10		PULU	X	
06D3	37	06		PULU	D	
06D5	E7	84		STB	,X	
06D7	16	F99D		LBRA	NEXT	
06DA				WORDM	7,<BUILD,S	
06E4	0073	076B	BUILDS	FDB	DOCOL,ZERO,CON,SEMS	
06E8	0740	0080				
06EC				WORDM	5,DOES,>	
06F4	0073	0647	DOES	FDB	DOCOL,FROMR,LATEST,PFA,STORE,PSCODE	
06F8	09B7	09F9				
06FC	06BF	0B21				
0700	34	20	DODOES	PSHS	Y	push return address to RP=S
0702	10AE	02		LDY	2,X	get new IP
0705	30	04		LEAX	4,X	get address of parameter
0707	36	10		PSHU	X	
0709	16	F96B		LBRA	NEXT	
070C				WORDM	6,TOGGL,E	
0715	0073	065D	TOGGLE	FDB	DOCOL,OVER,CAT,XOR,SWAP,CSTORE,SEMS	
0719	06B3	040F				
071D	0679	06CF				
0721	0080					

0723		WORDM	1,,;IMMEDIATE	
0727 0073 0A79	SEMI	FDB	DOCOL,QCSP,COMPIL,SEMIS,SMUDGE,LBRAK,SEMIS	
072B 0AAE 0080				
072F 0AE6 0AC4				
0733 0080				
0735		WORDM	8,CONSTAN,T	
0740 0073 0F7D	CON	FDB	DOCOL,CREATE,SMUDGE,COMMA,PSCODE	
0744 0AE6 08F4				
0748 0B21				
074A EC 02	DOCON	LDD	2,X	
074C 16 F908		LBRA	PUSHD	
074F		WORDM	8,VARIABL,E	
075A 0073 0740	VAR	FDB	DOCOL,CON,PSCODE	
075E 0B21				
0760 30 02	DOVAR	LEAX	2,X	gets address after CFA in W=X
0762 36 10		PSHU	X	
0764 16 F910		LBRA	NEXT	
0767		WORDM	1,,0	
076B 074A	ZERO	FDB	DOCON	
076D 0000		FDB	0	
076F		WORDM	1,,1	
0773 074A	ONE	FDB	DOCON	
0775 0001		FDB	1	
0777		WORDM	1,,2	
077B 074A	TWO	FDB	DOCON	
077D 0002		FDB	2	
077F		WORDM	1,,3	
0783 074A	THREE	FDB	DOCON	
0785 0003		FDB	3	
0787		WORDM	2,B,L	
078C 074A	BL	FDB	DOCON	
078E 0020		FDB	\$20	ascii blank
0790		WORDM	5,FIRS,T	
0798 074A	FIRST	FDB	DOCON	
079A 1BF0		FDB	VIRBGN	
079C		WORDM	5,LIMI,T	
07A4 074A	LIMIT	FDB	DOCON	
07A6 2000		FDB	VIREND	
	*			
07A8		WORDM	4,USE,R	
07AF 0073 0740	USER	FDB	DOCOL,CON,PSCODE	
07B3 0B21				
07B5 EC 02	DOUSER	LDD	2,X	gets offset to user's table
07B7 F3 200A		ADDD	UP	add to users base address
07BA 16 F89A		LBRA	PUSHD	
07BD		WORDM	7,+ORIGI,N	
07C7 0073 01E7	PORIG	FDB	DOCOL,LIT,PRGBGN,PLUS,SEMIS	
07CB 0000 041D				
07CF 0080				
07D1		WORDM	2,S,0	
07D6 07B5	SZERO	FDB	DOUSER	
07D8 0016		FDB	XSPZER-UORIG	

07DA		WORDM	2,R,0
07DF 07B5	RZERO	FDB	DOUSER
07E1 001A		FDB	KRZERO-UORIG
07E3		WORDM	3,TI,B,,USER,TIB,XTIB
07ED		WORDM	5,WIDT,H,,USER,WIDTH,XWIDTH
07F9		WORDM	7,WARNIN,G,,USER,WARN,XWARN
0807		WORDM	5,FENC,E,,USER,FENCE,XFENCE
0813		WORDM	2,D,P,,USER,DP,XDP
081C		WORDM	3,VOC-LIN,K,,USER,VOCLIN,XVOCL
082B		WORDM	3,BL,K,,USER,BLK,XBLK
0835		WORDM	2,I,N,,USER,IN,XIN
083E		WORDM	3,OU,T,,USER,OUT,XOUT
0848		WORDM	3,SC,R,,USER,SCR,XSCR
0852		WORDM	6,OFFSE,T,,USER,OFSET,XOFSET
085F		WORDM	7,CONTEX,T,,USER,CONXT,XCONT
086D		WORDM	7,CURREN,T,,USER,CURENT,XCURR
087B		WORDM	5,STAT,E,,USER,STATE,XSTATE
0887		WORDM	4,BAS,E,,USER,BASE,XBASE
0892		WORDM	3,DP,L,,USER,DPL,XDPL
089C		WORDM	3,FL,D,,USER,FLD,XFLD
08A6		WORDM	3,CS,P,,USER,CSP,XCSP
08B0		WORDM	2,R,#,,USER,RNUM,XRNUM
08B9		WORDM	3,HL,D,,USER,HLD,XHLD
08C3		WORDM	7,COLUMN,S,,USER,COLUMNS,XCOLUMN
	*		
08D1		WORDM	4,HER,E
08D8 0073 0818	HERE	FDB	DOCOL,DP,AT,SEHIS
08DC 06A7 0080			
08E0		WORDM	5,ALLO,T
08E8 0073 0818	ALLOT	FDB	DOCOL,DP,PSTORE,SEHIS
08EC 0696 0080			
08F0		WORDM	1,,,""
08F4 0073 08D8	COMMA	FDB	DOCOL,HERE,STORE,TWO,ALLOT,SEHIS
08F8 06EF 077B			
08FC 08E8 0080			
0900		WORDM	2,C,","
0905 0073 08D8	CCOMM	FDB	DOCOL,HERE,CSTORE,ONE,ALLOT,SEHIS
0909 06CF 0773			
090D 08E8 0080			
0911		WORDM	1,,-
0915 0073 0448	SUB	FDB	DOCOL,MINUS,PLUS,SEHIS
0919 041D 0080			
091D		WORDM	1,,=
0921 0073 0915	EQUAL	FDB	DOCOL,SUB,ZEQU,SEHIS
0925 05FE 0080			
0929		WORDM	1,,>
092D 0073 0679	GREAT	FDB	DOCOL,SWAP,LESS,SEHIS
0931 05A3 0080			
0935		WORDM	5,SPAC,E
093D 0073 078C	SPACE	FDB	DOCOL,BL,EMIT,SEHIS
0941 00B3 0080			
0945		WORDM	3,MI,N

094B 0073 065D	MIN	FDB	DOCOL,OVER,OVER,GREAT,ZBRAN
094F 065D 092D			
0953 020B			
0955 0004		FDB	MIN2-*
0957 0679		FDB	SWAP
0959 066B 0080	MIN2	FDB	DROP,SEMIS
095D		WORDM	3,MA,X
0963 0073 065D	MAX	FDB	DOCOL,OVER,OVER,LESS,ZBRAN
0967 065D 05A3			
096B 020B			
096D 0004		FDB	MAX2-*
096F 0679		FDB	SWAP
0971 066B 0080	MAX2	FDB	DROP,SEMIS
0975		WORDM	4,-DU,P
097C 0073 068A	DDUP	FDB	DOCOL,DUP,ZBRAN
0980 020B			
0982 0004		FDB	DDUP2-*
0984 068A		FDB	DUP
0986 0080	DDUP2	FDB	SEMIS
0988		WORDM	8,TRAVERS,E
0993 0073 0679	TRAV	FDB	DOCOL,SWAP
0997 065D 041D	TRAV2	FDB	OVER,PLUS,CLITER
099B 01EE			
099D 7F		FCB	\$7F
099E 065D 06B3		FDB	OVER,CAT,LESS,ZBRAN
09A2 05A3 020B			
09A6 FFF1		FDB	TRAV2-*
09A8 0679 066B		FDB	SWAP,DROP,SEMIS
09AC 0C80			
09AE		WORDM	6,LATES,T
09B7 0073 0877	LATEST	FDB	DOCOL,CURRENT,AT,AT,SEMIS
09BB 06A7 06A7			
09BF 0080			
09C1		WORDM	3,LF,A
09C7 0073 01EE	LFA	FDB	DOCOL,CLITER
09CB 04		FCB	4
09CC 0915 0080		FDB	SUB,SEMIS
09D0		WORDM	3,CF,A
09D6 0073 077B	CFA	FDB	DOCOL,TWO,SUB,SEMIS
09DA 0915 0080			
09DE		WORDM	3,NF,A
09E4 0073 01EE	NFA	FDB	DOCOL,CLITER
09E8 05		FCB	5
09E9 0915 0773		FDB	SUB,ONE,MINUS,TRAV,SEMIS
09ED 0448 0993			
09F1 0080			
09F3		WORDM	3,PF,A
09F9 0073 0773	PFA	FDB	DOCOL,ONE,TRAV,CLITER
09FD 0993 01EE			
0A01 05		FCB	5
0A02 041D 0080		FDB	PLUS,SEMIS
0A06		WORDM	4,!CS,P

0A0D 0073 01BB	SCSP	FDB	DOCOL,SPAT,CSP,STORE,SEMIS
0A11 08AC 06BF			
0A15 0080			
0A17		WORDM	6,?ERRO,R
0A20 0073 0679	QERR	FDB	DOCOL,SWAP,ZBRAN
0A24 020B			
0A26 0008		FDB	QERR2-*
0A28 0F18 01FF		FDB	ERROR,BRAN
0A2C 0004		FDB	QERR3-*
0A2E 066B	QERR2	FDB	DROP
0A30 0080	QERR3	FDB	SEMIS
0A32		WORDM	5,?COM,P
0A3A 0073 0883	QCOMP	FDB	DOCOL,STATE,AT,ZEQU,CLITER
0A3E 06A7 05FE			
0A42 01EE			
0A44 11		FCB	\$11
0A45 0A20 0080		FDB	QERR,SEMIS
0A49		WORDM	5,?EXE,C
0A51 0073 0883	QEXEC	FDB	DOCOL,STATE,AT,CLITER
0A55 06A7 01EE			
0A59 12		FCB	\$12
0A5A 0A20 0080		FDB	QERR,SEMIS
0A5E		WORDM	6,?PAIR,S
0A67 0073 0915	QPAIRS	FDB	DOCOL,SUB,CLITER
0A6B 01EE			
0A6D 13		FCB	\$13
0A6E 0A20 0080		FDB	QERR,SEMIS
0A72		WORDM	4,?CS,P
0A79 0073 01BD	QCSP	FDB	DOCOL,SPAT,CSP,AT,SUB,CLITER
0A7D 08AC 06A7			
0A81 0915 01EE			
0A85 14		FCB	\$14
0A86 0A20 0080		FDB	QERR,SEMIS
0A8A		WORDM	8,?LOADIN,G
0A95 0073 0831	QLOAD	FDB	DOCOL,BLK,AT,ZEQU,CLITER
0A99 06A7 05FE			
0A9D 01EE			
0A9F 16		FCB	\$16
0AA0 0A20 0080		FDB	QERR,SEMIS
0AA4		WORDM	7,COMPIL,E
0AAE 0073 0A3A	COMPIL	FDB	DOCOL,QCOMP,FROMR,DUP,TWOP,TOR,AT,COMMA,SEMIS
0AB2 0647 068A			
0AB6 048E 0639			
0ABA 06A7 08F4			
0ABE 0080			
0ACO		WORDM	1,,[,IMMEDIATE
0AC4 0073 076B	LBRAK	FDB	DOCOL,ZERO,STATE,STORE,SEMIS
0AC8 0883 06BF			
0ACC 0080			
0ACE		WORDM	1,,[,NOIM
0AD2 0073 01EE	RBRAK	FDB	DOCOL,CLITER
0AD6 C0		FCB	\$C0

