

```

;*****
;*
;*          SECTOR DEBLOCKING ALGORITHMS FOR CP/M 2.0
;*
;*****

```

```

;
;          UTILITY MACRO TO COMPUTE SECTOR MASK
SMASK    MACRO    HBLK
;;        COMPUTE LOG2(HBLK), RETURN @X AS RESULT
;;        (2 ** @X = HBLK ON RETURN)
@Y        SET      HBLK
@X        SET      0
;;        COUNT RIGHT SHIFTS OF @Y UNTIL = 1
REPT      8
IF        @Y = 1
EXITM
ENDIF
;;        @Y IS NOT 1, SHIFT RIGHT ONE POSITION
@Y        SET      @Y SHR 1
@X        SET      @X + 1
ENDM
ENDM

```

CP/M 2.2

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```

;*****
;*
;*          CP/M TO HOST DISK CONSTANTS
;*
;*****

```

0800 =	BLKSIZ	EQU	2048	;CP/M ALLOCATION SIZE
0200 =	HSTSIZ	EQU	512	;HOST DISK SECTOR SIZE
0014 =	HSTSPT	EQU	20	;HOST DISK SECTORS/TRK
0004 =	HSTBLK	EQU	HSTSIZ/128	;CP/M SECTS/HOST BUFF
0050 =	CPMSPT	EQU	HSTBLK * HSTSPT	;CP/M SECTORS/TRACK
0003 =	SECMASK	EQU	HSTBLK-1	;SECTOR MASK
	SMASK	EQU	HSTBLK	;COMPUTE SECTOR MASK
0002 =	SECSHF	EQU	@X	;LOG2(HSTBLK)

```

;*****
;*
;*          BDOS CONSTANTS ON ENTRY TO WRITE
;*
;*****

```

0000 =	WRALL	EQU	0	;WRITE TO ALLOCATED
0001 =	WRDIR	EQU	1	;WRITE TO DIRECTORY
0002 =	WRUAL	EQU	2	;WRITE TO UNALLOCATED

```

;*****
;*
;*          THE BDOS ENTRY POINTS GIVEN BELOW SHOW THE
;*          CODE WHICH IS RELEVANT TO DEBLOCKING ONLY.
;*
;*****

```

```

;
;          DISKDEF MACRO, OR HAND CODED TABLES GO HERE
0000 =    DPBASE    EQU    $                ;DISK PARAM BLOCK BASE
;

```

BOOT:
WBOOT:

```
0000 AF      ;ENTER HERE ON SYSTEM BOOT TO INITIALIZE
0001 326A01  XRA      A      ;0 TO ACCUMULATOR
0004 326C01  STA      HSTACT  ;HOST BUFFER INACTIVE
0007 C9      STA      UNACNT  ;CLEAR UNALLOC COUNT
RET
```

;
HOME:

;HOME THE SELECTED DISK

HOME:

```
0008 3A6B01  LDA      HSTWRT ;CHECK FOR PENDING WRITE
000B B7      ORA      A
000C C21200  JNZ      HOMED
000F 326A01  STA      HSTACT  ;CLEAR HOST ACTIVE FLAG
```

HOMED:

```
0012 C9      RET
```

;
SELDSK:

;SELECT DISK

```
0013 79      MOV      A,C      ;SELECTED DISK NUMBER
0014 326101  STA      SEKDSK  ;SEEK DISK NUMBER
0017 6F      MOV      L,A      ;DISK NUMBER TO HL
0018 2600    MVI      H,0
REPT 4      ;MULTIPLY BY 16
DAD H
ENDM
```

```
001A+29     DAD      H
001B+29     DAD      H
001C+29     DAD      H
001D+29     DAD      H
001E 110000  LXI      D,DPBASE ;BASE OF PARM BLOCK
0021 19      DAD      D      ;HL=.DPB(CURDSK)
0022 C9      RET
```

;
SETTRK:

;SET TRACK GIVEN BY REGISTERS BC

```
0023 60      MOV      H,B
0024 69      MOV      L,C
0025 226201  SHLD     SEKTRK ;TRACK TO SEEK
0028 C9      RET
```

;
SETSEC:

;SET SECTOR GIVEN BY REGISTER C

```
0029 79      MOV      A,C
002A 326401  STA      SEKSEC  ;SECTOR TO SEEK
002D C9      RET
```

;
SETDMA:

;SET DMA ADDRESS GIVEN BY BC

