SUPER BIOS

CP/M 2.2 BIOS

SUPER BIOS tm

THE CP/M 2.2 BIOS.

SUPER SIX/SUPER QUAD

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ADVANCED DIGITAL CORPORATION

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Introduction

Advanced Digital is proud to introduce the SuperBios. SuperBios is our special configuration of CP/M 2.2 with the following features.

1)   1024 byte sectors double density floppies, read/write.

2)   Interupt driven type-ahead buffer.

3)   Supports 8" and or 5-1/4" floppy drives.

4)   Supports a variaty of hard disk drives.

5)   Supports Parrallel and or Serial printers.

SUPERBIOS distribution diskette contents

CPM.SYS   is a memory image of CP/M with the SUPERBIOS.
                  Customers who have not purchased CP/M from Advanced
                  Digital will receive a CPM.SYS with the CCP
                  and BDOS zeroed out.

SUPRBIOS.MAC   is the source file for the SUPERBIOS. It can be
                  edited and reassembled if modification of the
                  SUPERBIOS is desired.

FMT8.COM   is the SUPERBIOS 8" floppy disk format program.

FMT48.COM   is the SUPERBIOS 5-1/4" 48 TPI format program.

FMT96.COM   is the SUPERBIOS 5-1/4" 96 TPI format program.

                  NOTE: the three format programs are all produced
                  from the source file "FORMAT.MAC".

FORMAT.MAC   is the source file for the above format programs.

LDRGEN.COM   is the equivalent of SYSGEN.COM in a normal CP/M
                  system. LDRGEN.COM transfers the SUPERBIOS cold
                  start loader from source (usually a disk) to
                  destination.

SBCBOOT.MAC   is the source file for the cold loader on track zero
                  sector one, which is brought in by the monitor PROM.

SBCHBOOT.MAC   is the source file for the cold boot loader for the
                  hard disk.

LDRBDOS.MAC   is the source file for the logical (non-hardware
                  dependent) portion of the loader.

LODRBIOS.MAC   is the source file for the floppy and hard disk
                  drivers used in the loader.

RAMDISK.MAC   is the SAMPLE (only) source file for a ram disk
                  board.

MODEM.COM   is the modified version of the public domain program
                  "MODEM7".

MODEM.DOC   contains the information for running "MODEM.COM".

FMTHD.COM   is the hard disk format program.

FMTHD.MAC   is the source file for "FMTHD.COM".

Just getting started

Generating a new system disk:

If you have purchased CP/M TM. from Advanced Digital Corp, you can put your bootable CP/M disk into floppy drive "A" and depress the reset key and you will be off running CP/M. If you do not have CP/M from Advanced Digital then please refer to STEP 1C of the section entitled "CP/M INSTALLATION" Page 5 for installing your CP/M with our BIOS.

It is important to make a back-up copy of the distribution diskettes, it is very possible when first learning how to use the system, you can rewite, or change the data on the diskette without meaning to do so (which will or could cause the diskette not to boot any more). So to prevent having to send the diskettes back to Advanced Digital for regenning of the system disks, make one or two back up copies to work with and store the orginal diskettes for any later reference. The following steps will help generate a back-up copy.

Use FORMAT.COM to format blank disk(s) to the desired format so to make a back up copy of your distribution diskette(s).

Now its time to put a track zero loader on the disk you have just finished formatting. Place your formatted disk into floppy drive "B" and your bootable CP/M disk into drive "A". Run the program entitled "LDRGEN", you will be promted by this message:

Read loader from Hard or Floppy drive (H,F) or (ret) if in memory:

You will need to respond by typing "F" for floppy, next you will be promted by this message:

Enter physical drive no. (0-3) of loader source or (ret) to reboot:

You will need to respond by typing "0" for the first physical drive (which is drive "A"). Next you will be promted by this message:

Enter physical drive no. (0-3) of loader destination or (ret) to reboot:

You will need to respond by typing "1" for the second physical drive (which is drive "B"). To exit the program type a (ret) or a "^C". You now have a track zero loader on both diskettes.