0AD7 0883 06BF		FDB	STATE,STORE,SEMIS
0ADB 0080			
0ADD		WORDM	6,SMUDG,E
0AE6 0073 09B7	SMUDGE	FDB	DOCOL,LATEST,CLITER
0AEA 01EE			
0AEC 20		FCB	\$20
0AED 0715 0080		FDB	TOGGLE,SEMIS
0AF1		WORDM	3,HE,X
0AF7 0073 01EE	HEX	FDB	DOCOL,CLITER
0AFB 10		FCB	16
0AFC 088E 06BF		FDB	BASE,STORE,SEMIS
0B00 0080			
0B02		WORDM	7,DECIMA,L
0B0C 0073 01EE	DEC	FDB	DOCOL,CLITER
0B10 0A		FCB	10
0B11 088E 06BF		FDB	BASE,STORE,SEMIS
0B15 0080			
0B17		WORDM	7,(;CODE,)
0B21 0073 0647	PSCODE	FDB	DOCOL,FROMR,LATEST,PFA,CFA,STORE,SEMIS
0B25 09B7 09F9			
0B29 09D6 06BF			
0B2D 0080			
0B2F		WORDM	5,;COD,E,IMMEDIATE
0B37 0073 0A79	SEMIC	FDB	DOCOL,QCSP,COMPIL,PSCODE,SMUDGE,LBRK,QSTACK,SEMIS
0B3B 0AAE 0B21			
0B3F 0AE6 0AC4			
0B43 0C5D 0080			
* NOTE : QSTACK is replaced by ASSEMBLER in versions with one.			
0B47		WORDM	5,COUN,T,NOIM
0B4F 0073 068A	COUNT	FDB	DOCOL,DUP,ONEP,SWAP,CAT,SEMIS
0B53 047F 0679			
0B57 06B3 0080			
0B5B		WORDM	4,TYP,E
0B62 0C73 097C	TYPE	FDB	DOCOL,DDUP,ZBRAN
0B66 020B			
0B68 0018		FDB	TYPE3-*
0B6A 065D 041D		FDB	OVER,PLUS,SWAP,XDO
0B6E 0679 0261			
0B72 0270 06B3	TYPE2	FDB	I,CAT,EMIT,XLOOP
0B76 00B3 0228			
0B7A FFF8		FDB	TYPE2-*
0B7C 01FF		FDB	BRAN
0B7E 0004		FDB	TYPE4-*
0B80 066B	TYPE3	FDB	DROP
0B82 0080	TYPE4	FDB	SEMIS
0B84		WORDM	9,-TRAILIN,G
0B90 0073 068A	DTRAIL	FDB	DOCOL,DUP,ZERO,XDO
0B94 076B 0261			
0B98 065D 065D	DTRAL2	FDB	OVER,OVER,PLUS,ONE,SUB,CAT,BL
0B9C 041D 0773			
0BA0 0915 06B3			
0BA4 078C			

OBA6 0915 020B		FDB	SUB,ZBRAN
OBAA 0008		FDB	DTRAL3-*
OBAC 062B 01FF		FDB	LEAVE,BRAN
OBEO 0006		FDB	DTRAL4-*
OBEB 0773 0915	DTRAL3	FDB	ONE,SUB
OBEB 0228	DTRAL4	FDB	XLOOP
OBEB FFEO		FDB	DTRAL2-*
OBBA 0080		FDB	SEMIS
	OBBC	NEXTNM	SET *
OBBC C1		FCB	\$C1
OBED A2		FCB	\$80+'"
OBEE 0B84		FDB	LASTNM
	OBBC	LASTNM	SET NEXTNM
OBEO 0073 01EE	QUOTE	FDB	DOCOL,CLITER
OBEC 22		FCB	\$22 quote
OBEC 0883 06A7		FDB	STATE,AT,ZBRAN
OBEC 020B			
OBEC 0014		FDB	QUOTE1-*
OBED 0AAE 0BF9		FDB	COMPIL,PQUOTE,WORD,HERE,CAT,ONEP,ALLOT,BRAN
OBED 0DED 08D8			
OBED 06B3 047F			
OBED 08E8 01FF			
OBED 0014		FDB	QUOTE2-*
OBED 0DED 08D8	QUOTE1	FDB	WORD,HERE,HERE,CAT,ONEP,PAD,SWAP,CMOVE,PAD
OBEB 08D8 06B3			
OBEB 047F 0DD8			
OBEB 0679 036D			
OBEB 0DD8			
OBFB 0080	QUOTE2	FDB	SEMIS
	OBFB	NEXTNM	SET *
OBFB 83		FCB	\$83
OBFB 28 22		FCC	/('"/
OBFB A9		FCB	\$80+'")
OBFB 0BBC		FDB	LASTNM
	OBFB	LASTNM	SET NEXTNM
OBFB 0073 0654	PQUOTE	FDB	DOCOL,R,DUP,CAT,ONEP,FROMR,PLUS,TOR,SEMIS
OBFB 068A 06B3			
OC01 047F 0647			
OC05 041D 0639			
OC09 0080			
	OC0B	NEXTNM	SET *
OC0B 84		FCB	\$84
OC0C 28 2E 22		FCC	/('"/
OC0F A9		FCB	\$80+'")
OC10 0BFB		FDB	LASTNM
	OC0B	LASTNM	SET NEXTNM
OC12 0073 0654	PDOTQ	FDB	DOCOL,R,COUNT,DUP,ONEP,FROMR,PLUS,TOR,TYPE,SEMIS
OC16 0B4F 068A			
OC1A 047F 0647			
OC1E 041D 0639			
OC22 0B62 0080			
	OC26	NEXTNM	SET *

0C26 C2	FCB	\$C2	IMMEDIATE
0C27 2E	FCB	'	
0C28 A2	FCB	\$80+'"	
0C29 0C0B	FDB	LASTNM	
0C26 LASTNM	SET	NEXTNM	
0C2B 0073 01EE	DOTQ	FDB	DOCOL,CLITER
0C2F 22	FCB	\$22	quote
0C30 0883 06A7	FDB	STATE,AT,ZBRAN	
0C34 020B			
0C36 0014	FDB	DOTQ1-*	
0C38 0AAE 0C12	FDB	COMPIL,PDOTQ,WORD,HERE,CAT,ONEP,ALLOT,BRAN	
0C3C 0DED 08D8			
0C40 06B3 047F			
0C44 08E8 01FF			
0C48 000A	FDB	DOTQ2-*	
0C4A 0DED 08D8	DOTQ1	FDB	WORD,HERE,COUNT,TYPE
0C4E 0B4F 0B62			
0C52 0080	DOTQ2	FDB	SEMIS
0C54	WORDM	6,?STAC,K	maachine dependent
0C5D 0073 01E7	QSTACK	FDB	DOCOL,LIT
0C61 003B	FDB	SINIT-PRGBGN	
0C63 07C7 06A7	FDB	PORIG,AT,SPAT,LESS,ONE,QERR	
0C67 01BB 05A3			
0C6B 0773 0A20			
0C6F 01BB	QSTAC2	FDB	SPAT
0C71 08D8 01EE	FDB	HERE,CLITER	
0C75 80	FCB	\$80	want 128 spaces higher than dict
0C76 041D 05A3	FDB	PLUS,LESS	
0C7A 077B 0A20	FDB	TWO,QERR	full stack
0C7E 0080	QSTAC3	FDB	SEMIS
			* WORDM 5,?FRE,E is done by ?STACK in this version
			*QFREE FDB DOCOL,SPAT,HERE,CLITER
			* FCB \$80
			* FDB PLUS,LESS,TWO,QERR,SEMIS
0C80	WORDM	3,RO,T	
0C86 0073 0639	ROT	FDB	DOCOL,TOR,SWAP,FROMR,SWAP,SEMIS
0C8A 0679 0647			
0C8E 0679 0080			
0C92	WORDM	6,EXPEC,T	
0C9B 0073 065D	EXPECT	FDB	DOCOL,OVER,PLUS,OVER,XDO
0C9F 041D 065D			
0CA3 0261			
0CA5 00D3 068A	EXPEC2	FDB	KEY,DUP,LIT
0CA9 01E7			
0CAB 2020 06B3	FDB	XLINDL,CAT,EQUAL,ZBRAN	
0CAF 0921 020B			
0CB3 0018	FDB	EXPECZ-*	
0CB5 066B 01E7	FDB	DROP,LIT,XLINDE,CAT,FROMR,DROP,OVER,ONEM,TOR,BRAN	
0CB9 2021 06B3			
0CBD 0647 066E			
0CC1 065D 049D			
0CC5 0639 01FF			

OCC9 0055		FDB	EXPEC6-*
OCCB 068A 01E7	EXPECZ	FDB	DUP,LIT,XBKSP,CAT
OCCF 201E 06B3			
OCD3 0921 020B		FDB	EQUAL,ZBRAN
OCD7 0022		FDB	EXPEC3-*
OCD9 066B 01E7		FDB	DROP,LIT
OCDD 201F 06B3		FDB	XBKSP,CAT
OCE1 065D 0270		FDB	OVER,I,EQUAL,DUP,FROMR,TWO,SUB,PLUS,TOR,SUB,BRAN
OCE5 0921 068A			
OCE9 0647 077B			
OCED 0915 041D			
OCF1 0639 0915			
OCF5 01FF			
OCF7 0027		FDB	EXPEC6-*
OCF9 068A 01EE	EXPEC3	FDB	DUP,CLITER
OCFD 0D		FCB	\$D (CR)
OCFE 0921 020B		FDB	EQUAL,ZBRAN
OD02 000E		FDB	EXPEC4-*
OD04 062B 066B		FDB	LEAVE,DROP,BL,ZERO,BRAN
OD08 078C 076B			
OD0C 01FF			
OD0E 0004		FDB	EXPEC5-*
OD10 068A	EXPEC4	FDB	DUP
OD12 0270 06CF	EXPEC5	FDB	I,CSTORE,ZERO,I,ONEP,STORE
OD16 076B 0270			
OD1A 047F 06BF			
OD1E 00B3 0228	EXPEC6	FDB	EMIT,XLOOP
OD22 FF83		FDB	EXPEC2-*
OD24 066B 0080		FDB	DROP,SEMIS
OD28		WORDM	5,QUER,Y
OD30 0073 07E9	QUERY	FDB	DOCOL,TIB,AT,COLUMNS,AT,EXPECT,ZERO,IN,STORE,SEMIS
OD34 06A7 08CD			
OD38 06A7 0C9B			
OD3C 076B 083A			
OD40 06BF 0080			
OD44	NEXTNM	SET	*
OD44 C1		FCB	\$C1 IMMEDIATE
OD45 80		FCB	\$80 (NULL)
OD46 0D28		FDB	LASTNM
OD44	LASTNM	SET	NEXTNM
OD48 0073 0831	NULL	FDB	DOCOL,BLK,AT,ZBRAN
OD4C 06A7 020B			
OD50 0026		FDB	NULL2-*
OD52 0773 0831		FDB	ONE,BLK,PSTORE,ZERO,IN,STORE,BLK,AT,BSCR,MOD,ZEQU
OD56 0696 076B			
OD5A 083A 06BF			
OD5E 0831 06A7			
OD62 17C5 052D			
OD66 05FE			
	* check for end of screen		
OD68 020B		FDB	ZBRAN
OD6A 0008		FDB	NULL1-*