```
002E 60      MOV      H,B
002F 69      MOV      L,C
0030 227501  SHLD     DMAADR
0033 C9      RET
```

;
SECTRAN:

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```

;TRANSLATE SECTOR NUMBER BC
0034 60      MOV     H,B
0035 69      MOV     L,C
0036 C9      RET

;
;*****
;
; THE READ ENTRY POINT TAKES THE PLACE OF
; THE PREVIOUS BIOS DEFINITION FOR READ.
;
;*****
READ:
;READ THE SELECTED CP/M SECTOR
0037 AF      XRA     A
0038 326C01  STA     UNACNT
003B 3E01     MVI     A,1
003D 327301  STA     READOP      ;READ OPERATION
0040 327201  STA     RSFLAG      ;MUST READ DATA
0043 3E02     MVI     A,WRUAL
0045 327401  STA     WRTYPE      ;TREAT AS UNALLOC
0048 C3B600  JMP     RWOPER      ;TO PERFORM THE READ

;
;*****
;
; THE WRITE ENTRY POINT TAKES THE PLACE OF
; THE PREVIOUS BIOS DEFINITION FOR WRITE.
;
;*****
WRITE:
;WRITE THE SELECTED CP/M SECTOR
004B AF      XRA     A      ;0 TO ACCUMULATOR
004C 327301  STA     READOP      ;NOT A READ OPERATION
004F 79      MOV     A,C      ;WRITE TYPE IN C
0050 327401  STA     WRTYPE
0053 FE02     CPI     WRUAL      ;WRITE UNALLOCATED?
0055 C26F00  JNZ     CHKUNA      ;CHECK FOR UNALLOC

;
; WRITE TO UNALLOCATED, SET PARAMETERS
0058 3E10     MVI     A,BLKSIZ/128 ;NEXT UNALLOC RECS
005A 326C01  STA     UNACNT
005D 3A6101  LDA     SEKDSK      ;DISK TO SEEK
0060 326D01  STA     UNADSK      ;UNADSK = SEKDSK
0063 2A6201  LHLD    SEKTRK
0066 226E01  SHLD    UNATRK      ;UNATRK = SECTRK
0069 3A6401  LDA     SEKSEC
006C 327001  STA     UNASEC      ;UNASEC = SEKSEC

;
CHKUNA:
;CHECK FOR WRITE TO UNALLOCATED SECTOR
006F 3A6C01  LDA     UNACNT      ;ANY UNALLOC REMAIN?
0072 B7      ORA     A
0073 CAAE00  JZ      ALLOC      ;SKIP IF NOT

;
; MORE UNALLOCATED RECORDS REMAIN
0076 3D      DCR     A      ;UNACNT = UNACNT-1
0077 326C01  STA     UNACNT

```

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```

007A 3A6101      LDA      SEKDSK          ;SAME DISK?
007D 216D01      LXI      H,UNADSK
0080 BE          CMP      M              ;SEKDSK = UNADSK?
0081 C2AE00      JNZ      ALLOC          ;SKIP IF NOT
;
; DISKS ARE THE SAME
0084 216E01      LXI      H,UNATRK
0087 CD5301      CALL     SEKTRKCMPL      ;SEKTRK = UNATRK?
008A C2AE00      JNZ      ALLOC          ;SKIP IF NOT
;
; TRACKS ARE THE SAME
008D 3A6401      LDA      SEKSEC          ;SAME SECTOR?
0090 217001      LXI      H,UNASEC
0093 BE          CMP      M              ;SEKSEC = UNASEC?
0094 C2AE00      JNZ      ALLOC          ;SKIP IF NOT
;
; MATCH, MOVE TO NEXT SECTOR FOR FUTURE REF
0097 34          INR      M              ;UNASEC = UNASEC+1
0098 7E          MOV      A,M            ;END OF TRACK?
0099 FE50        CPI      CPMSPT         ;COUNT CP/M SECTORS
009B DAA700      JC       NOOVF          ;SKIP IF NO OVERFLOW
;
; OVERFLOW TO NEXT TRACK
009E 3600        MVI      M,0            ;UNASEC = 0
00A0 2A6E01      LHLD     UNATRK
00A3 23          INX      H
00A4 226E01      SHLD     UNATRK          ;UNATRK = UNATRK+1
;
NOOVF:
;MATCH FOUND, MARK AS UNNECESSARY READ
00A7 AF          XRA      A              ;0 TO ACCUMULATOR
00A8 327201      STA      RSFLAG         ;RSFLAG = 0
00AB C3B600      JMP      RWOPER        ;TO PERFORM THE WRITE
;
ALLOC:
;NOT AN UNALLOCATED RECORD, REQUIRES PRE-READ
00AE AF          XRA      A              ;0 TO ACCUM
00AF 326C01      STA      UNACNT         ;UNACNT = 0
00B2 3C          INR      A              ;1 TO ACCUM
00B3 327201      STA      RSFLAG         ;RSFLAG = 1
;
;*****
;*
;* COMMON CODE FOR READ AND WRITE FOLLOWS
;*
;*****
RWOPER:
;ENTER HERE TO PERFORM THE READ/WRITE
00B6 AF          XRA      A              ;ZERO TO ACCUM
00B7 327101      STA      ERFLAG         ;NO ERRORS (YET)
00BA 3A6401      LDA      SEKSEC         ;COMPUTE HOST SECTOR
REPT     SECSHF
ORA      A              ;CARRY = 0
RAR      ;SHIFT RIGHT
ENDM
00BD+B7          ORA      A              ;CARRY = 0

```

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```

00BE+1F      RAR      ;SHIFT RIGHT
00BF+B7      ORA      A      ;CARRY = 0
00C0+1F      RAR      ;SHIFT RIGHT
00C1 326901  STA      SEKHST ;HOST SECTOR TO SEEK

