

Introduction

The QX-10 Programmer's Guide Vol. 1 lists the 63K MultiFonts CP/M BIOS (Basic Input Output System) programs, including entry points to resident routines making up the nucleus of BIOS and the non-resident routines which are used for device access and interrupt control.

The first section lists the content of the common data area and entry points to resident BIOS routines (addresses F600H to FFFFH) which make up the nucleus of BIOS.

The second section lists the keyboard input (CONIN) routine, flexible disk read/write routines, and routines for processing interrupts from the keyboard, RS-232C interface, and flexible disk drives.

The third section lists the console output (CONOUT) routine. Routines related to RS-232C interfaces, the light pen interface, and interrupt masks (MASKI) are listed in the fourth section, the printer output (LIST), PSET, and hard copy (HCOPY) routines are listed in the fifth section.



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TITLE * OX-10 63k MF-CP/M BIOS1 M1.3 *

BASIC I/O SYSTEM FOR OX-10 CP/M V2.2

created OX-10 63k MF-CP/M BIOS1
M1.0 1983. 2. 9 by Yuichi Ushiyama
Chisato Kobayashi
M1.1 3.10
M1.2 3.15
M1.3 4.29

.Z80

.PHASE 0F600H ;63k !!!!!

F600

BIOS:

CP/M SYSTEM FUNDAMENTAL CONSTANTS

```

;VERS EQU 22 ;CP/M VERSION 2.2
;CCP EQU BIOS-1600H
;BDOS EQU CCP+806H ;BDOS ADDRESS
;CPML EQU 16H ;(BIOS-CCP)/256 ;CP/M SECTORS
;INTTAB EQU 0FD80H
;PRMTAB EQU 0FE00H
;CPFSTR EQU 0A100H ;programmable function key table
;PRTBUF EQU 0C300H
;MFBUF1 EQU 0C400H
;MFSIZE EQU 800H
;MFBUF2 EQU MFBUF1+MFSIZE
;MFBUF3 EQU MFBUF2+MFSIZE
;HSTBUF EQU 0DC00H ;*BIOS2

```

CP/M TO HOST DISK CONSTANTS

```

;BLKSIZ EQU 2048 ;CP/M ALLOCATION SIZE
;HSTSIZ EQU 1024 ;HOST DISK SECTOR SIZE
;HSTSPT EQU 8 ;32*256/HSTSIZ ;HOST DISK SECTORS/TRK
;HSTBLK EQU 8 ;HSTSIZ/128 ;CP/M SECTRS/HOST BUFFER
;CPMSPT EQU 40H ;HSTBLK*HSTSPT ;CP/M SECTORS/TRACK
;SECMSK EQU HSTBLK-1 ;SECTOR MASK
;SECSHF EQU 3 ;LOG2(HSTBLK)

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BDOS CONSTANTS FOR ENTRY TO WRITE

```

;WRALL EQU 0 ;WRITE with Allocation
;WRDIR EQU 1 ;WRITE to directory
;WRUAL EQU 2 ;WRITE without Allocation

```

OTHER CONSTANTS

CP/M 0 PAGE WORK

```

;IOBYT EQU 0003H ;CP/M I/O BYTE
;CDISK EQU 0004H ;CP/M CURRENT DISK #
;NDISKS EQU 6 ;ON-LINE DISKS

```

BIOS STACK

```

;INITSTK EQU 0

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FF00

E007

```

;STARTCOM EQU INITSTK-100H ;auto-start command buffer
;CCPCOM EQU CCP+07H ;CCP command buffer

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CONTROL CHARACTER DEFINITION

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;CR EQU 0DH
;LF EQU 0AH

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* BIOS BEGINS HERE !! *
*** JUMP VECTOR FOR INDIVIDUAL ROUTINE ***

F600	C3	F6F9	JP	BOOT
F603	C3	F75B	WBOOT: JP	WBOOT
F605	C3	F873	JP	CONST
F609	C3	F87A	JP	CONIN
F60C	C3	F881	JP	CONOUT
F60F	C3	F896	JP	LIST
F612	C3	F88F	JP	PUNCH
F615	C3	F888	JP	READER
F618	C3	F83E	JP	HOME
F61B	C3	F828	JP	SELDSK
F61E	C3	F84A	JP	SETTRK
F621	C3	F850	JP	SETSEC
F624	C3	F855	JP	SETDMA
F627	C3	F85E	JP	READ
F62A	C3	F865	JP	WRITE
F62D	C3	F89D	JP	LISTST
F630	C3	F85B	JP	SECTAN
F633	C3	F9A9	JP	PSET
F636	C3	F980	JP	HCOPY
F639	C3	F94E	JP	BEEP
F63C	C3	F978	JP	RSOPEN
F63F	C3	F97F	JP	RSCLOSE
F642	C3	F986	JP	RSINST
F645	C3	F98D	JP	RSOUTST
F648	C3	F994	JP	RSIN
F64B	C3	F99B	JP	RSOUT
F64E	C3	F9B7	JP	TIMDAT
F651	C3	F9CC	JP	MEMORY
F654	C3	F9A2	JP	RSIOX
F657	C3	F9BE	JP	LIGHTPEN
F65A	C3	F9C5	JP	MASKI
F65D	C3	FA12	JP	LOADX
F660	C3	FA3C	JP	STORX
F663	C3	FA59	JP	LDIRX
F666	C3	FAAE	JP	JUMPX
F669	C3	FAD4	JP	CALLX
F66C	C3	FB23	JP	GETPFK
F66F	C3	FB29	JP	PUTPFK
F672	C3	F672	JP	\$
F675	C3	FA29	JP	LDAXX
F678	C3	FA54	JP	STAXX

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.....  
: DISK PARAMETER DEFINITION :  
: .....  
: data table for four drive double density double sided  
: 96 TPI, 5 1/4' diskette  
: disks 6  
: diskdef 0, 1, 64, 0, 2048, 140, 64, 64, 4  
: diskdef 0, 1, 64, 0, 1024, 56, 32, 32, 0  
: disk parameter headers  
: DPBASE:  
: disk parameter header for disk 0  
: DW 0000H, 0000H ; translate table  
: DW 0000H, 0000H ; scratch area  
: DW DIRBUF, DPBLK ; dir buf, parm block  
: DW CSV0, ALV0 ; check, alloc vectors  
: disk parameter header for disk 1  
: DW 0000H, 0000H  
: DW 0000H, 0000H  
: DW DIRBUF, DPBLK  
: DW CSV1, ALV1  
: disk parameter header for disk 2  
: DW 0000H, 0000H  
: DW 0000H, 0000H  
: DW DIRBUF, DPBLK  
: DW CSV2, ALV2  
: disk parameter header for disk 3  
: DW 0000H, 0000H  
: DW 0000H, 0000H  
: DW DIRBUF, DPBLK  
: DW CSV3, ALV3  
: disk parameter header for disk 4  
: DW 0000H, 0000H  
: DW 0000H, 0000H  
: DW DIRBUF, DPBLK4  
: DW CSV4, ALV4  
: disk parameter header for disk 5
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227 F6CB 0000 0000 DW 0000H,0000H
228 F6CF 0000 0000 DW 0000H,0000H
229 F6D3 FC56 F6EA DW DIRBUF,DPBLK4
230 F6D7 FD74 FD6D DW CSV5,ALV5
231
232 ;
233 ;
234 ; disk parameter block for disk 0 - disk 3
235 ;
236 F6DB DPBLK:
237 F6DB 0040 DW 64 ;CP/M sectors/track
238 F6DD 04 DB 4 ;block shift
239 F6DE 0F DB 15 ;block mask
240 F6DF 01 DB 1 ;extent mask
241 F6E0 008B DW 139 ;disk block size - 1
242 F6E2 003F DW 63 ;directory max
243 F6E4 80 DB 80H ;alloc 0
244 F6E5 00 DB 0 ;alloc 1
245 F6E6 0010 DW 16 ;directory check size
246 F6E8 0004 DW 4 ;track offset
247
248 ;
249 ; disk parameter blocks for disk 4 and disk 5
250 ;
251 F6EA DPBLK4:
252 F6EA 0040 DW 64 ;sectors/track
253 F6EC 03 DB 3 ;block shift
254 F6ED 07 DB 7 ;block mask
255 F6EE 00 DB 0 ;extent mask
256 F6EF 0037 DW 55 ;disk size - 1
257 F6F1 001F DW 31 ;directory max
258 F6F3 80 DB 128 ;alloc 0
259 F6F4 00 DB 0 ;alloc 1
260 F6F5 0008 DW 8 ;check size
261 F6F7 0000 DW 0 ;offset
262
263 ;
264 ;
265 ;
266 ;
267 ;
268 SUBTTL ## BIOS? ENTRY TABLE ##
269
270 0000 SIGNMSG EQU 3*0
271 0003 MCHRST EQU 3*1
272 0006 GTMCHR EQU 3*2
273 0009 MCOU EQU 3*3
274 000C MLIST EQU 3*4
275 0012 PUNCH2 EQU 3*5
276 0015 READR2 EQU 3*6
277 0018 CALBR2 EQU 3*7
278 001B NSEC2 EQU 3*8
279 001E WTHST2 EQU 3*9
280 0021 DMAST2 EQU 3*10
281 0024 COMMD2 EQU 3*11
282 0027 READ2 EQU 3*12
283 002A WRITE2 EQU 3*13
284 002D RSOPEN2 EQU 3*14
285 0030 RSCLOS2 EQU 3*15
286 0033 RSINST2 EQU 3*16
287 0036 RSOTST2 EQU 3*17
288 0039 RSIN2 EQU 3*18
289 003C RSOUT2 EQU 3*19
290 003F PSET2 EQU 3*20
291 0042 HCOPI2 EQU 3*21
292 0045 TIMDT2 EQU 3*22
293 0048 RSIOX2 EQU 3*23
294 004B LPEN2 EQU 3*24
295 004E MASK2 EQU 3*25
296 0051 GTPFK2 EQU 3*26
297 PTPFK2 EQU 3*27
298
299 0057 GOCPMX EQU 3*29
300 005A SIOIR2 EQU 3*30
301 005D FDCIR2 EQU 3*31
302
303 LPEN12 EQU 3*33
304 INTX21 EQU 3*34
305 INTX22 EQU 3*35
306 INTX23 EQU 3*36
307 INTX24 EQU 3*37
308 INTX25 EQU 3*38
309 INTX26 EQU 3*39
310 INTX27 EQU 3*40
311
312 ;
313 ;
314 SUBTTL ---- BIOS MAIN ROUTINE ----
315
316 ;
317 ;
318 ;
319 ;
320 ;
321 ;
322 ;
323 F6F9 BOOT:
324 F6F9 31 0000 LD SP,INITSTK
325
326 F6FC 3E 10 LD A,10H ;reset memory bank number in RAM
327 F6FE 32 FEFO LD (MEMBANK),A
328
329 F701 3E 95 LD A,95H ;reset 8259
330 F703 D3 08 OUT (8),A ;set interrupt vector address ( low INTTAB = 80H )
331 F705 3E FD LD A,high INTTAB
332 F707 D3 09 OUT (9),A
333 F709 3E 80 LD A,80H
334 F70B D3 09 OUT (9),A
335 F70D 3E 02 LD A,2
336 F70F D3 09 OUT (9),A
337 F711 3E 2E LD A,2EH
338 F713 D3 09 OUT (9),A ;mask-main [power down II KB II FDD II slave I
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453 F7B8 4F LD C,A
454 F7B9 CD F7EE CALL KBCOM
455
456 F7BC 3A FE4E LD A,(KBINTVL) ;set key repeat interval
457 F7BF E6 1F AND 1FH
458 F7C1 F6 20 OR 20H
459 F7C3 4F LD C,A
460 F7C4 CD F7EE CALL KBCOM
461
462 F7C7 0E 00 LD C,0 ;read date & time
463 F7C9 CD F9B7 CALL TIMDAT
464
465 F7CC DD 21 0057 LD IX,GOCPMX
466 F7D0 CD FB2F CALL BIOS2
467
468
469 ; set parameter 0 PAGE
470
471 F7D3 3E C3 LD A,0C3H ;set JP instruction
472 F7D5 32 0000 LD (0000H),A
473 F7D8 21 F603 LD HL,WBOOTE
474 F7DB 22 0001 LD (0001H),HL ;JP WBOOTE at 00
475 F7DE 32 0005 LD (0005H),A
476 F7E1 21 E806 LD HL,BDOS
477 F7E4 22 0006 LD (0006H),HL ;JP BDOS at 0005H
478 F7E7 3A 0004 LD A,(CDISK)
479 F7EA 4F LD C,A ;current disk # to C
480
481 F7EB C3 E000 JP CCP ; GO CCP
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488 F7EE KBCOM: DB 12
489 F7EF CD 57 BIT 2,A
490 F7F2 28 FA JR Z,KBCOM
491 F7F4 79 LD A,C
492 F7F5 D3 10 OUT (10H),A
493 F7F7 C9 RET
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498 WARM BOOT FAIL
499
500 F7F8 WBFAIL: LD HL,WBFMS
501 F7FB CD F803 CALL PRMSG ;print "CAN NOT WARM BOOT !!"
502 F7FE CD F96D CALL BUZZON ;buzz on
503 F801 18 FE JR $ ;loop forever
504
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507 F803 PRMSG: LD A,(HL)
508 F803 7E AND A
509 F804 A7 LD A,Z
510 F805 C8 RET Z ;yes
511
512 ; more to print
513
514 F806 E5 PUSH HL
515 F807 4F LD C,A
516 F808 CD F881 CALL CONOUT
517 F80B E1 POP HL
518 F80C 23 INC HL
519 F80D 18 F4 JR PRMSG
520
521
522 WARM BOOT FAIL MESSAGE
523
524 F80F WBFMS: DB CR,LF
525 F80F 0D 0A DB "CAN NOT WARM BOOT !!"
526 F811 43 41 4E 20
527 F815 4E 4F 54 20
528 F819 57 41 52 40
529 F81D 20 42 4F 4F
530 F821 54 20 21 21
531 F825 0D 0A 00 DB CR,LF,0
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540 ; CP/M INDIVIDUAL ROUTINE ;
541 ;
542 ;
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545 ;
546 ;
547 F828 SELECT DISK
548 F828 21 0000 SELDSK: LD HL,0 ;return 0000 if error
549 F82B 79 LD A,C ;selected disk # at C
550 F82C FE 06 CP NDISKS ; too large?
551 F82E 00 RET NC ;selected disk # is too large
552 F82F 32 FC40 LD (SEKDSK),A ;set seek disk number
553 F832 6F LD L,A
554 F833 26 00 LD H,0
555 F835 29 ADD HL,HL
556 F836 29 ADD HL,HL
557 F837 29 ADD HL,HL
558 F838 29 ADD HL,HL
559 F839 11 F67B LD DE,DPBASE ;multiplied by 16
560 F83C 19 ADD HL,DE ;base of parameter block
561 F83D C9 RET
562
563
564
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566
567
568
569 F83E
570 F83E 3A FC4A
571 F841 B7
572 F842 20 03
573 F844 32 FC49
574 F847
575 F847 01 0000
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584 F84A
585 F84A 60
586 F84B 69
587 F84C 22 FC41
588 F84F C9
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596 F850
597 F850 79
598 F851 32 FC43
599 F854 C9
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609 F856 69
610 F857 22 FC54
611 F85A C9
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625 F85D C9
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639 F85E
640 F85E DD 21 0024
641 F862 C3 FB2F
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655 F865
656 F865 DD 21 0027
657 F869 C3 FB2F
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666 F86C DD 21 001B
667 F870 C3 FB2F
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;
; HOME THE SELECTED DISK
HOME: LD A, (HSTWRT) ;check for pending write
      OR A
      JR NZ, HOMED
      LD (HSTACT), A ;clear host active flag
HOMED: LD BC, 0
      JR SETTRK
;
;
; SET TRACK NUMBER given by BC
SETTRK: LD H, B ;TRACK to seek
        LD L, C
        LD (SEKTRK), HL
        RET
;
;
; SET SECTOR given by C-reg.
SETSEC: LD A, C
        LD (SEKSEC), A ;SECTOR to seek
        RET
;
;
; SET DMA ADDRESS ( TO READ OR WRITE DISK ) given by BC
SETDMA: LD H, B
        LD L, C
        LD (DMAADR), HL
        RET
;
;
; TRANSLATE SECTOR NUMBER BC
; DE: translate table
; BC: logical sector number
; on return, physical sector # VIA HL
SECTAN: LD H, B
        LD L, C ;no translate
        RET
;
;
; *****
; *** READ DISK ROUTINE ***
; read the selected CP/M sector
; *****
READ: LD IX, READ2
      JP BIOS2 ;* execute BIOS2 subroutine
;
;
; *****
; *** WRITE DISK ROUTINE ***
; write the selected CP/M sector
; *****
WRITE: LD IX, WRITE2
       JP BIOS2
;
;
WRITEHST: LD IX, WTHST2
         JP BIOS2
;
;
SUBTTL CONST, CONIN, CONOUT
;
; *****
; *** CONST ***
;

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F873 DD 21 0003
F873 C3 FB2F
F877

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: read console status
: A=0 if not ready
: A=FF if ready
: and save character to "KEYF" if ready
:
CONST:
LD IX,MCHRST
JP BIOS2

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F87A DD 21 0006
F87A C3 FB2F
F87E