0D6C 0A51 0647		FDB	QEXEC, FROMR, DROP
0D70 066B			
0D72 01FF	NULL1	FDB	BRAN
0D74 0006		FDB	NULL3-*
0D76 0647 066B	NULL2	FDB	FROMR, DROP
0D7A 0080	NULL3	FDB	SEMIS
0D7C		WORDM	4, FIL, L
0D83 0073 0679	FILL	FDB	DOCOL, SWAP, TOR, OVER, CSTORE, DUP, ONEP, FROMR, ONE
0D87 0639 065D			
0D8B 06CF 068A			
0D8F 047F 0647			
0D93 0773			
0D95 0915 036D		FDB	SUB, CMOVE, SEMIS
0D99 0080			
0D9B		WORDM	5, ERAS, E
0DA3 0073 076B	ERASE	FDB	DOCOL, ZERO, FILL, SEMIS
0DA7 0D83 0080			
0DAB		WORDM	6, BLANK, S
0DB4 0073 078C	BLANKS	FDB	DOCOL, BL, FILL, SEMIS
0DB8 0D83 0080			
0DBC		WORDM	4, HOL, D
0DC3 0073 01E7	HOLD	FDB	DOCOL, LIT, \$FFFF, HLD, PSTORE, HLD, AT, CSTORE, SEMIS
0DC7 FFFF 08BF			
0DCB 0696 08BF			
0DCF 06A7 06CF			
0DD3 0080			
0DD5		WORDM	3, PA, D
0DDB 0073 08D8	PAD	FDB	DOCOL, HERE, CLITER
0DDF 01EE			
0DE1 44		FCB	\$44
0DE2 041D 0080		FDB	PLUS, SEMIS
0DE6		WORDM	4, WOR, D
0DED 0073 0831	WORD	FDB	DOCOL, BLK, AT, ZBRAN
0DF1 06A7 020B			
0DF5 000C		FDB	WORD2-*
0DF7 0831 06A7		FDB	BLK, AT, BLOCK, BRAN
0DFB 12B0 01FF			
0DFE 0006		FDB	WORD3-*
0E01 07E9 06A7	WORD2	FDB	TIB, AT
0E05 083A 06A7	WORD3	FDB	IN, AT, PLUS, SWAP, ENCLOS, HERE, CLITER
0E09 041D 0679			
0E0D 0318 08D8			
0E11 01EE			
0E13 22		FCB	34
0E14 0DB4 083A		FDB	BLANKS, IN, PSTORE, OVER, SUB, TOR, R, HERE, CSTORE, PLUS
0E18 0696 065D			
0E1C 0915 0639			
0E20 0654 08D8			
0E24 06CF 041D			
0E28 08D8 047F		FDB	HERE, ONEP, FROMR, CMOVE, SEMIS
0E2C 0647 036D			
0E30 0080			

0E32		WORDM	8,(NUMBER,)
0E3D 0073	PNUMB	FDB	DOCOL
0E3F 047F 068A	PNUMB2	FDB	ONEP,DUP,TOR,CAT,BASE,AT,DIGIT,ZBRAN
0E43 0639 06B3			
0E47 088E 06A7			
0E4B 0295 020B			
0E4F 002C		FDB	PNUMB4--*
0E51 0679 088E		FDB	SWAP,BASE,AT,USTAR,DROP,ROT,BASE
0E55 06A7 0394			
0E59 066B 0C86			
0E5D 088E			
0E5F 06A7 0394		FDB	AT,USTAR,DPLUS,DPL,AT,ONEP,ZBRAN
0E63 042B 0898			
0E67 06A7 047F			
0E6B 020B			
0E6D 0008		FDB	PNUMB3--*
0E6F 0773 0898		FDB	ONE,DPL,PSTORE
0E73 0696			
0E75 0647 01FF	PNUMB3	FDB	FROMR,BRAN
0E79 FFC6		FDB	PNUMB2--*
0E7B 0647 0080	PNUMB4	FDB	FROMR,SEMIS
0E7F		WORDM	6,NUMBE,R
0E88 0073 076E	NUMB	FDB	DOCOL,ZERO,ZERO,ROT,DUP,ONEP,CAT,CLITER
0E8C 076B 0C86			
0E90 068A 047F			
0E94 06B3 01EE			
0E98 2D		FCB	'- minus sign
0E99 0921 068A		FDB	EQUAL,DUP,TOR,PLUS,LIT,\$FFFF
0E9D 0639 041D			
0EA1 01E7 FFFF			
0EA5 0898 06BF	NUMB1	FDB	DPL,STORE,PNUMB,DUP,CAT,BL,SUB,ZBRAN
0EA9 0E3D 068A			
0EAD 06B3 078C			
0EB1 0915 020B			
0EB5 0015		FDB	NUMB2--*
0EB7 068A 06B3		FDB	DUP,CAT,CLITER
0EBB 01EE			
0EBD 2E		FCB	'.
0EBE 0915 076B		FDB	SUB,ZERO,QERR,ZERO,BRAN
0EC2 0A20 076B			
0EC6 01FF			
0EC8 FFDD		FDB	NUMB1--*
0ECA 066B 0647	NUMB2	FDB	DROP,FROMR,ZBRAN
0ECE 020B			
0ED0 0004		FDB	NUMB3--*
0ED2 0461		FDB	DMINUS
0ED4 0080	NUMB3	FDB	SEMIS
0ED6		WORDM	5,-FIN,D
0EDE 0073 078C	DFIND	FDB	DOCOL,BL,WORD,HERE,CONXT,AT,AT,PFIND,DUP,ZEQU,ZBRAN
0EE2 0DED 08D8			
0EE6 0869 06A7			
0EEA 06A7 02C8			

0EEE 068A 05FE
0EF2 020B
0EF4 000A
0EF6 066B 08D8
0EFA 09B7 02C8
0EFE 0080
0F00
0FOA 0073 1120
0FOE 0080
0F10
0F18 0073 0803
0F1C 06A7 0611
0F20 020B

DFIND2 FDB DFIND2-*
FDB DROP,HERE,LATEST,PFIND
DFIND2 FDB SEMIS
WORDM 7,(ABORT,)
PABORT FDB DOCOL,ABORT,SEMIS
WORDM 5,ERRO,R
ERROR FDB DOCOL,WARN,AT,ZLESS,ZBRAN

* WARNING is -1 to abort, 0 to print error #, and >1 to print
* error message from the message SCReen on disk

0F22 0004
0F24 0FOA
0F26 08D8 0B4F
0F2A 0B62 0C12
0F2E 04 07
0F30 20 3F 20
0F33 1372 01CA
0F37 083A 06A7
0F3B 0831 06A7
0F3F 10F2 0080
0F43
0F49 0073 0DD8
0F4D 01EE
0F4F 20
0F50 01EE
0F52 5F
0F53 0D83 068A
0F57 09F9 09C7
0F5B 065D 0915
0F5F 0DD8 0679
0F63 036D
0F65 0DD8 0B4F
0F69 01EE
0F6B 1F
0F6C 03ED 0B62
0F70 093D 0080
0F74
0F7D 0073 0EDE
0F81 020B
0F83 001A
0F85 066B 0C12
0F89 08 07
0F8B 72 65 64 65
0F8F 66 3A 20
0F92 09E4 0F49
0F96 01EE
0F98 04

FDB ERROR2-*
FDB PABORT
ERROR2 FDB HERE,COUNT,TYPE,PDOTQ
FCB 4,7 (BELL)
FCC " ? "
FDB MESS,SPSTOR,IN,AT,BLK,AT,QUIT,SEMIS
WORDM 3,ID,.
IDDOT FDB DOCOL,PAD,CLITER
FCB 32
FDB CLITER
FCB \$5F
FDB FILL,DUP,PFA,LFA,OVER,SUB,PAD,SWAP,CMOVE
FDB PAD,COUNT,CLITER
FCB 31
FDB AND,TYPE,SPACE,SEMIS
WORDM 6,CREAT,E
CREATE FDB DOCOL,DFIND,ZBRAN
FDB CREAT2-*
FDB DROP,PDOTQ
FCB 8,7 (BELL)
FCC "redef: "
FDB NFA,IDDOT,CLITER
FCB 4

0F99 1372 093D		FDB	MESS,SPACE
0F9D 08D8 068A	CREAT2	FDB	HERE,DUP,CAT,WIDTH,AT,MIN,ONEP,ALLOT,DUP,CLITER
0FA1 06B3 07F5			
0FA5 06A7 094B			
0FA9 047F 08E8			
0FAD 068A 01EE			
0FB1 A0		FCB	\$A0
0FB2 0715 08D8		FDB	TOGGLE,HERE,ONE,SUB,CLITER
0FB6 0773 0915			
0FEA 01EE			
0FBC 80		FCB	\$80
0FBD 0715 09B7		FDB	TOGGLE,LATEST,COMMA,CURRENT,AT,STORE,HERE,TWOP
0FC1 08F4 0377			
0FC5 06A7 06BF			
0FC9 03D8 048E			
0FCD 08F4 0080		FDB	COMMA,SEMI
0FD1		WORDM	9,[COMPILE,],IMMEDIATE
0FDD 0073 0EDE	BCOMP	FDB	DOCOL,DFIND,ZEQU,ZERO,QERR,DROP,CFA,COMMA,SEMI
0FE1 05FE 076B			
0FE5 0A20 066B			
0FE9 09D6 08F4			
0FED 0080			
0FEF		WORDM	7,LITERA,L,IMMEDIATE
OFF9 0073 0883	LITER	FDB	DOCOL,STATE,AT,ZBRAN
OFFD 06A7 020B			
1001 0008		FDB	LITER2-*
1003 0AAE 01E7		FDB	COMPIL,LIT,COMMA
1007 08F4			
1009 0080	LITER2	FDB	SEMI
100B		WORDM	8,DLITERA,L,IMMEDIATE
1016 0073 0883	DLITER	FDB	DOCOL,STATE,AT,ZBRAN
101A 06A7 020B			
101E 0008		FDB	DLITE2-*
1020 0679 0FF9		FDB	SWAP,LITER,LITER
1024 0FF9			
1026 0080	DLITE2	FDB	SEMI
1028		WORDM	9,INTERPRE,T,NOIM
1034 0073	INTERP	FDB	DOCOL
1036 0EDE 020B	INTER2	FDB	DFIND,ZBRAN
103A 001E		FDB	INTER5-*
103C 0883 06A7		FDB	STATE,AT,LESS
1040 05A3			
1042 020B		FDB	ZBRAN
1044 000A		FDB	INTER3-*
1046 09D6 08F4		FDB	CFA,COMMA,BRAN
104A 01FF			
104C 0006		FDB	INTER4-*
104E 09D6 0091	INTER3	FDB	CFA,EXEC
1052 0C5D 01FF	INTER4	FDB	QSTACK,BRAN
1056 001A		FDB	INTER7-*
1058 08D8 0E88	INTER5	FDB	HERE,NUMB,DPL,AT,ONEP,ZBRAN
105C 0898 06A7			

