

BIOS for Henry's

Winchester drive (15mg)

¢  
ORG 000H  
H17T EQU 0  
H37T EQU 0  
H47T EQU 1  
H67T EQU 1

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\*\*\* NOTE \*\*\*

THE ABOVE 5 LINES OF CODE ARE THE PREAMBLE TO THE BIOS.  
THESE LINES ARE USED BY 'MAKEBIOS' IN GENERATING THE BIOS.  
THESE LINES SHOULD NOT BE ALTERED FOR ANY REASON UNLESS THE  
PROGRAM 'MAKEBIOS' IS ALSO ALTERED. THESE LINES MUST APPEAR  
AS THE FIRST 5 LINES IN THIS SOURCE.

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VERS EQU 03  
LEVEL EQU ' '  
MONTH EQU 08  
DAY EQU 18  
YEAR EQU 83

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BIOS2, A BIOS MODULE FOR CP/M 2.2  
FOR USE WITH HEATH/ZENITH H/Z89 AND H-8 COMPUTERS  
AND H17/H77/H87 5 1/4 INCH DISKS  
AND H47/Z47 8 INCH DISKS  
AND H37 5 1/4 INCH DISKS  
AND H67 HARD DISK WITH 8 INCH FLOPPY

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HEATH/ZENITH SOFTWARE GROUP  
HILLTOP ROAD  
SAINT JOSEPH, MICHIGAN

80 TRACK H17 MODS BY:  
LIVINGSTON LOGIC LABS  
P. O. BOX 5334  
PASADENA, CAL. 91107

1-JAN-82

XEBEC HARD DISK MODS BY:  
LIVINGSTON LOGIC  
POST OFFICE BOX 5334  
PASADENA, CALIFORNIA 91107

26-JUL-83

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XEBT EQU H67T  
FALSE EQU 0  
TRUE EQU 1  
IF TRUE-1

%; TRUE NE 1

ENDIF

IF (H17T+H37T+H47T+XEBT-1) SHR 15

%; NO DISK DRIVE TYPES SPECIFIED

ENDIF

IF (2-(H17T+H37T+H47T+XEBT)) SHR 15

%; TOO MANY DISK DRIVE TYPES SPECIFIED

ENDIF

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PARTITN EQU	TRUE AND PARTITN
XEBPART2 EQU	TRUE AND PARTITN
TOD EQU	FALSE
EVENT EQU	FALSE
INTINP EQU	TRUE
BRKKEY EQU	TRUE AND INTINP
H37ED EQU	TRUE AND H37T
H47ED EQU	TRUE AND H47T
H17ND EQU	3*H17T
H37ND EQU	3*H37T
H47ND EQU	2*H47T
XEBND EQU	2*XEBT
BIOS EQU	\$
BDOS EQU	BIOS-0E00H
CCP EQU	BDOS-0800H
CCPCLR EQU	CCP+3
BOOT EQU	0000H
IOBYTE EQU	BOOT+3
LOGDSK EQU	BOOT+4
BDMAP EQU	0040H
BBDF EQU	0048H
BBDA EQU	0049H
BBP EQU	004AH
BUPB EQU	004DH
BBIOS EQU	004EH
FCB EQU	BOOT+5CH
BUFF EQU	BOOT+80H
TPA EQU	BOOT+100H
UPDP EQU	07CH
UPFC EQU	07DH
UPST EQU	07DH
UPSC EQU	07EH
UPSR EQU	07EH
DPDC EQU	07FH
U0 EQU	02H
U1 EQU	04H
U2 EQU	08H
DFMO EQU	10H
DFDI EQU	20H
DFST EQU	40H
DFHD EQU	01H
DFT0 EQU	02H
DFWP EQU	04H
DFSD EQU	08H
DSYN EQU	0FDH
LPSA EQU	20
STSA EQU	8/2+1
STSB EQU	12/2+1
WHDA EQU	20
WHNA EQU	20
WSCA EQU	64*25/20
WRITA EQU	20
WRITB EQU	10
WRITC EQU	128/8
READA EQU	48
SPD EQU	250
HLTG EQU	20
HST EQU	24/4
STEPR EQU	30/2
DELAYS EQU	6*256+15
RETRIES EQU	10
D\$E\$TRK EQU	001H
D\$E\$HSY EQU	002H
D\$E\$HCK EQU	004H
D\$E\$CHK EQU	008H
D\$E\$RNF EQU	010H
D\$E\$MDS EQU	020H

D\$E\$WRP	EQU	040H
D\$E\$UNR	EQU	080H
H47CTL	EQU	0
H47DAT	EQU	1
DSTR	EQU	10000000B
DSIE	EQU	01000000B
DSDONE	EQU	00100000B
DSERR	EQU	00000001B
DCIE	EQU	01000000B
DCRES	EQU	00000010B
DRS	EQU	01H
DRAS	EQU	02H
DSNS	EQU	03H
DRD	EQU	07H
DWR	EQU	08H
DCOPY	EQU	0BH
DFMT	EQU	0DH
DFMTD	EQU	0EH
DFMTD2	EQU	0FH
FD\$BASE	EQU	078H
FD\$CON	EQU	FD\$BASE
FD\$INT	EQU	FD\$BASE+1
FD\$CMD	EQU	FD\$BASE+2
FD\$STA	EQU	FD\$BASE+2
FD\$DAT	EQU	FD\$BASE+3
FD\$SEC	EQU	FD\$BASE+2
FD\$TRK	EQU	FD\$BASE+3
FD\$CD	EQU	0
FD\$TS	EQU	1
FDCRST	EQU	000H
FDCSEK	EQU	010H
FDCSTP	EQU	020H
FDCSTI	EQU	040H
FDCSTO	EQU	060H
FDCRDS	EQU	080H
FDCWRS	EQU	0A0H
FDCRDA	EQU	0C0H
FDCRDT	EQU	0E0H
FDCWRT	EQU	0F0H
FDCFI	EQU	0D0H
FDFUTR	EQU	00010000B
FDFHLB	EQU	00001000B
FDFVRF	EQU	00000100B
FDFS6	EQU	00000000B
FDFS12	EQU	00000001B
FDFS20	EQU	00000010B
FDFS30	EQU	00000011B
FDFMRF	EQU	00010000B
FDFSLE	EQU	00001000B
FDFDLF	EQU	00000100B
FDFSS1	EQU	00000010B
FDFDDM	EQU	00000001B
FDFINI	EQU	00000000B
FDFII0	EQU	00000001B
FDFII1	EQU	00000010B
FDFII2	EQU	00000100B
FDFII3	EQU	00001000B
FDSNRD	EQU	10000000B
FDSWPV	EQU	01000000B
FDSHLD	EQU	00100000B
FDSRTE	EQU	00100000B
FDSWTF	EQU	00100000B
FDSSEK	EQU	00010000B
FDSRNF	EQU	00010000B
FDSCRC	EQU	00001000B
FDSTK0	EQU	00000100B

FDSLDT	EQU	00000100B
FDSIND	EQU	00000010B
FDSBSY	EQU	00000001B
FDRATRK	EQU	0
FDRASID	EQU	1
FDRASEC	EQU	2
FDRASL	EQU	3
FDRACRC	EQU	4
FDRAL	EQU	6
FDSL128	EQU	0
FDSL256	EQU	1
FDSL512	EQU	2
FDSL1K	EQU	3
CONIRQ	EQU	00000001B
CONDRQ	EQU	00000010B
CONMFM	EQU	00000100B
CONMO	EQU	00001000B
CONDS0	EQU	00010000B
CONDS1	EQU	00100000B
CONDS2	EQU	01000000B
CONDS3	EQU	10000000B
NTRKS37	EQU	40
NTRKD37	EQU	80
NSPTS37	EQU	10
NSPTD37	EQU	16
NSPTE37	EQU	5
ILFS37	EQU	3
ILFD37	EQU	3
ILFE37	EQU	3
NSBT37	EQU	60
FDHDD	EQU	20
DELAY37	EQU	6*256+15
H37VEC	EQU	8*4
DLYMO37	EQU	H37VEC+3
DLYH37	EQU	H37VEC+4
H37CTL	EQU	H37VEC+5
H37IRET	EQU	H37VEC+6
SHUGART	EQU	FALSE
HD\$DAT	EQU	0
HD\$CON	EQU	1
HD\$STA	EQU	1
HD\$SWI	EQU	2
HDFACKH	EQU	10000000B
HDFSEL	EQU	01000000B
HDFEI	EQU	00100000B
HDFRES	EQU	00010000B
HDFDE	EQU	00000010B
HDBREQ	EQU	10000000B
HDBIO	EQU	01000000B
HDBMSG	EQU	00100000B
HDBCMD	EQU	00010000B
HDBBSY	EQU	00001000B
HDBPE	EQU	00000100B
HDBIRQ	EQU	00000010B
HDBACK	EQU	00000001B
HDCTDR	EQU	000H
HDCRCL	EQU	001H
HDCRSY	EQU	002H
HDCRS	EQU	003H
HDCFD	EQU	004H
HDCFT	EQU	006H
HDCFBS	EQU	007H
HDCRD	EQU	008H
HDCWPS	EQU	009H
HDCWR	EQU	00AH
HDCSEK	EQU	00BH
HDCSTG	EQU	00CV

HDCIDC	EQU	00CH
HDCCPY	EQU	020H
HDCFDD	EQU	0C0H
HD0OP	EQU	0
HD0LULA	EQU	1
HD0LUN	EQU	11100000B
HD0LA2	EQU	00011111B
HD0LA1	EQU	2
HD0LA0	EQU	3
HD0NB	EQU	4
HD0CON	EQU	5
HD1OP	EQU	0
HD1LUAS	EQU	1
HD1LUNS	EQU	11100000B
HD1LA2S	EQU	00011111B
HD1LA1S	EQU	2
HD1LA0S	EQU	3
HD1NB	EQU	4
HD1LUAD	EQU	5
HD1LUND	EQU	11100000B
HD1LA2D	EQU	00011111B
HD1LA1D	EQU	6
HD1LA0D	EQU	7
HD1SPAR	EQU	8
HD1CON	EQU	9
HD6OP	EQU	0
HD6LUN	EQU	1
HD6TFC	EQU	5
HDFDR	EQU	10000000B
HDFDDEC	EQU	01000000B
HDFDEN	EQU	00000010B
HDFSID	EQU	00000001B
HDFLUN	EQU	11100000B
HDFERR	EQU	00000010B
HDFPE	EQU	00000001B
HDSMB0	EQU	0
HDSLBS	EQU	1
HDFLB0	EQU	11100000B
HDFSYN	EQU	00001111B
HDSSB	EQU	0
HDSBAV	EQU	10000000B
HDSET	EQU	00110000B
HDSEC	EQU	00001111B
HDSLULA	EQU	1
HDSLUN	EQU	11100000B
HDSLA2	EQU	00011111B
HDSLA1	EQU	2
HDSLA0	EQU	3
HDENS	EQU	000H
HDENIS	EQU	001H
HDENSC	EQU	002H
HDEWF	EQU	003H
HDEDNR	EQU	004H
HDEDNS	EQU	005H
HDENTO	EQU	006H
HDEMDS	EQU	007H
HDEIR	EQU	010H
HDEUD	EQU	011H
HDEIAM	EQU	012H
HDEDAM	EQU	013H
HDERNF	EQU	014H
HDESE	EQU	015H
HDEWP	EQU	017H
HDECDF	EQU	018H
HDEBBF	EQU	019H
HDEFE	EQU	01AH
HDEFC	EQU	020H

```

HDEIDA EQU 021H
HDEIF EQU 022H
PTJMP EQU 0
PTVER EQU PTJMP+3
PVERS EQU 'A'
PTNUL EQU PTVER+1
PTSEK EQU PTNUL+3
PTECC EQU PTSEK+1
PTPCC EQU PTECC+1
PTRWC EQU PTPCC+2
PTHDS EQU PTRWC+2
PTCYL EQU PTHDS+1
PTPTBL EQU PTCYL+2
PTNAM EQU 0
PTCAT EQU PTNAM+10
PTWP EQU PTCAT+1
PTOFF EQU PTWP+1
PTPLEN EQU PTOFF+2
MI$JMP EQU 0C3H
H8CTL EQU 0F0H
H8TR EQU 0D0H
H88CTL EQU 0F2H
M1H EQU 020H
IO0 EQU 040H
CLKE EQU 002H
CLKVEC EQU 0008H
TICCNT EQU 000BH
CTLPRT EQU 000DH
H8FLAG EQU 000EH
DEVCTL EQU 000FH
SERVEC EQU 0008H*3
NDISKS EQU H17ND+H37ND+H47ND+XEBND
IF TRUE-1
%: TRUE NE 1
ENDIF
IF (8-NDISKS) SHR 15
%: NDISK GT 8 -- DRIVE MAP ONLY HAS 8 ENTRY SLOTS
ENDIF
NSECTS EQU 44
IF (H47T AND H47ED) OR (H37T AND H37ED)
HSTSIZ EQU 1024
ENDIF
IF NOT ((H47T AND H47ED) OR (H37T AND H37ED))
HSTSIZ EQU 256
ENDIF
BT$WM EQU 0FFH
BT$CD EQU 000H
H85CRT EQU 372Q
H84TTY EQU 0D0H
H84CRT EQU 0E8H
H84LPT EQU 0E0H
H84RDP EQU 0D8H
B75 EQU 1536
B110 EQU 1047
B134 EQU 857
B300 EQU 384
B600 EQU 192
B1200 EQU 96
B2400 EQU 48
B4800 EQU 24
B9600 EQU 12
B19200 EQU 6
NULL EQU 00H
CTLC EQU 03H
BELL EQU 07H

