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INTRODUCTION -

BIOS-80 is a modification to the Heath/Zenith CP/M BIOS (Ver. 2) which allows any combination of 40 track single sided and 80 track double sided drives to be used simultaneously. The files BIOSGENT, ASMBIOST, and MCPMGENT are used to generate the new BIOS source code, BIOS object code, and revised MOVCPM which will generate bootable system disks for either 40 track or 80 track disk formats. In addition, the utilities TFORMAT and CONFIGT are supplied for initializing disks to both formats, and configuring the BIOS to the hardware environment respectively.

BIOS-80 leaves intact all functions of the original BIOS including logical to physical mapping, boot from any drive, etc. The logical to physical mapping, however, is handled in a slightly different way due to the variety of disk formats available. The boot drive is ALWAYS used as the mapping unit for imaginary drives, and, therefore, all mapped disks are assumed to be of the same type as the boot disk. I.E. if you boot from a 40 track drive, ALL imaginary drives will be treated as 40 track drives. If you boot from an 80 track drive, ALL imaginary drives will be treated as 80 track drives.

BIOS-80 allows reading of 40 track disks in 80 track drives, but DOES NOT allow writing of 40 track disks in 80 track drives. This is necessary because a 40 track disk written in this way would not be readable in a standard 40 track drive. The BIOS automatically checks the disk type the first time each drive is accessed following a cold or warm boot, so you MUST do a Control-C before switching between 40 and 80 track disks. Failure to do so will result in a read error. Attempts to write to a 40 track disk in an 80 track drive will result in a disk write error.

The BIOS-80 utility MOVCPMT allows generation of bootable systems for either 40 track single sided or 80 track double sided disk formats. The proceedure for generating a bootable disk is essentially the same as for the standard MOVCPM5. Note that you can boot from any drive, except that it IS NOT POSSIBLE to boot from a 40 track disk placed in an 80 track drive!

Due to incompatibilies between the modified BIOS and the standard one, the Heath CONFIGUR and DUP programs should NOT be used under this BIOS. The Heath FORMAT program should be used only for initializing H-47 disks.

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SYSTEM GENERATION -

BIOS80.SUB is used to generate the new CP/M BIOS required to operate with both 40 track and 80 track 5" disk drives under the Heath/Zenith implementation of CP/M 2.2. The BIOS is supplied as a number of "patch" files rather than a complete BIOS in order to avoid copyright infringement. BIOS80.SUB uses the CP/M SUBMIT, XSUB, PIP, and ED transients to automatically modify the standard Heath/Zenith BIOS source code to adapt it for use with the new disk system. Once the new BIOS source is generated, ASMB80.SUB is used to assemble the new BIOS and create the relocatable BIOS module.

Proper execution of these programs requires that your system be configured with physical drive 0 as a 40 track drive. If this is not the configuration you are using, you should re-jumper the drives to obtain this configuration.

In the following steps, do EXACTLY as told or the process WILL NOT WORK. When told to copy a CP/M file onto a specific disk, take that file ONLY from the CP/M 2.2 Distribution Disks, NOT from other copies. This is particularly important when copying the file BIOS.ASM. If you have made ANY modifications to the BIOS in your system, you will have to make them again to the new BIOS AFTER IT IS GENERATED. If you try to run BIOS80.SUB on a modified BIOS source file, it WILL NOT work!!

Before executing BIOS80.SUB, it will be necessary for you to prepare three disks with specific programs on each. Proceed as follows:

1 - Format three 5" disks using the CP/M FORMAT program.

2 - Mark the three disks "A", "B", and "C".

3 - SYSGEN the "A" disk (see the Heath documentation) and then copy your CONFIGURed BIOS onto it.

4 - Copy the following files onto the "A" disk from your CP/M Distribution Disk I :

            SUBMIT.COM
            XSUB.COM
            ED.COM
            DDT.COM

5 - Copy the following files onto the "A" disk from your BIOS-80 Distribution Disk :

            SUBPATCH.SUB
            BIOS80.SUB
            ASMB80.SUB

6 - Copy the following file onto the "B" disk from your CP/M Distribution Disk II :

        BIOS.ASM

Use the PIP "U" flag to translate the file into upper case with a command line such as:

        PIP B:=A:BIOS.ASM U

This copy of the BIOS MUST BE taken from the distibution disk or the patch WILL NOT WORK. If you have customized your BIOS in any way, you will have to make the changes to the newly generated BIOS AFTER running BIOS80.SUB.