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1060 047F 020B
1064 0008          FDB    INTER6-*
1066 1016 01FF          FDB    DLITER,BRAN
106A 0006          FDB    INTER7-*
106C 066B 0FF9    INTER6 FDB    DROP,LITER
1070 0C5D 01FF    INTER7 FDB    QSTACK,BRAN
1074 FFC2          FDB    INTER2-*
      * FDB SEMIS never executed
1076          WORDM    9,IMMEDIATE
1082 0073 09B7    IMMED   FDB    DOCOL,LATEST,CLITER
1086 01EE
1088 40          FCB     $40
1089 0715 0080          FDB    TOGGLE,SEMIS
108D          WORDM    10,VOCABULAR,Y
109A 0073 06E4    VOCAB   FDB    DOCOL,BUILDS,LIT,$81A0,COMMA,CURRENT,AT,CFA,COMMA
109E 01E7 81A0
10A2 08F4 0877
10A6 06A7 09D6
10AA 08F4
10AC 08D8 0827          FDB    HERE,VOCLIN,AT,COMMA,VOCLIN,STORE,DOES
10B0 06A7 08F4
10B4 0327 06BF
10B8 06F4
10BA 048E 0869    DOVOC   FDB    TWOP,CONXTXT,STORE,SEMIS
10BE 06BF 0080
10C2 0000          FDB     0
10C4          WORDM    11,DEFINITION,S
10D2 0073 0869    DEFIN   FDB    DOCOL,CONXTXT,AT,CURRENT,STORE,SEMIS
10D6 06A7 0877
10DA 06BF 0080
10DE          WORDM    1,,(,IMMEDIATE
10E2 0073 01EE    PAREN   FDB    DOCOL,CLITER
10E6 29          FCB     '^')
10E7 0DED 0080          FDB    WORD,SEMIS
10EB          WORDM    4,QUIT,NOIM
10F2 0073 076E    QUIT    FDB    DOCOL,ZERO,BLK,STORE,LBRK
10F6 0831 06BF
10FA 0AC4
      * Here is outer interpreter which gets line of input, does it, and
      * then prints " OK" and repeats.
10FC 01D8 0100    QUIT2   FDB    RPSTOR,CR,QUERY,INTERP,STATE,AT,ZEQU,ZBRAN
1100 0D30 1034
1104 0883 06A7
1108 05FE 020B
110C 0008          FDB    QUIT3-*
110E 0C12          FDB    PDOTQ
1110 03          FCB     3
1111 20 4F 4B          FCC    " OK"
1114 01FF          QUIT3   FDB    BRAN
1116 FFE6          FDB    QUIT2-*
      * FDB SEMIS never executed
1118          WORDM    5,ABOR,T
```

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1120 0073 01CA    ABORT  FDB  DOCOL,SPSTOR,DEC,DRZERO,CR,PDOTQ
1124 0B0C 1812
1128 0100 0C12
112C 12          FCB  18
112D 36 38 27 46    FCC  "68FORTH-09 VERS #\"
1131 4F 52 54 48
1135 2D 30 39 20
1139 56 45 52 53
113D 20 23
113F 01E7 0008      FDB  LIT,VERSION,DUP,CAT,DOT,PDOTQ
1143 068A 06E3
1147 167C 0C12
114B 01          FCB  1
114C 2E          FCB  '
114D 047F 06E3      FDB  ONEP,CAT,DOT
1151 167C
1153 076B 083A      FDB  ZERO,IN,STORE,ZERO,BLK,STORE
1157 06EF 076B
115B 0831 06BF
115F 2058 10D2      FDB  FORTH,DEFIN,LIT,IFCOLD,CAT,ZERAN
1163 01E7 0138
1167 06E3 020B
116B 000C          FDB  ABORTC-*
116D 076B 01E7      FDB  ZERO,LIT,IFCOLD,CSTORE,GO
1171 0138 06CF
1175 117E
1177 10F2          ABORTC FDB  QUIT
                        * FDB SEMIS never executed
1179              WORDM 2,G,O
117E 0073 01E7      GO    FDB  DOCOL,LIT,XMSGBS,AT,THREE,PLUS,DRZERO,LOAD,SEMIS
1182 202E 06A7
1186 0783 041D
118A 1812 13C8
118E 0080
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*
* Here is stuff which gets copied to ram in user space
1190 C5      RAM    FCB    $C5      5, IMMEDIATE
1191 46 4F 52 54      FCC    "FORT"
1195 C8      FCB    $80+'H
1196 1A34      FDB    NOOP-7      LINK "BACK"
1198 0700 10BA      RFORTH  FDB    DODOES,DOVOC,$81A0,TASK-7
119C 81A0 207E
11A0 0000      FDB    0
11A2 28 43 29 20      FCC    "(C) Talbot Microsystems 1980"
11A6 54 61 6C 62
11AA 6F 74 20 4D
11AE 69 63 72 6F
11B2 73 79 73 74
11B6 65 6D 73 20
11BA 31 39 38 30
11BE 84      FCB    $84
11BF 54 41 53      FCC    "TAS"
11C2 CB      FCB    $80+'K
11C3 2050      FDB    FORTH-8      link "back" to FORTH
11C5 0073 0080      RTASK  FDB    DOCOL,SEMIS
11C9 52 2E 20 4A      ERAM   FCC    "R. J. Talbot, Jr."
11CD 2E 20 54 61
11D1 6C 62 6F 74
11D5 2C 20 4A 72
11D9 2E

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*
* Disc primitives :
11DA          WORDM 3,US,E
11E0 074A 004B USE   FDB  DOCON,XUSE
11E4          WORDM 4,PRE,V
11EB 074A 004D PREV  FDB  DOCON,XPREV
11EF          WORDM 4,+EU,F
11F6 0073 17E9 PBUF  FDB  DOCOL,BBUF
11FA 01EE          FDB  CLITER
11FC 04          FCB  4
11FD 041D          FDB  PLUS
11FF 041D 068A     FDB  PLUS,DUP,BBUF,PLUS,CLITER
1203 17E9 041D
1207 01EE
1209 04          FCB  4
120A 041D 07A4     FDB  PLUS,LIMIT,GREAT,ZBRAN
120E 092D 020B
1212 0006          FDB  PBUF2-*
1214 066B 0798     FDB  DROP,FIRST
1218 068A 11EB     PBUF2 FDB  DUP,PREV,AT,SUB,SEMS
121C 06A7 0915
1220 0080
1222          WORDM 6,UPDAT,E
122E 0073 11EB     UPDATE FDB  DOCOL,PREV,AT,AT,LIT,$8000,OR,PREV,AT,STORE,SEMS
122F 06A7 06A7
1233 01E7 8000
1237 03FF 11EB
123B 06A7 06BF
123F 0080
1241          WORDM 13,EMPTY-BUFFER,S
1251 0073 0798     MTBUF  FDB  DOCOL,FIRST,LIMIT,OVER,SUB,ERASE,SEMS
1255 07A4 065D
1259 0915 0DA3
125D 0080
125F          WORDM 6,BUFFE,R
126E 0073 11E0     BUFFER  FDB  DOCOL,USE,AT,DUP,TOR
126C 06A7 068A
1270 0639
1272 11F6 020B     BUFR2  FDB  PBUF,ZBRAN
1276 FFFC          FDB  BUFR2-*
1278 11E0 06BF     FDB  USE,STORE,R,AT,ZLESS,ZBRAN
127C 0654 06A7
1280 0611 020B
1284 0014          FDB  BUFR3-*
1286 0654 048E     FDB  R,TWOP,R,AT,LIT,$7FFF,AND,ZERO,RW
128A 0654 06A7
128E 01E7 7FFF
1292 03ED 076B
1296 186A
1298 0654 06BF     BUFR3  FDB  R,STORE,R,PREV,STORE,FROMR,TWOP,SEMS
129C 0654 11EB

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12A0 06BF 0647			
12A4 048E 0080			
12A8	WORDM	5, BLOC, K	
12B0 0073 085B	BLOCK	FDB	DOCOL, OFFSET, AT, PLUS, TOR, PREV, AT, DUP, AT, R, SUB
12B4 06A7 041D			
12B8 0639 11EB			
12BC 06A7 068A			
12C0 06A7 0654			
12C4 0915			
12C6 068A 041D		FDB	DUP, PLUS, ZBRAN
12CA 020B			
12CC 0034		FDB	BLOCK5-*
12CE 11F6 05FE	BLOCK3	FDB	PBUF, ZEQU, ZBRAN
12D2 020B			
12D4 0014		FDB	BLOCK4-*
12D6 066B 0654		FDB	DROP, R, BUFFER, DUP, R, ONE, RW, TWO, SUB
12DA 1268 068A			
12DE 0654 0773			
12E2 186A 077B			
12E6 0915			
12E8 068A 06A7	BLOCK4	FDB	DUP, AT, R, SUB, DUP, PLUS, ZEQU, ZBRAN
12EC 0654 0915			
12F0 068A 041D			
12F4 05FE 020B			
12F8 FFD6		FDB	BLOCK3-*
12FA 068A 11EB		FDB	DUP, PREV, STORE
12FE 06BF			
1300 0647 066B	BLOCK5	FDB	FROMR, DROP, TWOP, SEMIS
1304 048E 0080			
1308	WORDM	5, FLUS, H	
1310 0073 07A4	FLUSH	FDB	DOCOL, LIMIT, FIRST, SUB, BBUF, CLITER
1314 0798 0915			
1318 17B9 01EE			
131C 04		FCB	\$04
131D 041D 051D		FDB	PLUS, SLASH, ZERO, XDO
1321 076B 0261			
1325 01E7	FLUSH1	FDB	LIT
1327 7FFF		FDB	\$7FFF
1329 1268 066B		FDB	BUFFER, DROP
132D 0228		FDB	XLOOP
132F FFF6		FDB	FLUSH1-*
1331 0080		FDB	SEMIS
1333	WORDM	6, (LINE,)	
133C 0073 0639	PLINE	FDB	DOCOL, TOR, CLITER
1340 01EE			
1342 40		FCB	\$40
1343 17B9 053D		FDB	BBUF, SSMOD, FROMR, SCRBLK, PLUS, BLOCK, PLUS, CLITER
1347 0647 17DB			
134B 041D 12B0			
134F 041D 01EE			
1353 40		FCB	\$40
1354 0080		FDB	SEMIS

1356		WORDM	5, .LIN, E
135E 0073 133C	DLINE	FDB	DOCOL, PLINE, DTRAIL, TYPE, SEMIS
1362 0B90 0E62			
1366 0080			
1368		WORDM	7, MESSAG, E
1372 0073 0803	MESS	FDB	DOCOL, WARN, AT, ZBRAN
1376 06A7 020B			
137A 0028		FDB	MESS3-*
137C 097C 020B		FDB	DDUP, ZBRAN
1380 003F		FDB	MESS4-*
1382 01E7 202E		FDB	LIT, XMSGBS, AT
1386 06A7			
1388 085B 06A7		FDB	OFFSET, AT, TOR, ZERO, OFFSET, STORE, DLINE, FROMR, OFFSET, STORE
138C 0639 076B			
1390 085B 06EF			
1394 135E 0647			
1398 085B 06EF			
139C 0100 01FF		FDB	CR, BRAN
13A0 001F		FDB	MESS4-*
13A2 0C12	MESS3	FDB	PDOTQ
13A4 04		FCB	4
13A5 65 72 72 20		FCC	"err "
13A9 01EE		FDB	CLITER
13AB 23		FCB	"#
13AC 088E 06A7		FDB	BASE, AT, CLITER
13B0 01EE			
13B2 0A		FCB	10 DECIMAL
13B3 0921 05FE		FDB	EQUAL, ZEQU, PLUS if = 10, add 0, if = 16, add 1 TO MAKE '9
13B7 041D			
13B9 00B3 093D		FDB	EMIT, SPACE
13BD 167C		FDB	DOT
13BF 0080	MESS4	FDB	SEMIS
13C1		WORDM	4, LOA, D input: scr #
13C8 0073 0831	LOAD	FDB	DOCOL, BLK, AT, TOR, IN, AT, TOR, ZERO, IN, STORE, SCREBLK, BLK
13CC 06A7 0639			
13D0 083A 06A7			
13D4 0639 076B			
13D8 083A 06BF			
13DC 17DB 0831			
13E0 06BF 1034		FDB	STORE, INTERP, FROMR, IN, STORE, FROMR, BLK, STORE, SEMIS
13E4 0647 083A			
13E8 06BF 0647			
13EC 0831 06BF			
13F0 0080			
13F2		WORDM	3, --, >, IMMEDIATE
13F8 0073 0A95	ARROW	FDB	DOCOL, QLOAD, ZERO, IN, STORE, BSCR, BLK, AT, OVER, MOD
13FC 076B 083A			
1400 06BF 17C5			
1404 0831 06A7			
1408 065D 052D			
140C 0915 0831		FDB	SUB, BLK, PSTORE, SEMIS
1410 0696 0080			

1414		WORDM	1,,IMMEDIATE
1418 0073 0EDE	TICK	FDB	DOCOL,DFIND,ZEQU,ZERO,QERR,DROP,LITER,SEMI
141C 05FE 076B			
1420 0A20 066B			
1424 0FF9 0080			
1428		WORDM	6,FORCE,T,NOIM
1431 0073 0877	FORGET	FDB	DOCOL,CURRENT,AT,CONTEXT,AT,SUB,CLITER
1435 06A7 0869			
1439 06A7 0915			
143D 01EE			
143F 18		FCB	\$18
1440 0A20 1418		FDB	QERR,TICK,DUP,FENCE,AT,LESS,CLITER
1444 068A 030F			
1448 06A7 05A3			
144C 01EE			
144E 15		FCB	\$15
144F 0A20 068A		FDB	QERR,DUP,LIT,SINIT,AT,GREAT,CLITER
1453 01E7 003B			
1457 06A7 092D			
145B 01EE			
145D 15		FCB	\$15
145E 0A20 068A		FDB	QERR,DUP,NFA,DP,STORE,LFA,AT,CONTEXT,AT,STORE,SEMI
1462 09E4 0818			
1466 06EF 09C7			
146A 06A7 0869			
146E 06A7 06EF			
1472 0080			
*			
1474		WORDM	4,BACK
147B 0073 08D8	BACK	FDB	DOCOL,HERE,SUB,COMMA,SEMI
147F 0915 08F4			
1483 0080			
1485		WORDM	5,BEGIN,IMMEDIATE
148D 0073 0A3A	BEGIN	FDB	DOCOL,QCOMP,HERE,ONE,SEMI
1491 08D8 0773			
1495 0080			
1497		WORDM	5,ENDIF,IMMEDIATE
149F 0073 0A3A	ENDIF	FDB	DOCOL,QCOMP,TWO,QPAIRS,HERE,OVER,SUB,SWAP,STORE,SEMI
14A3 077B 0A67			
14A7 08D8 065D			
14AB 0915 0679			
14AF 06EF 0080			
14B3		WORDM	4,THEN,IMMEDIATE
14BA 0073 149F	THEN	FDB	DOCOL,ENDIF,SEMI
14BE 0080			
14C0		WORDM	2,DO,IMMEDIATE
14C5 0073 0AAE	DO	FDB	DOCOL,COMPIL,XDO,HERE,THREE,SEMI
14C9 0261 08D8			
14CD 0783 0080			
14D1		WORDM	4,LOOP,IMMEDIATE
14D8 0073 0783	LOOP	FDB	DOCOL,THREE,QPAIRS,COMPIL,XLOOP,BACK,SEMI
14DC 0A67 0AAE			

14E0 0228 147B			
14E4 0080			
14E6		WORDM	5,+LOO,P,IMMEDIATE
14EE 0073 0783	PLOOP	FDB	DOCOL,THREE,QPAIRS,COMPIL,XPLOOP,BACK,SEMIS
14F2 0A67 0AAE			
14F6 0239 147B			
14FA 0080			
14FC		WORDM	5,UNTI,L,IMMEDIATE
1504 0073 0773	UNTIL	FDB	DOCOL,ONE,QPAIRS,COMPIL,ZBRAN,BACK,SEMIS
1508 0A67 0AAE			
150C 020B 147B			
1510 0080			
1512		WORDM	3,EN,D,IMMEDIATE
1518 0073 1504	END	FDB	DOCOL,UNTIL,SEMIS
151C 0080			
151E		WORDM	5,AGAI,N,IMMEDIATE
1526 0073 0773	AGAIN	FDB	DOCOL,ONE,QPAIRS,COMPIL,BRAN,BACK,SEMIS
152A 0A67 0AAE			
152E 01FF 147B			
1532 0080			
1534		WORDM	6,REPEA,T,IMMEDIATE
153D 0073 0639	REPEAT	FDB	DOCOL,TOR,TOR,AGAIN,FROMR,FROMR,TWO,SUB,ENDIF,SEMIS
1541 0639 1526			
1545 0647 0647			
1549 077B 0915			
154D 149F 0080			
1551		WORDM	2,I,F,IMMEDIATE
1556 0073 0AAE	IF	FDB	DOCOL,COMPIL,ZBRAN,HERE,ZERO,COMMA,TWO,SEMIS
155A 020B 08D8			
155E 076B 08F4			
1562 077B 0080			
1566		WORDM	4,ELS,E,IMMEDIATE
156D 0073 077B	ELSE	FDB	DOCOL,TWO,QPAIRS,COMPIL,BRAN,HERE,ZERO,COMMA,SWAP
1571 0A67 0AAE			
1575 01FF 08D8			
1579 076B 08F4			
157D 0679			
157F 077B 149F		FDB	TWO,ENDIF,TWO,SEMIS
1583 077B 0080			
1587		WORDM	5,WHIL,E,IMMEDIATE
158F 0073 1556	WHILE	FDB	DOCOL,IF,TWOP,SEMIS
1593 048E 0080			
	*		
1597		WORDM	6,SPACE,S
15A0 0073 076B	SPACES	FDB	DOCOL,ZERO,MAX,DDUP,ZBRAN
15A4 0963 097C			
15A8 020B			
15AA 000C		FDB	SPACE3--*
15AC 076B 0261		FDB	ZERO,XDO
15B0 093D 0228	SPACE2	FDB	SPACE,XLOOP
15B4 FFFC		FDB	SPACE2--*
15B6 0080	SPACE3	FDB	SEMIS

15B8		WORDM	2,<,#
15BD 0073 0DDB	BDIGS	FDB	DOCOL,PAD,HLD,STORE,SEMIS
15C1 08BF 06BF			
15C5 0080			
15C7		WORDM	2,>#
15CC 0073 066B	EDIGS	FDB	DOCOL,DROP,DROP,HLD,AT,PAD,OVER,SUB,SEMIS
15D0 066B 08BF			
15D4 06A7 0DDB			
15D8 065D 0915			
15DC 0080			
15DE		WORDM	4,SIG,N
15E5 0073 0C86	SIGN	FDB	DOCOL,ROT,ZLESS,ZBRAN
15E9 0611 020B			
15ED 0007		FDB	SIGN2-*
15EF 01EE		FDB	CLITER
15F1 2D		FCB	'-
15F2 0DC3		FDB	HOLD
15F4 0080	SIGN2	FDB	SEMIS
15F6		WORDM	1,>#
15FA 0073 088E	DIG	FDB	DOCOL,BASE,AT,MSMOD,ROT,CLITER
15FE 06A7 0560			
1602 0C86 01EE			
1606 09		FCB	9
1607 065D 05A3		FDB	OVER,LESS,ZBRAN
160B 020B			
160D 0007		FDB	DIG2-*
160F 01EE		FDB	CLITER
1611 07		FCB	7
1612 041D		FDB	PLUS
1614 01EE	DIG2	FDB	CLITER
1616 30		FCB	'0 ascii zero
1617 041D 0DC3		FDB	PLUS,HOLD
161B 0080		FDB	SEMIS
161D		WORDM	2,>#S
1622 0073	DIGS	FDB	DOCOL
1624 15FA 065D	DIGS2	FDB	DIG,OVER,OVER,OR,ZEQU,ZBRAN
1628 065D 03FF			
162C 05FE 020B			
1630 FFF4		FDB	DIGS2-*
1632 0080		FDB	SEMIS
1634		WORDM	3,D.,R
163A 0073 0639	DDOTR	FDB	DOCOL,TOR,SWAP,OVER,DABS,BDIGS,DIGS,SIGN
163E 0679 065D			
1642 0591 15BD			
1646 1622 15E5			
164A 15CC 0647		FDB	EDIGS,FROMR,OVER,SUB,SPACES,TYPE,SEMIS
164E 065D 0915			
1652 15A0 0B62			
1656 0080			
1658		WORDM	2,.,R
165D 0073 0639	DOTR	FDB	DOCOL,TOR,STOD,FROMR,DDOTR,SEMIS
1661 05C1 0647			

1665 163A 0080			
1669		WORDM	2,D,.
166E 0073 076B	DDOT	FDB	DOCOL,ZERO,DDOTR,SPACE,SEMIS
1672 163A 093D			
1676 0080			
1678		WORDM	1,,.
167C 0073 05C1	DOT	FDB	DOCOL,STOD,DDOT,SEMIS
1680 166E 0080			
1684		WORDM	1,,?
1688 0073 06A7	QUEST	FDB	DOCOL,AT,DOT,SEMIS
168C 167C 0080			
	*		
1690		WORDM	4,LIS,T
1697 0073 0B0C	LIST	FDB	DOCOL,DEC,CR,DUP,SCR,STORE,PDOTQ
169B 0100 068A			
169F 084E 06BF			
16A3 0C12			
16A5 06		FCB	6
16A6 53 43 52 20		FCC	"SCR # "
16AA 23 20			
16AC 167C 01EE		FDB	DOT,CLITER
16B0 10		FCB	16
16B1 076B 0261		FDB	ZERO,XDO
16B5 0100 0270	LIST2	FDB	CR,I,THREE
16B9 0783			
16BB 165D 093D		FDB	DOTR,SPACE,I,SCR,AT,PLINE,TYPE,CLITER
16BF 0270 084E			
16C3 06A7 133C			
16C7 0B62 01EE			
16CB 3C		FCB	\$3C
16CC 00E3 0228		FDB	EMIT,XLOOP
16D0 FFE5		FDB	LIST2-*
16D2 0100 0080		FDB	CR,SEMIS
16D6		WORDM	4,DUM,P
16DD 0073 065D	DUMP	FDB	DOCOL,OVER,PLUS,SWAP,XDO
16E1 041D 0679			
16E5 0261			
16E7 0270 0100	DUMP1	FDB	I,CR,HEX,DOT,I,CLITER
16EB 0AF7 167C			
16EF 0270 01EE			
16F3 10		FCB	16
16F4 041D 0270		FDB	PLUS,I,XDO
16F8 0261			
16FA 093D 0270	DUMP2	FDB	SPACE,I,CAT,TWO,DOTR,XLOOP
16FE 06E3 077B			
1702 165D 0228			
1706 FFF4		FDB	DUMP2-*
1708 0783 15A0		FDB	THREE,SPACES,I,CLITER
170C 0270 01EE			
1710 10		FCB	16
1711 041D 0270		FDB	PLUS,I,XDO
1715 0261			