```

:
: *** CONIN ***
: read the character from console
: and put it into Acc
:
CONIN:
LD IX,GTMCHR
JP BIOS2

```

F881 DD 21 0009
F881 C3 FB2F
F885

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:
: *** CONOUT ***
:
CONOUT:
LD IX,MCOUT
JP BIOS2

SUBTTL READER, PUNCH, LIST, LISTST

```

F888 DD 21 0012
F888 C3 FB2F
F88C

```

:
: *** READER ***
:
READER:
LD IX,READR2
JP BIOS2

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F88F DD 21 000F
F88F C3 FB2F
F893

```

:
: *** PUNCH ***
:
PUNCH:
LD IX,PUNCH2
JP BIOS2

```

F896 DD 21 000C
F896 C3 FB2F
F89A

```

:
: *** LIST ***
:
LIST:
LD IX,MLIST
JP BIOS2

```

F89D 3A 0003
F8A0 E6 C0
F8A2 FE 80
F8A4 3E FF
F8A6 D8
F8A7 C2 F98D
F8AA DB 15
F8AC 47
F8AD AF
F8AE CB 68
F8B0 C0
F8B1 2F
F8B2 C9

```

:
: *** LISTST ***
:
LISTST:
LD A,(IOBYT)
AND 0C0H
CP 80H
LD A,0FFH
RET C
JP NZ,RSOUTST ;I/O byte=0c0h then rs232c
IN A,(15H) ;input PRINTER status
LD B,A
XOR A
BIT S,B
RET NZ ;A=0 : printer is not ready
CPL ;A=FF: printer is ready
RET

```

subttl * FDD ROUTINES *

FDD ROUTINES

CONSTANTS

```

: FDC COMMAND
:
RECAL EQU 07 ;RECALIBRATE COMMAND
SEEK EQU 0FH ;SEEK COMMAND
SDS EQU 04H ;SENSE DRIVE STATUS
RDCM EQU 48H ;READ COMMAND
WRCM EQU 45H ;WRITE COMMAND

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: FDC STATUS DATA
CBSY EQU 00010000B ;FDC BUSY FLAG
NSEEK EQU 00001111B ;IN SEEK FLAG

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792      0009      USX      EQU      00001001B      ;UNIT SELECT OFF
793      000A      US0      EQU      00001010B      ;SELECT DRIVE 00
794      000C      US1      EQU      00001100B      ;SELECT DRIVE 1
795      ;READY    EQU      00100000B
796      ;
797      ; FDC STATUS BIT
798      ;
799      0007      ROM      EQU      7              ;REQUEST FOR MASTER
800      0006      DIO      EQU      6              ;DATA IN/ OUT
801      ;
802      ; RE-TRY COUNT IF OPERATION CAUSE ERROR
803      ;
804      0002      RETRY     EQU      2              ; 2 TIMES
805      ;
806      ;
807      ;
808      ;
809      ;
810      ; FDD COMMAND OUT ROUTINES ;
811      ; SEEK, CALIBRATE, READ, WRITE ;
812      ;
813      ;
814      ;
815      ; CARIBRATION COMMAND
816      ;
817      F8B3      CALBRT:
818      F8B3      DD 21 0015      LD          IX,CALBR2
819      F8B7      C3 FB2F          JP          BIOS2
820      ;
821      ;
822      ;
823      ; FDD READ COMMAND OUT
824      ;
825      F8BA      READCM:
826      F8BA      E5              PUSH     HL
827      F8BB      D5              PUSH     DE
828      F8BC      C5              PUSH     BC
829      F8BD      01 6044          LD       BC,6044H      ;B=60H, C=44H
830      F8C0      CD F947          CALL    DMASET
831      F8C3      3E 46            LD       A,RDCM        ;set read command
832      F8C5      18 0B            JR       RWCMD
833      ;
834      ;
835      ;
836      ; FDD WRITE COMMAND
837      ;
838      F8C7      WRITCM:
839      F8C7      E5              PUSH     HL
840      F8C8      D5              PUSH     DE
841      F8C9      C5              PUSH     BC
842      F8CA      01 6048          LD       BC,6048H      ;B=60H, C=48H
843      F8CD      CD F947          CALL    DMASET
844      F8D0      3E 45            LD       A,WRCM        ;set write command
845      ;
846      ; read/write command out
847      ;
848      F8D2      RWCMD:
849      F8D2      32 FE08          LD       (FDCOM),A     ;put read/write command
850      F8D5      21 FE11          LD       HL,FDBSY
851      F8D8      CB AE            RES     5,(HL)         ;reset error
852      F8DA      CB F6            SET     6,(HL)         ;set busy read/write
853      F8DC      CD F925          CALL    SETPDRV        ;set HD,US1,US0 to 'DRIVE'
854      F8DF      21 FE02          LD       HL,TRACK
855      F8E2      11 FE0A          LD       DE,PTRACK
856      F8E5      01 0003          LD       BC,3
857      F8E8      ED B0            LDIR
858      F8EA      06 09            LD       B,9           ;command byte count 9
859      F8EC      CD F8F3          CALL    COMMD          ;command out
860      F8EF      C1              POP      BC
861      F8F0      D1              POP      DE
862      F8F1      E1              POP      HL
863      F8F2      C9              RET
864      ;
865      ;
866      ;
867      ;
868      ;
869      ; FDD COMMAND OUT
870      ; on call, B REG. has command byte number
871      ; and all command data is set already
872      ; in FDCOM,PDRIVE,PHEAD, etc.
873      ;
874      ;
875      ;
876      F8F3      COMMD:
877      F8F3      DD 21 0021      LD       IX,COMMD2
878      F8F7      C3 FB2F          JP       BIOS2
879      ;
880      ;
881      ;
882      ;
883      ;
884      ; EXECUTE FDD COMMAND ROUTINES
885      ; on return, Z=0 if error occured
886      ; Z=1 if successful
887      ;
888      ;
889      ;
890      F8FA      FDCALB:
891      F8FA      CD F8B3          CALL    CALBRT         ;CALIBRATE COMMAND OUT
892      F8FD      CHKEND:
893      F8FD      3A FE11          LD       A,(FDBSY)
894      F900      CB 57            BIT     2,A
895      F902      20 F9            JR     NZ,CHKEND      ; WAIT UNTIL SEEK/RECAL END
896      F904      CB 4F            BIT     1,A
897      F906      C9              RET
898      ;
899      ;
900      ;
901      ; EXECUTE READ DISK
902      ;
903      F907      FDFEAD:
904      F907      CD F8BA          CALL    READCM         ;OUT READ COMMAND

```

```

905 F90A 18 03 JR FDRSLT
906
907
908
909 : EXECUTE WRITE
910
911 F90C FDWRITE: CALL WRITCM
912 F90C CD F8C7
913
914 : GET READ COMMAND RESULT
915 Z=1: NORMAL END
916 Z=0: ABNORMAL END
917
918 F90F FDRSLT:
919 F90F 3A FE11 LD A,(FDBSY)
920 F912 CB 77 BIT S,A :EXECUTION COMPLETE ?
921 F914 20 F9 JR NZ,FDRSLT :NO. WAIT
922 F916 CB 6F BIT S,A :CHECK NORMAL END
923 F918 C9 RET
924
925
926
927
928
929
930
931
932
933 : FDD UTILITY ROUTINES
934
935
936
937
938 :READ,WRITE N SECTORS
939 :BUT N SECTORS MUST BE IN SAME HEAD, SAME TRACK
940 :PARAMETERS ARE SET ALREADY IN DRIVE, HEAD, SECTOR, ETC.
941
942
943 F919 NSECRD:
944 F919 3E DB 3EH :set I LD A,0AFH I
945 F91A NSECWT:
946 F91A AF XOR A
947 F91B 32 FE00 LD (RWFLG),A :SET READ/WRITE FLAG (<>0/-0)
948
949
950 : enter here, read/write N sectors
951
952 F91E NSECRW:
953 F91E DD 21 0018 LD IX,NSEC2
954 F922 C3 FB2F JP BIOS2
955
956
957
958
959
960
961
962
963 : FDD ANOTHER SUBROUTINES
964
965
966
967
968
969 : GET TRACK,HEAD THEN CONSTRUCT HD,US1,US0 BYTE
970 : AND PUT IT TO "PDRIVE"
971 : US1,US0=00---DRIVE 0
972 : US1,US0=01---DRIVE 1
973
974 F925 SETPDRV:
975 F925 3A FE03 LD A,(HEAD)
976 F928 E8 01 AND I
977 F92A 07 RLCA :SHIFT LEFT 2 TIMES
978 F92B 07 RLCA
979 F92C 47 LD B,A :DATA SAVE
980 F92D 3A FE01 LD A,(DRIVE)
981 F930 E6 03 AND I
982 F932 32 FE2D LD (CURDRIV),A
983 F935 B0 OR B :CREATE HD,US1,US0
984 F936 32 FE09 LD (PDRIVE),A
985 F939 C9 RET
986
987
988
989
990 : software interval timer 2
991 : about 1 milli second
992
993 F93A ST1ML:
994 F93A C5 PUSH BC
995 F93B F5 PUSH AF
996 F93C 01 009A LD BC,154
997
998 : soft timer loop
999 : this loop takes 26 states i.e. it is 26*1/4
1000 : ( about 6.5 micro sec )
1001
1002 F93F ST8MIC:
1003 F93F 0B DEC BC
1004 F940 78 LD A,B
1005 F941 B1 OR C
1006 F942 20 FB JR NZ,ST8MIC
1007 F944 F1 POP AF
1008 F945 C1 POP BC
1009 F946 C9 RET
1010
1011
1012
1013
1014
1015
1016
1017 : Z-80 DMA parameter set for read/write disk

```