Use PIP to transfer the file CPM.SYS from A to B. For optimum performance, CPM.SYS should be the first file you write to any system disk. This is because the system must access this file on each warm boot (control-C), and the access is much faster if the file is on the outermost tracks of the disk (files are writen to a new disk from the outer tracks in).

Use the "STAT" command to set the CPM.SYS file to read only.

A)STAT B:CPM.SYS $R/O

Next copy the rest of the file over to the back-up diskette by using,

A)PIP B:=A:*.*[V]

Operation of the SUPERBIOS

The SUPERBIOS behaves in general as any normal CP/M system bios. However, you must not change density of disks without doing a control-C. This is because the SUPERBIOS checks only once after each warm boot to see what density each disk is.

You may not change the system disk at any time, unless:

1)   You hard reset the system by depressing the reset button.

   or

2)   The system disks are the same density and the CPM.SYS file is located on the disk in EXACTLY the same place in the directory as the old disk. To ensure that the CPM.SYS file will always be in the same place on the disk, ALWAYS make CPM.SYS the first file copied to any diskette.

If you wish to change the density of the system disk you must hard reset the system by depressing the reset button.

Printer Selection:

The "SUPER BIOS" comes defaulted to a parallel type printer, if you desire to run a serial printer you have one of two options.
   1) Refer to the section entitled "CP/M INSTALLATION" for the steps necessary to incorporate a change of printer.
   2) If you wish to select between the two types of printers you can use the "STAT" command to change the printer output.

A)STAT LST:=CRT: this will select output to the serial printer.
A)STAT LST:=TTY: this will reselect output to the parallel printer.

NOTICE:

As shipped, the SUPERBIOS for the Super Six is configured to support two eight inch drives (drives A & B), one 5-1/4" 48 TPI as drive C, and one 5-1/4" 96 TPI as drive D. On the Super Quad there are two eight inch drives A & B.
   If you need to change your system configuration please refer to the section entitled "CP/M INSTALLATION".

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CP/M Installation

This section will explain the procedures necessary to change the operating system size or system configuration.

In order to properly assemble the SUPERBIOS, after making any changes you must use Microsoft's M80.COM and L80.COM versions "3.44".

STEP 1A how to change your CP/M system size.

STEP 1B how to change the system configuration.

STEP 1C how to install your own copy of CP/M.

STEP 1A:

To change the system size, you will need to change the '.PHASE' pseudo-op in the SUPRBIOS.MAC file to the address of where the bios will reside.

CP/M size	'.PHASE' address	
63k	F600 HEX	62976 DEC
62K	F200 HEX	61952 DEC
61K	EE00 HEX	60928 DEC
60K	EA00 HEX	59904 DEC
59K	E600 HEX	58880 DEC
58K	E200 HEX	57856 DEC
57K	DE00 HEX	56832 DEC
56K	DA00 HEX	55808 DEC
33K	7E00 HEX	32256 DEC
32K	7A00 HEX	31232 DEC
31K	7600 HEX	30208 DEC

The '.PHASE' pseudo-op is located immediately before the bios jump vector in the source file.

STEP 2A:

To assemble the SUPERBIOS use M80 with the command syntax:

A)M80 =SUPRBIOS/L.

The /L switch will produce a .PRN file with the macros expanded. Now link the SUPERBIOS using L80 with the following command syntax:

STEP 3A:

A)L80 /P:100,SUPRBIOS,SUPRBIOS/N/E

STEP 4A:

Now generate the CPM??.COM file (?? denotes the system by size). Type "MOVCPM ?? *". Save the file generated from the MOVCPM operation by typing "SAVE 34 CPM??.COM". Remember that the system size MUST correspond to the system size made in the SUPERBIOS.