```

1717 0270 06B3      DUMP3   FDB    I,CAT,DUP,CLITER
171B 068A 01EE
171F 20              FCB    $20
1720 05A3 020B      FDB    LESS,ZBRAN
1724 0007              FDB    DUMP31-*
1726 066B 01EE      FDB    DROP,CLITER
172A 5F              FCB    _
172B 00B3 0228      DUMP31  FDB    EMIT,XLOOP
172F FFE8              FDB    DUMP3-*
1731 01EE              FDB    CLITER
1733 10              FCB    16
1734 0239              FDB    XPLOOP
1736 FFB1              FDB    DUMP1-*
1738 0080              FDB    SEMIS
173A              WORDM    5,VLI,T
1742 0073 01EE      VLIST   FDB    DOCOL,CLITER
1746 80              FCB    $80
1747 0844 06BF              FDB    OUT,STORE,CONXT,AT,AT
174B 0869 06A7
174F 06A7
1751 0844 06A7      VLIST1  FDB    OUT,AT,COLUMNS,AT,CLITER
1755 08CD 06A7
1759 01EE
175B 10              FCB    16
175C 0915 092D      FDB    SUB,GREAT,ZBRAN
1760 020B
1762 000A              FDB    VLIST2-*
1764 0100 076B      FDB    CR,ZERO,OUT,STORE
1768 0844 06BF
176C 068A 0F49      VLIST2  FDB    DUP,IDDOT,SPACE,SPACE,PFA,LFA,AT,DUP,ZEQU,QTERM
1770 093D 093D
1774 09F9 09C7
1778 06A7 068A
177C 05FE 00F0
1780 03FF 020B      FDB    OR,ZBRAN
1784 FFCD              FDB    VLIST1-*
1786 066B 0080      FDB    DROP,SEMIS

```

*

*

***** FILE FDISK.TXT

*<<<< DISK I/O WORDS >>>> SYSTEM DEPENDENT