```

CR	EQU	0DH
LF	EQU	0AH
PADCH	EQU	CR
TTY	EQU	0
CRT	EQU	1
PTR	EQU	1
PTP	EQU	1
BAT	EQU	2
UR1	EQU	2
UP1	EQU	2
LPT	EQU	2
UC1	EQU	3
UR2	EQU	3
UP2	EQU	3
UL1	EQU	3
DIOB	EQU	(CRT) OR (UR1 SHL 2) OR (UP1 SHL 4) OR (LPT SHL 6)
DDSEL	EQU	0
DDRD	EQU	3
DDWR	EQU	6
DDRES	EQU	9
DDMNT	EQU	12
DPEXLT	EQU	0
DPEDPB	EQU	10
DPEHTH	EQU	16
DPEL	EQU	24
DPEFLAG	EQU	DPEHTH+0
DPETYPE	EQU	11100000B
DPENE	EQU	00000000B
DPEH17	EQU	01000000B
DPEH37	EQU	01100000B
DPEH47	EQU	10000000B
DPEXEB	EQU	11000000B
DPEP7C	EQU	00010000B
DPE48RO	EQU	00010000B
DPE96T	EQU	00001000B
DPEASGN	EQU	00000100B
DPEED	EQU	00000100B
DPEDD	EQU	00000010B
DPE2S	EQU	00000001B
DPEUNIT	EQU	DPEHTH+1
DPERPS	EQU	DPEHTH+2
DPERPAB	EQU	DPEHTH+3
DPETRK	EQU	DPEHTH+4
DPEUNK	EQU	10000000B
DPESEK	EQU	DPEHTH+5
DPEMO	EQU	10000000B
DPEUPB	EQU	DPEHTH+6
DPEFLG2	EQU	DPEHTH+6
DPEIMG	EQU	00000010B
DPE96TM	EQU	00000001B
DPELUN	EQU	DPEHTH+7
DPEHL	EQU	8
DPBSPT	EQU	0
DPBBSH	EQU	DPBSPT+2
DPBBLM	EQU	DPBSPT+3
DPBEXM	EQU	DPBSPT+4
DPBDSM	EQU	DPBSPT+5
DPBDRM	EQU	DPBSPT+7
DPBAL0	EQU	DPBSPT+9
DPBAL1	EQU	DPBSPT+10
DPBCKS	EQU	DPBSPT+11
DPBOFF	EQU	DPBSPT+13
DPBL	EQU	15
LABVER	EQU	0
LABBUF	EQU	0
RDTYPE	EQU	L.ABRUF+3

LABEL	EQU	LABBUF+4
LABTYP	EQU	LABEL+0
LABHTH	EQU	LABTYP+1
LABDPB	EQU	LABHTH+DPEHL
LABCS	EQU	LABDPB+DPBL
LABLEN	EQU	LABCS-LABEL+1
SBC\$SBC	EQU	0
SBC\$JMP	EQU	0000H
SBC\$VER	EQU	0003H
SBC\$REV	EQU	0004H
SBC\$DBS	EQU	0005H
SBC\$BSA	EQU	0018H
SBC\$BSB	EQU	001BH
SBC\$SBA	EQU	001EH
SBC\$SBB	EQU	0021H
SBC\$SSZ	EQU	0024H
SBC\$SPT	EQU	0026H
SBC\$TPC	EQU	0028H
SBC\$CPV	EQU	002AH
SBC\$SPS	EQU	002CH
SBC\$VSZ	EQU	002EH
SBC\$NSL	EQU	0031H
SBC\$CSA	EQU	0032H
SBC\$CSB	EQU	0034H
SBC\$CBA	EQU	0036H
SBC\$CBB	EQU	0038H
SBC\$LEN	EQU	0080H
SPB\$OSD	EQU	0
SPB\$PAT	EQU	1
SPB\$OSL	EQU	16
SPB\$OSN	EQU	16
SPB\$OSI	EQU	0
SPB\$OSM	EQU	00011111B
SPB\$UAR	EQU	00011110B
SPB\$EOL	EQU	SPB\$OSM
SPB\$FSN	EQU	1
SPB\$PEL	EQU	4
SBC\$BEL	EQU	3
	JMP	CBOOT
WBOOT:	JMP	WBOOT
	JMP	CONST
	JMP	CONIN
	JMP	CONOUT
	JMP	LIST
	JMP	PUNCH
	JMP	READER
	JMP	HOME
	JMP	SETDSK
	JMP	SETTRK
	JMP	SETSEC
	JMP	SETDMA
	JMP	READ
	JMP	WRITE
	JMP	LISTST
	JMP	SECTAN
BIOSVER	DB	VERS
DEFIOB	DB	DIOB
PRTRDY	DB	010H
MODE	DB	PARTITN*MODEB3+MODEB7
MODEB0	EQU	00000001B
MODEB1	EQU	00000010B
MODEB2	EQU	00000100B
MODEB3	EQU	00001000B
MODEB5	EQU	00100000B
MODEB6	EQU	01000000B
MODEB7	EQU	10000000B

```

H84PT1: DB      H84CRT
CRTBAUD DW      B9600+8000H
H84PT2: DB      H84TTY
TTYBAUD:DW      B300
H84PT3: DB      H84LPT
LPTBAUD:DW      B4800
H84PT4: DB      H84RDP
RDPBAUD:DW      B300
ALTPRT: DB      0A8H
XEPART0:DB      (16*(DPEXE$0-DPBASE)/DPEL)+0
XEPART1:DB      (16*(DPEXE$1-DPBASE)/DPEL)+1
BSIZE   DB      (BIOSEND-BIOS+255)/256
BEND    DW      BIOSEND
SECNT17 DW      0
SECNT37 DW      0
BNDISKS DB      NDISKS
DPBASE  DS      0
        IF      H17T
DPE0:   DW      XLT17,0000H
        DW      0000H,0000H
        DW      DIRBUF,DPB17S
        DW      CSV0,ALV0
        DB      DPEH17
        DB      U0
        DB      2
        DB      8
        DB      0FFH
        DB      STEPR
        DB      0
        DB      0
DPE1:   DW      XLT17,0000H
        DW      0000H,0000H
        DW      DIRBUF,DPB17S
        DW      CSV1,ALV1
        DB      DPEH17
        DB      U1
        DB      2
        DB      8
        DB      0FFH
        DB      STEPR
        DB      0
        DB      0
DPE2:   DW      XLT17,0000H
        DW      0000H,0000H
        DW      DIRBUF,DPB17S
        DW      CSV2,ALV2
        DB      DPEH17
        DB      U2
        DB      2
        DB      8
        DB      0FFH
        DB      STEPR
        DB      0
        DB      0
        ENDIF
        IF      H37T
DPE37$0 DW      0000H,0000H
        DW      0000H,0000H
        DW      DIRBUF,DPB37$0
        DW      CSV37$0,ALV37$0
        DB      DPEH37+DPEDD
        DB      CONDS0
        DB      2
        DB      8
        DB      DPEUNK
        DB      FDFS30

```

```

DB 0
DB 0
DPE37$1 DW 0000H,0000H
DW 0000H,0000H
DW DIRBUF,DPB37$1
DW CSV37$1,ALV37$1
DB DPEH37+DPEDD
DB CONDS1
DB 2
DB 8
DB DPEUNK
DB FDFS30
DB 0
DB 0
DPE37$2 DW 0000H,0000H
DW 0000H,0000H
DW DIRBUF,DPB37$2
DW CSV37$2,ALV37$2
DB DPEH37+DPEDD
DB CONDS2
DB 2
DB 8
DB DPEUNK
DB FDFS30
DB 0
DB 0
ENDIF
IF H47T
DPE47$0 DW XLT0S,0000H
DW 0000H,0000H
DW DIRBUF,DPBOSS
DW CSV47$0,ALV47$0
DB DPEH47
DB 000H
DB 1
DB 8
DB 0,0,0,0
DPE47$1 DW XLT0S,0000H
DW 0000H,0000H
DW DIRBUF,DPBOSS
DW CSV47$1,ALV47$1
DB DPEH47
DB 020H
DB 1
DB 8
DB 0,0,0,0
ENDIF
IF XEBT
DPEXE$0 DW 0000H,0000H
DW 0000H,0000H
DW DIRBUF,DPBXE$0
DW 0000H,ALVXE$0
DB DPEXEB
DB 0
DB 2
DB 32
DW 0
DW 0
ENDIF
IF XEBPART2 AND (XEBT)
DPEXE$1 DW 0000H,0000H
DW 0000H,0000H
DW DIRBUF,DPBXE$1
DW 0000H,ALVXE$1
DB DPEXEB
DB 0

```

```

2
DB      32
DW      0
DW      0
ENDIF
WBOOT: LXI      SP,STACK
        EI
        XRA     A
        MOV     C,A
        MOV     E,A
        CALL   SETDSK
        MOV     A,H
        ORA    L
        JZ     WBTE
        PUSH   H
        CALL   HLIHL
        SHLD   XLTW1
        SHLD   XLTW
        POP    H
        PUSH   H
        LXI    D,DPEDPB
        DAD    D
        CALL   HLIHL
        MOV     A,M
        STA    SPT1
        STA    SPT
        POP    H
        IF     H47T
        PUSH   H
        LXI    D,DPEHTH
        DAD    D
        MOV     A,M
        MOV     C,A
        ANI    DPETYPE
        CPI    DPEH47
        JNZ    WBT0
WBT0X: MVI     A,26
        LXI    H,XLT0S
        STA    SPT
        SHLD   XLTW
WBT0:  POP    H
        ENDIF
        LXI    D,DPEHTH
        DAD    D
        LXI    D,CCP-128
        LXI    B,NSECTS*256
        IF     H37T OR XEBT
        MOV     A,M
        ANI    DPETYPE
        CPI    DPEH37
        JZ     WBT0Y
        CPI    DPEXEB
        JNZ    WBT0Z
WBT0Y: LXI     D,CCP-256
        ENDIF
WBT0Z: LXI     H,0
WBT1:  SHLD   SEKTRK
        XCHG
        SHLD   DMAB
WBT2:  PUSH   B
        MVI    B,0
        LHLD   XLTW
        XCHG
        CALL   SECTRAN
        MOV     C,L
        MOV     A,L
        PUSH   D

```

	PUSH	PSW
	CALL	SETSEC
	POP	PSW
	DCR	A
	CALL	CDA
	SHLD	DMAADR
	MOV	A,H
	LXI	B,CCP
	CMP	B
	JC	WBT3
	LXI	B,BIOS
	CMP	B
	JNC	WBT3
	CALL	READ
	ORA	A
	JNZ	WBTE
	POP	B
	DCR	B
	JZ	WBT4
	PUSH	B
WBT3:	POP	B
	INR	C
	LDA	SPT
	CMP	C
	JNZ	WBT2
	MVI	C,0
	CALL	CDA
	PUSH	H
	LDA	SPT1
	STA	SPT
	LHLD	XLTW1
	SHLD	XLTW
	POP	H
	XCHG	
	LHLD	SEKTRK
	INX	H
	JMP	WBT1
WBT4:	MVI	A,BT\$WM
GOW:	PUSH	PSW
	MVI	A,MI\$JMP
	LXI	H,WBOOTE
	STA	BOOT
	SHLD	BOOT+1
	LXI	H,BDOS+6
	STA	BOOT+5
	SHLD	BOOT+6
	LXI	B,BUFF
	CALL	SETDMA
	CALL	FLUSH1
	POP	PSW
	RRC	
	LDA	MODE
	JNC	GOW1
	RAL	
GOW1:	RAL	
	LDA	LOGDSK
	STA	SEKDSK
	MOV	C,A
	JC	CCP
	JMP	CCPCLR
WBTE:	LXI	H,BTMSG
	CALL	PMSG
	CALL	CONIN
	JMP	WBOOT
CDA:	LHLD	DMAB
	ORA	A
	DAB	

	MOV	D,A
	MVI	A,0
	RAR	
	MOV	E,A
	DAD	D
	RET	
HOME:	LDA	HSTWRT
	ORA	A
	JNZ	HOMED
	STA	HSTACT
HOMED:	LXI	B,0
SETTRK:	MOV	H,B
	MOV	L,C
	SHLD	SEKTRK
	RET	
SETDSK:	MOV	A,E
	STA	SETDSKB
	MOV	A,C
	STA	SETDSKA
	CPI	NDISKS
	JNC	SETDE
	LXI	H,BDMAP
	CALL	DADA
	MOV	A,M
	STA	SEKDSK
	CALL	GETDPE
	SHLD	SETDSKC
	LXI	D,DPEHTH
	DAD	D
	SHLD	DPBX
	IF	PARTITN AND (XEPT)
	MOV	A,M
	ANI	DPETYPE
	CPI	DPEXEB
	JNZ	SETDSK1
	LDA	XEIFLG
	ORA	A
	JZ	SETDSK1
	MOV	A,M
	ANI	DPEASGN
	JZ	SETDE
	ENDIF	
SETDSK1:	LDA	SETDSKB
	RAR	
	JC	SETDSK2
	CALL	FLUSH
	LXI	H,MODE
	MOV	A,M
	STA	SETDSKD
	ANI	OFFH-MODEB1
	MOV	M,A
	LDA	SEKDSK
	CALL	SHD
	LXI	D,DDSEL
	CALL	DSKDIS
	LDA	SETDSKD
	STA	MODE
	JC	SETDE
SETDSK2:	LHLD	SETDSKC
	RET	
SETDE:	LDA	SETDSKA
	LXI	H,LOGDSK
	CMP	M
	JNZ	SETDE1

```

MVI      M,0
SETDE1:  LXI      H,0000H
          RET
SETDSKA  DS      1
SETDSKB  DS      1
SETDSKC  DS      2
SETDSKD  DS      1
DSKDIS:  MOV      A,M
          RLC
          RLC
          RLC
          ANI      DPETYPE/32
          IF      DPETYPE-11100000B
%:        DPETYPE NE 11100000B
          ENDIF
          ADD      A
          LXI      H,DTT
          CALL     DADA
          CALL     HLIHL
          DAD      D
          PCHL

DTT:     DW      NULDVD
          DW      NULDVD
          IF      H17T
          DW      H17DVD
          ENDIF
          IF      NOT (H17T)
          DW      NULDVD
          ENDIF
          IF      H37T
          DW      H37DVD
          ENDIF
          IF      NOT (H37T)
          DW      NULDVD
          ENDIF
          IF      H47T
          DW      H47DVD
          ENDIF
          IF      NOT (H47T)
          DW      NULDVD
          ENDIF
          DW      NULDVD
          IF      XEBT
          DW      XEBDVD
          ENDIF
          IF      NOT (XEBT)
          DW      NULDVD
          ENDIF
          DW      NULDVD
SETSEC:  MOV      A,C
          DCR      A
          STA      SEKSEC
          RET
SETDMA:  MOV      H,B
          MOV      L,C
          SHLD     DMAADR
          RET
SECTRAN: XCHG
          MOV      A,H
          ORA      L
          DAD      B
          JZ      SECTRAN1
          MOV      L,M
          MVI      H,0
          RET