```

```

;
;
00C4 216A01  LXI      H,HSTACT ;HOST ACTIVE FLAG
00C7 7E      MOV      A,M
00C8 3601    MVI      M,1      ;ALWAYS BECOMES 1
00CA B7      ORA      A      ;WAS IT ALREADY?
00CB CAF200  JZ        FILHST ;FILL HOST IF NOT

```

```

;
;
00CE 3A6101  LDA      SEKDSK
00D1 216501  LXI      H,HSTDSK ;SAME DISK?
00D4 BE      CMP      M      ;SEKDSK = HSTDSK?
00D5 C2EB00  JNZ      NOMATCH

```

```

;
;
00D8 216601  LXI      H,HSTTRK
00DB CD5301  CALL     SEKTRCMP ;SEKTRK = HSTTRK?
00DE C2EB00  JNZ      NOMATCH

```

```

;
;
00E1 3A6901  LDA      SEKHST
00E4 216801  LXI      H,HSTSEC ;SEKHST = HSTSEC?
00E7 BE      CMP      M
00E8 CA0F01  JZ        MATCH ;SKIP IF MATCH

```

NOMATCH:

```

;PROPER DISK, BUT NOT CORRECT SECTOR
00EB 3A6B01  LDA      HSTWRT ;HOST WRITTEN?
00EE B7      ORA      A
00EF C45F01  CNZ      WRITEHST ;CLEAR HOST BUFF

```

FILHST:

```

;MAY HAVE TO FILL THE HOST BUFFER
00F2 3A6101  LDA      SEKDSK
00F5 326501  STA      HSTDSK
00F8 2A6201  LHLD     SEKTRK
00FB 226601  SHLD     HSTTRK
00FE 3A6901  LDA      SEKHST
0101 326801  STA      HSTSEC
0104 3A7201  LDA      RSFLAG ;NEED TO READ?
0107 B7      ORA      A
0108 C46001  CNZ      READHST ;YES, IF 1
010B AF      XRA      A      ;0 TO ACCUM
010C 326B01  STA      HSTWRT ;NO PENDING WRITE

```

MATCH:

```

;COPY DATA TO OR FROM BUFFER
010F 3A6401  LDA      SEKSEC ;MASK BUFFER NUMBER
0112 E603    ANI      SECMSK ;LEAST SIGNIF BITS
0114 6F      MOV      L,A    ;READY TO SHIFT
0115 2600    MVI      H,0    ;DOUBLE COUNT
                        REPT   7 ;SHIFT LEFT 7