7 - Copy the following files onto the "B" disk from your BIOS-80 Distribution Disk :

        ALL FILES WITH THE ".LIB" EXTENSION

8 - Copy the following files onto the "C" disk from your CP/M Distribution Disk I :

        ASM.COM
        PIP.COM

9 - Copy the following file onto the "C" disk from your CP/M Distribution Disk II :

        PREL.COM

10 - Copy the following file onto the "C" disk from your BIOS-80 Distribution Disk :

        ORG.ASM

11 - At this point, use the CP/M STAT transient to verify that ALL files on ALL three disks are set for read/write and directory list by using commands of the form:

        STAT B:*.* $R/W
        STAT B:*.* $DIR

12 - Place the "A" disk in Drive A: and perform a COLD boot by resetting the computer and re-booting CP/M.

13 - Type "SUBMIT SUBPATCH" followed by a carriage return. SUBPATCH fixes an undocumented bug in the SUBMIT supplied with CP/M 2.2 which causes an error if an attempt is made to insert any control characters in the .SUB file. This patch is required because the files BIOS80 and ASMB80 both make extensive use of control characters. It is suggested that once SUBPATCH has run that you replace any existing copies of SUBMIT with the new version.

14 -   If you have 2 or more 5" disk drives, place the "B" disk
       in drive B:. If you have only one disk drive, you will
       be prompted about 4000 times to switch disks in the A:
       drive during the BIOS80 process. When prompted to place
       5.25" disk A: in drive 0, place the "A" disk in the drive.
       When prompted to place 5.25" disk B: in drive 0, place the
       "B" disk in the drive.

15 -   Type "SUBMIT BIOS80" followed by a carriage return. If
       you have 2 or more disk drives, you can go get a snack or
       something, as BIOS80 will run itself for about 5 minutes.
       If you have only a single drive, you will have to sit by
       the computer to switch disks when prompted.

16 -   When BIOS80 has finished running, the "A>" prompt will
       return, and the disk drives will turn off. At this point,
       the file BIOS.ASM on disk "B" will have been erased, and
       the "A" disk will contain the file BIOS80.ASM which is the
       newly generated source code for the new BIOS. It is a good
       idea to make a backup copy of BIOS80.ASM at this point in
       case you might have a need for it in the future.

17 -   It is now time to assemble the new BIOS and convert it to
       relocatable format. To do this, remove the "B" disk from
       drive B:, and place the "C" disk in drive B:. If you have
       only a single drive, when prompted to put disk A: in
       5.25" drive 0, place the "A" disk in the drive. When
       prompted to place 5.25" disk B: in 5.25" drive 0, place
       the "C" disk in the drive.

18 -   Type "SUBMIT ASMB80" followed by a carriage return. If
       you have 2 or more disk drives, you can again leave the
       room, this time for 10-15 minutes. If you have only one
       disk drive, you will again have to sit by the computer and
       switch disks when prompted to.

19 -   When ASMB80 has finished running, the "A>" prompt will
       return, and the disk drives will turn off. At this point,
       the "A" disk will contain the file BIOS.SYS which is the
       new relocatable BIOS module.

20 -   Make a backup copy of BIOS.SYS from the "A" disk. This
       is the final BIOS which you will use on all disks in the
       future.

21 -   Copy the file CONFIG80.COM from your BIOS-80 Distribution
       Disk onto disk "A".

33 - When the "FORMAT" prompt appears, enter "B" followed by a carriage return. This will generate a system for an 80 track double sided disk.

34 - When the "A>" prompt again appears, type "SYSGEN" followed by a carriage return.

35 - In response to the "SOURCE" prompt, enter a carriage return.

36 - For the "DESTINATION" drive, enter the address of the 80 track drive followed by a return.

37 - When the "DESTINATION" prompt re-appears, type a carriage return.

38 - Copy BIOS.SYS from the A: disk to the 80 track disk.