```

SECTRAN1:	INX	H
	RET	
WRALL	EQU	0
WRDIR	EQU	1
WRUAL	EQU	2
READ:	XRA	A
	STA	UNACNT
	MVI	A,1
	STA	READOP
	STA	RSFLAG
	MVI	A,WRUAL
	STA	WRTYPE
	JMP	RWOPER
WRITE:	XRA	A
	STA	READOP
	MOV	A,C
	STA	WRTYPE
	CPI	WRUAL
	JNZ	CHKUNA
	LHLD	DPBX
	INX	H
	INX	H
	INX	H
	MOV	A,M
	STA	UNACNT
	LDA	SEKDSK
	STA	UNADSK
	LHLD	SEKTRK
	SHLD	UNATRK
	LHLD	DPBX
	LXI	D,-DPEHTH
	DAD	D
	CALL	HLIHL
	MOV	A,H
	ORA	L
	JNZ	WRITE0
	LDA	SEKSEC
	STA	UNASI
	JMP	CHKUNA
WRITE0:	LDA	SEKSEC
	INR	A
	MVI	C,0
WRITE1:	CMP	M
	JZ	WRITE2
	INR	C
	INX	H
	JMP	WRITE1
WRITE2:	MOV	A,C
	STA	UNASI
CHKUNA:	LDA	UNACNT
	ORA	A
	JZ	ALLOC
	DCR	A
	STA	UNACNT
	LDA	SEKDSK
	LXI	H,UNADSK
	CMP	M
	JNZ	ALLOC
	LDA	SEKTRK
	LXI	H,UNATRK
	CMP	M
	JNZ	ALLOC
	LDA	SEKTRK+1
	INX	H
	CMP	M

	JNZ	ALLOC	
	LHLD	DPBX	
	LXI	D,-DPEHTH	
	<del>MOV</del>	<del>HL,HL</del>	
	ORA	L	
	JNZ	CHKUNA5	
	LDA	UNASI	
	LXI	H,SEKSEC	
	JMP	CHKUNA6	
CHKUNA5:	LDA	UNASI	
	CALL	DADA	
	LDA	SEKSEC	
	INR	A	
CHKUNA6:	CMP	M	
	LXI	H,UNASI	
	JNZ	ALLOC	
	INR	M	
	MOV	A,M	
	PUSH	H	
	PUSH	PSW	
	LHLD	DPBX	
	LXI	D,-DPEHTH+DPEDPB	
	DAD	D	
	CALL	HLIHL	
	POP	PSW	
	CMP	M	
	POP	H	
	JC	NOOVF	
	MVI	M,0	
	LHLD	UNATRK	
	INX	H	
	SHLD	UNATRK	
NOOVF:	XRA	A	
	STA	RSFLAG	
	JMP	RWOPER	
ALLOC:	XRA	A	
	STA	UNACNT	
	INR	A	
	STA	RSFLAG	
RWOPER:	XRA	A	
	STA	ERFLAG	
	LHLD	DPBX	
	MOV	C,M	
	INX	H	
	INX	H	
	MOV	B,M	
	IF	H47T	
	MOV	A,C	
	ANI	DPETYPE	
	CPI	DPEH47	
	JNZ	RW0	
RWOX:	LHLD	SEKTRK	
	MOV	A,H	
	ORA	L	
	JNZ	RW0	
	MVI	B,1	
	ENDIF		
RW0:	MOV	A,B	
	STA	LSP	
	LDA	SEKSEC	
RW1:	PUSH	PSW	
	MOV	A,B	
	RAR		
	MOV	B,A	
	JC	RW2	
	POP	PSW	

	ORA	A
	RAR	
RW2:	JMP	RW1
	POP	PSW
	STA	SEKHST
	LXI	H,HSTACT
	MOV	A,M
	MVI	M,1
	ORA	A
	JZ	FILHST
	LDA	SEKDSK
	LXI	H,HSTDSK
	CMP	M
	JNZ	NOMATCH
	LDA	SEKTRK
	LXI	H,HSTTRK
	CMP	M
	JNZ	NOMATCH
	LDA	SEKTRK+1
	INX	H
	CMP	M
	JNZ	NOMATCH
	LDA	SEKHST
	LXI	H,HSTSEC
	CMP	M
	JZ	MATCH
NOMATCH:	LDA	HSTWRT
	ORA	A
	CNZ	WRITEHST
FILHST:	LDA	SEKDSK
	STA	HSTDSK
	LHLD	SEKTRK
	SHLD	HSTTRK
	LDA	SEKHST
	STA	HSTSEC
	LDA	READOP
	ORA	A
	JNZ	FIL1
	LDA	LSP
	DCR	A
	JZ	FIL2
FIL1:	LDA	RSFLAG
	ORA	A
	CNZ	READHST
FIL2:	XRA	A
	STA	HSTWRT
MATCH:	LDA	LSP
	DCR	A
	LXI	H,SEKSEC
	ANA	M
	LXI	H,0
	JZ	M2
	LXI	D,128
M1:	DAD	D
	DCR	A
	JNZ	M1
M2:	LXI	D,HSTBUF
	DAD	D
	XCHG	
	LHLD	DMAADR
	MVI	C,128
	LDA	READOP
	ORA	A
	JNZ	RWMOVE
	MVI	A,1
	STA	HSTWRT

	XCHG	
RWMOVE:	CALL	MOVEITX
	LDA	WRTYPE
	CPI	WRDIR
	LDA	ERFLAG
	JNZ	RW9
	ORA	A
	JNZ	RW9A
	XRA	A
	STA	HSTWRT
	CALL	WRITEHST
	LDA	ERFLAG
RW9:	ANA	A
	RZ	
RW9A:	PUSH	PSW
	CALL	FLUSH1
	POP	PSW
	RET	
READHST:		
	XRA	A
	STA	RWOP
	LDA	HSTDSK
	CALL	SHD
	LXI	D, DDRD
	JMP	DSKDIS
WRITEHST:		
	MVI	A, 1
	STA	RWOP
	LDA	HSTDSK
	CALL	SHD
	LXI	D, DDWR
	JMP	DSKDIS
FLUSH:	LDA	HSTACT
	ANA	A
	JZ	FLUSH1
	LDA	HSTWRT
	ANA	A
	CNZ	WRITEHST
FLUSH1:	XRA	A
	STA	HSTACT
	STA	HSTWRT
	STA	UNACNT
	RET	
PRTERR:	LDA	MODE
	ANI	MODEB1
	RZ	
	PUSH	H
	LXI	H, CRLF
	CALL	PMSG
	POP	H
	CALL	PMSG
	LDA	RWOP
	LXI	H, RDMSG
	ANA	A
	JZ	PRTERR1
	LXI	H, WRMSG
PRTERR1:		
	CALL	PMSG
	LXI	H, ERRMSG
	CALL	PMSG
	LDA	ERRTYP
	CALL	HOUT
	LXI	H, CRLF
	CALL	PMSG
	RET	

```

SHD:
IF      H17T OR H37T
STA     SHDA
STA     SHDB
ENDIF
CALL    GETDPEX
SHLD    HSTDPB
IF      H17T OR H37T
MOV     A,M
ANI     DPETYPE
CPI     DPEH17
JZ      SHD1
CPI     DPEH37
JNZ     SHD6
SHD1:   XCHG
        LXI     H,DPEFLG2-DPEH7H
        DAD     D
        MOV     A,M
        ANI     DPEIMG
        JZ      SHD2
        LXI     H,DPELUN-DPEH7H
        DAD     D
        MOV     A,M
        STA     SHDB
        CALL    GETDPEX
        XCHG
SHD2:   LXI     H,DPELUN-DPEH7H
        DAD     D
        LDA     SHDA
        CMP     M
        JZ      SHD5
        MOV     M,A
        CALL    SHD9
        ADI     'A'
        STA     MNMSGA
        LDA     SHDB
        CALL    SHD9
        ADI     'A'
        STA     MNMSGB
        LXI     D,DDMNT
        LHLD    HSTDPB
        CALL    DSKDIS
        LXI     H,MNMSG
SHD3:   CALL    PMSG
        CALL    CONIN
        CPI     CR
        JZ      SHD4
        MVI     C,BELL
        CALL    CONOUT
        JMP     SHD3
SHD4:   LXI     H,CRLF
        CALL    PMSG
SHD5:   LHLD    HSTDPB
        ENDIF
SHD6:   RET
IF      H17T OR H37T
SHD9:   RAR
        RAR
        RAR
        RAR
        ANI     0FH
        RET
SHDA    DS     1
SHDB    DS     1
MNMSG   DB     CR,LF,'PUT DISK '
MNMSGA  DB     '. IN DRIVE '

```

```

MNMSGB DB      ': AND PRESS RETURN',0
        ENDIF
        IF      H17T
H17DVD: JMP     SET17
        JMP     RD17M
        JMP     WR17M
        JMP     RESH17
        JMP     MNTH17
H17PMS: DW     DPB17S
        DB     DPE48RO,8
        DW     DPB17S
        DB     0,8
        DW     DPB17X
        DB     0,8
        DW     DPB17X
        DB     DPE48RO+DPE2S,8
        DW     DPB17X
        DB     1,8
        DW     DPB17D
        DB     1,16
SET17:  CALL    RDYH17
        RC
        LHL    HSTDPB
        LXI    D,DPETRK-DPEHTH
        DAD    D
        MVI    M,0FFH
        EI
        CALL   SDP
        CALL   MAI
        CALL   MAI
        MVI    A,HST
        STA    DLYW
        CALL   SET17CK
        JC     SET17ER
        LHL    HSTDPB
        DCR    A
        JZ     SET17D
        INR    A
        CPI    2
        JNZ    SET17A
        MVI    A,DPE96T
        ANA    M
SET17ER: MVI    A,1
        JZ     SET17D
        CALL   MAI
        PUSH   H
        CALL   SET17CK
        POP    H
        JC     SET17E
        DCR    A
        CPI    2
        JZ     SET17D
SET17E: MVI    A,3
        JMP     SET17D
SET17A: MVI    A,DPE96T
        ANA    M
        MVI    A,4
        JZ     SET17D
        INR    A
        JMP     SET17D
;
SET17D: PUSH   PSW
        CALL   STZ
        POP    PSW
        ADD    A
        ADD    A
        MOV    F,A

```

MOV	E,A
MVI	D,0
LXI	H,H17PMS
DAD	D
XCHG	
LHLD	SETDSKC
LXI	B,DPEDPB
DAD	B
LDAX	D
MOV	M,A
INX	D
INX	H
LDAX	D
MOV	M,A
INX	D
LHLD	HSTDPB
MVI	A,0FFH-DPE2S-DPE48RO
ANA	M
XCHG	
ORA	M
XCHG	
MOV	M,A
INX	D
LXI	B,DPERPAB-DPEHTH
DAD	B
LDAX	D
MOV	M,A
JMP	XOK
SET17CK0: CALL	STS
SET17CK:LDA	DLYW
ORA	A
JNZ	SET17CK0
MVI	B,LPSA
SET17K1:DI	
CALL	WSC
JC	SET17K2
CALL	RDB
CALL	RDB
PUSH	PSW
CALL	RDB
MOV	H,D
CALL	RDB
EI	
CMP	H
JZ	SET17K3
POP	PSW
SET17K2:CALL	STS
DCR	B
JNZ	SET17K1
STC	
RET	
SET17K3:POP	PSW
ANA	A
RET	
RD17M: LDA	HSTSEC
STA	SECTOR
LDA	HSTTRK
STA	TRACK
CALL	RD17
MVI	A,00H
JNC	RDH1
DCR	A
RDH1: STA	ERFLAG
RET	
WR17M: LDA	HSTSEC
STA	SECTOR

	LDA	HSTTRK
	STA	TRACK
	CALL	WR17
	MVI	A,00H
	JNC	WRH1
	DCR	A
WRH1:	STA	ERFLAG
	RET	
XOK:	XRA	A
XIT:	PUSH	PSW
	DI	
	LXI	H,DELAYS
	SHLD	DLYMO
	LDA	CTLPRT
	ANI	OFFH-040H
	STA	CTLPRT
	OUT	H88CTL
	POP	PSW
	EI	
	RET	
RD17:	CALL	SDP
RD171:	CALL	SDT
	CALL	LPS
	JC	RD17E
	MVI	B,0
	LXI	H,HSTBUF
	CALL	WSC
	MVI	A,D\$E\$MDS
	JC	RD17E
RD172:	CALL	RDB
	MOV	M,A
	INX	H
	DCR	B
	JNZ	RD172
	MOV	B,D
	CALL	RDB
	CMP	B
	JZ	XOK
	MVI	A,D\$E\$CHK
RD17E:	CALL	H17E
	JNC	RD171
	JMP	XIT
WR17:	CALL	SDP
WR171:	IN	DPDC
	ANI	DFWP
	MVI	A,D\$E\$WRP
	JNZ	WR17E
	LHLD	DPBX
	MOV	A,M
	ANI	DPE48RO
	MVI	A,D\$E\$WRP
	JNZ	WR17E
	CALL	SDT
	CALL	LPS
	JC	WR17E
	MVI	B,0
	LXI	H,HSTBUF
WRITAL:	EQU	+\$1
	MVI	A,WRITA
WR172:	DCR	A
	JNZ	WR172
	MVI	C,WRITB
WRITCL:	EQU	+\$1
	MVI	A,WRITC
	CALL	WSP
WR173:	MOV	A,M

	CALL	WNB
	INX	H
	DCR	B
	JNZ	WR173
	MOV	A,D
	CALL	WNB
	CALL	WNB
	CALL	WNB
	CALL	WNB
	LDA	DEVCTL
	OUT	DPDC
	JMP	XOK
WR17E:	CALL	H17E
	JNC	WR171
	JMP	XIT
H17E:	EI	
	STA	ERRTYP
	ANI	D\$E\$UNR+D\$E\$WRP
	JNZ	H17E4
	LHLD	SECNT17
	INX	H
	SHLD	SECNT17
	LXI	H,ERRCNT
	DCR	M
	JZ	H17E4
	LDA	ERRTYP
	CPI	D\$E\$TRK
	JZ	H17E2
	MOV	A,M
	CPI	5
	JZ	H17E2
	RAR	
	CMC	
	RNC	
	LHLD	TRKPT
	RAR	
	MOV	A,M
	JC	H17E1
	CPI	39
	JZ	H17E3
	INR	M
	CALL	MAI
	JMP	H17E3
H17E1:	ORA	A
	JZ	H17E3
	DCR	M
	CALL	MAO
	JMP	H17E3
H17E2:	CALL	STZ
H17E3:	XRA	A
	RET	
H17E4:	LXI	H,H17MSG
	CALL	PRTERR
	STC	
	RET	
H17MSG	DB	'H17',0
MNTH17:	LHLD	HSTDPB
	LXI	D,DPETRK-DPEHTH
	DAD	D
	MVI	M,OFFH
	JMP	RESH17
; RESH17:	XRA	A
	OUT	DPDC
	STA	DEVCTL
	LXI	H,0
	SHLD	DLYMO