*

```

178A              WORDM    3,#D,R
1790 074A      NUMDR   FDB    DOCON
1792 0002              FDB    2          the number of disk drives
1794              WORDM    8,TRK/DIS,K tracks per disk
179F 074A      TRKDSK  FDB    DOCON
17A1 0023              FDB    35
17A3              WORDM    7,SEC/TR,K sectors per track == block = sector
17AD 074A      SECTRK  FDB    DOCON
17AF 000A              FDB    10
17B1              WORDM    5,B/BU,F

```

17B9 074A	BBUF	FDB	DOCOM
17BB 0100		FDB	256
17BD		WORDM	5,E/SC,R
17C5 0073 01E7	BSCR	FDB	DOCOL,LIT,1024,BBUF,SLASH,SEMI
17C9 0400 17B9			
17CD 051D 0080			
17D1		WORDM	7,SCR>EL,K
17DB 0073 17C5	SCRBLK	FDB	DOCOL,BSCR,STAR,USEBLK,SLMOD,SECTRK,STAR
17DF 04D7 17FA			
17E3 050D 17AD			
17E7 04D7			
17E9 179F 04D7		FDB	TRKDSK,STAR,PLUS,SEMI converts SCR# TO BLOCK #
17ED 041D 0080			
17F1	*		ALLOWING FOR THE NON INTEGER # OF SCR PER DISK
17FA 0073 17AD	USEBLK	WORDM	6,USEBL,K no of blocks per disk useable as SCReens
17FE 179F 04D7		FDB	DOCOL,SECTRK,TRKDSK,STAR,BSCR,SLASH,BSCR,STAR,SEMI
1802 17C5 051D			
1806 17C5 04D7			
180A 0080			
180C		WORDM	3,DR,0
1812 0073 076B	DRZERO	FDB	DOCOL,ZERO,OFFSET,STORE
1816 085B 06EF			
181A 0080		FDB	SEMI
181C		WORDM	3,DR,1
1822 0073 0773	DRONE	FDB	DOCOL,ONE,DRIVE,SEMI
1826 1842 0080			
182A		WORDM	5,DRSI,M
1832 0073 1790	DRSIM	FDB	DOCOL,NUMDR,DRIVE,SEMI
1836 1842 0080			
183A		WORDM	5,DRIV,E drive number is arg on stack
1842 0073 17AD	DRIVE	FDB	DOCOL,SECTRK,TRKDSK,STAR,STAR,OFFSET,STORE,SEMI
1846 179F 04D7			
184A 04D7 085B			
184E 06EF 0080			
	*		
		PAG	

*** The next 4 words are written to create a substitute for
* disc mass memory, located in DSMBGN to DSMEND in RAM

1852		WORDM	2,L,O	low address for simulated disk
1857 074A	LO	FDB	DOCON	
1859 3000		FDB	DSMBGN	
185B		WORDM	2,H,I	high address for simulated disk
1860 074A	HI	FDB	DOCON	
1862 4000		FDB	DSMEND	
1864		WORDM	3,R/,W	
186A 0073 0679	RW	FDB	DOCOL,SWAP now have BLOCK NO ON STACK	
186E 068A 0611		FDB	DUP,ZLESS,ZEQU,ZBRAN cant have block < 0	
1872 05FE 020B				
1876 0014		FDB	RWDE-*	
1878 17AD 179F		FDB	SECTRK,TRKDSK,STAR,SLMOD now have block-2,dr-1	
187C 04D7 050D				
1880 068A 1790		FDB	DUP,NUMDR,GREAT,ZBRAN	
1884 092D 020B				
1888 001D		FDB	RWD1-* > RWD1 IF DRIVE <= #DR	
188A C100 167C	RWDE	FDB	CR,DOT,PDOTQ drive error	
188E 0C12				
1890 08		FCB	8	
1891 20 44 72 69		FCC	" Drive ?"	
1895 76 65 20 3F				
1899 01E7 7FFF	RWDE1	FDB	LIT,\$7FFF,PREV,AT,STORE,QUIT	
189D 11EB 06A7				
18A1 06BF 10F2				
18A5 068A 1790	RWD1	FDB	DUP,NUMDR,EQUAL,ZBRAN	
18A9 0921 020B				
18AD 0049		FDB	RWD2-* -> RWD2 IF < #DR	
18AF 066B 04AC		FDB	DROP,TWOM,TWOM,DUP,ZLESS,ZBRAN USE SIM BUFF	
18B3 04AC 068A				
18B7 0611 020B				
18BB 0015		FDB	RWS1-* ONLY IF SCR>0	
18BD 0100 167C	RWRE	FDB	CR,DOT,PDOTQ	
18C1 0C12				
18C3 08		FCB	8	
18C4 20 52 61 6E		FCC	" Range ?"	
18C8 67 65 20 3F				
18CC 01FF		FDB	BRAN	
18CE FFCB		FDB	RWDE1-*	
18D0 17B9 04D7	RWS1	FDB	B3UF,STAR,LO,PLUS,DUP,HI,B3UF,SUB,GREAT,ZEQU,ZBRAN	
18D4 1857 041D				
18D8 068A 1860				
18DC 17E9 0915				
18E0 092D 05FE				
18E4 020B				
18E6 FFD7		FDB	RWRE-*	
18E8 0679 020B	RW4	FDB	SWAP,ZBRAN	
18EC 0C04		FDB	RW44-*	
18EE 0679		FDB	SWAP	

18F0 17B9 036D	RN44	FDB	BBUF,CMOVE,SEMIS
18F4 0080			
18F6 0639 17AD	RWD2	FDB	TOR,SECTRK,SLMOD,SWAP,ONEP,SWAP,FROMR
18FA 050D 0679			
18FE 047F 0679			
1902 0647			
1904 1911 0080		FDB	DISKRW,SEMIS
1903		WORDM	6,DISKR,W
1911 1913	DISKRW	FDB	*+2
1913 17 014D		LBSR	DSKRW0
1916 16 E75E		LBRA	NEXT
1919		WORDM	3,(_ ,)
191F 0073 0654	PDOS	FDB	DOCOL,R,COUNT,DUP,ONEP,FROMR,PLUS,TOR,GODOS,SEMIS
1923 0E4F 068A			
1927 047F 0647			
192B 041D 0639			
192F 1933 0080			
1933 1935	GODOS	FDB	*+2
1935 17 0128		LBSR	GODOSO
1938 16 E73C		LBRA	NEXT
193B 193B	NEXTNM	SET	*
193B C1		FCB	\$C1 immediate
193C DF		FCB	\$80+'
193D 1919		FDB	LASTNM
193B 193B	LASTNM	SET	NEXTNM
193F 0073 01EE	DOSQ	FDB	DOCOL,CLITER
1943 22		FCE	\$22 ascii quote
1944 0883 06A7		FDB	STATE,AT,ZBRAN
1948 020B			
194A 0014		FDB	DOS1-*
194C 0AAE 191F		FDB	COMPIL,PDOS,WORD,HERE,CAT,ONEP,ALLOT,BRAN
1950 0DED 08D8			
1954 06B3 047F			
1958 08E8 01FF			
195C 000A		FDB	DOS2-*
195E 0DED 08D8	DOS1	FDB	WORD,HERE,COUNT,GODOS
1962 0B4F 1933			
1966 0080	DOS2	FDB	SEMIS
1968		WORDM	3,DO,S
196E 1A5C	DOS	FDB	PDOSW
2C80	FCBIN	EQU	USREND-\$100-640
2DC0	FCBOUT	EQU	FCBIN+320
1970		WORDM	6,DISKI,N
1979 074A 2C80	DISKIN	FDB	DOCON,FCBIN
197D		WORDM	7,DISKOU,T
1987 074A 2DC0	DISKOUT	FDB	DOCON,FCBOUT
198B		WORDM	6,REWIN,D
1994 1996	REWDF0	FDB	*+2
1996 17 00D3		LBSR	REWDF
1999 16 E6DE		LBRA	NEXT
199C		WORDM	6,DELET,E
19A5 19A7	DELTF0	FDB	*+2

19A7 17	00C5		LBSR	DELETF	
19AA 16	E6CA		LBRA	NEXT	
19AD			WORDM	4,OPE,N	
19B4 19B6		OPENFO	FDB	*+2	
19B6 17	00AD		LBSR	OPENF	expects filenameaddr,iocode,fcbadr on STACK
19B9 16	E6BB		LBRA	NEXT	
19BC			WORDM	4,REA,D	
19C3 0073	0773	READ	FDB	DOCOL,ONE,DISKIN,OPENFO,DISKIN,LIT,XFINA	
19C7 1979	19B4				
19CB 1979	01E7				
19CF	2028				
19D1 06BF	0080		FDB	STORE,SEMIS	
19D5			WORDM	5,WRIT,E	
19DD 0073	076E	WRITE	FDE	DOCOL,ZERO,DISKOUT,OPENFO,DISKOUT,LIT,XFOUTA	
19E1 1987	19B4				
19E5 1987	01E7				
19E9	202A				
19EB 06BF	0080		FDB	STORE,SEMIS	
19EF			WORDM	5,CLOS,E	
19F7 19F9		CLOSFO	FDB	*+2	
>19F9 17	006D		LBSR	CLOSEF	expects fcb adr on stack
19FC 16	E678		LBRA	NEXT	
19FF			WORDM	7,CLOSEI,N	
1A09 0073	076E	CLOSIN	FDB	DOCOL,ZERO,LIT,XFINA,STORE	
1A0D 01E7	2028				
1A11 06BF					
1A13 1979	19F7		FDB	DISKIN,CLOSFO,SEMIS	
1A17	0080				
1A19			WORDM	8,CLOSEOU,T	
1A24 0073	076E	CLOSOT	FDB	DOCOL,ZERO,LIT,XFOUTA,STORE	
1A28 01E7	202A				
1A2C 06BF					
1A2E 1987	19F7		FDB	DISKOUT,CLOSFO,SEMIS	
1A32	0080				
		*			
1A34			WORDM	4,NOO,P	a noop
1A3B 0077		NOOP	FDB	NEXT	
		*			

* CHECK TO SEE IF SPACE OK FOR FDOS

1A3D FDOSBG EQU *

*

* FOLLOWING ARE SYSTEM DEPENDENT MACHINE LANGUAGE ROUTINES
PAG

*** * * *

* TALBOT MICROSYSTEMS 68'FORTH

*

TTL (c)1980 TALBOT MICROSYSTEMS
STTL 68'FORTH I/O DRIVERS
OPT PAG,NOC,MAC,NOE

*

* FDOS IS A FILE CONTAINING THE ASSEMBLY LANGUAGE ROUTINES WHICH
* INTERFACE 68'FORTH WITH A DISK OPERATING SYSTEM
* THIS IS VERSION 1.1 (80.3.8)

*

* IT IS SUPPLIED FOR TSC FLEX 9.0

*

* THERE ARE ADDRESSES IN HERE WHICH REFER BACK INTO THE CODE
* 68'FORTH AND THESE MUST NOT BE CHANGED
* THERE ARE ENTRY POINTS AT WHICH 68'FORTH EXPECTS TO FIND
* VARIOUS ROUTINES, AND THESE ADDRESSES MUST NOT BE CHANGED
* THE STARTING POINT IS FBGNIO
* THE LAST BYTE OF THESE ROUTINES MUST NOT GO BEYOND \$1BEF

*

* IF NECESSARY TO USE MORE SPACE, YOU MUST ALLOCATE IT SOMEWHERE
* UP ABOVE THE MEMORY SPACE USED FOR VIRTUAL MEMORY DISK BUFFERS
* STACKS, AND SIMULATED DISK.

*

*

* THE NEXT WORDS ARE SYSTEM-DEPENDENT I/O SUBROUTINES

*

* FBGNIO this is the address where these I/O routines are to start.

*

* FBYTSC the addr of # of bytes in a sector in the disk IO
* in FLEX9.0 this is 256

*

* FFINA location for storing address of input FCB
* FFOUTA location for storing address of output FCB
* FACIA location of address of terminal ACIA status word
* data byte is 1+

*

*<<<<<<<< FROM HERE TO >>>>>>> THE ADDRESSES CAN NOT BE CHANGED

*

1A50

1A50 FBGNIO SET \$1A50
ORG FBGNIO

*

17BB FBYTSC SET \$17BB

*

2028 FFINA SET \$2028

202A FFOUTA SET \$202A

2018 FACIA SET \$2018

*

*** * * *