```

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```

0117+29
0118+29
0119+29
011A+29
011B+29
011C+29
011D+29
;
011E 117701
0121 19
0122 EB
0123 2A7501
0126 0E80
0128 3A7301
012B B7
012C C27501
;
;
012F 3E01
0131 326B01
0134 EB
;
RWMOVE:
;C INITIALLY 128, DE IS SOURCE, HL IS DEST
0135 1A
0136 13
0137 77
0138 23
0139 0D
013A C23501
;
;
013D 3A7401
0140 FE01
0142 3A7101
0145 C0
;
;
0146 B7
0147 C0
0148 AF
0149 326B01
014C CD5F01
014F 3A7101
0152 C9
;
*****
;
;
UTILITY SUBROUTINE FOR 16-BIT COMPARE
;
*****
SEKTRKCOMP:
;HL = .UNATRK OR .HSTTRK, COMPARE WITH SEKTRK
0153 EB

```

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```

0154 216201      LXI      H,SEKTRK
0157 1A          LDAX     D                ;LOW BYTE COMPARE
0158 BE          CMP      M                ;SAME?
0159 C0          RNZ              ;RETURN IF NOT
;               LOW BYTES EQUAL, TEST HIGH 1S
015A 13          INX      D
015B 23          INX      H
015C 1A          LDAX     D
015D BE          CMP      M                ;SETS FLAGS
015E C9          RET

```

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```

;*****
;
; WRITEHST PERFORMS THE PHYSICAL WRITE TO
; THE HOST DISK, READHST READS THE PHYSICAL
; DISK.
;*****

```

WRITEHST:

```

;HSTDSK = HOST DISK #, HSTTRK = HOST TRACK #,
;HSTSEC = HOST SECT #. WRITE "HSTSIZ" BYTES
;FROM HSTBUF AND RETURN ERROR FLAG IN ERFLAG.
;RETURN ERFLAG NON-ZERO IF ERROR
RET

```

015F C9

;
 READHST:

```

;HSTDSK = HOST DISK #, HSTTRK = HOST TRACK #,
;HSTSEC = HOST SECT #. READ "HSTSIZ" BYTES
;INTO HSTBUF AND RETURN ERROR FLAG IN ERFLAG.
RET

```

0160 C9

```

;*****
;
; UNINITIALIZED RAM DATA AREAS
;*****

```

```

0161      SEKDSK: DS      1                ;SEEK DISK NUMBER
0162      SEKTRK: DS      2                ;SEEK TRACK NUMBER
0164      SEKSEC: DS      1                ;SEEK SECTOR NUMBER
;
0165      HSTDSK: DS      1                ;HOST DISK NUMBER
0166      HSTTRK: DS      2                ;HOST TRACK NUMBER
0168      HSTSEC: DS      1                ;HOST SECTOR NUMBER
;
0169      SEKHST: DS      1                ;SEEK SHR SECSHF
016A      HSTACT: DS      1                ;HOST ACTIVE FLAG
016B      HSTWRT: DS      1                ;HOST WRITTEN FLAG
;
016C      UNACNT: DS      1                ;UNALLOC REC CNT
016D      UNADSK: DS      1                ;LAST UNALLOC DISK
016E      UNATRK: DS      2                ;LAST UNALLOC TRACK
0170      UNASEC: DS      1                ;LAST UNALLOC SECTOR
;
0171      ERFLAG: DS      1                ;ERROR REPORTING
0172      RSFLAG: DS      1                ;READ SECTOR FLAG

```

0173	READOP: DS	1	;1 IF READ OPERATION
0174	WRTYPE: DS	1	;WRITE OPERATION TYPE
0175	DMAADR: DS	2	;LAST DMA ADDRESS
0177	HSTBUF: DS	HSTSIZ	;HOST BUFFER

```

;
;*****
;*
;* THE ENDEF MACRO INVOCATION GOES HERE *
;*
;*****
;

```

0377

END

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SERIAL # _____

00AE ALLOC	0800 BLKSIZ	0000 BOOT	006F CHKUNA	0050 CPMSPT
0175 DMAADR	0000 DPBASE	0171 ERFLAG	00F2 FILHST	0008 HOME
0012 HOMED	016A HSTACT	0004 HSTBLK	0177 HSTBUF	0165 HSTDSK
0168 HSTSEC	0200 HSTSIZ	0014 HSTSPT	0166 HSTTRK	016B HSTWRT
010F MATCH	00EB NOMATCH	00A7 NOOVF	0037 READ	0160 READHST
0173 READOP	0172 RSFLAG	0135 RWMOVE	00B6 RWOPER	0003 SECMSK
0002 SECSHF	0034 SECTRAN	0161 SEKDSK	0169 SEKHST	0164 SEKSEC
0162 SEKTRK	0153 SEKTRKCOMP	0013 SELDSK	002E SETDMA	0029 SETSEC
0023 SETTRK	016C UNACNT	016D UNADSK	0170 UNASEC	016E UNATRK
0000 WBOOT	0000 WRALL	0001 WRDIR	004B WRITE	015F WRITEHST
0174 WRTYPE	0002 WRUAL			

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