	RET	
RDYH17:	CALL	ONH17
	LXI	H,DLYW
RDYH17A:	MOV	A,M
	ANA	A
	JNZ	RDYH17A
	LXI	H,TICCNT
	MVI	A,100
	ADD	M
	MOV	B,A
	MVI	C,0
	MOV	D,C
RDYH17B:	IN	DPDC
	ANI	DFHD
	CMP	D
	JZ	RDYH17C
	MOV	D,A
	INR	C
WHDAL1:	EQU	\$+1
	MVI	A,WHDA
RDYH17B1:	DCR	A
	JNZ	RDYH17B1
RDYH17C:	MOV	A,B
	CMP	M
	JNZ	RDYH17B
	MOV	A,C
	CPI	10*2
	JC	RDYH17D
	CPI	12*2+1
	CMC	
	JNC	RDYH17E
RDYH17D:	MVI	A,D\$E\$UNR
	CALL	H17E
RDYH17E:	JMP	XIT
ONH17:	EI	
	LXI	H,0
	SHLD	DLYMO
	LDA	CTLPRT
	ANI	OFFH-040H
	STA	CTLPRT
	OUT	H88CTL
	LHLD	HSTDPB
	INX	H
	MOV	A,M
	ORI	DFMO
	OUT	DPDC
	MOV	B,A
	LXI	H,DEVCTL
	MOV	A,M
	ANI	DFMO
	JNZ	ONH17A
	PUSH	H
	LHLD	HSTDPB
	LXI	D,DPESEK-DPEHTH
	DAD	D
	MOV	A,M
	POP	H
	RAL	
	ENDIF	

```

      8: DPEMO NE 10000000B
        ENDIF
        IF      (H17T)
        MVI    A,SPD
        JNC    ONH17B
        RAR
        RAR
        ANI    03FH
        JMP    ONH17B
ONH17A: MOV    A,M
        ANI    U0+U1+U2
        ANA    B
        MVI    A,0
        JNZ    ONH17B
        MVI    A,HLTG
ONH17B: STA    DLYW
        MOV    M,B
        RET

SDP:
        MVI    A,4
        LXI    B,0
SDP0:  PUSH   PSW
        LXI    D,9
        LXI    H,TICCNT
        MOV    A,M
SDP1:  CMP    M
        JZ    SDP1
        MOV    A,M
SDP2:  INX    D
        ANA    A
        RC
        CMP    M
        JZ    SDP2
        XCHG
        DAD    B
        MOV    C,L
        MOV    B,H
        POP   PSW
        DCR    A
        JNZ    SDP0
        MOV    A,B
        INR    A
        ANI    006H
        RAR
        MOV    B,A
        MVI    A,WRITA
        CALL   MCON
        STA    WRITAL
        MVI    A,WRITC
        CALL   MCON
        STA    WRITCL
        MVI    A,WHDA
        CALL   MCON
        STA    WHDAL1
        STA    WHDAL2
        MVI    A,WHNA
        CALL   MCON
        STA    WHNAL
        MVI    A,READA
        CALL   MCON
        STA    READAL
        MVI    A,WSCA
        CALL   MCON
        STA    WSCAL
        CALL   ONH17

```

	MVI	A, RETRIES
	STA	ERRCNT
	LHLD	HSTDPB
	LXI	D, DPETRK-DPEHTH
	DAD	D
	SHLD	TRKPT
	MOV	A, M
	INR	A
	RNZ	
	JMP	STZ
MCON:	PUSH	B
	MOV	C, A
	XRA	A
MCON0:	ADD	C
	DCR	B
	JNZ	MCON0
	POP	B
	RET	
SDT:	XRA	A
	STA	SIDE
	LHLD	HSTDPB
	MOV	A, M
	ANI	DPE2S
	LDA	HSTTRK
	JZ	SDT0
	RRC	
	PUSH	PSW
	RRC	
	ANI	040H
	STA	SIDE
	POP	PSW
	ANI	7FH
SDT0:	STA	TRACK
	JMP	SDT2
SDT1:	INR	M
	CALL	MAI
	LHLD	HSTDPB
	MOV	A, M
	ANI	DPE48RO
	JZ	SDT2
	CALL	MAI
SDT2:	LHLD	TRKPT
	LDA	TRACK
	CMP	M
	JZ	SDT3
	JP	SDT1
	DCR	M
	CALL	MAO
	LHLD	HSTDPB
	MOV	A, M
	ANI	DPE48RO
	JZ	SDT2
	CALL	MAO
	JMP	SDT2
SDT3:	LDA	CTLPRT
	PUSH	H
	LXI	H, SIDE
	ANI	0FFH-40H
	ORA	M
	OUT	H88CTL
	STA	CTLPRT
	POP	H
	LDA	HSTTRK
	STA	TRACK
SDT4:	LDA	DLYW
	CPT	HST

	RNC	
	MVI	A,HST
	STA	DLYW
	RET	
STZ0:	CALL	MAO
STZ:	IN	DPDC
	ANI	DFT0
	JZ	STZ0
	LHLD	TRKPT
	MVI	M,0
	JMP	SDT4
MAI:	MVI	A,DFDI
	JMP	MAO1
MAO:	XRA	A
MAO1:	PUSH	H
	MOV	H,A
	LDA	DEVCTL
	ORA	H
	OUT	DPDC
	ORI	DFST
	OUT	DPDC
	XRI	DFST
	OUT	DPDC
	LHLD	HSTDPB
	LXI	D,5
	DAD	D
	MOV	A,M
	ANI	07FH
	POP	H
	CPI	00FH
	JNZ	DLY
	INR	A
DLY:	PUSH	H
	LXI	H,TICCNT
	ADD	M
DLY1:	CMP	M
	JNZ	DLY1
	POP	H
	RET	
LPS0:	CALL	STS
LPS:	LDA	DLYW
	ORA	A
	JNZ	LPS0
	MVI	B,LPSA
LPS1:	DI	
	CALL	WSC
	MVI	A,D\$E\$HSY
	JC	LPS2
	CALL	RDB
	CALL	RDB
	LXI	H,TRACK
	CMP	M
	MVI	A,D\$E\$TRK
	JNZ	LPS2
	CALL	RDB
	INX	H
	CMP	M
	MVI	A,D\$E\$RNF
	JNZ	LPS2
	MOV	H,D
	CALL	RDB
	CMP	H
	RZ	
	MVI	A,D\$E\$HCK
LPS2:	PUSH	PSW
	CALL	STS

	POP	PSW
	DCR	B
	JNZ	LPS1
	STC	
	RET	
STS:	EI	
	PUSH	B
	IN	DPDC
	RAR	
	JC	STS2
	LXI	H,TICCNT
	MOV	B,M
STS1:	IN	DPDC
	RAR	
	JC	STS2
	MVI	A,STSA
	ADD	B
	CMP	M
	JNZ	STS1
	JMP	STS3
STS2:	CALL	WNH
	MVI	A,STSB
	CALL	DLY
STS3:	POP	B
	DI	
WHD:	IN	DPDC
	RAR	
	JNC	WHD
WHDAL2:	EQU	\$/+1
	MVI	A,WHDA
	JMP	UDLY
WNH:	IN	DPDC
	RAR	
	JC	WNH
WHNAL:	EQU	\$/+1
	MVI	A,WHNA
UDLY:	DCR	A
	JNZ	UDLY
	RET	
RDB:	IN	UPST
	RAR	
	JNC	RDB
	IN	UPDP
	MOV	E,A
	XRA	D
	RLC	
	MOV	D,A
	MOV	A,E
	RET	
READAL:	EQU	\$/+1
WSC:	MVI	A,READA
WSC0:	DCR	A
	JNZ	WSC0
	MVI	A,DSYN
	OUT	UPSC
	IN	UPSR
WSCAL:	EQU	\$/+1
	MVI	A,WSCA
	MOV	D,A
WSC1:	IN	DPDC
	ANI	DFSD
	JNZ	WSC2
	DCR	D
	JNZ	WSC1
	STC	
	RET	

```

WSP2:      IN      UPDP
           MVI      D,0
           RET
WSP:       DCR      A
           JNZ      WSP
           LDA      DEVCTL
           INR      A
           OUT      DPDC
WSP1:      XRA      A
           CALL     WNB
           DCR      C
           JNZ      WSP1
           MVI      A,DSYN
           MOV      D,A
WNB:       MOV      E,A
WNB1:      IN      UPST
           ANA      A
           JP       WNB1
           MOV      A,E
           OUT      UPDP
           XRA      D
           RLC
           MOV      D,A
           RET
           ENDIF
H37DVD:    IF      H37T
           JMP      SET37
           JMP      RD37
           JMP      WR37
           JMP      RESH37
           JMP      MNTH37
SET37:
           LXI      H,0
           SHLD     HSTTRK
           XRA      A
           STA      HSTSEC
           DCR      A
           STA      SET37A
           CALL     RDYH37
           JC       SET379
           LHL     DPBX
           LXI      D,DPETRK-DPEPTH
           DAD      D
           MVI      M,DPEUNK
           ENDIF
           IF      H37ED AND (H37T)
           CALL     RD37
           JZ       SET373
           LHL     DPBX
           MOV      A,M
           XRI      DPEDD
           MOV      M,A
           CALL     RD37
           JNZ      SET379
SET373:
           ENDIF
           IF      NOT (H37ED) AND (H37T)
           MVI      A,FDCRDA
           LXI      D,H37TMP
           CALL     H37RD
           JZ       SET373
           LHL     DPBX
           MOV      A,M
           XRI      DPEDD
           MOV      M,A
           LXI      H,H37CTL

```

```

MOV      A,M
XRI      CONMFM
MOV      M,A
OUT      FD$CON
MVI      A,FDCRDA
LXI      D,H37TMP
CALL     H37RD
JNZ      SET379
SET373: LDA      H37TMP+FDRASL
CPI      FDSL256
JNZ      SET379
CALL     RD37
JNZ      SET379
ENDIF
IF      (H37T)
CALL     CHKLAB
JZ       SET373A
LHLD    DPBX
MOV      A,M
ANI      DPEDD
JNZ      SET379
MVI      C,LABLEN-1
LXI      D,HSTBUF+LABEL
LXI      H,DFTL37
CALL     MOVEIT
SET373A: LHLD    DPBX
MOV      A,M
ANI      DPETYPE+DPE96T
MOV      B,A
LXI      D,HSTBUF+LABHTH+DPEFLAG-DPEHTH
LDAX    D
ANI      DPEED+DPEDD+DPE2S
ORA      B
MOV      M,A
INX     D
INX     D
LDAX    D
INX     H
INX     H
MOV      M,A
INX     D
LDAX    D
INX     H
MOV      M,A
INX     D
INX     D
INX     D
LDAX    D
ANI      OFFH-DPEIMG
MOV      B,A
INX     H
INX     H
INX     H
MOV      A,M
ANI      DPEIMG
ORA      B
MOV      M,A
ENDIF
IF      (DPEFLG2-DPERPAB-3) AND (H37T)
*:      (DPEFLG2-DPERPAB) NE 3
ENDIF
IF      (H37T)
LDA      HSTBUF+LABHTH+DPEFLAG-DPEHTH
ANI      DPE2S
JZ       SET374

```

```

MVI      A, FDCRDA+FDSS1
LXI      D, H37TMP
CALL     H37RD
JNZ      SET379
LDA      H37TMP+FDRASID
CPI      1
JNZ      SET379

SET374:  MVI      A, 2
          STA      TRACK
          CALL     SDT37
          MVI      A, FDCRDA
          LXI      D, H37TMP
          CALL     H37RD
          JNZ      SET379
          LDA      H37TMP+FDRATR
          CPI      2
          JZ       SET374D
          CPI      1
          JNZ      SET379
          LHL     DPBX
          MOV      A, M
          ORI      DPE48RO
          MOV      M, A
SET374D: CALL     RST37
SET375:  LHL     SETDSKC
          LXI      B, DPEDPB
          DAD      B
          CALL     HLIHL
          LXI      D, HSTBUF+LABDPB
          MVI      C, DPBL
          CALL     MOVEITX
          XRA      A
SET378:  MVI      A, 0
          STA      SET37A
          CALL     H37DONE
          RET

SET379:  STC
          JMP      SET378

DFTL37  DB      LABVER
          DB      DPEH37, 0, 2, 8, 0, 0, 0, 0
          DW      20
          DB      3, 7, 0
          DW      91, 63, 00C0H, 16, 3

SET37A  DB      0
H37TMP  DS      FDRAL
H37WAIT: POP      H
          SHLD     H37IRET
          MOV      B, A
          MVI      A, FD$CD
          OUT     FD$INT
          MOV      A, B
          OUT     FD$CMD
          JMP      $

H37RD:  LXI      H, H37RD2
          SHLD     H37IRET
          MOV      B, A
          LDA      H37CTL
          ORI      CONDRQ
          OUT     FD$CON
          MVI      A, FD$CD
          OUT     FD$INT
          MOV

```

	MOV	A,B
	LXI	H,H37RD1
	OUT	FD\$CMD
H37RD1:	HLT	
	IN	FD\$DAT
	STAX	D
	INX	D
	PCHL	
H37RD2:	PUSH	PSW
	LDA	H37CTL
	OUT	FD\$CON
	POP	PSW
	ANA	A
	RET	
H37DONE:	PUSH	PSW
	LDA	SET37A
	ANA	A
	JNZ	H37DONE1
	LXI	H,H37CTL
	MOV	A,M
	ANI	0FFH-CONIRQ
	OUT	FD\$CON
	MOV	M,A
	LXI	H,DELAY37
	SHLD	DLYMO37
H37DONE1:	POP	PSW
	RET	
RD37:	CALL	SDP37
RD370:	CALL	SDT37
	LDA	SIDE
	ORI	FDCRDS+FDFSLE
	LXI	D,HSTBUF
	CALL	H37RD
	JZ	RD373
	CALL	H37E
	JNC	RD370
	ORI	0FFH
	STA	ERFLAG
RD373:	JMP	H37DONE
WR37:	LHLD	HSTDPB
	MOV	A,M
	ANI	DPE48RO
	MVI	A,FDSWPV
	JNZ	WR37E
	CALL	SDP37
WR370:	CALL	SDT37
	MVI	A,FD\$CD
	OUT	FD\$INT
	LDA	H37CTL
	ORI	CONDRQ
	OUT	FD\$CON
	LDA	SIDE
	ORI	FDCWRS+FDFSLE
	LXI	H,WR372
	SHLD	H37IRET
	LXI	H,WR371
	LXI	D,HSTBUF
	OUT	FD\$CMD
WR371:	LDAX	D
	HLT	
	OUT	FD\$DAT