```

1018 ; transfer memory to port
1019 ; on call, BC has transfer direction
1020 ; ::::::::::::::::::::::::::::::::::::::::::::
1021 ;
1022 F947 DMASET: LD IX, DMAST2
1023 F947 DD 21 001E JP BIOS2
1024 F94B C3 FB2F
1025 ;
1026 ;
1027 ;
1028 ;
1029 ;
1030 ;
1031 ;
1032 F94E BEEP: INC C
1033 F94E 0C JR Z, BUZZON ; buzzer on if C=0FFH
1034 F94F 28 1C LD A, (MEMBANK)
1035 F951 3A FEF0 DEC C
1036 F954 0D JR Z, BP90
1037 F955 28 11 SET 2, A
1038 F957 CB D7 OUT (18H), A
1039 F959 D3 18 PUSH AF
1040 F95B F5 BP10: LD B, 10
1041 F95C BP20: CALL STIML ; wait 1ms
1042 F95C 06 0A DEC B
1043 F95E 05 JR NZ, BP20
1044 F95E CD F93A DEC C
1045 F961 05 JR NZ, BP10
1046 F962 20 FA POP AF
1047 F964 0D BP90: RES 2, A
1048 F965 20 F5 JP BUZZZ
1049 F967 F1
1050 F968
1051 F968 CB 97
1052 F96A C3 F972
1053 ;
1054 ;
1055 F96D BUZZON: LD A, (MEMBANK)
1056 F96D 3A FEF0 SET 2, A
1057 F970 CB D7 BUZZZ: LD (MEMBANK), A
1058 F972 F972 OUT (18H), A
1059 F972 32 FEF0 RET
1060 F975 D3 18
1061 F977 C9
1062 ;
1063 ;
1064 ;
1065 ;
1066 ;
1067 ;
1068 SUBTTL RS232C
1069 ;
1070 ;*****
1071 ;* RS 232 C *
1072 ;*****
1073 ;
1074 ;
1075 F978 RSOPEN: LD IX, RSOPEN2 ; OPEN MAIN BOARD RS232C
1076 F978 DD 21 002A JP BIOS2
1077 F97C C3 FB2F
1078 ;
1079 ;
1080 F97F RSCLOSE: LD IX, RSCLOS2 ; CLOSE MAIN BOARD RS232C
1081 F97F DD 21 002D JP BIOS2
1082 F983 C3 FB2F
1083 ;
1084 ;
1085 F986 RSINST: LD IX, RSINST2 ; GET INPUT STATUS
1086 F986 DD 21 0030 JP BIOS2
1087 F98A C3 FB2F
1088 ;
1089 ;
1090 F98D RSOUTST: LD IX, RSOTST2 ; GET OUTPUT STATUS
1091 F98D DD 21 0033 JP BIOS2
1092 F991 C3 FB2F
1093 ;
1094 ;
1095 F994 RSIN: LD IX, RSIN2 ; read character FROM RS232C
1096 F994 DD 21 0036 JP BIOS2
1097 F998 C3 FB2F
1098 ;
1099 ;
1100 F99B RSOUT: LD IX, RSOUT2 ; output character to RS232C
1101 F99B DD 21 0039 JP BIOS2
1102 F99F C3 FB2F
1103 ;
1104 ;
1105 ;
1106 F9A2 RSIOX: LD IX, RSIOX2 ; option RS232C handler
1107 F9A2 DD 21 0045 JP BIOS2
1108 F9A6 C3 FB2F
1109 ;
1110 ;
1111 ;
1112 ;
1113 ;
1114 ;
1115 SUBTTL PSET, HCOPY, TIME & DATE
1116 ;
1117 F9A9 PSET: LD IX, PSET2
1118 F9A9 DD 21 003C JP BIOS2
1119 F9AD C3 FB2F
1120 ;
1121 ;
1122 ;
1123 ;
1124 ;
1125 F9B0 HCOPY: LD IX, HCOPY2
1126 F9B0 DD 21 003F JP BIOS2
1127 F9B4 C3 FB2F
1128 ;
1129 ;
1130 ;

```



```

1244 ; option RAM test
1245 ;
1246 FA2D
1247 FA2D 77
1248 FA2E BE
1249 FA2F 3E 00
1250 FA31 28 01
1251 FA33 3D
1252 FA34
1253 FA34 08
1254 FA35 3A FEF0
1255 FA38 D3 18
1256 FA3A 08
1257 FA3B C9
1258
1259
1260
1261
1262
1263 FA3C
1264 FA3C F3
1265 FA3D 08
1266 FA3E ED 73 FA08
1267 FA42 31 FA12
1268 FA45 CD F9F3
1269 FA48 ED 7B FA08
1270 FA4C FB
1271 FA4D D0
1272 FA4E F3
1273 FA4F CD FA54
1274 FA52 FB
1275 FA53 C9
1276
1277
1278 FA54
1279 FA54 D3 18
1280 FA56 08
1281 FA57 18 D4
1282
1283
1284
1285
1286
1287 FA59
1288 FA59 F3
1289 FA5A ED 73 FA08
1290 FA5E 31 FA12
1291 FA61 C5
1292 FA62 D5
1293 FA63 E5
1294 FA64 3A FEF1
1295 FA67 4F
1296 FA68 CD F9F3
1297 FA6B 30 0A
1298 FA6D 47
1299 FA6E 3A FEF2
1300 FA71 4F
1301 FA72 CD F9F3
1302 FA75 4F
1303 FA76 D9
1304 FA77
1305 FA77 E1
1306 FA78 D1
1307 FA79 C1
1308 FA7A ED 7B FA08
1309 FA7E FB
1310 FA7F D0
1311
1312 FA80 F3
1313
1314 FA81
1315 FA81 D9
1316 FA82 78
1317 FA83 D3 18
1318 FA85 D9
1319 FA86 7E
1320 FA87 77
1321 FA88 BE
1322 FA89 20 1C
1323 FA8B 08
1324 FA8C D9
1325 FA8D 79
1326 FA8E D3 18
1327 FA90 D9
1328 FA91 08
1329 FA92 EB
1330 FA93 77
1331 FA94 BE
1332 FA95 EB
1333 FA96 20 0F
1334
1335 FA98 23
1336 FA99 13
1337 FA9A 0B
1338 FA9B 78
1339 FA9C B1
1340 FA9D 20 E2
1341 FA9F 3A FEF0
1342 FAA2 D3 18
1343 FAA4 FB
1344 FAA5 AF
1345 FAA6 C9
1346
1347 FAA7
1348 FAA7 3A FEF0
1349 FAAA D3 18
1350 FAAC FB
1351 FAAD C9
1352
1353
1354
1355
1356

; LDXCHK:
LD (HL), A
CP (HL)
LD A, 0
JR Z, LDXRET ; normal return
DEC A ; =0FFH error ( no option RAM )

; LDXRET:
EX AF, AF'
LD A, (MEMBANK)
OUT (18H), A
EX AF, AF'
RET

; STORX:
DI
EX AF, AF'
LD (SAVSPX), SP
LD SP, STACKX
CALL SMBANK
LD SP, (SAVSPX)
EI
RET NC ; parameter error (A>3)
DI
CALL STAXX
EI
RET

; STAXX:
OUT (18H), A
EX AF, AF'
JR LDXCHK

; LDIRX:
DI
LD (SAVSPX), SP
LD SP, STACKX
PUSH BC
PUSH DE
PUSH HL
LD A, (MBANKS)
LD C, A
CALL SMBANK
JR NC, LDIR10 ; parameter error (A>3)
LD B, A
LD A, (MBANKD)
LD C, A
CALL SMBANK
LD C, A
EXX

; LDIR10:
POP HL
POP DE
POP BC
LD SP, (SAVSPX)
EI
RET NC ; parameter error (A>3)

; LDIR20:
DI
EXX
LD A, B
OUT (18H), A
EXX
LD A, (HL)
LD (HL), A ; check option RAM
CP (HL)
JR NZ, LDIRER ; no option RAM
EX AF, AF'
EXX
LD A, C
OUT (18H), A
EXX
EX AF, AF'
EX DE, HL
LD (HL), A
CP (HL) ; check option RAM
EX DE, HL
JR NZ, LDIRER ; no option RAM

; LDIRER:
INC HL
INC DE
DEC BC
LD A, B
OR C
JR NZ, LDIR20
LD A, (MEMBANK)
OUT (18H), A
EI
XOR A ; A=0
RET

; LDIRER:
LD A, (MEMBANK)
OUT (18H), A
EI
RET ; A<0

```

```

1357 FAAE
1358 FAAE F3
1359 FAAF ED 73 FA08
1360 FAB3 31 FA12
1361 FAB6 08
1362 FAB7 C5
1363 FAB8 3A FEF2
1364 FABB 4F
1365 FABC CD F9F3
1366 FABF 4F
1367 FAC0 3A FEF0
1368 FAC3 E6 0F
1369 FAC5 B1
1370 FAC6 32 FEF0
1371 FAC9 D3 18
1372 FACB C1
1373 FACD 08
1374 FACD ED 7B FA08
1375 FAD1 FB
1376 FAD2 DD E9
1377
1378
1379
1380
1381
1382 FAD4
1383 FAD4 F3
1384 FAD5 ED 73 FA08
1385 FAD9 31 FA12
1386 FADC 08
1387 FADD C5
1388 FADE 3A FEF2
1389 FAE1 4F
1390 FAE2 CD F9F3
1391 FAE5 4F
1392 FAE6 DB 30
1393 FAE8 E6 F0
1394 FAEA 47
1395 FAEB 3A FEF0
1396 FAEE E6 0F
1397 FAF0 B0
1398 FAF1 32 FEF2
1399 FAF4 E6 0F
1400 FAF6 B1
1401 FAF7 32 FEF0
1402 FAFA D3 18
1403 FAFC C1
1404 FAFD 08
1405 FAFE ED 7B FA08
1406 FB02 FB
1407 FB03 FD 21 FB08
1408 FB07 FD E5
1409 FB09 DD E9
1410 FB0B
1411 FB0B 08
1412 FB0C D9
1413 FB0D 3A FEF0
1414 FB10 E6 0F
1415 FB12 4F
1416 FB13 3A FEF2
1417 FB16 E6 F0
1418 FB18 B1
1419 FB19 F3
1420 FB1A 32 FEF0
1421 FB1D D3 18
1422 FB1F FB
1423 FB20 D9
1424 FB21 08
1425 FB22 C9
1426
1427
1428
1429
1430
1431
1432
1433
1434
1435
1436
1437 FB23
1438 FB23 DD 21 004E
1439 FB27 18 06
1440
1441
1442 FB29
1443 FB29 DD 21 0051
1444 FB2D 18 00
1445
1446
1447
1448
1449
1450
1451
1452
1453 FB2F
1454 FB2F 08
1455 FB30 D9
1456 FB31 ED 73 FB8D
1457 FB35 ED 5B FB8D
1458 FB39 2A FE9E
1459 FB3C 23
1460 FB3D 73
1461 FB3E 23
1462 FB3F 72
1463 FB40 23
1464 FB41 DB 30
1465 FB43 E6 F0
1466 FB45 57
1467 FB46 3A FEF0
1468 FB49 E6 0F
1469 FB4B B2

JUMPX:
DI
LD (SAVSPX), SP
LD SP, STACKX
EX AF, AF'
PUSH BC
LD A, (MBANK)
LD C, A
CALL SMBANK
LD C, A
LD A, (MEMBANK)
AND OFH
OR C
LD (MEMBANK), A
OUT (18H), A
POP BC
EX AF, AF'
LD SP, (SAVSPX)
EI
JP (IX)

CALLX:
DI
LD (SAVSPX), SP
LD SP, STACKX
EX AF, AF'
PUSH BC
LD A, (MBANK)
LD C, A
CALL SMBANK
LD C, A
IN A, (30H)
AND OF0H
LD B, A
LD A, (MEMBANK)
AND OFH
OR B
LD (MBANKD), A
AND OFH
OR C
LD (MEMBANK), A
OUT (18H), A
POP BC
EX AF, AF'
LD SP, (SAVSPX)
EI
LD IY, RETX
PUSH IY
JP (IX)

RETX:
EX AF, AF'
EXX
LD A, (MEMBANK)
AND OFH
LD C, A
LD A, (MBANKD)
AND OF0H
OR C
DI
LD (MEMBANK), A
OUT (18H), A
EI
EXX
EX AF, AF'
RET

SUBTTL ### GETPFK, PUTPFK ###

GETPFK:
LD IX, GTPFK2
JR BIOS2

PUTPFK:
LD IX, PTPFK2
JR BIOS2

SUBTTL ##### BIOS2 #####

BIOS2:
EX AF, AF'
EXX
LD (SHELT), SP
LD DE, (SHELT)
LD HL, (MEMPTR)
INC HL
LD (HL), E
INC HL
LD (HL), D
INC HL
IN A, (30H)
AND OF0H
LD D, A
LD A, (MEMBANK)
AND OFH
OR D

```



```

1583 FC07 21 0063 LD HL,LPENI2 ;
1584 FC0A 18 AB JR BIOS2I ;
1585 ;
1586 ;
1587 ;
1588 ;
1589 ; OPTION BOARD INTERRUPT
1590 ;
1591 FC0C INTX1: LD HL,INTX21 ;
1592 FC0F 21 0066 JR BIOS2I ;
1593 ;
1594 ;
1595 ;
1596 FC11 INTX2: LD HL,INTX22 ;
1597 FC14 21 0069 JR BIOS2I ;
1598 ;
1599 ;
1600 FC16 INTX3: LD HL,INTX23 ;
1601 FC16 21 006C JR BIOS2I ;
1602 FC19 18 9C ;
1603 ;
1604 ;
1605 FC1B INTX4: LD HL,INTX24 ;
1606 FC1B 21 006F JR BIOS2I ;
1607 FC1E 18 97 ;
1608 ;
1609 ;
1610 FC20 INTX5: LD HL,INTX25 ;
1611 FC20 21 0072 JR BIOS2I ;
1612 FC23 18 92 ;
1613 ;
1614 ;
1615 FC25 INTX6: LD HL,INTX26 ;
1616 FC25 21 0075 JR BIOS2I ;
1617 FC28 18 8D ;
1618 ;
1619 ;
1620 FC2A INTX7: LD HL,INTX27 ;
1621 FC2A 21 0078 JP BIOS2I ;
1622 FC2D C3 F8B7 ;
1623 ;
1624 ;
1625 ;
1626 ;
1627 ;
1628 ;
1629 ;
1630 ;
1631 ; -----+
1632 ; not using interrupt |
1633 ; -----+
1634 ;
1635 FC30 PRNIR: RET ;
1636 FC30 C9 ;
1637 ;
1638 ;
1639 FC31 SOFT1: ;
1640 FC31 SOFT2: ;
1641 FC31 C9 RET ;
1642 ;
1643 ;
1644 ;
1645 FC32 CLKIR: HALT ;
1646 FC32 76 ;
1647 ;
1648 ;
1649 ;
1650 ;
1651 ;
1652 FC33 PWDWN: ;
1653 FC33 AF XOR A ;
1654 FC34 D3 20 OUT (20H),A ;CMOS RAM disable
1655 FC35 D3 4D OUT (4DH),A ;DMA reset
1656 FC38 76 HALT ;
1657 ;
1658 ;
1659 ;
1660 ;
1661 ;
1662 ;
1663 ;
1664 ;
1665 ;
1666 ;
1667 ;
1668 ;
1669 ;
1670 ;
1671 FC39 DS INTTAB-140H-S ;
1672 ;
1673 ;
1674 FC40 00 SEKDSK: DB 0 ;seek disk number
1675 FC41 0000 SEKTRK: DW 0 ;seek track number
1676 FC43 00 SEKSEC: DB 0 ;seek sector number
1677 ;
1678 FC44 00 HSTDISK: DB 0 ;host disk number
1679 FC45 0000 HSTTRK: DW 0 ;host track number
1680 FC47 00 HSTSEC: DB 0 ;host sector number
1681 ;
1682 FC48 00 SEKHST: DB 0 ;sector number of seeked host
1683 FC49 00 HSTACT: DB 0 ;host active flag
1684 FC4A 00 HSTWRT: DB 0 ;host written flag
1685 ;
1686 FC4B 00 UNACNT: DB 0 ;unallocated records count
1687 FC4C 00 UNADSK: DB 0 ;last unalloc. disk
1688 FC4D 0000 UNATRK: DW 0 ;last unalloc. track
1689 FC4F 00 UNASEC: DB 0 ;last unalloc. sector
1690 ;
1691 FC50 00 ERFLAG: DB 0 ;error reporting
1692 FC51 00 RSFLAG: DB 0 ;read sector flag
1693 FC52 00 READOP: DB 0 ;1 during read operation
1694 FC53 00 WRTYPE: DB 0 ;write operation type
1695 FC54 0000 DMAADR: DW 0 ;last DMA address