```
*
* NOW JUMP VECTORS FOR FORTH - 3 BYTES EACH
*
>1A50 16    0048    PENIT   LBRA    PPEMIT   emit char in A to terminal
>1A53 16    0062    PKEY    LBRA    PPKEY    get char from termn1 - put in A, NO ECHO!
>1A56 16    0079    PQTER   LBRA    PPQTER   query terminal to see if char typed -
*                                ret 0 if not, ret char if so - ESC is treated as a
*                                request to pause, another ESC will resume as if no
*                                key had been pressed.
*
1A59 16     016D    PMON     LBRA    RESMON   close any open files and return to MONITOR
1A5C 6E     9D 0027 PDOSW    JMP      [DOSWRM,PCR] return to DOS
1A60 16     0091    GODOSO   LBRA    GODOSI   routine to set up DOS command call
1A63 16     00AD    DSKRWO   LBRA    DSKRWI   disk sector IO - args on U stack
*                                FORTH-BUFFER-ADDRESS -5
*                                READ/WRITE CODE - 1=READ, 0=WRITE -4
*                                SECTOR NUMBER       -3
*                                TRACK NUMBER        -2
*                                DRIVE NUMBER        -1
1A66 16     0109    OPENF    LERA    OPENFI   OPEN file - args on the U stack
*                                ADDRESS OF FIRST CHAR (COUNT FIELD) OF STRING WITH
*                                NAME OF FILE -3
*                                READ/WRITE FLAG      1=READ,0=WRITE -2
*                                ADDRESS OF FCB -1
*
1A69 16     0151    CLOSEF   LBRA    CLOSFI   arg is on stack ADDRESS OF FCB -1
1A6C 16     0152    REWNDF   LBRA    REWNDI   " " " " " " " "
1A6F 16     0153    DELETF   LERA    DELETI   " " " " " " " "
*
1A72                RMB      9          reserve space for 3 more vectors
*
* >>>>>>>>>>>> THE ABOVE CODE CAN NOT BE CHANGED
*
*<<<<<<<<<<<< THE CODE BELOW MAY BE CHANGED, BUT THE LAST ADDRESS MAY
* NOT BE LARGER THAN 1BEF - 1BF0 TO 2000 IS USED FOR DISK
* VIRTUAL MEMORY BUFFERS
*
* THIS VERSION IS FOR FLEX 9.0 WITH MF-68 DUAL DISK
* The following are variable depending upon the DOS system
* or the monitor
*
F802 NKTMON EQU $F802 MONITOR LOC of addr to restart,
* i.e., JMP [NXTMON,PCR]
*
* NOT ALL OF THESE ARE ACTUALLY USED AT PRESENT. THE ONES WHICH ARE
* ARE MARKED WITH < IN COMMENTS AND SO MUST BE SET TO DOS
* LOCATION WHICH DOES EQUIVALENT FLEX FUNCTION OR YOU MUST
* CREATE YOUR OWN ROUTINE TO DO EQUIVALENT.
*
1A7B C840    DOSFCB   FDB      $C840    <address of FLEX system FCB
1A7D C080    DOSIBF   FDB      $C080    <beginning of input line buffer for FLEX
1A7F CC0B    DOSSDN   FDB      $CC0B    address of system drive number
1A81 CC0C    DOSWDN   FDB      $CC0C    <address of working drive number
```

1A83	CC14		DOSBPT	FDB	\$CC14	<address of DOS line buffer pointer
1A85	CC20		DOSDET	FDB	\$CC20	<address of FMS error type number
1A87	CD03		DOSWRM	FDB	\$CD03	<FLEX WARMS warm start entry
1A89	CD2D		DOSGFL	FDB	\$CD2D	<FLEX GETFIL get file specification
1A8B	CD33		DOSEXT	FDB	\$CD33	<FLEX SETEXT set extension for file
1A8D	CD3F		DOSRER	FDB	\$CD3F	<FLEX RPTERR rept File Managemnt Sys error
1A8F	CD4B		DOSCMD	FDB	\$CD4B	<FLEX call as subroutine
1A91	D403		DOSFCL	FDB	\$D403	<FLEX FMS CLOSE close all open files
1A93	D406		DOSFMS	FDB	\$D406	<FLEX FMS
			*			
1A95				RMB	6	reserve space for 3 more system parameters
1A9B	34	14	PPEMIT	PSHS	B,X	
1A9D	7D	202A		TST	FFOUTA	test to see if file output add set
1AA0	27	08		BEQ	PEMIT0	if not, do terminal IO
1AA2	BE	202A		LDX	FFOUTA	get output file FCB address
1AA5	17	010E	FLAIO	LBSR	FMSCAL	call DOS FMS
1AA8	20	0B		BRA	PEMIT2	
1AAA	BE	2018	PEMIT0	LDX	FACIA	
1AAD	E6	84	PEMIT1	LDB	,X	get status
1AAF	C5	02		BITB	#2	check ready bit
1AB1	27	FA		BEQ	PEMIT1	
1AB3	A7	01		STA	1,X	send character in A
1AB5	35	14	PEMIT2	PULS	B,X	
1AB7	39			RTS		
1AB8	34	14	PPKEY	PSHS	B,X	
1ABA	7D	2028		TST	FFINA	test if input file address is set
1ABD	27	05		BEQ	PKEY0	if not, read from terminal
1ABF	BE	2028		LDX	FFINA	get input address
1AC2	20	E1		BRA	FLAIO	go to file io routine
1AC4	BE	2018	PKEY0	LDX	FACIA	
1AC7	E6	84	PKEY2	LDB	,X	get status
1AC9	57			ASRB		
1ACA	24	FB		BCC	PKEY2	no incoming data yet
1ACC	A6	01		LDA	1,X	
1ACE	84	7F		ANDA	#\$7F	strip parity
1AD0	20	E3		BRA	PEMIT2	
1AD2	34	10	PPQTER	PSHS	X	terminal query routine
1AD4	BE	2018		LDX	FACIA	
1AD7	A6	84		LDA	,X	look at status
1AD9	47			ASRA		
1ADA	25	03		BCS	PQTER2	if key has been pressed, get it and return
			*			in A register;
1ADC	4F			CLRA		if not, return 0 - note cntl @ = NULL will
1ADD	20	12		BRA	PQTER3	be regarded as no key
1ADF	A6	01	PQTER2	LDA	1,X	puts character into A
1AE1	81	1B		CMPA	#\$1B	test if it was ESCAPE KEY
1AE3	26	0C		BNE	PQTER3	if not, return and just signal that key presse
1AE5	A6	84	PQTER8	LDA	,X	look for another key
1AE7	47			ASRA		
1AE8	24	FB		BCC	PQTER8	loop until find one
1AEA	A6	01		LDA	1,X	get it
1AEC	81	1B		CMPA	#\$1B	test to see if escape

1AEE 26	01		BNE	PQTER3	if not, then pass it on
1AF0 4F			CLRA		if so, then treat as if no key pressed
1AF1 35	10	PQTER3	PULS	X	
1AF3 39		PQTER4	RTS		
1AF4 37	16	GODOS1	PULU	D,X	
1AF6 34	60		PSHS	U,Y	
1AF8 FE	1A7D		LDU	DOSIBF	
1AFB EF	9C 85		STU	[DOSBPT,PCR] init	LINE BUFFER POINTER
1AFE 1F	02		TFR	D,Y	use Y as counter
1B00 A6	80	GODOS1	LDA	,X+	
1B02 A7	C0		STA	,U+	
1B04 31	3F		LEAY	-1,Y	
1B06 26	F8		BNE	GODOS1	
1B08 86	0D		LDA	#\$0D	
1B0A A7	C4		STA	,U	
1B0C AD	9C 80		JSR	[DOSCMD,PCR]	
1B0F 35	60		PULS	U,Y	
1B11 39			RTS		
		DEOC	DRSEL	EQU	\$DEOC
		DE00	DRREAD	EQU	\$DE00
		DE03	DRWRIT	EQU	\$DE03
		DE06	DRVERF	EQU	\$DE06
1B12 00		NUMTRY	FCB	0	holds number of tries
1B13 BE	1A7B	DSKRWI	LDX	DOSFCB	buffered rwcode sector track drive
1B16 EC	C1		LDD	,U++	get drive
1B18 E7	03		STB	3,X	drive byte of FCB
1B1A ED	DEOC		JSR	DRSEL	
1B1D 86	0A		LDA	#\$10	number of tries
1B1F B7	1B12		STA	NUMTRY	
1B22 A6	41	DSKRC1	LDA	1,U	
1B24 E6	43		LDB	3,U	
1B26 6D	45		TST	5,U	test rwcode
1B28 27	10		BEQ	DSKRWW	0==WRITE
1B2A AE	46		LDX	6,U	buff ad into X
1B2C BD	DE00	DSKRWI	JSR	DRREAD	
1B2F 27	1C		BEQ	DSKRTS	
1B31 7A	1B12		DEC	NUMTRY	
1B34 26	EC		BNE	DSKRC1	try read again
1B36 86	52		LDA	#\$R	
1B38 20	16		BRA	DSKRWE	
1B3A AE	46	DSKRWW	LDX	6,U	buff ad into X
1B3C BD	DE03	DSKRWL	JSR	DRWRIT	
1B3F BD	DE06		JSR	DRVERF	
1B42 27	09		BEQ	DSKRTS	
1B44 7A	1B12		DEC	NUMTRY	
1B47 26	D9		BNE	DSKRC1	
1B49 86	57		LDA	#\$W	
1B4B 20	03		BRA	DSKRWE	
1B4D 33	48	DSKRTS	LEAU	8,U	
1B4F 39			RTS		
1B50 17	FF48	DSKRWE	LBSR	PPEMIT	type io type
1B53 33	48		LEAU	8,U	

1B55	16	E4AB		LBRA	3	warm restart
1B58	AD	9D FF31	RWDSEO	JSR	[DOSRER,PCR]	report error
1B5C	6E	8D E4A3		JMP	3,PCR	warm start entry point
1B60	26	01	CHKERR	BNE	CHKERO	if any error consider what it is
1B62	39			RTS		otherwise return
1B63	E6	01	CHKERO	LDB	1,X	get error code
1B65	C1	08		CMPB	#\$8	is it EOF?
1B67	26	EF		BNE	RWDSEO	go report error and warm restart
1B69	7F	2028		CLR	FFINA	clear input file FCB address so that input
1B6C	7F	2029		CLR	FFINA+1	will be from terminal
1B6F	86	0D		LDA	#\$D	return a car ret and continue
1B71	39			RTS		
1B72	34	20	OPENFI	PSHS	Y	
1B74	10AE	44		LDY	4,U	get addr of count byte of string for
			*		name of file	
1B77	31	21		LEAY	1,Y	move Y up to first character of name
1B79	AE	8D FF00		LDX	DOSIBF,PCR	address of DOS input line buffer
1B7D	E6	3F		LDB	-1,Y	get number of characters in name of file
1B7F	27	07	OPNL1	BEQ	OPNL2	br down when out of characters
1B81	A6	A0		LDA	,Y+	get next char
1B83	A7	80		STA	,X+	store in next buff loc
1B85	5A			DECB		decr ctr
1B86	20	F7		BRA	OPNL1	
1B88	86	0D	OPNL2	LDA	#\$D	carriage ret denotes end of name
1B8A	A7	84		STA	,X	
1B8C	AE	8D FEED		LDX	DOSIBF,PCR	get buffer address again
1B90	AF	9D FEEF		STX	[DOSBPT,PCR]	set buffer ptr to pt to buffer beginning
1B94	AE	C4		LDX	0,U	get address of FCB to use for this file
1B96	A6	9D FEE7		LDA	[DOSWDN,PCR]	get DCS working file no to use as default
1B9A	A7	03		STA	3,X	
1B9C	AD	9D FEE9		JSR	[DOSGFL,PCR]	call DOS GETFIL rtn to parse file name
			*			and set up FCB
1BA0	86	01		LDA	#1	set default extinsion to TXT
1BA2	AD	9D FEE5		JSR	[DOSEXT,PCR]	sets extinsion to default if not given.
1BA6	A6	43		LDA	3,U	get READ (=1) or WRITE (=0) code from stack
1BA8	33	46		LEAU	6,U	drop all arguments from stack
1BAA	35	20		PULS	Y	
1BAC	26	06		BNE	FMSCL1	
1BAE	86	02		LDA	#2	0 = WRITE , IN FLEX, WRITE IS COMMAND 2
1BB0	20	02		BRA	FMSCL1	
1BB2	AE	C1	FMSCLL	LDX	,U++	get FCB address from stack and drop it
1BB4	A7	84	FMSCL1	STA	0,X	
1BB6	AD	9D FED9	FMSCAL	JSR	[DOSEMS,PCR]	
1BBA	8D	A4		BSR	CHKERR	
1BBC	39			RTS		
1BED	86	04	CLOSF1	LDA	#\$04	FLEX CLOSE FILE
1BBF	20	F1		BRA	FMSCLL	
1BC1	86	05	REWINDI	LDA	#\$5	FLEX REWIND AN OPEN FOR READ FILE
1BC3	20	ED		BRA	FMSCLL	
1BC5	86	0C	DELETI	LDA	#\$0C	DELETE FILE FROM DISK (CLOSE FIRST)
1BC7	20	E9		BRA	FMSCLL	
1BC9	AD	9D FEC4	RESMON	JSR	[DOSFCL,PCR]	close all open files

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```
1BCD 6E    9D DC31    JMP    [NXTMON,PCR] next monitor command processor
              1BD0 FDOSIN EQU    *-1      this address FDOSIN must assemble to be <= 1BEF
              *
              END    PRGBGN
```

1 ERROR(S) DETECTED

SYMBOL TABLE:

ABORT	1120	ABORTC	1177	ABS	057C	ABS2	0588	ACIAI	0029
AGAIN	1526	ALLOT	08E8	AND	03ED	ARROW	13F8	AT	06A7
BACK	147B	BACKEC	0030	BACKSP	002F	BASE	088E	BBUF	17B9
BCOMP	0FDD	BDIGS	15BD	BEGIN	148D	BL	078C	BLANKS	0DB4
BLK	0831	BLOCK	12B0	BLOCK3	12CE	BLOCK4	12E8	BLOCK5	1300
BRAN	01FF	BSCR	17C5	BUFFER	1268	BUFFR2	1272	BUFFR3	1298
BUFSIZ	0100	BUILDS	06E4	CAT	06B3	CCOMM	0905	CEMIT	00B9
CENT	0142	CFA	09D6	CHKERO	1B63	CHKERR	1B60	CKEY	00D9
CLITER	01EE	CLOSEF	1A69	CLOSFO	19F7	CLOSFI	1BBD	CLOSIN	1A09
CLOSOT	1A24	CNOV2	0380	CNOV3	038A	CMOVE	036D	COLD	0140
COLD2	0147	COLD8	0168	COLDZ	0180	COLINT	002D	COLON	005F
COLUMNS	08CD	COMMA	08F4	COMPIL	0AAE	CON	0740	CONTXT	0869
COUNT	0B4F	CPUTYP	0006	CR	0100	CR1	010A	CR2	012E
CRE	0136	CREAT2	0F9D	CREATE	0F7D	CSP	08AC	CSTORE	06CF
CURRENT	0877	DABS	0591	DABS2	059D	DDOT	166E	DDCTR	163A
DDUP	097C	DDUP2	0986	DEC	0E0C	DEFIN	10D2	DELETF	1A6F
DELETI	1BC5	DELINT	002B	DELTF0	19A5	DFIND	0EDE	DFIND2	0EFE
DIG	15FA	DIG2	1614	DIGIT	0295	DIGIT0	02AB	DIGIT1	02B3
DIGIT2	02B8	DIGS	1622	DIGS2	1624	DISKIN	1979	DISKOU	1987
DISKRW	1911	DLINE	135E	DLITE2	1026	DLITER	1016	DMINUS	0461
DMINX	0477	DO	14C5	DOCOL	0073	DOCON	074A	DODOES	0700
DOES	06F4	DOS	196E	DOS1	195E	DOS2	1966	DOSBPT	1A83
DOSCMD	1A8F	DOSDET	1A85	DOSEXT	1A8B	DOSFCB	1A7B	DOSFCL	1A91
DOSFMS	1A93	DOSGFL	1A89	DOSIBF	1A7D	DOSQ	193F	DOSRER	1A8D
DOSSDN	1A7F	DOSWDN	1A81	DOSWRM	1A87	DOT	167C	DOTQ	0C2B
DOTQ1	0C4A	DOTQ2	0C52	DOTR	165D	DOUSER	07B5	DOVAR	0760
DOVOC	10BA	DP	0818	DPINIT	0025	DPL	0898	DPLUS	042B
DRIVE	1842	DRONE	1822	DROP	066B	DRREAD	DE00	DRSEL	DE0C
DRSIM	1832	DRVERF	DE06	DRWRIT	DE03	DRZERO	1812	DSETS2	05F2
DSETSM	05E8	DSKRC1	1B22	DSKRTS	1B4D	DSKRWO	1A63	DSKRW1	1B2C
DSKRWE	1B50	DSKRWI	1B13	DSKRWL	1B3C	DSKRWW	1B3A	DSMBGN	3000
DSMEND	4000	DTRAIL	0B90	DTRAL2	0B98	DTRAL3	0BB2	DTRAL4	0BB6
DUMP	16DD	DUMP1	16E7	DUMP2	16FA	DUMP3	1717	DUMP31	172B
DUP	068A	EDIGS	15CC	ELSE	156D	EMIT	00B3	ENCL2	0324
ENCL3	0334	ENCL4	033A	ENCL5	0348	ENCL6	0352	ENCL7	035A
ENCL7P	035D	ENCL8	035F	ENCLOS	0318	END	1518	ENDIF	149F
EQUAL	0921	ERAM	11C9	ERASE	0DA3	ERROR	0F18	ERROR2	0F26
EXEC	0091	EXPEC2	0CA5	EXPEC3	0CF9	EXPEC4	0D10	EXPEC5	0D12
EXPEC6	0D1E	EXPECT	0C9B	EXPECZ	0CCB	FACIA	2018	FBNIO	1A50
FBYTSC	17BB	FCBIN	2C80	FCBOUT	2DC0	FDCSBC	1A3D	FDOSIN	1BD0
FENCE	080F	FENCIN	0023	FFINA	2028	FFOUTA	202A	FILL	0D83
FINA	0041	FIRST	0798	FLAIO	1AA5	FLD	08A2	FLUSH	1310
FLUSH1	1325	FMSCAL	1BB6	FMSCL1	1BE4	FMSCLL	1BE2	FORGET	1431
FORTH	2058	FOUND	02FF	FOUTA	0043	FROMR	0647	GETX	0055
GO	117E	GODOS	1933	GODOSO	1A60	GODOS1	1B00	GODOSI	1AF4
GREAT	092D	HERE	08D8	HEX	0AF7	HI	1860	ILD	08BF
HOLD	0DC3	I	0270	IDDOT	0F49	IF	1556	IFCOLD	0138
IMMED	1082	IN	083A	INTER2	1036	INTER3	104E	INTER4	1052

INTER5 1058	INTER6 106C	INTER7 1070	INTERP 1034	INTSPC 01AF
IOSTAT 204E	J 027D	JSR 00A5	K 0286	KERNAL 0000
KEY 00D3	LASTNM 1A34	LATEST 09B7	LBRAK 0AC4	LEAVE 062B
LESS 05A3	LESSF 05B1	LESST 05B4	LESSX 05B6	LFA 09C7
LIMIT 07A4	LINDEC 0032	LINDEL 0031	LIST 1697	LIST2 16B5
LIT 01E7	LITER 0FF9	LITER2 1009	LO 1857	LOAD 13C8
LOOP 14D8	MAX 0963	MAX2 0971	MEMEND 3000	MEMTOP 4000
MESS 1372	MESS3 13A2	MESS4 13BF	MIN 094B	MIN2 0959
MINUS 0448	MINUS2 0453	MOD 052D	MON 009D	MSGBAS 0047
MSLASH 04E4	MSMOD 0560	MSTAR 04BB	MTBUF 1251	N 2000
NBLK 0004	NEXT 0077	NEXT3 0079	NEXTNM 1A34	NFA 09E4
NOOP 1A3B	NULL 0D48	NULL1 0D72	NULL2 0D76	NULL3 0D7A
NUMB 0E38	NUMB1 0EA5	NUMB2 0ECA	NUMB3 0ED4	NUMDR 1790
NUMTRY 1B12	NXTMON F802	OFFSET 085B	ONE 0773	ONEM 049D
ONEP 047F	OPENF 1A66	OPENF0 19B4	OPENFI 1B72	OPNL1 1B7F
OPNL2 1B88	OR 03FF	OUT 0844	OVER 065D	PA 2004
PA0 2002	PABORT 0F0A	PAD 0DDB	PAREN 10E2	PBUF 11F6
PBUF2 1218	PCHR 2006	PCMOVE 0374	PD 2000	PDOS 191F
PDOSW 1A5C	PDOTQ 0C12	PENIT 1A50	PENIT0 1AAA	PENIT1 1AAD
PEMIT2 1AD5	PFA 09F9	PFIND 02C8	PFIND0 02CC	PFIND1 02D2
PFIND2 02E1	PFIND3 02ED	PFIND4 02F9	PFIND8 02F5	PFINDE 0309
PKEY 1A53	PKEY0 1AC4	PKEY2 1AC7	PLINE 133C	PLOOP 14EE
PLUS 041D	PMON 1A59	PNUMB 0E3D	PNUMB2 0E3F	PNUMB3 0E75
PNUMB4 0E7B	PORIG 07C7	PPEMIT 1A9B	PPKEY 1AB8	PPQTER 1AD2
PQTER 1A56	PQTER2 1ADF	PQTER3 1AF1	PQTER4 1AF3	PQTER8 1AE5
PQUOTE 0BF9	PREV 11EB	PRGBGN 0000	PSCODE 0B21	PSEMIS 0082
PSTORE 0696	PULLEX 004F	PUSHD 0057	PUTD 03F5	QCOMP 0A3A
QCSP 0A79	QERR 0A20	QERR2 0A2E	QERR3 0A30	QEXEC 0A51
QLOAD 0A95	QPAIRS 0A67	QSTAC2 0C6F	QSTAC3 0C7E	QSTACK 0C5D
QTERM 00F0	QUERY 0D30	QUEST 1688	QUIT 10F2	QUIT2 10FC
QUIT3 1114	QUOTE 0BC0	QUOTE1 0BDF	QUOTE2 0BF1	R 0654
RAM 1190	RBRAK 0AD2	READ 19C3	REND 2089	REPEAT 153D
RESMON 1BC9	REWDF0 1994	REWDF 1A6C	REWNDI 1BC1	RFORTH 1198
RINIT 003F	RNUM 08B5	ROT 0C86	RPSTOR 01D8	RTASK 11C5
RW 186A	RW4 18E3	RW44 18F0	RWD1 18A5	RWD2 18F6
RWDE 188A	RWDE1 1899	RWDSE0 1B58	RWRE 18BD	RWS1 18D0
RZERO 07DF	SCR 084E	SCRBLK 17DB	SCSP 0A0D	SECTRK 17AD
SEMI 0727	SEMIC 0B37	SEMIS 0080	SETSN 05D6	SETSN2 05E0
SIGN 15E5	SIGN2 15F4	SINIT 003B	SLASH 051D	SLMOD 050D
SMUDGE 0AE6	SPACE 093D	SPACE2 15B0	SPACE3 15B6	SPACES 15A0
SPAT 01BB	SPSTOR 01CA	SSLASH 054E	SSMOD 053D	STAR 04D7
STATE 0883	STOD 05C1	STOD2 05CC	STORE 06EF	STOREX 0051
SUB 0915	SWAP 0679	SZERO 07D6	TASK 2085	TASKAA 207E
THEN 14BA	THREE 0783	TIB 07E9	TIBINT 003D	TICK 1418
TOGGLE 0715	TOR 0639	TRAV 0993	TRAV2 0997	TRKDSK 179F
TWO 077B	TWOM 04AC	TWOP 048E	TYPE 0B62	TYPE2 0B72
TYPE3 0B80	TYPE4 0B82	UNTIL 1504	UORIG 200C	UP 200A
UPDATE 122B	UPINIT 0021	USE 11E0	USEBLK 17FA	USER 07AF
USLASH 03B9	USLL1 03CA	USLL2 03DA	USRBGN 2000	USREND 3000
USTAR 0394	USTAR2 03A3	USTAR3 03AF	USTAR4 03B3	USTARS 039D
VAR 075A	VERSION 0008	VIRBGN 1BF0	VIREND 2000	VLIST 1742
VLIST1 1751	VLIST2 176C	VOCAB 109A	VOCINT 0027	VOCLIN 0827

WARM	0192	WARN2	019A	WARN	0803	WENT	0194	WHILE	158F
WIDINT	0045	WIDTH	07F5	WORD	0DED	WORD2	0E01	WORD3	0E05
WRITE	19DD	WRNINT	0049	XACIA	2018	XEASE	2042	XBKSP	201E
XBKSPE	201F	XBLK	2032	XCOLUM	201C	XCONT	203C	XCSP	2048
XCURR	203E	XDELAY	201A	XDO	0261	XDP	2014	XDPL	2044
XDSMBG	0037	XDSMED	0039	XFENCE	2012	XFINA	2028	XFLD	2046
XFOUTA	202A	XHLD	204C	XIN	2034	XLINDE	2021	XLINDL	2020
XLOOP	0228	XMSGBS	202E	XOFSET	203A	XOR	040F	XOUT	2036
XPLOF	024E	XPLONO	0256	XPLOOP	0239	XPLOP2	023D	XPREV	004D
XRNUM	204A	XRZERO	2026	XSCR	2038	XSPZER	2022	XSTATE	2040
XTIB	2024	XUSE	004B	XVIRBG	0033	XVIREB	0035	XVOCL	2016
XWARN	2030	XWIDTH	202C	ZBNO	021A	ZBRAN	020B	ZYES	0211
ZEQU	05FE	ZEQU2	0607	ZERO	076B	ZLESS	0611	ZLESS2	061F