	INX	D
	PCHL	
WR372:	CALL	H37RD2
	JZ	WR373
WR37E:	CALL	H37E
	JNC	WR370
	ORI	OFFH
	STA	ERFLAG
WR373:	JMP	H37DONE
H37E:		
	STA	ERRTYP
	ANI	FDSNRD+FDSWPV
	JNZ	H37E1
	LDA	SET37A
	ANA	A
	JNZ	H37E0
	LHLD	SECNT37
	INX	H
	SHLD	SECNT37
H37E0:	LXI	H,ERRCNT
	DCR	M
	JZ	H37E1
	MOV	A,M
	CPI	2
	CZ	RST37
	XRA	A
	RET	
H37E1:	LXI	H,H37MSG
	CALL	PRTERR
	STC	
	RET	
H37MSG	DB	'H37',0
H37ISR:	MVI	A,10
H37ISR1:	DCR	A
	JNZ	H37ISR1
	IN	FD\$STA
	XTHL	
	LHLD	H37IRET
	XTHL	
	EI	
	RET	
SDP37:		
	CALL	ONH37
	LDA	SET37A
	ANA	A
	MVI	A,4
	JZ	SDP371
	RAR	
SDP371:	STA	ERRCNT
	LDA	HSTTRK
	STA	TRACK
	MVI	B,0
	LHLD	HSTDPB
	MOV	A,M
	ANI	DPE2S
	JZ	SDP374
	LXI	H,TRACK
	MOV	A,M
	ANA	A
	RAR	
	MOV	M,A
	JNC	SDP374
	MVI	B,PDFSS1
SDP374:	MOV	A,B
	STA	SIDE
	LDA	HSTSEC

```

INR      A
STA      SECTOR
LHLD     HSTDPB
LXI      D,DPETRK-DPEHTH
DAD      D
SHLD     TRKPT
MOV      A,M
RAL
JC        RST37
MVI      A,FD$TS
OUT      FD$INT
MOV      A,M
OUT      FD$TRK
RET

ONH37:
LXI      H,0
SHLD     DLYMO37
LHLD     HSTDPB
MOV      A,M
ANI      DPEDD
JZ       ONH37A
MVI      A,CONMFM
ONH37A: INX      H
ORA      M
ORI      CONMO+CONIRQ
OUT      FD$CON
MOV      B,A
LXI      H,H37CTL
MOV      A,M
ANI      CONMO
JNZ      ONH37B
PUSH     H
LHLD     HSTDPB
LXI      D,DPESEK-DPEHTH
DAD      D
MOV      A,M
POP      H
RAL
ENDIF
IF       DPEMO-10000000B AND (H37T)
%:      DPEMO NE 10000000B
ENDIF
IF       (H37T)
MVI      A,(1000+3)/4+1
JNC      ONH37C
RAR
RAR
ANI      03FH
JMP      ONH37C
ONH37B: MOV      A,M
ANI      CONDS0+CONDS1+CONDS2+CONDS3
ANA      B
MVI      A,0
JNZ      ONH37C
MVI      A,(50+3)/4+1
ONH37C: STA      DLYW
MOV      M,B
RET

RST37:  CALL     WBS37
LHLD     TRKPT
MVI      M,0
INX      H
ENDIF
IF       (DPETRK+1)-DPESEK AND (H37T)
%:      DPESEK NE (DPETRK+1)
ENDIF

```

```

ENDIT
IF      (H37T)
MOV     A,M
ANI     OFFH-DPEMO
ORI     FDCRST
JMP     H37WAIT
MNTH37: LHL D   HSTDPB
LXI     D,DPETRK-DPEPTH
DAD     D
MVI     M,DPEUNK
;
RESH37: JMP     RESH37
MVI     A,FD$CD
OUT     FD$INT
MVI     A,FDCFI+FDFINI
OUT     FD$CMD
XRA     A
OUT     FD$CON
STA     H37CTL
LXI     H,0
SHLD   DLYMO37
SHLD   H37IRET
IN      FD$DAT
MVI     A,10
RESH371:
DCR     A
JNZ     RESH371
IN      FD$STA
RET
SDT37:  LHL D   TRKPT
MOV     A,M
LXI     H,TRACK
CMP     M
JZ      SDT372
CALL   WBS37
MOV     A,M
CALL   SDT376
LHL D   HSTDPB
MOV     A,M
ANI     DPE48RO
JZ      SDT371
MVI     A,FD$TS
OUT     FD$INT
LHL D   TRKPT
MOV     A,M
OUT     FD$TRK
LDA     TRACK
CALL   SDT376
SDT371: MVI     A,FD$TS
OUT     FD$INT
LDA     TRACK
OUT     FD$TRK
LHL D   TRKPT
MOV     M,A
MVI     A,(15+3)/4+1
LXI     H,DLYW
CMP     M
JC      SDT372
MOV     M,A
SDT372: MVI     A,FD$TS
OUT     FD$INT
LDA     SECTOR
OUT     FD$SEC
SDT373: LDA     DLYW
ORA     A
JNZ     SDT373
RET

```

SDT376: MOV B,A  
MVI A,FD\$CD  
OUT FD\$INT  
MOV A,B  
OUT FD\$DAT  
LHLD TRKPT  
INX H  
MOV A,M  
ANI OFFH-DPEMO  
ORI FDCSEK+FDFHLB  
JMP H37WAIT

RDYH37: CALL ONH37  
LXI H,DLYW

RDYH37A: MOV A,M  
ANA A  
JNZ RDYH37A  
MVI A,FD\$CD  
OUT FD\$INT  
MVI A,FDCFI+FDFINI  
OUT FD\$CMD  
MVI A,10

RDYH37B: DCR A  
JNZ RDYH37B  
LXI H,TICCNT  
MVI A,200  
ADD M  
MOV B,A  
MVI C,0  
MOV D,C

RDYH37C: IN FD\$STA  
ANI FDSIND  
CMP D  
JZ RDYH37D  
MOV D,A  
INR C  
MVI A,FDHDD

RDYH37C1: DCR A  
JNZ RDYH37C1

RDYH37D: MOV A,B  
CMP M  
JNZ RDYH37C  
MOV A,C  
CPI 1\*2  
JC RDYH37E  
CPI 3\*2+1  
CMC  
JNC RDYH37F

RDYH37E: MVI A,FDSNRD  
CALL H37E

RDYH37F: JMP H37DONE

WBS37: MVI A,150  
WBS371: DCR A  
JNZ WBS371

RET  
ENDIF  
IF H47T  
H47DVD: JMP SETD47  
JMP RD47

```

JMP      WR47
JMP      RESH47
XRA A !  RET !  NOP
H47PMS:  DW      XLT0S,DPBOSS
          DB      0,1,8
          DW      XLT0S,DPB0SD
          DB      DPE2S,1,16
          DW      XLT0D,DPB0DS
          DB      DPEDD,2,16
          DW      XLT0D,DPB0DD
          DB      DPEDD+DPE2S,2,16
          ENDIF
          IF      H47ED AND (H47T)
          DW      0,DPBOES
          DB      DPEED+DPEDD,8,16
          DW      0,DPBOED
          DB      DPEED+DPEDD+DPE2S,8,16
          ENDIF
          IF      (H47T)
SETD47:  MVI      A,DRAS
          CALL     WCD
          LHL     DPBX
          INX     H
          MOV     A,M
          ORI     001H
          CALL     WBD
          CALL     W4TR
          CALL     H47IND
          PUSH    PSW
          ANI     03H
          CPI     2
          ENDIF
          IF      H47ED AND (H47T)
          JC      SETD1
          MVI     A,2
          ENDIF
          IF      NOT (H47ED) AND (H47T)
          JNC     SETD9
          ENDIF
          IF      (H47T)
SETD1:   ADD      A
          MOV     D,A
          POP     PSW
          ANI     10H
          MOV     A,D
          JZ      SETD2
          ORI     1
SETD2:   MOV     B,A
          ADD     A
          ADD     B
          ADD     A
          ADD     B
          LXI    H,H47PMS
          CALL    DADA
          XCHG
          LHL     SETDSKC
          LDAX   D
          MOV     M,A
          INX     D
          INX     H
          LDAX   D
          MOV     M,A
          INX     D
          PUSH   D
          LXI    D,DPEDPB-1
          DAD     D

```

	POP	D
	LDAX	D
	MOV	M,A
	INX	D
	INX	H
	LDAX	D
	MOV	M,A
	INX	D
	LHLD	DPBX
	MOV	A,M
	ANI	0FFH-DPEED-DPEDD-DPE2S
	MOV	B,A
	LDAX	D
	ORA	B
	MOV	M,A
	INX	D
	INX	H
	INX	H
	LDAX	D
	MOV	M,A
	INX	D
	INX	H
	LDAX	D
	MOV	M,A
	XRA	A
	RET	
	ENDIF	
	IF	NOT H47ED AND (H47T)
SETD9:	STC	
	RET	
	ENDIF	
	IF	(H47T)
RESH47:	MVI	A,DCRES
	CALL	H47OUTC
	CALL	W4DONE
	XRA	A
	CALL	H47OUTC
	RET	
RD47:	MVI	A,DRD
	CALL	SET47
	JC	RDERR
RDH3:	CALL	H47INS
	ANI	DSTR+DSDONE+DSERR
	JZ	RDH3
	ANI	DSDONE+DSERR
	JNZ	RDH4
	CALL	H47IND
	MOV	M,A
	INX	H
	JMP	RDH3
RDH4:	CALL	H47INS
	ANI	DSERR
	RZ	
RDERR:		
ER47:	MVI	A,DRS
	CALL	WCD
	CALL	W4TR
	CALL	H47IND
	STA	ERRTYP
	LXI	H,H47MSG
	CALL	PRTERR
	CALL	RESH47
	MVI	A,0FFH
	STA	ERFLAG
	RET	
H47MSG	DB	'H47'.0

```

WR47:  MVI      A,DWR
        CALL    SET47
        JC      WRERR
        CALL    H47INS
        ANI     DSERR
        JNZ     WRERR
WRH3:  CALL    H47INS
        ANI     DSTR+DSDONE+DSERR
        JZ      WRH3
        ANI     DSDONE+DSERR
        JNZ     WRH4
        MOV     A,M
        CALL    H47OUTD
        INX     H
        JMP     WRH3
WRH4:  CALL    H47INS
        ANI     DSERR
        RZ
WRERR: JMP     ER47
SET47: CALL    WCD
        RC
        LHL    HSTDPB
        MOV     A,M
        RAR
        ENDIF
        IF      DPE2S-1 AND (H47T)
%:     DPE2S NE 1
        ENDIF
        IF      (H47T)
        MVI     A,0
        STA    SIDE
        LDA    HSTTRK
        JNC    SET472
        RRC
        PUSH   PSW
        ANI    080H
        STA    SIDE
        POP    PSW
        ANI    07FH
SET472: CALL    WBD
        RC
        LHL    HSTDPB
        INX     H
        LDA    HSTSEC
        INR     A
        ORA    M
        LXI    H,SIDE
        ORA    M
        CALL   WBD
        RC
        LXI    H,HSTBUF
        RET
WCD:   CALL    W4DONE
        RC
        CALL   H47OUTD
        CALL   W4ND
        RET
WBD:   CALL    W4TR
        RC
        CALL   H47OUTD
        RET
W4DONE: PUSH   PSW
        PUSH   B
        LXI    B,0FFFFH
W4D1:  CALL    H47INS
        ANI     DSDONE

```

	ANI	DSDONE
	JNZ	W4D2
	DCX	B
	MOV	A,B
	ORA	C
	JNZ	W4D1
	POP	B
	POP	PSW
	STC	
	RET	
W4D2:	POP	B
	POP	PSW
	ORA	A
	RET	
W4ND:	PUSH	PSW
W4ND1:	CALL	H47INS
	ANI	DSDONE
	JNZ	W4ND1
	POP	PSW
	RET	
W4TR:	PUSH	PSW
W4TR1:	CALL	H47INS
	ANI	DSDONE+DSTR
	JZ	W4TR1
	ANI	DSDONE
	JNZ	W4TR2
	POP	PSW
	ORA	A
	RET	
W4TR2:	POP	PSW
	STC	
	RET	
H47INS:	IN	78H
H47INS1	EQU	\$-1
	RET	
H47OUTC:	OUT	78H
H47OUTC1	EQU	\$-1
	RET	
H47IND:	IN	79H
H47IND1	EQU	\$-1
	RET	
H47OUTD:	OUT	79H
H47OUTD1	EQU	\$-1
	RET	
	ENDIF	
	IF	XEBT
XEBDVD:	JMP	SETXEB
	JMP	RDxEB
	JMP	WRxEB
	JMP	RESXEB
	JMP	MNTXEB
SETXEB:	LDA	XEIFLG
	ORA	A
	CZ	XEINIT
	RC	
	XRA	A
	STA	HSTSEC
	LXI	H,0
	SHLD	HSTTRK
	CALL	RDxEB
	STC	
	RNZ	
	CALL	CHKLAB
	STC	
	RNZ	
	LHLD	DPBX
	TVT	D. DDETRK. DDEHTH

1st time selection for hard disk

if partition

	LXI	D,DPETRK-DPEPTH
	DAD	D
	CALL	HLIHL
	XCHG	
	LHLD	HSTBUF+LABHTH+DPETRK-DPEPTH
	CALL	CPHLDE
	STC	
	RNZ	
	LHLD	DPBX
	LXI	D,DPEUPB-DPEPTH
	DAD	D
	CALL	HLIHL
	XCHG	
	LHLD	HSTBUF+LABHTH+DPEUPB-DPEPTH
	CALL	CPHLDE
	STC	
	RNZ	
	LHLD	DPBX
	LXI	D,DPERPAB-DPEPTH
	DAD	D
	LDA	HSTBUF+LABHTH+DPERPAB-DPEPTH
	MOV	M,A
	LHLD	SETDSKC
	LXI	D,DPEDPB
	DAD	D
	CALL	HLIHL
	LXI	D,HSTBUF+LABDPB
	MVI	C,DPBL
	CALL	MOVEITX
	XRA	A
	RET	
RDxEB:	MVI	A,HDCRD
	CALL	SETUP
	RNZ	
	LXI	H,HSTBUF
	XRA	A
	STA	RDCNT
RDxE0:	CALL	INSTAT
	ANA	A
	JP	RDxE0
	ANI	HDBCMD
	JNZ	CKSTAT
RDCNT:	EQU	\$+1
	MVI	B,0
	LDA	Z80FLG
	ORA	A
	JNZ	RDxE1
	LDA	INDATP
	MOV	C,A
	DB	0EDH,0B2H
	JMP	RDxE0
RDxE1:	CALL	INSTAT
	ANA	A
	JP	RDxE1
	ANI	HDBCMD
	JNZ	CKSTAT
	CALL	INDAT
	MOV	M,A
	INX	H
	JMP	RDxE1
WRxEB:	LHLD	HSTDPB
	MOV	A,M
	ANI	DPE2S
	MVI	A,HDEWF
	JNZ	XERR
	MVI	A,HDCWR
	CALL	SETUP