To patch the SUPERBIOS and the CP/M file together do the following:

```
A)DDT CPM??.COM   (?? = system size)
DDT VERS 2.2
NEXT PC
2300 0100
-M980,1F7F,100
-ISUPRBIOS.COM
-R1600
NEXT PC
???? 0100
-G0
A)SAVE ?? XCPM.SYS
```

The number of pages to save in the XCPM.SYS file will vary depending on your system configuration, and can be calculated as follows: ie. if ???? = 2A80, then use the high byte (2A) of the address and round it off to the next highest value if the lower byte is not zero, (ie 2A80 to look like 2B). Convert the value to the number of pages to be saved using the following formula (2*16) + (11*1) - 1 = ??. In the example for 2A80 you would save 42 pages.

System configuration changes:

STEP 1B:

To change the system configuration, You will need to refer to one of the following steps:

Printer changes - STEP 2B:
Drive changes - STEP 3B:
Type ahead buffer - STEP 4B:

STEP 2B:

To change the printer from parallel to serial or serial to parallel change the equate labeled "PARPRNT" to true for parallel printer enabled, or to false for serial printer enabled. The first serial port is always reserved for the console and the second serial port is available for the serial printer.

Refer to STEP 2A to complete installation of the SUPERBIOS.

STEP 3B:

     To make drive configuartion changes,   the macro named
"DSKDEF" (located near the end of the source file) shows the
drive type and the logial mapping of the physical drive.   The
"DSKDEF" macro is used as follows:

     DSKDEF (F8,F8,ST419)

Note: In the Super Six bios you can mix 5-1/4" floppies with 8"
floppies, but this can NOT be done with the Super Quad bios.

This say's drives A,B are 8 inch floppies and drives C,D are an
ST419 20meg. hard disk.

     The "DSKDEF" macro will partition the drive into 8 meg. byte
partitions.

Other possible drive configurations are as follows:

F8 = 8 inch floppy drive
F548 = 5-1/4 inch 48tpi floppy drive
F596 = 5-1/4 inch 96tpi floppy drive

Drive type	num. logical drvs.	manufacture
NODRIVE	1	No drive selected skip a logical drive
DMA	2	dma systems cartridge
ST412	1	segate technology
ST419	1	segate technology
TM601S	1	tandom magnetics
TM602S	1	tandom magnetics
TM603S	1	tandom magnetics
TM603SE	2	tandom magnetics
TM501	1	tandom magnetics
TM502	2	tandom magnetics
TM503	2	tandom magnetics
SA602	1	shugart assoc.
SA604	1	shugart assoc.
SA606	1	shugart assoc.
SA1002	1	shugart assoc.
SA1004	1	shugart assoc.
Q2010	1	quantum
Q2020	2	quantum
Q2030	3	quantum
Q2040	4	quantum
M4010	1	miniscribe
M4020	2	miniscribe

The floppy step rate for 5 and 8 inch drive can be change at the equate labeled "FSTPR" to the desired step rate specifed in the following table:

```
00 = 3ms
01 = 6ms
02 = 10ms
03 = 15ms
```

The hard disk step rate is preset in the SUPERBIOS library for each individual drive type and should not be changed.

Refer to STEP 2A to complete instalation of the SUPERBIOS.

STEP 4B:

To install the type ahead buffer change the equate labeled "INTRIN" to true for enabled and false for disabled. This allows interupt driven console input.

Refer to STEP 2A: to complete instalation of the SUPERBIOS.

Install your own copy of CP/M.

STEP 1C:

The following implemention will work as long as your supplier has not made any modifications to the MOVCPM.COM file as sent by Digital Research.

If you have bought CP/M from Advanced Digital then you will not need to make the following patch to your "MOVCPM.COM" file. If you already own CP/M you must make the following patch inorder to correctly operate CP/M on any Advanved Digtial product.

```
A)ddt movcpm.com
DDT vers 2.0
NEXT PC
2800 0100
-a1cd2                        the instructions were
1CD2 nop                          DCR C
1CD3 nop                          DCR C
1CD4 lxi h,0                      JNZ 12DF
1CD5 .
-g0
A)save 39 movcpm.com
```

This is necessary because the SUPERBIOS uses a sector blocking/deblocking algorithm that uses the directory write code in C to flush disk buffers after file closing.