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1809 FE15 00 STRACK: DB 0 ;SENSE TRACK
1810 FE16 00 SHEAD: DB 0 ;SENSE HEAD
1811 FE17 00 SSECTOR: DB 0 ;SENSE SECTOR
1812 FE18 00 SLENGTH: DB 0 ;SENSE SECTOR COUNT
1813 FE19 00 ST3: DB 0 ;RESULT STATUS REG.3
1814 FE1A 00 ST00: DB 0 ;STS 0
1815 FE1B 00 STRK: DB 0 ;RESULT TRACK #
1816 ;
1817 ;
1818 FE1C F8FA -----
1819 FE1E F907 DW FDCALB
DW FDREAD
1820 ;
1821 ;-----
1822 ; DATA FOR INPUT KEY DATA ROUTINE
1823 ;-----
1824 FE20 00 KBDATA: DB 0 ;KEYBOARD HARD CODE1
1825 FE21 FE2E INTPTR: DW KBUF ;KEY PUT POINTER
1826 FE23 FE2E KEYPTR: DW KBUF ;KEY GET POINTER
1827 FE25 0000 XPFKSTR: DW 0 ;programmable function key pointer
1828 FE27 0000 PFKPTR: DW 0 ;
1829 FE29 00 DB 0 ;not used.
1830 ;-----
1831 FE2A 0002 DFLTPRT: DW 2 ;default printer MX-80 TYPE2,3
1832 FE2C 00 PRTHRU: DB 0 ;print through flag
1833 ;-----
1834 FE2D 01 CURDRIV: DB 1 ;current drive no.
1835 ;-----
1836 FE2E FE2E KBUF: DS 16 ;key data buffer
1837 FE3E FF KBUFEND: DB 0FFH ;key data buffer end mark
1838 FE3F 00 PFKCNT: DB 0 ;programmable function key byte count
1839 ;-----
1840 FE40 00 DFLTFLG: DB 0 ;default MBFLG
1841 FE41 006F DFLTILCH: DW 111 ;default illegal character CG no.
1842 FE43 00 BRKFLG: DB 0 ;keyboard break flag
1843 ;-----
1844 FE44 0008 SCRLTIM: DW 008H ;CRT scrol timer
1845 FE46 F8F3 ;-----
1846 FE48 1E DW COMMD ;entry for COMMD routine
1847 FE49 1F DFLTUP: DB 1EH ;up arrow hard code
1848 FE4A 1C DFLTDN: DB 1FH ;down
1849 FE4B 1D DFLTRT: DB 1CH ;right
1850 FE4B 1D DFLTLT: DB 1DH ;left
1851 ;-----
1852 FE4C FF KBREPT: DB 0FFH ;keyboard repeat control
1853 FE4D 0E KBSTRT: DB 00EH ;keyboard repeat start time (650ms)
1854 FE4E 08 KBINTVL: DB 8 ;keyboard repeat interval (70ms)
1855 ;-----
1856 FE4F 50 WIDTH: DB 80 ;CRT WIDTH for BASIC
1857 ;-----
1858 FE50 00 MBFLG: DB 0 ;non-zero:MFBASIC mode
1859 ;-----
1860 FE51 00 SWITCH: DB 0 ;not used.
1861 FE52 00 DB 0 ;keyboard switch status
1862 FE53 00 DB 0 ;not used.
1863 FE54 00 XSHFDT: DB 0 ;
1864 ;-----
1865 FE55 8000 PRINTER: DW 8000H ;?????
1866 ;-----
1867 FE57 00 CRTPASS: DB 0 ;0ffH=direct display
1868 ;-----
1869 FE58 1E XCHUP: DB 1EH ;
1870 FE59 1F XCHDOWN: DB 1FH ;
1871 FE5A 1C XCHRIGT: DB 1CH ;
1872 FE5B 1D XCHLEFT: DB 1DH ;
1873 FE5C 00 DB 0 ;not used.
1874 FE5D 0C DB 0CH ;not used.
1875 FE5E 0B DB 0BH ;not used.
1876 FE5F FF DB 0FFH ;not used.
1877 ;-----
1878 ;
1879 ; uP07201(NEC) channel B
1880 ;-----
1881 FE60 RSDAT: DB 06H ;bit rate (300)
1882 FE60 06 DB 03H ;bit/character (8)
1883 FE61 03 DB 00H ;parity (non-parity)
1884 FE62 00 DB 01H ;stop bit (1)
1885 FE63 01 ;
1886 ;-----
1887 FE64 00 RSDFOP: DB 0 ;default / option
1888 ;-----
1889 ;
1890 ; MAIN BOARD RS232C parameter block
1891 ;-----
1892 FE65 MRSDATA: DW MRSBUF ;main board RS232C buffer address
1893 FE65 7000 DW MRSSIZ ;main board RS232C buffer size
1894 FE67 0200 BITRATE: DB 0 ;bit rate
1895 FE69 00 DATACHR: DB 0 ;TX,RX bit/character
1896 FE6A 00 PARITY: DB 0 ;parity
1897 FE6B 00 STOPBIT: DB 0 ;stop bit
1898 FE6C 00 RSV: DB 0FFH ;reserved
1899 FE6D FF ;
1900 ;-----
1901 7000 MRSBUF EQU 7000H ;main board RS data buffer on OS2
1902 0200 MRSSIZ EQU 200H ;main RS data buffer size
1903 ;-----
1904 FE6E 0050 XSHIFT: DW 50H ;KBTAB bias. default=normal
1905 ;-----
1906 FE70 0000 SPOS: DW 0 ;screen starting address
1907 FE72 FF CSRDSP: DB 0FFH ;0:no cursor, FF:cursor on
1908 FE73 0000 CRTPOS: DW 0 ;
1909 FE75 00 HPOS: DB 0 ;CRT horizontal position
1910 FE76 00 VPOS: DB 0 ;CRT vertical position
1911 FE77 00 CRFLG: DB 0 ;
1912 FE78 00 T1ST: DB 0 ;
1913 FE79 00 TSAVE: DB 0 ;
1914 FE7A 00 ATTR: DB 0 ;character attribute
1915 FE7B 07 COLOR: DB 7 ;CRT color fore:white back:black
1916 ;-----
1917 FE7C 00 00 KBSTS: DB 0,0 ;keyboard status
1918 FE7E 00 KBOBF: DB 0 ;keyboard overflow flag
1919 FE7F 00 KEYDATA: DB 0 ;key data
1920 ;-----
1921 ;

```

```

1922          ;----- PRMTAB+80H -----
1923          ;
1924 FE80 00 COUNTRY: DB 0 ;language 0 - 7
1925 FE81 00 MFNO: DB 0 ;MultiFonts style no.
1926 FE82 00 MFLG: DB 0 ;0:Normal mode, FF:MultiFonts mode
1927 FE83 01 STYLE: DB 1 ;MF mode style no.
1928          ;
1929 FE84 C301 PRTPNT: DW PRTBUF+1 ;
1930 FE86 00 KSAVE: DB 0 ;save 1st byte of MF (for LIST)
1931 FE87 00 LCRFLG: DB 0 ;LIST routine CR flag
1932 FE88 01 LSP: DB 1 ;left spacing
1933 FE89 01 RSP: DB 1 ;right spacing
1934 FE8A 00 LPESC: DB 0 ;ESC flag (for LIST)
1935 FE8B 0000 MFDOT: DW 0 ;
1936 FE8D C400 MFPT1: DW MFBUF1 ;
1937 FE8F CC00 MFPT2: DW MFBUF2 ;
1938 FE91 D400 MFPT3: DW MFBUF3 ;
1939 FE93 C400 PTMAX: DW MFBUF1 ;
1940 FE95 50 KETA: DB 80 ;characters / line
1941 FE96 03C0 DOTPL: DW 960 ;dots / line
1942 FE98 FF PREF: DB 0FFH ;
1943          ;
1944 FE99 00 DFLTMF: DB 0 ;MFLG default value
1945 FE9A 00 DB 0 ;not used.
1946          ;
1947 FE9B FFFE GLPBIAS: DW -2 ;Green Graphic mode Lightpen
1948          ;
1949 FE9D 00 LISTERR: DB 0 ;BASIC mode printer error flag
1950          ;
1951          ;----- PRMTAB+9EH -----
1952          ;
1953 FE9E FE9F MEMPTR: DW MEMBUF-1 ;for BIOS2 routine
1954 FEA0 MEMBUF: DS 32 ;for BIOS2 routine
1955          ;
1956 FECA DS PRMTAB+0D0H-$ ;
1957          ;
1958 FED0 00 ESCFLG: DB 0 ;ESCAPE flag (CONOUT)
1959 FED1 00 FUNCFLG: DB 0 ;Func. key check mode ON(OFFH)/OFF(0)
1960          ;
1961 FED2 00 MFROM: DB 0 ;MF ROM ON(OFFH)/OFF(0)
1962          ;
1963 FED3 00 FDSTAT: DB 0 ;FDD status
1964          ;
1965 FED4 00 BASIC: DB 0 ;MFBASIC FDSTAT check mode
1966          ;
1967 FED5 01 CPMSW: DB 1 ;1: MF CP/M
1968          ;
1969 FED6 0000 0000 RSLTBUF: DW 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
1970 FEDA 0000 0000
1971 FEDE 0000 0000
1972 FEE2 0000 0000
1973 FEE6 0000 0000
1974 FEEA 0000 0000
1975 FEEE 0000
1976          ;
1977 FEFO 10 FDERCNT: DW 0 ;
1978 FEF1 00 MEMBANK: DB 10H ;
1979 FEF2 00 MBANKS: DB 0 ;
1980 FEF3 00 MBANKD: DB 0 ;
1981          ;
1982 FEF4 FFFD SVIBANK: DB 0 ;memory bank before executing interrupt
1983 FEF6 FFFB CLPBIAS: DW -3 ;Color Lightpen
1984          ;
1985          ;
1986          ;----- PRMTAB+0F8H -----
1987          ;
1988 FEF8 00 YMDHMS: DB 0 ;Year
1989 FEF9 00 DB 0 ;Month
1990 FEFA 00 DB 0 ;Day
1991 FEFB 00 DB 0 ;Hour
1992 FEFC 00 DB 0 ;Minute
1993 FEFD 00 DB 0 ;Second
1994 FEFE 00 DB 0 ;Week
1995 FEFF 00 DB 0 ;reserved
1996          ;
1997          ;----- OFF00H -----
1998          ;
1999 FF00 00 00 ;
2000          ;
2001          ;
2002          ;
2003          ;
2004          ;
2005          ;
2006          ;

```

END

Macros:

Symbols:

FCDB	ALV0	FCF8	ALV1	FD1A	ALV2
FD3C	ALV3	FD5E	ALV4	FD6D	ALV5
FE7A	ATTR	FA04	BANKTAB	FED4	BASIC
E806	BDOS	F94E	BEEP	F600	BIOS
FB2F	BIOS2	F8B7	BIOS2I	FE69	BITRATE
0800	BLKSIZ	F6F9	BOOT	F753	BOOTE
F95C	BP10	F95E	BP20	F968	BP90
FE43	BRKFLG	F96D	BUZZON	F972	BUZZZ
0015	CALBR2	F8B3	CALBRT	FAD4	CALLX
0010	CBSY	E000	CCP	E007	CCPCOM
0004	CDISK	F8FD	CHKEND	FC32	CLKIR
FEF4	CLPBIAS	FE7B	COLOR	F8F3	COMM0
0021	COMM02	F87A	CONIN	F881	CONOUT
F873	CONST	FE80	COUNTRY	A100	CPFSTR
0016	CPML	0040	CPMSPT	FED5	CPMSW
00D0	CR	FE77	CRFLG	FE57	CRTPASS
FE73	CRTPOS	FE72	CSRDSP	FCE8	CSV0
FD0A	CSV1	FD2C	CSV2	FD4E	CSV3
FD65	CSV4	FD74	CSV5	FE2D	CURDRIV
FE6A	DATACHR	FE06	DBADDR	FE49	DFLTDN
FE40	DFLTFLG	FE41	DFLTILCH	FE48	DFLLTL
FE99	DFLTMF	FE2A	DFLTPRT	FE4A	DFLTRT
FE48	DFLTUP	0006	DIO	FC56	DIRBUF
FC54	DMAADR	F947	DMASET	001E	DMAST2

BOOT	126	323#					
BOOTE	374	377#					
BP10	1041#	1048					
BP20	1043#	1046					
BP90	1037	1050#					
BRKFLG	1841#						
BUZZON	502	1034	1055#				
BUZZZ	1052	1058#					
CALBR2	276#	818					
CALBRT	817#	891					
CALLX	161	1382#					
CBSY	790#						
CCP	41#	42	105	413	425	481	
CCPCOM	105#	362					
CDISK	95#	354	478				
CHKEND	892#	895					
CLKIR	1645#	1752					
CLPBIAS	1982#						
COLOR	1916#						
COMMD	859	876#	1845				
COMMD2	280#	877					
CONIN	129	698#					
CONOUT	130	516	708#				
CONST	128	685#					
COUNTRY	1924#						
CPFSTR	48#						
CPML	43#	423					
CPMSPT	68#						
CPMSW	1967#						
CR	110#	525	531				
CRFLG	1912#						
CRTPASS	1867#						
CRTPOS	1909#						
CSRDSP	1908#						
CSV0	195	1702#					
CSV1	202	1704#					
CSV2	209	1706#					
CSV3	216	1708#					
CSV4	223	1710#					
CSV5	230	1712#					
CURDRIV	981	1833#					
DATACHR	1896#						
DBADDR	414	426	1791#				
DFLTON	1848#						
DFLTLG	1839#						
DFLTILCH		1840#					
DFLTLT	1850#						
DFLTMF	1944#						
DFLTPRT	1830#						
DFLTRT	1849#						
DFLTUP	1847#						
DIO	800#						
DIRBUF	194	201	208	215	222	229	1700#
DMAADR	610	1695#					
DMASET	830	843	1022#				
DMAST2	279#	1023					
DOTPL	1941#						
DPBASE	188#	559					
DPBLK	194	201	208	215	236#		
DPBLK4	222	229	250#				
DRIVE	406	979	1786#				
ERFLAG	1691#						
ESCFLG	1958#						
FDBSY	850	893	919	1807#			
FDCALB	890#	1818					
FDCIR	1574#	1742					
FDCIR2	300#	1575					
FDCOM	849	1795#					
FDERCNT	1975#						
FDRPM	1800#						
FDREAD	903#	1819					
FDRSLT	905	918#	921				
FDSTAT	1963#						
FDWRITE	911#						
FUNCFLG	1959#						
GETPFK	162	1436#					
GLPBIAS	1947#						
GOCPM	383	434#					
GOCPM1	446	448#					
GOCPM2	298#	465					
GTMCHR	271#	699					
GTPFK2	295#	1437					
HCOPY	144	1125#					
HCOPY2	290#	1126					
HEAD	407	421	974	1788#			
HOME	134	569#					
HOMED	572	574#					
HPOS	1910#						
HSTACT	573	1683#					
HSTBLK	67#	69					
HSTBUF	54#						
HSTDSK	1678#						
HSTSEC	1680#						
HSTSIZ	65#						
HSTSPT	66#						
HSTRK	1679#						
HSTWRT	399	570	1684#				
INITSTK	101#	104	324	398			
INTPTR	1824#						
INTTAB	45#	331	342	1671	1725		
INTX1	1590#	1734					
INTX2	1595#	1736					
INTX21	303#	1591					
INTX22	304#	1596					
INTX23	305#	1601					
INTX24	306#	1606					
INTX25	307#	1611					
INTX26	308#	1616					
INTX27	309#	1621					
INTX3	1600#	1750					
INTX4	1605#	1754					
INTX5	1610#	1756					
INTX6	1615#	1760					

Device Input and Device Interrupts

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```
TITLE * OX-10 63k MF-CP/M BIOS2 M1.3 *
VERS EQU 13
BASIC I/O SYSTEM FOR OX-10 CP/M V2.2
created OX-10 63k MF-CP/M BIOS2
M1.0 1983. 2. 9 by Yuichi Ushiyama
Chisato Kobayashi
updated M1.1 3.10
updated M1.2 3.18
updated M1.3 4.29
```

```
.Z80
.phase 0
```

```
PUBLIC LIST1
PUBLIC BUZZPU, ST1ML
PUBLIC SRMBANK, ST50ML
PUBLIC SVSP1R, STCK1R
PUBLIC OINT1, OINT2, OINT3, OINT4, OINT5, OINT6, OINT7
```