End if

	CALL	SETUP
	RNZ	
	XRA	A
	STA	WRCNT
	LXI	H,HSTBUF
WRXE0:	CALL	INSTAT
	ANA	A
	JP	WRXE0
	ANI	HDBCMD
	JNZ	CKSTAT
	LDA	Z80FLG
	ORA	A
	JZ	WRXE1
	LDA	INDATP
	MOV	C,A
WRCNT:	EQU	\$+1
	MVI	B,0
	DB	0EDH,0B3H
	JMP	WRXE0
WRXE1:	CALL	INSTAT
	ANA	A
	JP	WRXE1
	ANI	HDBCMD
	JNZ	CKSTAT
	MOV	A,M
	CALL	OUTDAT
	INX	H
	JMP	WRXE1
RESXEB:	XRA	A
	RET	
MNTXEB:	XRA	A
	RET	
XEINIT:	MVI	A,80H
	ADI	081H
	JPO	XEINIO
	STA	Z80FLG
XEINIO:	LXI	H,0
	SHLD	HSTTRK
	MVI	A,1
	STA	HSTSEC
	CALL	RDXEB
	STC	
	RNZ	
	LXI	H,HSTBUF
	LXI	D,XEVER
	MVI	C,4
XECK:	LDAX	D
	CMP	M
	STC	
	RNZ	
	INX	H
	INX	D
	DCR	C
	JNZ	XECK
	LDA	HSTBUF+PTSEK
	STA	XESTEP
	LXI	H,HSTBUF+PTPTBL-1
	LXI	D,XEBBUF
	MVI	C,8
XEINI1:	MOV	A,M
	STAX	D
	DCX	H
	INX	D
	DCR	C
	JNZ	XEINI1
	MVI	A,HDCIDC

	CALL	SETUP
	STC	
	RNZ	
	MVI	A,8
	STA	WRCNT
	LXI	H,XEBBUF
	CALL	WRXE0
	STC	
	RNZ	
	LDA	DPEXE\$0+DPEHTH
	ANI	DPEASGN
	JZ	SETDFLT
	MVI	C,0FFH
FNDPART:	INR	C
	MOV	A,C
	CALL	GETPART
	LXI	D,PTCAT
	DAD	D
	MOV	A,M
	CPI	2
	JNZ	FNDPART
	INX	H
	INX	H
	CALL	HLIHL
	CALL	CYLSEC
	XCHG	
	LHLD	DPEXE\$0+DPETRK
	CALL	CPHLDE
	JNZ	FNDPART
	LHLD	XEPART0
	MOV	A,L
	ANI	0F0H
	ORA	C
	STA	XEPART0
	CMP	L
	MOV	A,L
	JNZ	SETDFL2
	MOV	A,H
	JMP	SETDFL2
SETDFLT:	LDA	XEPART0
	LXI	H,DPEXE\$0+DPEHTH
	CALL	SETPART
	LDA	XEPART1
SETDFL2:	LXI	H,XEPART1
	ANI	00FH
	MOV	C,A
	MOV	A,M
	ANI	0F0H
	ORA	C
	MOV	M,A
	LXI	H,DPEXE\$1+DPEHTH
	CALL	SETPART
	MVI	A,0FFH
	STA	XEIFLG
	XRA	A
	RET	
GETPART:	ANI	00FH
	INR	A
	ADD	A
	ADD	A
	ADD	A
	ADD	A
	ADD	A
	MOV	E,A
	MVI	D,0
	LXI	H,HSTBUF
	DAD	D

	RET	
CYLSEC:	DAD	H
	DAD	H
	DAD	H
	DAD	H
	DAD	H
	LDA	HSTBUF+PTHDS
	XCHG	
	LXI	H,0
CYLSEC0:	DAD	D
	DCR	A
	JNZ	CYLSEC0
	RET	
SETPART:	PUSH	H
	CALL	GETPART
	LXI	D,PTCAT
	DAD	D
	MOV	A,M
	CPI	2
	POP	D
	RNZ	
	PUSH	D
	INX	H
	MOV	A,M
	ANI	1
	ORI	DPEASGN
	MOV	C,A
	LDAX	D
	ANI	0FFH-DPEASGN-DPE2S
	ORA	C
	STAX	D
	INX	H
	PUSH	H
	CALL	HLIHL
	CALL	CYLSEC
	XTHL	
	INX	H
	INX	H
	CALL	HLIHL
	CALL	CYLSEC
	POP	D
	DAD	D
	XTHL	
	LXI	B,DPETRK-DPEHTR
	DAD	B
	MOV	M,E
	INX	H
	MOV	M,D
	INX	H
	POP	D
	MOV	M,E
	INX	H
	MOV	M,D
	RET	
HOMXE:	MVI	A,HDCRCL
	STA	CMDBUF+HDOOP
	CALL	SETUP2
	MVI	A,1
	STA	RSFLG
	JMP	CKSTAT
RSXE:	MVI	A,HDCRS
	STA	CMDBUF+HDOOP
	XRA	A
	STA	CMDBUF+HDOCON
	CALL	SETUP2
	MVI	A,1

	STA	RSFLG
	LXI	H,XEBBUF
	MVI	M,0
	MVI	A,4
	STA	RDCNT
	CALL	RDXE1
	MVI	A,0
	JNZ	RSXE1
	LDA	XEBBUF
RSXE1:	ANI	HDSET+HDSEC
	STA	ERRTYP
	RET	
SETUP:	LXI	H,CMDBUF
	MOV	M,A
	INX	H
	MVI	M,0
	XCHG	
	INX	D
	PUSH	D
	LHLD	HSTTRK
	DAD	H
	DAD	H
	DAD	H
	DAD	H
	DAD	H
	LDA	HSTSEC
	MOV	E,A
	MVI	D,0
	DAD	D
	XCHG	
	LDA	XEIFLG
	ORA	A
	JZ	SETUP9
	LHLD	HSTDPB
	LXI	B,DPETRK-DPEHTH
	DAD	B
	CALL	HLIHL
	XCHG	
	DAD	D
	CALL	CPHLDE
	JC	SETUP8
	XCHG	
	LHLD	HSTDPB
	LXI	B,DPEUPB-DPEHTH
	DAD	B
	CALL	HLIHL
	XCHG	
	CALL	CPHLDE
	JNC	SETUP8
	XCHG	
SETUP9:	POP	H
	MOV	M,D
	INX	H
	MOV	M,E
	INX	H
	MVI	M,1
	INX	H
XESTEP:	EQU	#+1
	MVI	M,0
SETUP2:	XRA	A
	STA	RSFLG
	LXI	D,0
SETUP3:	CALL	INSTAT
	ANI	HDBBSY
	JZ	SETUP4
	DCX	D

```

MOV      A,D
ORA      E
JZ       SETUP7
JMP      SETUP3
SETUP4: MVI      A,HDFSEL
        CALL    OUTCTL
        LXI    D,0
WBUSY:  CALL    INSTAT
        ANI    HDBBSY
        JNZ   SETUP5
        DCX   D
        MOV   A,D
        ORA   E
        JZ    SETUP7
        JMP   WBUSY
SETUP5: DI
        MVI   A,HDFDE
        CALL  OUTCTL
        LXI   H,CMDBUF
OUTCMD: CALL    INSTAT
        ANI   HDBREQ+HDBCMD+HDBIO
        JP    OUTCMD
        CPI   HDBREQ+HDBCMD+HDBIO
        JNZ   SETUP6
        MOV   A,M
        CALL  OUTDAT
        INX   H
        JMP   OUTCMD
SETUP6: XRA    A
        RET
SETUP7: MVI   A,84H
        JMP   XERR
SETUP8: POP   H
        MVI   A,83H
        JMP   XERR
CKSTAT: CALL  INDAT
        MOV   C,A
CKST0:  CALL  INSTAT
        ANA   A
        JP    CKST0
        CALL  INDAT
        EI
        ORA   A
        MVI   A,80H
        JNZ   XERR
        MOV   A,C
        ANI   HDFERR+HDFPE
        RZ
        ANI   HDFERR
        MVI   A,82H
        JZ    XERR
        LDA   RSFLG
        ANA   A
        RNZ
        CALL  RSXE
XERR:   STA   ERRTP
        CPI   HDEWF
        CZ    HOMXE
        LXI   H,XEMSG
        CALL  PRERR
        ORI   OFFH
        STA   ERFLAG
        RET
XEMSG:  DB     'XEBEC',0
OUTDATP: EQU  $+1
OUTDAT: OUT

```

```

    RET
INDATP: EQU      $+1
INDAT:  IN       ' .'
    RET
OUTCTLP: EQU     $+1
OUTCTL: OUT     ' .'
    RET
INSTAP: EQU      $+1
INSTAT: IN       ' .'
    RET
XEIFLG: DB       0
Z80FLG: DB       0
RSFLG:  DB       0
XEVER:  DB       0C3H,080H,024H,PVERS
XEBCUF: DB       0,0,0,0,0,0,0,0
CMDBUF: DB       0
        DB       0
        DB       0
        DB       0
        DB       1
        DB       0
        ENDIF
NULDVD: JMP      SETNUL
        JMP      RDNUL
        JMP      WRNUL
        JMP      RESNUL
        JMP      MNTNUL

SETNUL:
RDNUL:
WRNUL:
RESNUL:
MNTNUL:

        MVI      A,0FFH
        STA      ERFLAG
        STC
        RET
    IF      TOD
NDAYS  DB       31,28,31,30,31,30,31,31,30,31,30,31
    ENDIF
TODVAL DB       0,0,0,0,0,0
EVTCTR DW       0
DLYMO: DB       0
DLYH:  DB       0
DLYW:  DB       0
CLOCK: SHLD     HSAV
        POP      H
        SHLD     RETSAV
        PUSH     PSW
        LXI     H,CTLPRT
        MOV     A,M
        OUT     H88CTL
        INX     H
        MOV     A,M
        ORA     A
        JZ      CLK0
        OUT     H8CTL
CLK0:  LHLD     TICCNT
        INX     H
        SHLD     TICCNT
        MOV     A,L
        ORA     A
        JNZ     CLKRET
        IF      TOD
        MOV     A,H
        RAR

```

CLOCK

```

JC      CLK1
LXI    H,TODVAL
INR    M
MOV    A,M
CPI    60
JC     CLK1
MVI    M,0
INX    H
INR    M
MOV    A,M
CPI    60
JC     CLK1
MVI    M,0
INX    H
INR    M
MOV    A,M
CPI    24
JC     CLK1
MVI    M,0
INX    H
INX    H
MOV    A,M
LXI    H,NDAYS-1
ADD    L
MOV    L,A
MOV    A,H
ACI    0
MOV    H,A
MOV    A,M
LXI    H,TODVAL+3
INR    M
CMP    M
JNC    CLK1
MVI    M,1
INX    H
INR    M
MOV    A,M
CPI    13
JC     CLK1
MVI    M,1
INX    H
INR    M
ENDIF

```

CLK1:

```

IF     EVENT
LHLD  EVTCTR
MOV   A,H
ORA   L
JZ    CLK2
DCX  H
SHLD EVTCTR
ENDIF

```

CLK2:

```

IF     H17T
LXI   H,DLYMO
MOV   A,M
ORA   A
JZ    CLK4
DCR  M
JNZ  CLK3
LDA  DEVCTL
ANI  OFFH-DFMO
STA  DEVCTL
OUT  DPDC

```

CLK3:

```

INX  H
MOV  A,M

```

	ORA	A
	JZ	CLK4
	DCR	M
	JNZ	CLK4
	LDA	DEVCTL
	ANI	0FFH-U0-U1-U2
	STA	DEVCTL
	OUT	DPDC
	ENDIF	
CLK4:		
	IF	H37T
	LXI	H,DLYMO37
	MOV	A,M
	ORA	A
	JZ	CLKRET
	DCR	M
	JNZ	CLK5
	LDA	H37CTL
	ANI	0FFH-CONMO
	STA	H37CTL
	OUT	FD\$CON
CLK5:	INX	H
	MOV	A,M
	ORA	A
	JZ	CLKRET
	DCR	M
	JNZ	CLKRET
	LDA	H37CTL
	ANI	0FFH-CONDS0-CONDS1-CONDS2-CONDS3
	STA	H37CTL
	OUT	FD\$CON
	ENDIF	
CLKRET:	LDA	TICCNT
	RAR	
	JC	CLKR2
	LXI	H,DLYW
	MOV	A,M
	ORA	A
	JZ	CLKR2
	DCR	M
CLKR2:	POP	PSW
	LHLD	RETSAV
	PUSH	H
	LHLD	HSAV
	EI	
	RET	
CHKLAB:		
	XRA	A
	MVI	B,LABLEN
	LXI	H,HSTBUF+LABEL
CHKLAB1:		
	ADD	M
	INX	H
	DCR	B
	JNZ	CHKLAB1
	INR	A
	RET	
CPHLDE:		
	MOV	A,H
	CMP	D
	RNZ	
	MOV	A,L
	CMP	E
	RET	
DADA:	ADD	L
	MOV	L,A

```

RNC
INR      H
RET
GETDPE:  ANI      0FH
          MOV      L,A
          MVI      H,0
          MOV      D,H
          MOV      E,L
          DAD      H
          DAD      D
          DAD      H
          DAD      H
          DAD      H
          IF      DPEL-24
%:        DPEL NE 24
          ENDIF
          LXI      D,DPBASE
          DAD      D
          RET
GETDPEX: CALL     GETDPE
          LXI      D,DPEHTH
          DAD      D
          RET
HLIHL:   MOV      A,M
          INX      H
          MOV      H,M
          MOV      L,A
          RET
MOVEITX: XCHG
          IF      $-MOVEIT
%:        MOVEIT MUST IMMEDIATELY FOLLOW MOVEITX
          ENDIF
MOVEIT:  MVI      A,81H
          ADI      80H
          JPO     MOVEIT1
          MVI      B,0
          DB      0EDH,0B0H
          RET
MOVEIT1: MOV      A,M
          STAX    D
          INX      H
          INX      D
          DCR      C
          JNZ     MOVEIT1
          RET
CONST:   CALL     CONS
          ORA     A
          RZ
          MVI     A,0FFH
          RET
CONS:    LDA      IOBYTE
          CALL    INDXIT
          DW      TTYSTAT
          DW      CRTSTAT
          DW      RDRST
          DW      CRTSTAT
RDRST:   LDA      IOBYTE
          RRC
          CALL    GOTOIT
          DW      TTYSTAT
          DW      BUSY
          DW      MDSTAT