STEP 2C:

Make a copy of your SUPERBIOS distribution disk to work on. Do PIP B:=A:*.*[VO] then use LDRGEN to transfer the loader.

STEP 3C:

Put the copy of of the SUPERBIOS distribution disk in your second floppy drive (B:), and your current CP/M system disk (with the patched MOVCPM.COM) in the first floppy drive (A:).

STEP 4C:

Run MOVCPM and DDT to create a system file.

```
A)MOVCPM 61 *          ( 61K is the normal system size )

CONTSTRUCTING 61K CP/M V2.2
READY FOR "SYSGEN" OR "SAVE 34 CPM61.COM"

A)SAVE 34 B:CPM61.COM

A)B:
B)A:DDT  CPM61.COM    ( Use your DDT to bring in CP/M )

NEXT       PC
2300       0100

-M980,1F7F,100        ( Move the CCP and BDOS to 100H )

-ICPM.SYS
-R1600                ( The CPM.SYS file has the BIOS image )

-M2D00,3700,1700      ( Move the new BIOS to 1700H )

-11700,1702           ( Make sure move went OK )

 1700 JMP FA00

-G0                   ( Exit and save )

B)ERA CPM.SYS
B)SAVE  ??  CPM.SYS       ?? = number of pages to  be  saved.
```
(refer to the formula in STEP 4A on calculating the number of pages to be saved.)

STEP 5C:

You now have a bootable system disk equivalent to those sent to customers who have purchased CP/M from Advanced Micro Digital.

Floppy disk formats

The SUPERBIOS single density eight inch format is completely IBM standard 3740 compatable. The disks should be readable by any CP/M standard single density 8" system. Note that the Advanced Digital format program fills all sectors with E5's in accordance with standard practice.

Some eight inch single density disks from other systems may not be readable at first with the SUPERBIOS. This is because they have an odd byte located on track 0 sector 1 byte 7F (this is the standard location). This is where the density code is supposed to be. The SUPERBIOS interprets either a 00 or E5 to be single density, anything else other than the SUPERBIOS single density code byte will cause an error. If you are unable to read a supposedly standard single density disk, try running the SUPERBIOS format program with the FORMAT SYSTEM TRACKS ONLY option. This will fill the outer two tracks with E5 and not hurt any of the data. It will destroy the present system already on the disk.

The SUPERBIOS double density format for eight inch disks has the first track of each disk formated to be single density, in accordance with IBM practice. All tracks of minifloppies are double density. Byte 7F of track zero, sector 1 is a code byte (this is the standard location). Our codes are E5 for single density, E6 for single sided double density, and E7 for double sided double density. There is no double sided single density format, as there are no standards available for such disks.

Double density disks have only one reserved track. The sectors are 1024 bytes in length. Eight inch disks have eight sectors per track, five inch disks have four. The physical skew on the disk is three for eight inch, two for five inch. These numbers were chosen to optimize sequential sector operations such as program loads, since these operations are the most sensitive to the skew factor. There is no logical skew used with double density disks.

Hard Disk formats

The hard disk driver will support most any SA1000 or ST506 interfaces. The hard disk controller can handle up to four physical drives in any combination as long as you don't try to mix SA1000 interface with ST506. As supplied the Superbios contains configuartions for the following disk drives:

SEAGATE TECHNOLOGY
        ST412   ST419

TANDON MAGNETICS
        TM601S   TM602S   TM603S   TM603SE   TM501
        TM502   TM503

SHUGART ASSOCIATES
        SA602   SA604   SA606   SA1002   SA1004

QUANTUM
        Q2010   Q2020   Q2030   Q2040

MINISCRIBE
        4010   4020

ATASI
        3020   3033   3046

DMA SYSTEMS
        MICRO MAGNUM 5/5

other drives can be added without a lot of difficulty.