< BIOS3 SIMBOLS >

```
EXTRN CONOUT, CONOT1, CONOT2
EXTRN CONVCD, KCGIN, KCGOT
EXTRN CLS, DYCUSR, LEDOFF
```

< BIOS4 SIMBOLS >

```
EXTRN RSIOX, RSOPEN, RSCLOSE, RSINST, RSOUTST, RSIN, RSOUT, ORS140
EXTRN MASKI
EXTRN LIGHTPEN
EXTRN LPENIR
EXTRN INTX1, INTX2, INTX3, INTX4, INTX5, INTX6, INTX7
EXTRN MRSP
```

CP/M SYSTEM FUNDAMENTAL CONSTANTS

```
BIOS EQU 0F600H ;63k
INTTAB EQU 0FD80H ;interrupt vector table
PRMTAB EQU 0FE00H ;parameter table
KBTAB EQU 8E00H
CGTAB EQU 9080H
PRTAB EQU 9100H
CKANTAB EQU 9800H
ANTAB EQU 9900H
CPFSTR EQU 0A100H
GAIJITB EQU 0A300H
PRTBUF EQU 0C300H
MFBUF1 EQU 0C400H
MFSIZE EQU 800H
MFBUF2 EQU MFBUF1+MFSIZE
MFBUF3 EQU MFBUF2+MFSIZE
HSTBUF EQU 0DC00H
```

CP/M TO HOST DISK CONSTANTS

```
BLKSIZ EQU 2048 ;CP/M ALLOCATION SIZE
HSTSIZ EQU 1024 ;HOST DISK SECTOR SIZE
HSTSPT EQU 8 ;32*256/HSTSIZ ;HOST DISK SECTORS/TRK
HSTBLK EQU 8 ;HSTSIZ/128 ;CP/M SECTRS/HOST BUFFER
CPMSPT EQU 40H ;HSTBLK*HSTSPT ;CP/M SECTORS/TRACK
SECMSK EQU HSTBLK-1 ;SECTOR MASK
SECSHF EQU 3 ;LOG2(HSTBLK)
```

BIOS CONSTANT ON ENTRY TO WRITE

```
WRALL EQU 0 ;WRITE with allocation
WRDIR EQU 1 ;WRITE to DIRECTORY
WRUAL EQU 2 ;WRITE without allocation
```

OTHER CONSTANTS

CP/M 0 PAGE WORK

```
IOBYT EQU 0003H ;CP/M I/O BYTE
CDISK EQU 0004H ;CP/M CURRENT DISK #
NDISKS EQU 4 ;ON-LINE DISKS
```



```

227 00B5 0D 0A          DB    CR,LF
228 00B7 00            DB    0
229
230
231
232
233
234 00B8              PRMSG:
235 00B8 7E            LD    A,(HL)
236 00B9 A7            AND   A
237 00BA C8            RET   Z
238
239
240
241 00BB E5            ; more to print
242 00BC 4F            ;
243 00BD CD 0000*      PUSH  HL
244 00C0 E1            LD    C,A
245 00C1 23            CALL CONOUT
246 00C2 18 F4       POP   HL
247
248
249
250
251
252
253
254
255
256 00C4              GOCPM:
257 00C4 0E 1B       LD    C,ESC
258 00C6 CD 0000*   CALL CONOT2
259 00C9 0E 33       LD    C,'3'
260 00CB CD 0000*   CALL CONOT2
261 00CE FB         EI
262
263 00CF 2A FE48     LD    HL,(DFLTUP)
264 00D2 22 FE58     LD    HL,(XCHUP),HL
265 00D5 2A FE4A     LD    HL,(DFLTRT)
266 00D8 22 FE5A     LD    HL,(XCHRIGT),HL
267
268 00DB 21 A100     LD    HL,CPFSTR
269 00DE 22 FE25     LD    HL,(XPFKSTR),HL
270
271 00E1 3A FE40     LD    A,(DFLTFLG)
272 00E4 32 FE50     LD    A,(MBFLG),A
273 00E7 3A FE99     LD    A,(DFTLTMF)
274 00EA 32 FE82     LD    A,(MFLG),A
275 00ED 2A FE2A     LD    HL,(DFLTprt)
276 00F0 22 FE55     LD    HL,(PRINTER),HL
277
278 00F3 AF          XOR   A
279 00F4 32 FC49     LD    A,(HSTACT),A
280 00F7 32 FC4B     LD    A,(UNACNT),A
281
282 00FA 0E 1B       LD    C,ESC
283 00FC CD 0000*   CALL CONOUT
284 00FF 0E 43       LD    C,'C'
285 0101 CD 0000*   CALL CONOUT
286 0104 3A FE80     LD    A,(COUNTRY)
287 0107 A7         AND   A
288 0108 28 23       JR    Z,GOCPMU
289 010A 0E 46       LD    C,'F'
290 010C 3D         DEC   A
291 010D 28 20       JR    Z,GOCPMC
292 010F 0E 47       LD    C,'G'
293 0111 3D         DEC   A
294 0112 28 1B       JR    Z,GOCPMC
295 0114 0E 45       LD    C,'E'
296 0116 3D         DEC   A
297 0117 28 16       JR    Z,GOCPMC
298 0119 0E 44       LD    C,'D'
299 011B 3D         DEC   A
300 011C 28 11       JR    Z,GOCPMC
301 011E 0E 57       LD    C,'W'
302 0120 3D         DEC   A
303 0121 28 0C       JR    Z,GOCPMC
304 0123 0E 49       LD    C,'I'
305 0125 3D         DEC   A
306 0126 28 07       JR    Z,GOCPMC
307 0128 0E 53       LD    C,'S'
308 012A 3D         DEC   A
309 012B 28 02       JR    Z,GOCPMC
310 012D             GOCPMU:
311 012D 0E 55       LD    C,'U'
312 012F             GOCPMC:
313 012F CD 0000*   CALL CONOUT
314
315 0132 2A FE8B     LD    HL,(MFDOT)
316 0135 7C         LD    A,H
317 0136 B5         OR    L
318 0137 20 12       JR    NZ,PRIN10
319 0139 AF          XOR   A
320 013A 32 C300     LD    A,(PRTBUF),A
321 013D 21 C400     LD    HL,MFBUF1
322 0140 77         LD    HL,A
323 0141 11 C401     LD    DE,MFBUF1+1
324 0144 01 17FF    LD    BC,MFSIZE*3-1
325 0147 ED B0       LD    DIR
326 0149 18 06       LD    PRIN20
327 014B             PRIN10:
328 014B 0E 0D       LD    C,CR
329 014D CD 0482     CALL LIST
330 0150 FB         EI
331 0151             PRIN20:
332 0151 AF          XOR   A
333 0152 32 FE86     LD    A,(KSAVE),A
334 0155 32 FE87     LD    A,(LCRFLG),A
335 0158 32 FE8A     LD    A,(LPESC),A
336 015B 3C         INC   A
337 015C 32 FE88     LD    A,(LSP),A
338 015F 32 FE89     LD    A,(RSP),A
339 0162 3D         DEC   A

```



```

905
906
907
908
909 042C
910 042C 21 0003
911 042F 3E 10
912 0431 F3
913 0432 CD F675
914 0435 79
915 0436 E6 03
916 0438 FE 02
917 043A D2 0000*
918
919
920 043D
921 043D 21 045D
922 0440 7E
923 0441 36 00
924 0443 B7
925 0444 3A 045F
926 0447 4F
927 0448 3A 045E
928 044B C0
929
930 044C ED 73 0480
931 0450 31 0480
932 0453 FB
933 0454 CD 0AAC
934 0457 F3
935 0458 ED 7B 0480
936 045C C9
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939 045D 00
940 045E 00
941 045F 00
942 0460
943 0480
944 0480 0000
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957 0482
958 0482 41
959 0483 21 0003
960 0486 3E 10
961 0488 F3
962 0489 CD F675
963 048C 79
964 048D 48
965 048E E6 C0
966 0490 C8
967 0491 FE 80
968 0493 CA 049C
969 0496 DA 0000*
970 0499 C3 0000*
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972
973
974 049C
975 049C ED 73 04AD
976 04A0 31 04CF
977 04A3 FB
978 04A4 CD 4000
979 04A7 F3
980 04A8 ED 7B 04AD
981 04AC C9
982
983
984 04AD 0000
985 04AF
986 04CF
987
988
989
990
991
992
993
994 04CF
995 04CF 41
996 04D0 21 0003
997 04D3 3E 10
998 04D5 F3
999 04D6 CD F675
1000 04D9 79
1001 04DA 48
1002 04DB E6 30
1003 04DD 28 BD
1004 04DF FE 20
1005 04E1 C0
1006 04E2 C3 0000*
1007
1008
1009
1010
1011
1012 04E5
1013 04E5 21 0003
1014 04E8 3E 10
1015 04EA F3
1016 04EB CD F675
1017 04EE 79

```

```

; read character from console and put it in Acc
;
CONIN:
LD HL,IOBYT
LD A,10H
DI
CALL LDAXX
LD A,C
AND 3
CP 2
JP NC,RSIN
;
CONIN1:
LD HL,KEYF
LD A,(HL)
LD (HL),0
OR A
LD A,(KEYS)
LD C,A
LD A,(KEYD)
RET NZ
LD (SAVSP2),SP
LD SP,STACK2
EI
CALL GETCHR
DI
LD SP,(SAVSP2)
RET
;
KEYF: DB 0
KEYD: DB 0
KEYS: DB 0
DS 32
STACK2: DW 0
SAVSP2:
;
;
;
SUBTTL * LIST. PUNCH, READER *
;
*** LIST ***
LIST:
LD B,C
LD HL,IOBYT
LD A,10H
DI
CALL LDAXX
LD A,C
LD C,B
AND 0C0H
RET Z
CP 80H
JP Z,LIST1
JP C,CONOT1
JP RSOUT
;
LIST1:
LD (SAVSP4),SP
LD SP,STACK4
EI
CALL LIST2
DI
LD SP,(SAVSP4)
RET
;
SAVSP4: DW 0
DS 32
STACK4:
;
;
;
*** PUNCH ***
PUNCH:
LD B,C
LD HL,IOBYT
LD A,10H
DI
CALL LDAXX
LD A,C
LD C,B
AND 30H
JR Z,LIST1
CP 20H
RET NZ
JP RSOUT
;
;
;
*** READER ***
READER:
LD HL,IOBYT
LD A,10H
DI
CALL LDAXX
LD A,C