```

```

      DW          CRTSTAT
CONIN: LDA        IOBYTE
      CALL       INDXIT
      DW          TTYIN
      DW          CRTIN
      DW          READER
      DW          CRTIN
CONOUT: LDA       IOBYTE
      CALL       INDXIT
      DW          TTYOUT
      DW          CRTOUT
      DW          LIST
      DW          LIST
LISTST: LDA       IOBYTE
      RLC
      RLC
      CALL       INDXIT
      DW          TTYOS
      DW          CRTOS
      DW          LPTOS
      DW          DBDOS
LIST:  LDA       IOBYTE
      RLC
      RLC
      CALL       INDXIT
      DW          TTYOUT
      DW          CRTOUT
      DW          LPTOUT
      DW          DBD
PUNCH: LDA       IOBYTE
      RRC
      RRC
      RRC
      CALL       GOTOIT
      DW          TTYOUT
      DW          DMYOUT
      DW          MDOUT
      DW          CRTOUT
READER: LDA      IOBYTE
      RRC
      CALL       GOTOIT
      DW          TTYIN
      DW          DMYIN
      DW          MDIN
      DW          CRTIN
INDXIT: RLC
GOTOIT: ANI      06H
      XTHL
      CALL       DADA
      CALL       HLIHL
      XTHL
      RET
CRTSTAT:
      IF          NOT INTINP
      LDA        MODE
      RAR
      JC         CRTS1
      ENDIF
%:      IF          MODEB0-1 AND (NOT INTINP)
      MODEB0 NE 1
      ENDIF
      IF          (NOT INTINP)
      LXI        H,H84PT1
      JMP        US
CRTS1: IN        H85CRT+1
      ANT       02H

```

```

RET
ENDIF
IF INTINP
LDA CRTB
ORA A
RNZ
CRTS2: LDA MODE
RAR
JNC CRTS2A
ENDIF
%: IF MODEB0-1 AND (INTINP)
MODEB0 NE 1
ENDIF
IF (INTINP)
IN H85CRT+1
ANI 04H
JZ CRTS3
MVI A,17H
OUT H85CRT+1
JMP CRTS3
CRTS2A: LDA H84PT1
INR A
STA CRTS2B
MVI A,1
OUT 0
CRTS2B EQU $-1
CRTS3: EI
XRA A
RET
ENDIF
CRTIN: IF NOT INTINP
LDA MODE
RAR
JC CRTI1
ENDIF
%: IF MODEB0-1 AND (NOT INTINP)
MODEB0 NE 1
ENDIF
IF (NOT INTINP)
LXI H,H84PT1
CALL UI
ANI 7FH
RET
CRTI1: IN H85CRT+1
ANI 02H
JZ CRTI1
IN H85CRT
ANI 7FH
RET
ENDIF
CRTIN1: IF INTINP
CALL CRTSTAT
JZ CRTIN1
DI
LXI H,CRTB
DCR M
LHLD CRTGET
MOV C,M
INX H
MOV A,L
PUSH B
LXI B,CRTBND
CMP C
POP B

```

```

JNZ CRTIN2
LXI H,CRTBUF
CRTIN2: SHLD CRTGET
EI
MOV A,C
RET
CRTISR: SHLD HSAV
POP H
SHLD RETSAV
PUSH PSW
LXI H,0
DAD SP
SHLD OLDSP
LXI SP,LCLSTK
LXI H,H84PT1
MVI A,2
CALL PINX
CPI 0100B
JNZ CRTIS6
ENDIF
IF BRKKEY AND (INTINP)
MVI A,5
CALL PINX
ANI 10H
JNZ CRTIS8
ENDIF
IF (INTINP)
CALL UI1
CRTIS1: ANI 7FH
PUSH PSW
LDA CRTB
CPI CRTLEN-4
JC CRTIS2
PUSH B
PUSH D
MVI C,BELL
CALL CRTOUT
POP D
POP B
LDA CRTB
CPI CRTLEN
JZ CRTIS5
CRTIS2: POP PSW
LHLD CRTPUT
MOV M,A
INX H
MOV A,L
PUSH B
LXI B,CRTBND
CMP C
POP B
JNZ CRTIS3
LXI H,CRTBUF
CRTIS3: SHLD CRTPUT
LXI H,CRTB
INR M
CRTIS4: LHLD OLDSP
SPHL
POP PSW
LHLD RETSAV
PUSH H
LHLD HSAV
EI
RET
CRTIS5: POP PSW

```

```

JMP CRTIS4
CRTIS6: IN H85CRT+1
        ENDIF
        IF BRKKEY AND (INTINP)
        ANI 20H
        JNZ CRTI11
        ENDIF
        IF (INTINP)
        IN H85CRT
        JMP CRTIS1
        ENDIF
        IF BRKKEY AND (INTINP)
CRTIS8: CALL UI1
        LXI D,6000
CRTIS9: MVI A,5
        CALL PINX
        ANI 9
        JNZ CRTIS8
        DCX D
        MOV A,D
        ORA E
        JNZ CRTIS9
        CALL UI1
CRTI10: LXI H,CRTBUF
        SHLD CRTGET
        SHLD CRTPUT
        XRA A
        STA CRTB
        ENDIF
        IF H17T AND (BRKKEY) AND (INTINP)
        CALL RESH17
        ENDIF
        IF (BRKKEY) AND (INTINP)
        ENDIF
        IF H37T AND (BRKKEY) AND (INTINP)
        CALL RESH37
        ENDIF
        IF (BRKKEY) AND (INTINP)
        ENDIF
        IF H47T AND (BRKKEY) AND (INTINP)
        CALL RESH47
        ENDIF
        IF (BRKKEY) AND (INTINP)
        ENDIF
        IF XE7T AND (BRKKEY) AND (INTINP)
        CALL RESXE7
        ENDIF
        IF (BRKKEY) AND (INTINP)
        CALL FLUSH1
        EI
        JMP BOOT
CRTI11: IN H85CRT
        MVI A,17H
        OUT H85CRT+1
        LXI D,6000
CRTI12: IN H85CRT+1
        ANI 22H
        JNZ CRTI11
        DCX D
        MOV A,D
        ORA E
        JNZ CRTI12
        IN H85CRT
        JMP CRTI10
        ENDIF
        IF (INTINP)

```

```

      ENDIF
CRTOUT: CALL    CRTOS
        ORA    A
        JZ    CRTOUT
        LDA    MODE
        RAR
        JC    CRTO1
        IF    MODEB0-1
%:      MODEB0 NE 1
      ENDIF
      JMP    UO
CRTO1:  PUSH   H
        INX   H
        INX   H
        MOV   A,M
        RAL
        POP   H
        MOV   A,C
        CC    MUC
        OUT   H85CRT
        JMP   POUT2
TTYIN:  LXI   H,H84PT2
        CALL  UI
        ANI  7FH
        RET
TTYSTAT:LXI   H,H84PT2
        JMP   US
TTYOUT: CALL  TTYOS
        ORA  A
        JZ  TTYOUT
        JMP  UO
LPTOUT: LDA  DCLPOS
        ORA  A
        JNZ  LPTOU2
LPTOU1: CALL  LPTOS
        ORA  A
        JZ  LPTOU1
LPTOU2: LXI  H,H84PT3
        LXI  D,LPTCTS
        XRA  A
        STA  DCLPOS
        JMP  UO
DBD:    CALL  DBDOS
        ORA  A
        JZ  DBD
        CALL  UO
        LXI  H,HSCNT
        DCR  M
        CPI  01BH
        MOV  A,M
        JNZ  DBD1
        CPI  2
        RNC
        MVI  M,2
        RET
DBD1:   ORA  A
        RNZ
        MVI  A,1
        STAX D
        RET
HSCNT:  DB   32
MDIN:   LXI  H,H84PT4
        JMP  UI
MDSTAT: LXI  H,H84PT4
        JMP  US
MDOUT:  CALL  MDOS

```

	ORA	A
	JZ	MDOU
	JMP	UO
MDOS:	LXI	H,H84PT4
	LXI	D,MDCTS
	JMP	CRTOS1
TTYOS:	LXI	H,H84PT2
	LXI	D,TTYCTS
	JMP	CRTOS1
CRTOS:	LXI	H,H84PT1
	LXI	D,CRTCTS
	LDA	MODE
	RAR	
	JC	CRTOS3
CRTOS1:	CALL	UOS
	JZ	CRTOSB
	LDAX	D
	ORA	A
	JNZ	CRTOS2
	DCR	A
	RET	
CRTOS2:	DCR	A
	STAX	D
	PUSH	B
	MVI	C,NULL
	CALL	UO
	POP	B
CRTOSB:	XRA	A
	RET	
CRTOS3:	IN	H85CRT+1
	RAR	
	JNC	CRTOSB
	LDAX	D
	ORA	A
	JNZ	CRTOS4
	DCR	A
	RET	
CRTOS4:	DCR	A
	STAX	D
	MVI	A,NULL
	OUT	H85CRT
	XRA	A
	RET	
LPTOS:	LXI	H,H84PT3
	LXI	D,LPTCTS
	CALL	UOS
	JZ	LPTOSB
	MVI	A,6
	CALL	PINX
	MOV	B,A
	LDA	MODE
	ANI	MODEB2
	JNZ	LPTOS0
	MOV	A,B
	CMA	
	MOV	B,A
LPTOS0:	LDA	PRTRDY
	ANA	B
	JZ	LPTOSB
	LDAX	D
	ORA	A
	JNZ	LPTOS1
	DCR	A
	STA	DCLPOS
	RET	
LPTOS1:	DCR	A

	STAX	D
	PUSH	B
	MVI	C, NULL
	CALL	UO
	POP	B
LPTOSB:	XRA	A
	RET	
DBDOS:	LXI	H, H84PT3
	LXI	D, DBDCTS
	LDAX	D
	CPI	2
	JNZ	DBDOS1
	CALL	US
	JZ	DBDOSB
	CALL	UI1
	ANI	07FH
	SUI	'F' MOD 32
	JNZ	DBDOSB
	STAX	D
	MVI	A, 32
	STA	HSCNT
DBDOS1:	CALL	UOS
	JZ	DBDOSB
	LDAX	D
	ORA	A
	JNZ	DBDOS2
	DCR	A
	RET	
DBDOS2:	INR	A
	STAX	D
	PUSH	B
	MVI	C, 'C' MOD 32
	CALL	UO
	POP	B
BUSY:		
DBDOSB:	XRA	A
	RET	
DMYIN:	MVI	A, 'Z' - 40H
DMYOUT:	RET	
US:	MVI	A, 5
	CALL	PINX
	ANI	1
	RET	
UOS:	MVI	A, 5
	CALL	PINX
	ANI	20H
	RET	
UO:	MOV	A, M
POUT:	STA	POUT1+1
	PUSH	H
	INX	H
	INX	H
	MOV	A, M
	RAL	
	POP	H
	MOV	A, C
	CC	MUC
POUT1:	OUT	00H
POUT2:	CPI	PADCH
	RNZ	
	PUSH	H
	INX	H
	INX	H
	MOV	A, M
	POP	H
	RAR	

```

RAR
RAR
RAR
ANI      07H
RZ
STAX     D
RET
UI:      CALL    US
        JZ      UI
UI1:     XRA     A
PINX:    ADD     M
PIN:     STA     PIN1+1
PIN1:    IN      00H
MUC:     RET
        CPI     'a'
        RC
        CPI     'z'+1
        RNC
        SUI     'a'-'A'
        RET
PMSG:    MOV     A,M
        ORA     A
        RZ
        MOV     C,A
        PUSH    H
        CALL    CONOUT
        POP     H
        INX     H
        JMP     PMSG
HOUT:    PUSH    PSW
        RRC
        RRC
        RRC
        RRC
        CALL    NIBBLE
        POP     PSW
NIBBLE:  ANI     0FH
        CPI     10
        JM      NIBBL1
        ADI     7
NIBBL1:  ADI     30H
        MOV     C,A
        JMP     CONOUT
BTMSG:   DB      CR,LF
        DB      'ERROR DURING WARM BOOT - PRESS ANY KEY',0
RDMSG:   DB      ' READ',0
WRMSG:   DB      ' WRITE',0
ERRMSG:  DB      ' ERROR ',0
CRLF:    DB      CR,LF,0
DCLPOS:  DB      0
TTYCTS:  DB      0
CRTCTS:  DB      0
LPTCTS:  DB      0
MDCTS:   DB      0
DBDCTS:  DB      0
        IF      INTINP
CRTB:    DB      0
CRTGET:  DW      CRTBUF
CRTPUT:  DW      CRTBUF
ENDIF
        IF      H17T
DPB17S:  DW      20
        DB      3
        DB      7
        DB      0
        DW      91

```

```

DW 63
DB 192
DB 0
DW 16
DW 3
DPB17X: DW 20
DB 3,7,0
DW 191
DW 63
DB 192
DB 0
DW 16
DW 3
DPB17D: DW 20
DB 4,15,1
DW 195
DW 127
DB 192
DB 0
DW 32
DW 3
ENDIF
IF H47T
DPBOSS: DW 26
DB 3,7,0
DW 242
DW 63
DB 192,0
DW 16
DW 2
DPBOSD: DW 26
DB 4,15,1
DW 246
DW 127
DB 0C0H,000H
DW 32
DW 2
DPBODS: DW 52
DB 4,15,0
DW 242
DW 127
DB 0C0H,000H
DW 32
DW 2
DPBODD: DW 52
DB 4,15,0
DW 493
DW 255
DB 0F0H,000H
DW 64
DW 2
ENDIF
IF H47T AND H47ED
DPBOES: DW 64
DB 4,15,0
DW 299
DW 127
DB 0C0H,000H
DW 32
DW 2
DPBOED: DW 64
DB 4,15,0
DW 607
DW 255
DB 0F0H,000H
DW 64

```

```

DW      2
ENDIF
IF      H17T
XLT17: DB      1,2,9,10,17,18
        DB      5,6,13,14
        DB      3,4,11,12,19,20
        DB      7,8,15,16
ENDIF
IF      H47T
XLT0S: DB      1,7,13,19,25
        DB      5,11,17,23
        DB      3,9,15,21
        DB      2,8,14,20,26
        DB      6,12,18,24
        DB      4,10,16,22
XLT0D: DB      1,2,19,20,37,38
        DB      3,4,21,22,39,40
        DB      5,6,23,24,41,42
        DB      7,8,25,26,43,44
        DB      9,10,27,28,45,46
        DB      11,12,29,30,47,48
        DB      13,14,31,32,49,50
        DB      15,16,33,34,51,52
        DB      17,18,35,36
ENDIF
HSTACT DB      0
HSTWRT DB      0
UNACNT DB      0
HSTBUF EQU     $
CBOOT: DI
        LXI     SP,STACK
        LDA     DEFIOB
        STA     IOBYTE
        MVI     A,MI$JMP
        LXI     H,CLOCK
        STA     CLKVEC
        SHLD    CLKVEC+1
        IF      INTINP
        LXI     H,CRTISR
        STA     SERVEC
        SHLD    SERVEC+1
        ENDIF
        LXI     H,CTLPRT
        MOV     A,M
        OUT    H88CTL
        INX     H
        MOV     A,M
        ORA     A
        JZ      CBT0
        OUT    H8CTL
CBT0:  LDA     MODE
        ANI     0FFH-MODEB0
        STA     MODE
        LDA     H8FLAG
        ORA     A
        JZ      CBT1
        LXI     H,H84PT1
        MOV     A,M
        ADI     3
        STA     OUTH84+1
        PUSH   PSW
        MVI     A,3
        CALL   OUTH84
        POP    PSW
        CALL   PIN