39 - When the "A>" prompt re-appears, again reset the computer and this time perform an alternate boot by typing "B" followed by the physical address of the 80 track drive (either 1 or 2), followed by a carriage return. If all goes well, the 80 track drive should turn on, and, after a few seconds, the CP/M sign-on should appear, followed by the "A>" prompt.

ADDITIONAL OPTIONS -

If, after performing all of the above steps, you wish to re-jumper your drives to place an 80 track drive at physical address 0, proceed as follows:

1 - Prepare an 80 track boot disk as described above.

2 - Boot up CP/M using this disk in an 80 track drive addressed at either 0 or 1.

3 - Run CONFIG80, and configure drive 0 as an 80 track drive.

4 - After saving the new BIOS to the disk, turn off the computer, and re-address the drives to place an 80 track drive at address 0.

5 - Turn on the system, and boot up CP/M from drive 0, using the disk generated in steps 1-4 above.

6 - Again run CONFIG80, and set the final disk system configuration. Using this proceedure, it is possible to generate a system containing ONLY 80 track drives, if desired.

22 - Perform another COLD boot using the "A" disk in 5" drive 0. This will load the new BIOS into memory, and begin executing it. After a few seconds you should get the CP/M "A>" prompt back following the sign-on message. At this point, you should be able to read 40 track disks placed in the 80 track drives. (Note - it is NOT possible to write to a 40 track disk placed in an 80 track drive. If this is attempted, a Write Error will be generated.)

23 - Read the CONFIG80 documentation and execute CONFIG80 to configure the new BIOS to the hardware in your system. Be sure to go through the DISK OPTIONS section!!!

24 - Execute the file FORMAT80.COM from your BIOS-80 Distribution Disk. This program will initialize an 80 track disk to the required format for CP/M.

25 - When the "Which Drive" prompt appears, place a blank disk in the 80 track drive (The "C" disk can be used if desired).

26 - Enter the address of the 80 track drive (either "B" or "C"), followed by a carriage return.

27 - When FORMAT80 has finished initializing the disk, the "Which Drive" prompt will return. When this happens, type a Control-C to return to the CP/M command mode.

28 - At this point, you are almost done. It is now necessary to generate the new version of MOVCPM to support the new disk system. This will make it possible to boot from the 80 track drives. Copy the following files onto the "A" disk from your CP/M distribution Disk I :

                    DDT.COM
                    MOVCPM5.COM
                    SYSGEN.COM

29 - Copy the following files onto the "A" disk from your BIOS-80 Distribution Disk :

                    MOVCPM80.SUB
                    MOVCPM80.HEX
                    SDT80.PRE

30 - Type "SUBMIT MOVCPM80" followed by a carriage return. This will cause a new version of MOVCPM to be generated by patching the existing MOVCPM5. (See the file MOVCPM80.ASM for more details)

31 - When MOVCPM80 is through, the "A>" prompt will return, and the file MOVCPM5.COM will have been replaced by the file MOVCPM80.COM. It is a good idea to make a backup copy of MOVCPM80 at this time.

32 - Do a warm boot (Control-C)and then type "MOVCPM80" followed by a carriage return.

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CONFIG80 is, for the most part, operationally identical to the Heath/Zenith CONFIGUR. The only major area of change is in the disk related options. Therefore, for information relating to the other areas of the program, refer to the Heath/Zenith CONFIGUR documentation.

Each time CONFIG80 is run, it will test for the presence of each of the 5" disk drives. For each drive located, the type will be assumed to be the same as that in the currently set BIOS configuration. If a drive is located at a particular address and if the current BIOS indicates no drive at that location, then that drive will be assumed to be a 40 track single sided drive. If no drive is located at a particular address, then that drive will be flagged as imaginary.

There are two options to be set for each drive: these are the drive type and step rate. The available options for drive type are "S" for a 40 track single sided drive, and "D" for an 80 track double sided drive. The drive type displayed by CONFIG80 MUST accurately reflect the actual type of drive at each address, or the system will not function properly. The step rates can be any multiple of 2 milliseconds from 2 msec to 40 msec.

If the above discussion is not sufficiently clear, I would suggest you simply experiment with CONFIG80, and generate several different systems. You should very quickly get a feel for what the different possibilites are.