```



```

1470
1471      06D4
1472      0604 DB 35
1473      0606 CD 0817
1474      0609 CD 082F
1475      06DC 0E 20
1476      06DE CD 0000*
1477      06E1
1478      06E1 DB 34
1479      06E3 CB 7F
1480      06E5 28 FA
1481      06E7 CB 77
1482      06E9 20 E9
1483      06EB FB
1484      06EC C1
1485      06ED 18 B5
1486
1487
1488
1489      06EF
1490      06EF 21 FE11
1491      06F2 CB EE
1492      06F4 CB B6
1493      06F6 CB CE
1494      06F8 CB 96
1495      06FA CD 082F
1496      06FD C1
1497      06FE C9
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1500
1501      06FF 00
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1516      0700
1517      0700 3A FE11
1518      0703 CB 57
1519      0705 20 F9
1520      0707 CB 4F
1521      0709 C9
1522
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1527      070A
1528      070A CD 0653
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1536      070D
1537      070D 3A FE11
1538      0710 CB 77
1539      0712 20 F9
1540      0714 CB 6F
1541      0716 C9
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1561      0717
1562      0717 3E
1563      0718
1564      0718 AF
1565      0719 32 FE00
1566
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1568
1569      071C
1570      071C ED 73 078E
1571      0720 31 078E
1572      0723 FB
1573
1574      0724 1E 08
1575      0726
1576      0726 CD 0790
1577      0729 20 3A
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1579
1580
1581      072B 3A FE00
1582      072E B7

```

```

;
COM30: IN A, (FDCDT) ;
CALL HEXA ;
CALL BUZZPU ;
LD C, 20H ;
CALL CONOUT ;
;
COM40: IN A, (FDCST) ;
BIT ROM, A ;
JR Z, COM40 ;
BIT DIO, A ;
JR NZ, COM30 ;
EI ;
POP BC ;
JR COMMD ;
;
;
COM70: LD HL, FDBSY ;
SET 5, (HL) ;
RES 6, (HL) ;
SET 1, (HL) ;
RES 2, (HL) ;
CALL BUZZPU ;
POP BC ;
RET ;
;
;
MASTM: DB 0 ;interrupt mask save area. (MASTER 0259)
;
;
;
;
; EXECUTE FDD COMMAND ROUTINES ;
; ON RETURN, Z=0 IF ERROR OCCURED ;
; Z=1, IF SUCCESSFUL ;
;
;
;
CHKEND: LD A, (FDBSY) ;
BIT 2, A ;
JR NZ, CHKEND ;wait until seek/recal end
BIT 1, A ;
RET ;
;
;
; EXECUTE READ DISK
;
FDREAD: CALL READCM ;
JR FDRSLT ;
;
;
; get read/write command result
; Z=1 : normal end, Z=0 : abnormal end
;
FDRSLT: LD A, (FDBSY) ;
BIT 6, A ;execution complete ?
JR NZ, FDRSLT ;no
BIT 5, A ;check normal end
RET ;
;
;
;
;
;
;
; FDD UTILITY ROUTINES ;
;
;
;
; READ, WRITE N SECTORS
; BUT N SECTORS MUST BE IN SAME HEAD, SAME TRACK
; PARAMETERS ARE SET ALREADY IN DRIVE, HEAD, SECTOR, ETC.
;
;
NSECRD: DB 3EH ;SET LD A, 0AFH
;
NSECRW: XOR A ;
LD (RWFLG), A ;SET READ/WRITE FLAG
;
; enter here , read/write N sectors
;
NSECRW: LD (SAVSP6), SP ;
LD SP, STACK6 ;
EI ;
;
;
DORDWT: LD E, 8 ;
CALL DOSEEK ;SEEK THE TRACK
JR NZ, RWERR ;go to RWERR if seek error
;
; r/w done
;
LD A, (RWFLG) ;
OR A ;READ OPERATION ?

```



```

1922 084F DD E5          PUSH IX          ;
1923 0851 FD E5          PUSH IY          ;
1924                                     ;
1925 0853 21 FED6        LD HL, RSLTBUF ; RESULT BUFFER=FF
1926 0856 06 08          LD B, 8          ;
1927 0858                                     ;
1928 0858 36 FF          RSTR00: LD (HL), OFFH ;
1929 085A 23             INC HL           ;
1930 085B 10 FB          DJNZ RSTR00    ;
1931                                     ;
1932 085D 21 FED6        RSTR0: LD HL, RSLTBUF ;
1933 0860                                     ;
1934 0860 0B 34          IN A, (FDCST)  ;
1935 0862 CB 7F          BIT ROM, A       ;
1936 0864 28 FA          JR Z, RSTR0    ;
1937 0866 CB 77          BIT DIO, A      ;
1938 0868 20 0E          JR NZ, RSTR2   ;
1939 086A 3E 08          LD A, SINTS    ; DIO=0 SENSE INT STS
1940 086C D3 35          OUT (FDCDT), A ;
1941 086E                                     ;
1942 086E 0B 34          RSTR1: IN A, (FDCST) ;
1943 0870 CB 7F          BIT ROM, A       ;
1944 0872 28 FA          JR Z, RSTR1    ;
1945 0874 CB 77          BIT DIO, A      ;
1946 0876 28 06          JR Z, RSTR3    ;
1947 0878                                     ;
1948 0878 0B 35          RSTR2: IN A, (FDCDT) ;
1949 087A 77             LD (HL), A       ;
1950 087B 23             INC HL           ;
1951 087C 18 F0          JR RSTR1        ;
1952                                     ;
1953                                     ;
1954                                     ;
1955 087E                                     ;
1956 087E 3A FED6        RSTR3: LD A, (RSLTBUF) ;
1957 0881 E6 03          AND 3          ;
1958 0883 47             LD B, A          ;
1959 0884 3A FE2D        LD A, (CURDRIV) ;
1960 0887 B8             CP B            ;
1961 0888 C2 0906        JP NZ, FDWRNG   ;
1962                                     ;
1963 088B 3A FED6        LD A, (RSLTBUF) ;
1964 088E CB 6F          BIT 5, A        ;
1965 0890 28 19          JR Z, RWEND     ;
1966                                     ;
1967 ; seek end          ;
1968                                     ;
1969 0892 3A FED6        LD A, (RSLTBUF) ;
1970 0895 21 FE11        LD HL, FDBSY    ;
1971 0898 E6 C0          AND 0C0H        ;
1972 089A 28 0A          JR Z, SINT10   ;
1973 089C FE C0          CP 0C0H         ;
1974 089E CA 08C6        JP Z, FDEND     ;
1975                                     ;
1976 ; seek error       ;
1977                                     ;
1978 08A1 21 FE11        LD HL, FDBSY    ;
1979 08A4 CB CE          SET 1, (HL)     ;
1980 08A6                                     ;
1981 08A6 CB 96          SINT10: RES 2, (HL) ;
1982 08A8 C3 08C6        JP FDEND        ;
1983                                     ;
1984                                     ;
1985                                     ;
1986                                     ;
1987 08AB RWEND:        ;
1988 08AB AF             xor a           ;
1989 08AC D3 4D          out (4dh), a    ; DMA disable
1990 08AE 2F             cpl           ;
1991 08AF D3 4F          out (4fh), a    ; DMA MASK set
1992 08B1 3A FED6        LD A, (RSLTBUF) ; GET RESULT STATUS
1993 08B4 E6 C0          AND 0C0H        ;
1994 08B6 28 09          JR Z, FDN1      ; COMMAND NORMAL TERM.
1995 08B8 FE C0          CP 0C0H         ;
1996 08BA 28 0A          JR Z, FDEND     ; ATTENTION INT.
1997                                     ;
1998 ; abnormal term or invalid command ;
1999                                     ;
2000 08BC 21 FE11        LD HL, FDBSY    ;
2001 08BF CB EE          SET 5, (HL)     ;
2002 08C1                                     ;
2003 08C4 21 FE11        FDN1: LD HL, FDBSY ;
2004 08C4 CB B6          RES 6, (HL)     ; set command execute flag
2005                                     ;
2006 08C6 FDEND:        ;
2007 08C6 21 FED6        LD HL, RSLTBUF ; RESULT BUFFER=FF
2008 08C9 06 08          LD B, 8          ;
2009 08CB                                     ;
2010 08CB 36 FF          FDTR00: LD (HL), OFFH ;
2011 08CD 23             INC HL           ;
2012 08CE 10 FB          DJNZ FDTR00    ;
2013                                     ;
2014 08D0 21 FED6        FDTR0: LD HL, RSLTBUF ;
2015 08D3 DB 34          IN A, (FDCST)  ;
2016 08D5 CB 7F          BIT ROM, A       ;
2017 08D7 28 FA          JR Z, FDTR0    ;
2018 08D9 CB 77          BIT DIO, A      ;
2019 08DB 20 0E          JR NZ, FDTR2   ;
2020 08DD 3E 08          LD A, SINTS    ; DIO=0 SENSE INT STS
2021 08DF D3 35          OUT (FDCDT), A ;
2022 08E1                                     ;
2023 08E1 0B 34          FDTR1: IN A, (FDCST) ;
2024 08E3 CB 7F          BIT ROM, A       ;
2025 08E5 28 FA          JR Z, FDTR1    ;
2026 08E7 CB 77          BIT DIO, A      ;
2027 08E9 28 06          JR Z, FDTR3    ;
2028 08EB                                     ;
2029 08EB 0B 35          FDTR2: IN A, (FDCDT) ;
2030 08ED 77             LD (HL), A       ;
2031 08EE 23             INC HL           ;
2032 08EF 18 F0          JR FDTR1        ;
2033                                     ;
2034

```



```

2487 0B26 FE 1C CP 1CH
2488 0B28 38 04 JR C, KY35
2489 0B2A FE 25 CP 25H
2490 0B2C 38 E3 JR C, KY40
2491 0B2E
2492 0B2E 7E KY35: LD A, (HL)
2493 0B2F 0E FF LD C, -1
2494 0B31 A7 AND A
2495 0B32 C9 RET
2496
2497
2498
2499
2500
2501 0B33
2502 0B33 D6 E0
2503 0B35 4F KY50: sub 0e0h
2504 0B36 D6 0B ld c, a
2505 0B38 D2 0B5F sub 0bh
2506 jp nc, ky55
2507
2508
2509
2510 0B3B 3A FED1
2511 0B3E 3C LD A, (FUNCFLG)
2512 0B3F 20 07 INC A
2513 JR NZ, KY52
2514
2515
2516 0B41 79
2517 0B42 C6 E0 LD A, C
2518 0B44 0E FF ADD A, 0E0H
2519 0B46 A7 LD C, -1
2520 0B47 C9 AND A ;clear carry flag
2521 RET
2522
2523
2524 0B48
2525 0B4A 2A FE25 KY52: ld b, 0
2526 0B4D 79 ld hl, (xpkstr)
2527 0B4E 87 ld a, c
2528 0B4F 87 add a, a
2529 0B50 87 add a, a
2530 0B51 87 add a, a
2531 0B52 4F ld c, a
2532 0B53 09 add hl, bc
2533 0B54 7E ld a, (hl) ;chracter count
2534 0B55 32 FE3F ld (pfkent), a
2535 0B58 23 inc hl
2536 0B59 22 FE27 ld (pfkptr), hl ;set pointer
2537 0B5C C3 0AC6 jp gtkbrd
2538
2539
2540
2541
2542
2543
2544 0B5F
2545 0B5F 5F KY55: ld e, a
2546 0B60 16 00 ld d, 0
2547 0B62 21 0C82 ld hl, FUNCTAB
2548 0B65 19 add hl, de
2549 0B66 19 add hl, de
2550 0B67 7E ld a, (hl)
2551 0B68 23 inc hl
2552 0B69 66 ld h, (hl)
2553 0B6A 6F ld l, a
2554 0B6B E9 jp (hl) ;goto func. key routine
2555 ;return to GTKBRD :
2556
2557
2558
2559 0B6C
2560 0B6C 21 FE54 KY60: LD HL, XSHFDT
2561 0B6F FE 8B CP 8BH ;CTRL
2562 0B71 20 02 JR NZ, KY61
2563 0B73 CB EE SET 5, (HL)
2564 0B75 FE 8A KY61: CP 8AH
2565 0B77 20 02 JR NZ, KY62
2566 0B79 CB AE RES 5, (HL)
2567 0B7B
2568 0B7B FE 84 KY62: CP 84H ;SHIFT
2569 0B7D 38 0E JR C, KY63
2570 0B7F FE 88 CP 88H
2571 0B81 30 0A JR NZ, KY63
2572 0B83 CB 86 RES 0, (HL)
2573 0B85 E5 01 AND 1
2574 0B87 28 04 JR Z, KY63
2575 0B89 CB C6 SET 0, (HL)
2576 0B8B 18 0C JR KY70
2577 0B8D
2578 0B8D FE 8C KY63: CP 8CH ;GRAPH
2579 0B8F 20 02 JR NZ, KY65
2580 0B91 CB 96 RES 2, (HL)
2581 0B93
2582 0B93 FE 8D KY65: CP 8DH
2583 0B95 20 02 JR NZ, KY70
2584 0B97 CB D6 SET 2, (HL)
2585
2586
2587
2588 0B99
2589 0B99 11 0000 KY70: LD DE, 00H
2590 0B9C CB 6E BIT 5, (HL) ;CTRL?
2591 0B9E 20 11 JR NZ, KY79 ;yes
2592 0BA0 11 0190 LD DE, 190H
2593 0BA3 CB 56 BIT 2, (HL) ;GRAPH?
2594 0BA5 20 0A JR NZ, KY79 ;yes
2595 0BA7 11 0050 LD DE, 50H
2596 0BAA CB 46 BIT 0, (HL) ;SHIFT?
2597 0BAC 28 03 JR Z, KY79 ;no
2598 0BAE 11 00A0 LD DE, 0A0H
2599 0BB1
KY79:

```

```

2600   OBB1   ED 53 FE6E          LD      (XSHIFT),DE
2601   OBB5   C3 0AC6          JP      GTKBRD
2602   ;
2603   ;
2604   ;
2605   ;
2606   ;
2607   OBB8   FB                XEMPTY:
2608   OBB8   AF                EI
2609   OBB9   32 FE43          XOR     A
2610   OBB8A  32 FE2C          LD      (BRKFLG),A
2611   OBBD   37               LD      (PRTHRU),A
2612   OBC0   37               SCF
2613   OBC1   C9               RET
2614   ;
2615   ;
2616   ;
2617   ;
2618   OBC2   21 FE54          XCHEE: [ CAPS LOCK ]
2619   OBC2   7E               LD      HL,XSHFDT
2620   OBC5   EE 02           ld      a,(hl)
2621   OBC6   77               xor     2
2622   OBC8   E6 02           ld      (hl),a
2623   OBC9   16 40           and    2
2624   OBCB   28 31           ld      d,40h
2625   OBCD   14             jr      z,cflcd
2626   OBCF   18 2E           inc    d
2627   OBD0   ;               jr      cflcd
2628   ;
2629   ;
2630   ;
2631   ;
2632   OBD2   11 4E08          XCHF0: [ MF1 ]
2633   OBD2   18 1F           ld      de,4e08h
2634   OBD5   ;               jr      cf00
2635   ;
2636   ;
2637   ;
2638   OBD7   11 4C04          XCHF1: [ MF2 ]
2639   OBD7   18 1A           ld      de,4c04h
2640   OBD8   ;               jr      cf00
2641   ;
2642   ;
2643   ;
2644   OBD8   11 4A02          XCHF2: [ MF3 ]
2645   OBD8   18 15           ld      de,4a02h
2646   OBDF   ;               jr      cf00
2647   ;
2648   ;
2649   ;
2650   OBE1   16 42           XCHF3: [ MF4 ]
2651   OBE3   3A FE52          LD      D,42H
2652   OBE6   0F               LD      A,(SWITCH)
2653   OBE7   38 01          RRCA
2654   OBE9   14             JR      C,XCHF35
2655   OBEA   DB 12          INC     D
2656   OBEA   CB 57          XCHF35:
2657   OBEA   28 FA          IN      A,(12H)
2658   OBF0   C3 10          BIT    2,A
2659   OBF3   11 4801        JR      Z,XCHF35
2660   OBF6   ;               LD      A,D
2661   OBF6   ;               OUT    (10H),A
2662   OBF6   ;               LD      de,4801h
2663   ;
2664   OBF6   21 FE52          CF00:
2665   OBF6   7E             ld      hl,switch
2666   OBF9   AB             ld      a,(hl)
2667   OBF9   77             xor     e
2668   OBF9   A3             ld      (hl),a
2669   OBF9   28 01          and    e
2670   OBF9   14             jr      z,cflcd
2671   OBF9   ;             inc    d
2672   ;
2673   ;
2674   ;
2675   OC00   DB 12           ; put LED control command
2676   OC00   CB 57          CFLED:
2677   OC02   28 FA          IN      A,(12H)
2678   OC04   7A             BIT    2,A
2679   OC06   D3 10          JR      Z,CFLED
2680   OC07   C3 0AC6        LD      A,D
2681   OC09   ;             OUT    (10H),A
2682   ;             JP      GTKBRD
2683   ;
2684   ;
2685   ;
2686   OC0C   0E 01          XCHF4: [ 00 <GERMAN> ]
2687   OC0E   21             LD      C,1
2688   ;             DB      21H
2689   ;             ; skip next instruction
2690   ;
2691   OC0F   0E 02          XCHF5: [ 000 ]
2692   ;             LD      C,2
2693   ;
2694   OC11   3A FED1        ;
2695   OC14   3C             LD      A,(FUNCFLG)
2696   OC15   20 07          INC    A
2697   OC17   3E F3          JR      NZ,XCHF54
2698   OC19   81             LD      A,0F3H
2699   OC1A   0E FF          ADD   A,C
2700   OC1C   A7             LD      C,-1
2701   OC1D   C9             AND   A
2702   ;             ; clear carry flag
2703   ;
2704   OC1E   79             XCHF54:
2705   OC1F   32 FE3F        LD      A,C
2706   OC22   21 0C52        LD      (PFKCNT),A
2707   OC25   22 FE27        LD      HL,ZERO2
2708   ;             LD      (PFKPTR),HL
2709   ;
2710   OC28   3A FE50        LD      A,(MBFLG)
2711   OC2B   A7             AND   A
2712   OC2C   28 1E          JR      Z,XCHF50
2713   OC2E   3A FE81        LD      A,(MFNO)

```

```

2713 0C31 A7 AND A
2714 0C32 28 18 JR Z,XCHF50
2715 0C34 C6 A0 ADD A,0A0H
2716 0C36 4F LD C,A
2717 0C37 3A FE3F LD A,(PFKCNT)
2718 0C3A 87 ADD A,A
2719 0C3B 3C INC A
2720 0C3C 32 FE3F LD (PFKCNT),A :PFKCNT=2*(PFKCNT)+1
2721 0C3F 21 0C54 LD HL,ZERO2B
2722 0C42 22 FE27 LD (PFKPTR),HL
2723 0C45 79 LD A,C :=(MFNO)+0A0H
2724 0C46 23 INC HL
2725 0C47 77 LD (HL),A
2726 0C48 23 INC HL
2727 0C49 23 INC HL
2728 0C4A 77 LD (HL),A
2729 0C4B 21 DB 21H :skip next instruction
2730
2731 0C4C ;
2732 0C4C XCHF50: LD A,'0'
2733 0C4E 0E 00 LD C,0
2734 0C50 B7 OR A :clear carry flag
2735 0C51 C9 RET
2736
2737 0C52 30 30 ZERO2: DB '00'
2738 0C54 B0 A1 B0 A1 ZERO2B: DB '0'+80H,0A1H,'0'+80H,0A1H,'0'+80H
2739 0C58 B0
2740
2741 ;
2742 ;
2743 ;
2744 0C59 ; [ UP ]
2745 0C59 XCHF6: ld a,(xchup)
2746 0C5C 0E 00 LD C,0
2747 0C5E B7 or a
2748 0C5F C9 ret
2749
2750 ;
2751 ;
2752 0C60 ; [ DOWN ]
2753 0C60 XCHF7: ld a,(xchdown)
2754 0C63 0E 00 LD C,0
2755 0C65 B7 or a
2756 0C66 C9 ret
2757
2758 ;
2759 ;
2760 0C67 ; [ LEFT ]
2761 0C67 XCHF8: ld a,(xchleft)
2762 0C6A 0E 00 LD C,0
2763 0C6C B7 or a
2764 0C6D C9 ret
2765
2766 ;
2767 ;
2768 0C6E ; [ RIGHT ]
2769 0C6E XCHF9: ld a,(xchright)
2770 0C71 0E 00 LD C,0
2771 0C73 B7 or a
2772 0C74 C9 ret
2773
2774 ;
2775 ;
2776 ;
2777 0C75 ; [ BREAK ]
2778 0C75 XCHFA: ld a,3
2779 0C77 0E 00 LD C,0
2780 0C79 B7 or a
2781 0C7A C9 ret
2782
2783 ;
2784 ;
2785 ;
2786 0C7B ; [ SCREEN DUMP ]
2787 0C7B XCHFB: CALL HCOPIY :ee
2788 0C7E FB EI
2789 0C7F C3 0AC6 JP GTKBRD
2790
2791 ;
2792 ;
2793 ;
2794 ;
2795 0C82 ;
2796 0C82 0AC6 FUNCTAB: DW GTKBRD
2797 0C84 0AC6 DW GTKBRD
2798 0C86 0AC6 DW GTKBRD
2799 0C88 0BC2 DW XCHEE :CAPS LOCK
2800 0C8A 0AC6 DW GTKBRD
2801 0C8C 0BD2 DW XCHF0 :MF1
2802 0C8E 0BD7 DW XCHF1 :MF2
2803 0C90 0BDC DW XCHF2 :MF3
2804 0C92 0BE1 DW XCHF3 :MF4
2805 0C94 0C0C DW XCHF4 :<GERMAN> 00
2806 0C96 0C0F DW XCHF5 :000
2807 0C98 0C59 DW XCHF6 :Cursor up
2808 0C9A 0C60 DW XCHF7 :Cursor down
2809 0C9C 0C67 DW XCHF8 :Cursor left
2810 0C9E 0C6E DW XCHF9 :Cursor right
2811 0CA0 0C75 DW XCHFA :Break
2812 0CA2 0C7B DW XCHFB :Screen Dump
2813 0CA4 0AC6 DW GTKBRD
2814 0CA6 0AC6 DW GTKBRD
2815 0CA8 0AC6 DW GTKBRD
2816 0CAA 0AC6 DW GTKBRD
2817
2818 ;
2819 ;
2820 ;
2821 ;
2822 SUBTTL ** TIME & DATE **
2823
2824 ;
2825 ; TIME & DATE

```



```

2939 ;
2940 ;
2941 ;
2942 ;
2943 <<>> DATA AREA FOR DISK ROUTINE <<>>
2944 ;
2945 ;
2946 ;
2947 * LOGICAL DISK PARAMETER *
2948 FE00 RWFLG EQU PRMTAB ;READ/WRITE OPERATION FLAG
2949 FE01 DRIVE EQU PRMTAB+01H ;DRIVE #
2950 FE02 TRACK EQU PRMTAB+02H
2951 FE03 HEAD EQU PRMTAB+03H
2952 FE04 SECTOR EQU PRMTAB+04H
2953 FE05 SECTCT EQU PRMTAB+05H ;NUMBER OF SECTORS
2954 FE06 DBADDR EQU PRMTAB+06H ;DISK BUFFER ADDRESS
2955 ;
2956 ;
2957 * DISK COMMAND PARAMETER *
2958 FE08 FDCOM EQU PRMTAB+08H ;DISK COMMAND
2959 FE09 PDRIIVE EQU PRMTAB+09H ;HD, US1, US0
2960 FE0A PTRACK EQU PRMTAB+0AH
2961 FE0B PHEAD EQU PRMTAB+0BH ;PHYSICAL HEAD
2962 FE0C PSECTOR EQU PRMTAB+0CH
2963 FE0D FDP RM EQU PRMTAB+0DH
2964 ;
2965 ;
2966 * RESULT STATUS *
2967 FE11 FDBSY EQU PRMTAB+11H ;FDD COMMAND RESULT
2968 FE12 ST0 EQU PRMTAB+12H ;FDC RESULT STATUS BYTES
2969 FE15 STRACK EQU PRMTAB+15H ;SENSE TRACK
2970 FE16 SHEAD EQU PRMTAB+16H ;SENSE HEAD
2971 FE17 SSECTOR EQU PRMTAB+17H ;SENSE SECTOR
2972 FE18 SLENGTH EQU PRMTAB+18H ;SENSE SECTOR COUNT
2973 FE19 ST3 EQU PRMTAB+19H ;RESULT STATUS REG.3
2974 FE1A ST00 EQU PRMTAB+1AH ;STS 0
2975 FE1B STRK EQU PRMTAB+1BH ;RESULT TRACK #
2976 ;
2977 ;
2978 ;
2979 <<>> DATA FOR INPUT KEY DATA ROUTINE <<>>
2980 ;
2981 ;
2982 FE20 KBDATA EQU PRMTAB+20H ;KEYBOARD HARD CODE1
2983 FE21 INTPTR EQU PRMTAB+21H ;KEY PUT POINTER
2984 FE23 KEYPTR EQU PRMTAB+23H ;KEY GET POINTER
2985 FE25 XPFKSTR EQU PRMTAB+25H ;programmable function key pointer
2986 FE27 PFKPTR EQU PRMTAB+27H
2987 ;
2988 FE2A DFLTPT EQU PRMTAB+2AH ;2bytes
2989 FE2C PRTHRU EQU PRMTAB+2CH ;
2990 FE2D CURDRIV EQU PRMTAB+2DH
2991 FE2E KBUF EQU PRMTAB+2EH ;KEY DATA BUFFER
2992 FE3E KBUFEND EQU PRMTAB+3EH
2993 FE3F PFKCNT EQU PRMTAB+3FH ;
2994 ;
2995 FE40 DFLTFLG EQU PRMTAB+40H
2996 FE41 DFLTILCH EQU PRMTAB+41H
2997 ;
2998 FE43 BRKFLG EQU PRMTAB+43H ;
2999 FE44 SCRLTIM EQU PRMTAB+44H
3000 ;
3001 FE48 DFLTUP EQU PRMTAB+48H
3002 FE49 DFLTON EQU PRMTAB+49H
3003 FE4A DFLTRT EQU PRMTAB+4AH
3004 FE4B DFLTLT EQU PRMTAB+4BH
3005 FE4C KBREPT EQU PRMTAB+4CH ;keyboard repeat control
3006 FE4D KBSTRT EQU PRMTAB+4DH ;repeat start time
3007 FE4E KBINTVL EQU PRMTAB+4EH ;repeat interval
3008 ;
3009 FE50 MBFLG EQU PRMTAB+50H ;MFBASIC flag
3010 FE52 SWITCH EQU PRMTAB+52H
3011 ;
3012 FE54 XSHFDT EQU PRMTAB+54H
3013 FE55 PRINTER EQU PRMTAB+55H ;2bytes
3014 FE57 CRTPASS EQU PRMTAB+57H ;0ffh=direct display
3015 FE58 XCHUP EQU PRMTAB+58H
3016 FE59 XCHDOWN EQU PRMTAB+59H
3017 FE5A XCHRIGT EQU PRMTAB+5AH
3018 FE5B XCHLEFT EQU PRMTAB+5BH
3019 ;
3020 FE6E XSHIFT EQU PRMTAB+6EH
3021 ;
3022 FE72 CSROSP EQU PRMTAB+72H
3023 ;
3024 FE7C KBSTS EQU PRMTAB+7CH
3025 FE7E KBOBF EQU PRMTAB+7EH
3026 FE7F KEYDATA EQU PRMTAB+7FH
3027 FE80 COUNTRY EQU PRMTAB+80H
3028 FE81 MFNO EQU PRMTAB+81H
3029 FE82 MFLG EQU PRMTAB+82H
3030 ;
3031 FE86 KSAVE EQU PRMTAB+86H
3032 FE87 LCRFLG EQU PRMTAB+87H
3033 FE88 LSP EQU PRMTAB+88H
3034 FE89 RSP EQU PRMTAB+89H
3035 FE8A LPESC EQU PRMTAB+8AH
3036 FE8B MFDOT EQU PRMTAB+8BH
3037 FE98 PREF EQU PRMTAB+98H
3038 FE99 DFLTMF EQU PRMTAB+99H
3039 ;
3040 FE9E MEMPTR EQU PRMTAB+9EH
3041 FEAO MEMBUF EQU PRMTAB+0A0H
3042 ;
3043 ;
3044 FE01 FUNCFLG EQU PRMTAB+0D1H ;Func. key check mode ON(OFFH)/OFF(0)
3045 FE02 MFROM EQU PRMTAB+0D2H ;MF ROM check flag
3046 FE03 FDSTAT EQU PRMTAB+0D3H ;FDD status
3047 FE04 BASIC EQU PRMTAB+0D4H ;MFBASIC FDSTAT check flag
3048 ;
3049 FE06 RSLTBUF EQU PRMTAB+0D6H
3050 FE0E FDERCNT EQU PRMTAB+0EEH
3051 FE0F MEMBANK EQU PRMTAB+0F0H

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3052 FEF1 MBANKS EQU PRMTAB+0F1H
3053 FEF2 MBANKD EQU PRMTAB+0F2H
3054 FEF3 SVIBANK EQU PRMTAB+0F3H
3055
3056 FEF8 YMDHMS EQU PRMTAB+0F8H
3057
3058
3059
3060
3061
3062
3063
3064 rept 0E00h-S
3065 .XLIST
3066 db 0e5h
3067 .LIST
3068 endm
3069
3070
3071
3072
3073
3074 END