```

```

CPI 3
JZ CBT1
LDA MODE
ORI MODEB0
STA MODE
MVI A,15H
OUT H85CRT+1
MVI A,40H
OUT H85CRT+1
MVI A,4EH
OUT H85CRT+1
IF NOT INTINP
MVI A,15H
ENDIF
IF INTINP
MVI A,17H
ENDIF
OUT H85CRT+1
CBT1: LHLD CRTBAUD
LDA H84PT1
CALL IN8250
IF INTINP
LDA H84PT1
INR A
STA OUTH84+1
MVI A,1
CALL OUTH84
ENDIF
LHLD TTYBAUD
LDA H84PT2
CALL IN8250
LHLD LPTBAUD
LDA H84PT3
CALL IN8250
LHLD RDPBAUD
LDA H84PT4
CALL IN8250
LXI H,MSG0
CALL PMSG
LXI H,BIOSEND
MOV A,H
INR A
RAR
RAR
ANI 03FH
JNZ CBOOT1
MVI A,64
CBOOT1: CALL TYDN
LXI H,MSG1
CALL PMSG
CBI: LDA BBDA
STA CBIB
LXI H,CBI1
PUSH H
LDA LOGDSK
MOV C,A
LDA BBDF
ANI DPETYPE
IF H17T
CPI DPEH17
JZ CBH17
ENDIF
IF H37T
CPI DPEH37
JZ CBH37
ENDIF

```

```

IF H47T
CPI DPEH47
JZ CBH47
ENDIF
IF XEBT
CPI DPEXEB
JZ CBXEB
ENDIF
MVI C,BELL
CALL CONOUT
HLT
CBI1: XRA A
STA CBIA
LDA CBIB
XRI 7CH-78H
STA CBIB
LXI H,CBI2
PUSH H
LDA BBDF
ANI DPETYPE
MVI C,0
IF H17T
CPI DPEH17
JNZ CBH17
ENDIF
IF H37T
CPI DPEH37
JNZ CBH37
ENDIF
IF H47T
CPI DPEH47
JNZ CBH47
ENDIF
IF XEBT
CPI DPEXEB
JNZ CBXEB
ENDIF
POP H
CBI2: XRA A
STA LOGDSK
LXI H,BIOS
SHLD BBIOS
EI
MVI A,BT$CD
JMP GOW
MSG0: DB CR,LF,LF,0
MSG1: DB 'K LLL/HEATH/ZENITH XEBIOS(c) CP/M 2.2X'
DB 'VERS/10+'0',(VERS MOD 10)+'0',LEVEL
DB ' ',MONTH/10+'0',(MONTH MOD 10)+'0','/',DAY/10+'0'
DB (DAY MOD 10)+'0','/',YEAR/10+'0',(YEAR MOD 10)+'0'
DB CR,LF
DB 'FOR'
IF H17T
DB ' H17'
ENDIF
IF H37T
DB ' H37'
ENDIF
IF H47T
DB ' H47'
ENDIF
IF XEBT
DB ' XEBEC'
ENDIF

```

```

DISKS
WRKVARX EQU PARTITN OR XEBPART2 OR INTINP OR BRKKEY OR TOD OR EVENT
WRKVAR EQU WRKVARX OR H37ED OR H47ED
IF WRKVAR
DB ' WITH OPTION(S) '
ENDIF
IF PARTITN AND (WRKVAR)
DB 'P'
ENDIF
IF (WRKVAR)
ENDIF
IF XEBPART2 AND (WRKVAR)
DB '2'
ENDIF
IF (WRKVAR)
ENDIF
IF TOD AND (WRKVAR)
DB 'T'
ENDIF
IF (WRKVAR)
ENDIF
IF EVENT AND (WRKVAR)
DB 'E'
ENDIF
IF (WRKVAR)
ENDIF
IF INTINP AND (WRKVAR)
DB 'I'
ENDIF
IF (WRKVAR)
ENDIF
IF BRKKEY AND (WRKVAR)
DB 'B'
ENDIF
IF (WRKVAR)
ENDIF
IF H37ED AND (WRKVAR)
DB 'E3'
ENDIF
IF (WRKVAR)
ENDIF
IF H47ED AND (WRKVAR)
DB 'E4'
ENDIF
IF (WRKVAR)
ENDIF
DB CR,LF,0
CBIA: DB 1
CBIB: DS 1
CBIC: DB 0
IF H17T
CBH17: MVI B,H17ND
MVI D,(DPE0-DPBASE)/DPEL
CALL CBTFIL
MVI A,DFMO
STA DEVCTL
LDA CBIA
ANA A
CZ RESH17
RET
ENDIF
IF H37T
CBH37: LDA CBIB
CPI 78H
RNZ
MVI B,H37ND

```

```

MVI D,(DPE37$0-DPBASE)/DPEL
CALL CBTFIL
MVI A,MI$JMP
LXI H,H37ISR
STA H37VEC
SHLD H37VEC+1
LDA CBIA
ANA A
JZ RESH37
LXI H,DLYMO37
XRA A
MOV M,A
INX H
MOV M,A
MVI A,CONMO
STA H37CTL
RET
ENDIF
IF H47T
CBH47: MVI B,H47ND
MVI D,(DPE47$0-DPBASE)/DPEL
CALL CBTFIL
LDA CBIB
ENDIF
IF H47CTL AND (H47T)
%: H47CTL NE 0
ENDIF
IF (H47T)
STA H47INS1
STA H47OUTC1
INR A
ENDIF
IF H47CTL+1-H47DAT AND (H47T)
%: H47DAT NE H47CTL+1
ENDIF
IF (H47T)
STA H47IND1
STA H47OUTD1
LDA CBIB
CPI 7CH
JNZ CBH472
MVI B,H47ND
LXI D,DPEL
LXI H,DPE47$0+DPEFLAG
CBH471: MOV A,M
ORI DPEP7C
MOV M,A
DAD D
DCR B
JNZ CBH471
CBH472: LDA CBIA
ANA A
CZ RESH47
RET
ENDIF
IF XEBT
CBXEB: MVI B,XEBND
MVI D,(DPEXE$0-DPBASE)/DPEL
CALL CBTFIL
LDA CBIA
ORA A
LDA CBIB
JNZ CBXEB0
LDA MODE
ANI MODEB5
LDA CBIB

```

	JZ	CBXEB0	
	LDA	ALTPRT	
CBXEBO:	STA	INDATP	
	STA	OUTDATP	
	STA	ALTPRT	— 48H
	INR	A	
	STA	INSTAP	
	STA	OUTCTLP	
	DCR	A	
	CPI	7CH	
	JNZ	CBXEB2	
	MVI	B,XEBND	
	LXI	D,DPEL	
	LXI	H,DPEXE\$0+DPEFLAG	
CBXEBO1:	MOV	A,M	
	ORI	DPEP7C	
	MOV	M,A	
	DAD	D	
	DCR	B	
	JNZ	CBXEBO1	
CBXEBO2:	LDA	CBIA	
	ANA	A	
	JZ	RESXEB	
	LDA	DPEXE\$0+DPEFLAG	
	ORI	DPEASGN	
	STA	DPEXE\$0+DPEFLAG	
	LHLD	BBP	
	SHLD	DPEXE\$0+DPETRK	
	LHLD	BUPB	
	SHLD	DPEXE\$0+DPEUPB	
	RET		
	ENDIF		
CBTFIL:			
	LXI	H,0	
	SHLD	CBTIA	
CBTFIL1:			
	PUSH	B	
	PUSH	D	
	LDA	CBIA	
	ANA	A	
	CNZ	CBTF7	
	XRA	A	
	CALL	CBTF0	
	POP	D	
	POP	B	
	LHLD	CBTIA	
	MOV	A,H	
	ORA	L	
	JNZ	CBTFIL2	
	CALL	CBTF7	
	JMP	CBTFIL1	
CBTFIL2:			
	MVI	A,1	
CBTF0:	STA	CBTFA	
	MOV	E,B	
CBTF1:	MOV	A,C	
	CMP	B	
	JC	CBTF2	
	SUB	B	
CBTF2:	ADD	D	
	PUSH	B	
	MOV	B,A	
	LDA	CBIC	
	ADD	A	
	ADD	A	
	ADD	A	

	ADD	A
	ADD	B
	MOV	B,A
	PUSH	D
	CALL	GETDPEX
	XCHG	
	LXI	H,DPEFLG2-DPEH1H
	DAD	D
	MOV	A,M
	ANI	DPEIMG
	LDA	CBTFA
	JNZ	CBTF3
	ANA	A
	JNZ	CBTF4
	PUSH	H
	LHLD	CBTIA
	MOV	A,H
	ORA	L
	POP	H
	JNZ	CBTF2A
	XCHG	
	SHLD	CBTIA
	XCHG	
CBTF2A:	INX	H
	IF	DPEFLG2+1-DPELUN
*		(DPEFLG2+1) NE DPELUN
	ENDIF	
	MOV	M,B
	CALL	CBTF6
	JMP	CBTF4
CBTF3:	ANA	A
	JZ	CBTF4
	PUSH	H
	CALL	CBTF6
	LHLD	CBTIA
	MVI	C,DPEHL
	CALL	MOVEIT
	POP	H
	MOV	A,M
	ORI	DPEIMG
	MOV	M,A
CBTF4:	POP	D
	POP	B
	INR	C
	DCR	E
	JNZ	CBTF1
	RET	
CBTF6:	LDA	CBIC
	LXI	H,BDMAP
	CALL	DADA
	MOV	M,B
	LXI	H,CBIC
	INR	M
	RET	
CBTF7:		
	PUSH	B
	PUSH	D
	MOV	A,C
	ADD	D
	CALL	GETDPEX
	SHLD	CBTIA
	LXI	D,DPEFLG2-DPEH1H
	DAD	D
	MOV	A,M
	ANI	OFFH-DPEIMG
	MOV	M,A

```

POP      D
POP      B
RET
CBTFA   DS      1
CBTIA   DS      2
TYDN:   MVI     C,0
TYDN1:  SUI     10
        JC      TYDN2
        INR     C
        JMP     TYDN1
TYDN2:  ADI     10
        PUSH   PSW
        MOV    A,C
        ADI   030H
        MOV    C,A
        CALL  CONOUT
        POP   PSW
        ADI   030H
        MOV    C,A
        JMP   CONOUT
IN8250: MOV    B,A
        XCHG
        LXI   H,OUTH84+1
        MVI   A,3
        ADD   B
        MOV   C,A
        MOV   M,A
        MVI   A,83H
        CALL  OUTH84
        INR   M
        MVI   A,0FH
        CALL  OUTH84
        MOV   M,B
        MOV   A,E
        CALL  OUTH84
        MOV   A,D
        ANI   0FH
        INR   M
        CALL  OUTH84
        MOV   M,C
        CPI   B110 SHR 8
        MVI   A,3
        JC    IN821
        ORI   4
IN821:  CALL  OUTH84
        DCR   M
        DCR   M
        XRA   A
        CALL  OUTH84
        XCHG
        DAD   H
        DAD   H
        DAD   H
        DAD   H
LOOP1:  DCX   H
        MOV   A,L
        ORA   H
        JNZ  LOOP1
        RET
OUTH84: OUT   0
        RET
CLLEN   EQU    $-HSTBUF

```

```

;*****
;

```

```

; IF COLD BOOT CODE IS SMALLER THAN HOST BUFFER,
; THEN FILL OUT 'HSTBUF' WITH DS STATEMENT.

```

```

IF      (CLEN-HSTSIZ) SHR 15
DS      HSTSIZ-CLEN
; OTHERWISE REORG SO RUN-TIME VARIABLES CAN ALSO OVERLAY
; COLD BOOT CODE.
ENDIF
IF      NOT ((CLEN-HSTSIZ) SHR 15)
ORG     HSTBUF+HSTSIZ
ENDIF

;
;*****
DIRBUF: DS      128
        IF      H17T
ALV0:   DS      26
CSV0:   DS      32
ALV1:   DS      26
CSV1:   DS      32
ALV2:   DS      26
CSV2:   DS      32
        ENDIF
        IF      H37T
DPB37$0 DS      DPBL
ALV37$0 DS      50
CSV37$0 DS      64
DPB37$1 DS      DPBL
ALV37$1 DS      50
CSV37$1 DS      64
DPB37$2 DS      DPBL
ALV37$2 DS      50
CSV37$2 DS      64
        ENDIF
        IF      H47T
ALV47$0 DS      77
CSV47$0 DS      64
ALV47$1 DS      77
CSV47$1 DS      64
        ENDIF
        IF      XEBT
DPBXE$0 DS      DPBL
ALVXE$0 DS      256
        ENDIF
        IF      XEBPART2 AND (XEBT)
DPBXE$1 DS      DPBL
ALVXE$1 DS      256
        ENDIF
DPBX:   DS      2
HSTDPB: DS      2
DMAB:   DS      2
SPT:    DS      1
XLTW:   DS      2
SPT1:   DS      1
XLTW1:  DS      2
TRACK:  DS      1
SECTOR: DS      1
SIDE:   DS      1
RWOP:   DS      1
LSP:    DS      1
ERRCNT: DS      1
ERRTYP: DS      1
TRKPT:  DS      2
SEKDSK: DS      1
SEKTRK: DS      2
SEKSEC: DS      1
HSTDSK: DS      1
HSTTRK: DS      2
HSTSEC: DS      1
SEKHST: DS      1

```

```
UNADSK: DS 1
UNATRK: DS 2
UNASI: DS 1
ERFLAG: DS 1
RSFLAG: DS 1
READOP: DS 1
WRTYPE: DS 1
DMAADR: DS 2
        IF (($-HSTBUF)-CLEN) SHR 15
        ORG HSTBUF+CLEN
        ENDIF
HSAV: DS 2
RETSAV: DS 2
OLDSP: DS 2
        IF INTINP
CRTBUF: DS 40
CRTBND EQU $
CRTLEN EQU CRTBND-CRTBUF
        DS 16
LCLSTK EQU $
        ENDIF
        DS 32
STACK DS 0
BIOSEND EQU $
        END
```

A>