```

memory bank calls interrupt

Macros:

Symbols:

0201	ALLOC	FC06	ALV0	FCF8	ALV1
FD1A	ALV2	FD3C	ALV3	9900	ANTAB
FED4	BASIC	F639	BEEP	F600	BIOS
0800	BLKSIZ	0009	BRKCHR	FE43	BRKFLG
0340	BSELCT	0837	BUZZON	082F	BUZZPU
059F	CALBRT	0010	CBSY	0004	CDISK
0BF6	CF00	0C00	CFLED	9080	CGTAB
0700	CHKEND	01C8	CHKUNA	0A64	CHR10
0A5A	CHRSTAT	9800	CKANTAB	0756	CKPRTCT
0740	CKRETRY	008F*	CLS	064A	CMERET
05D0	CMRETX	05E5	CMRTXX	06A9	COM10
06B8	COM20	06D4	COM30	06E1	COM40
06EF	COM70	06A4	COMMD	042C	CONIN
043D	CONIN1	0497*	CONOT1	00CC*	CONOT2
082C*	CONOUT	03CF	CONST	008B*	CONVCD
FE80	COUNTRY	A100	CPFSTR	0040	CPMSPT
000D	CR	FE57	CRTPASS	FE72	CSRDSPT
FCE8	CSV0	FD0A	CSV1	FD2C	CSV2
FD4E	CSV3	FE2D	CURDRIV	FE06	DBADDR
07AC	DCAL1	079F	DCALIB	04FA	DDRDY
FE49	DFLTDN	FE40	DFLTFLG	FE41	DFLTILCH
FE4B	DFLTTL	FE99	DFLTMF	FE2A	DFLTPRT
FE4A	DFLTRT	FE48	DFLTUP	0828	DG10
0820	DIGIT	0006	DIO	FC56	DIRBUF
FC54	DMAADR	07F5	DMASET	079D	DOCALIB
0330	DOOPER	0726	DORDWT	0790	DOSEEK
0736	DOWRT	0501	DR00	0515	DR10
0523	DR20	0534	DR30	054E	DR80
055B	DR90	04FE	DRDY	07B0	DREAD
FE01	DRIVE	0792	DSEEK	0CB0	DT00
0CB9	DT20	0CCF	DT50	0CD3	DT60
0CEE	DT70	0D04	DTVCTR	07B8	DWRITE
007C*	DYCUSR	FC50	ERFLAG	001B	ESC
FE11	FDBSY	0035	FDCDT	0842	FDCIR
FE08	FDCOM	0034	FDCST	08C1	FDEN1
08C6	FDEND	FEEE	FDERCNT	0030	FDMOTR
FE0D	FDRPM	070A	FDREAD	070D	FDRSLT
FED3	FDRSTAT	08D3	FDTR0	08CB	FDTR00
08E1	FDTR1	08EB	FDTR2	08F1	FDTR3
0906	FDWRNG	0244	FILHST	FED1	FUNCFLG
0C82	FUNCTAB	A300	GAIJITB	0AAC	GETCHR
09E5	GETPFK	07C8	GIVERR	00C4	GOCPM
012F	GOCPMC	012D	GOCPMU	0AB2	GTFUKY
0AC6	GTKBRD	5000	HCOPY	FE03	HEAD
0817	HEXA	FC49	HSTACT	0008	HSTBLK
DC00	HSTBUF	FC44	HSTDSK	FC47	HSTSEC
0400	HSTSIZ	0008	HSTSPT	FC45	HSSTRK
FC4A	HSTWRT	FE21	INTPTR	FD80	INTTAB
0067*	INTX1	006A*	INTX2	006D*	INTX3
0070*	INTX4	0073*	INTX5	0078*	INTX6
0079*	INTX7	0003	IOBYT	0AAB	ISECBYT
FE20	KBDATA	FE4E	KBINTVL	FE7E	KB0BF
FE4C	KBREPT	FE4D	KBSTRT	FE7C	KBSTS
8E00	KBTAB	FE2E	KBUF	FE3E	KBUFEND
0085*	KCGIN	0088*	KCGOT	045E	KEYD
FE7F	KEYDATA	045D	KEYF	FE23	KEYPTR
045F	KEYS	FE86	KSAVE	0ADB	KY20
0AEF	KY25	0B1A	KY30	0B2E	KY35
0B11	KY40	0B33	KY50	0B48	KY52
0B5F	KY55	0B6C	KY60	0B75	KY61
0B7B	KY62	0B8D	KY63	0B93	KY65
0B99	KY70	0BB1	KY79	FE87	LCRFLG
F675	LDAXX	F663	LDIRX	0168*	LEDOFF
000A	LF	0049*	LIGHTPEN	0482	LIST
049C1	LIST1	4000	LIST2	F65D	LOADX
0064*	LPENIR	FE8A	LPESC	FE88	LSP
0174*	MASK1	06FF	MASTM	0262	MATCH
FEF2	MBANKD	FEF1	MBANKS	FE50	MBFLG
0AA9	MCHR70	0A72	MCHRST	FEF0	MEMBANK
FEA0	MEMBUF	FE9E	MEMPTR	058D	MESTO
C400	MFBUF1	CC00	MFBUF2	D400	MFBUF3
FE8B	MFDOT	FE82	MFLG	FE81	MFNO
FED2	MFROM	0800	MFSIZE	0A06	MOVPFK
09B5	MRSINST	096D*	MRSP	0A14	MVPF10
0A32	MVPF15	0A3C	MVPF20	0A1D	MVPFX1
0A47	MVPFX2	0A4C	MVPFX3	0004	NDISKS
0402	NOKEY	023C	NOMATCH	0179	NOMFROM
01FB	NOOVF	0717	NSECRD	071C	NSECRW
0718	NSECWT	000F	NSEEK	0000	OFF
00661	OINT1	00691	OINT2	006C1	OINT3
006F1	OINT4	00721	OINT5	00751	OINT6
00781	OINT7	00FF	ON	09CB*	ORS140
FE09	PDRIVE	FE3F	PFKCNT	FE27	PFKPTR
FE0B	PHEAD	FE98	PREF	014B	PRIN10
0151	PRIN20	FE55	PRINTER	0088	PRMSG
FE00	PRMTAB	9100	PRTAB	C300	PRTBUF

FE2C	PRTHRU	FE0C	PSECTOR	4D00	PSET
FE0A	PTRACK	04CF	PUNCH	09F6	PUTPFK
03CA	RAMD50	0375	RAMDISK	07C1	RDAF1
0046	RDCM	017F	READ	0653	READCM
04E5	READER	02CE	READHST	FC52	READOP
0007	RECAL	0696	REDCM2	07C1	RERDAF
07AE	REREAD	0002	RETRY	074E	RETRYO
07B8	REWRT	0007	ROM	002E*	RSCLOSE
FC51	RSFLAG	04F8*	RSIN	03DE*	RSINST
0046*	RSIOX	FED6	RSLTBUF	002B*	RSOPEN
04E3*	RSOUT	0034*	RSOUTST	FE89	RSP
0860	RSTRO	0858	RSTR00	086E	RSTR1
0878	RSTR2	087E	RSTR3	073E	RWCHK
0675	RWCMD	08AB	RWEND	0766	RWENDX
0765	RWERR	FE00	RWFLG	02DD	RWHST
02A8	RWMOVE	Q209	RWOPER	042A	SAVSP1
0480	SAVSP2	04AD	SAVSP4	0605	SAVSP5
078E	SAVSP6	FE44	SCRLLTM	0004	SDS
0007	SECMSK	0003	SECSHF	FE05	SECTCT
FE04	SECTOR	0607	SEEK	0629	SEEK39
000F	SEEK	FC40	SEKDSK	FC48	SEKST
FC43	SEKSEC	Q2C2	SEKTKCMP	FC41	SEKTRK
07CC	SETPDRV	FE16	SHEAD	0373	SHELTO
0A58	SHLTPF	0080	SIGNMSG	0099	SIGNON
08A6	SINT10	0008	SINTS	0975	SIOENO
0991	SIOEN1	096B	SIOEND	09CF	SIOERR
091D	SIOIR	092F	SIOIRO	095B	SIORO2
0968	SIORD3	FE18	SLENGTH	0D0BI	SRMBANK
FE17	SSECTOR	FE12	ST0	FE1A	ST00
07E8I	ST1ML	FE19	ST3	07E1I	ST50ML
07ED	ST8MIC	0373	STACK0	042A	STACK1
0480	STACK2	04CF	STACK4	0605	STACK5
078E	STACK6	F678	STAXX	0D46I	STCKIR
0333	STERF	030B	STHED	F660	STORX
FE15	STRACK	FE1B	STRK	FEF3	SVIBANK
0D1CI	SVSP1R	FE52	SWITCH	0CAC	TIMDAT
0568	TIMEOUT	0575	TIMOT20	FE02	TRACK
FC4B	UNACNT	FC4C	UNADSK	FC4F	UNASEC
FC4D	UNATRK	000A	US0	000C	US1
0009	USX	000D	VERS	0045	WRMCM
0001	WRDIR	0661	WRITCM	019C	WRITE
033C	WRITEHST	FC53	WRTYPE	0002	WRUAL
FE59	XCHDOWN	0BC2	XCHEE	0BD2	XCHF0
0BD7	XCHF1	0BDC	XCHF2	0BE1	XCHF3
0BEA	XCHF35	0C0C	XCHF4	0C0F	XCHF5
0C4C	XCHF50	0C1E	XCHF54	0C59	XCHF6
0C60	XCHF7	0C67	XCHF8	0CE6	XCHF9
0C75	XCHFA	0C7B	XCHFB	FE5B	XCHLEFT
FE5A	XCHRIGT	FE58	XCHUP	0BB8	XEMPTY
FE25	XPFKSTR	FE54	XSHFDT	FE6E	XSHIFT
FEF8	YMDHMS	0C52	ZERO2	0C54	ZERO2B

No Fatal error(s)

ALLOC	426	435	442	450	476#				
ALV0	1064#								
ALV1	1066#								
ALV2	1068#								
ALV3	1070#								
ANTAB	69#								
BASIC	1205	3047#							
BEEP	1868	1873#							
BIOS	61#	130	131	132	134	135	1873		
BLKSIZ	85#	412							
BRKCHR	121#	2103							
BRKFLG	2105	2610	2998#						
BSELECT	732	763#	1283						
BUZZON	1876#								
BUZZPU	30	195	1188	1219	1474	1495	1865#		
CALBRT	159	1250#	1673						
CBSY	1096#	1140	1445						
CDISK	112#								
CF00	2634	2640	2646	2664#					
CFLED	2625	2627	2670	2675#	2678				
CGTAB	66#								
CHKEND	1516#	1519	1607	1656	1675				
CHKUNA	408	423#							
CHR10	2319#								
CHRSTAT	876	2311#	2387						
CKANTAB	68#								
CKPRTCT	1589	1612#							
CKRETRY	1597#	1615							
CLS	39#	207							
CMERET	1314	1333	1349#						
CMRETXX	1256	1276#							
CMRTXX	1279	1291#							
COM10	1438#	1446							
COM20	1451#	1454	1460						
COM30	1456	1471#	1482						
COM40	1477#	1480							
COM70	1442	1489#							
COMMD	163	1267	1324	1343	1401	1434#	1485		
CONIN	154	909#							
CONIN1	920#	1019	1220						
CONOT1	37#	194	969						
CONOT2	37#	258	260						
CONOUT	37#	155	243	283	285	313	1190	1476	1860
CONST	153	856#							
CONVCD	38#	198							
COUNTRY	286	3027#							
CPFSTR	70#	268	2233	2237					
CPMSPT	89#	456							
CR	118#	227	328	1228					
CRTPASS	3014#								
C3RDSP	3022#								
CSV0	1065#								
CSV1	1067#								
CSV2	1069#								
CSV3	1071#								

WRUAL	101#	384	407		
XCHDOWN	2753	3016#			
XCHEE	2618#	2799			
XCHF0	2632#	2801			
XCHF1	2638#	2802			
XCHF2	2644#	2803			
XCHF3	2650#	2804			
XCHF35	2654	2656#	2659		
XCHF4	2666#	2805			
XCHF5	2691#	2806			
XCHF50	2711	2714	2731#		
XCHF54	2696	2703#			
XCHF6	2744#	2807			
XCHF7	2752#	2808			
XCHF8	2760#	2809			
XCHF9	2768#	2810			
XCHFA	2777#	2811			
XCHFB	2786#	2812			
XCHLEFT	2761	3018#			
XCHRIGT	266	2769	3017#		
XCHUP	264	2745	3015#		
XEMPTY	2427	2607#			
XPFKSTR	269	2525	2985#		
XSHFDT	2458	2559	2619	3012#	
XSHIFT	2455	2600	3020#		
YMDHMS	2838	2861	2877	2885	3056#
ZERO2	2706	2737#			
ZERO2B	2721	2738#			

