

# Creating CP/M 2.2 Boot Image for Genie III

## Assembling Source Files (CP/M 2.2 and CP/M 3)

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```
A>>ASM CPM22.AAZ                                the "Z" generates no listing
CP/M ASSEMBLER - VER 2.0
EC33
01DH USE FACTOR
END OF ASSEMBLY

A>>M80 BOOTER, =BOOTER                            no listing
No Fatal error(s)

A>>L80 /P:4200, BOOTER, BOOTER/N/X/E             the "/P:4200" makes the output file start at 4200h instead
                                                of 0100h. "/N/X/E" generates a .hex file and exits
Link-80  3.44  09-Dec-81  Copyright (c) 1981 Microsoft
Data    4200   42E8    < 232>
46930 Bytes Free
[0000   42E8       66]

A>>M80 CBIOS, =CBIOS                              no listing
No Fatal error(s)

A>>L80 CBIOS, CBIOS/N/X/E                         ".PHASE" directive in CBIOS.MAC outputs from L80 at
                                                0100h even though the code will run at EC00h
Link-80  3.44  09-Dec-81  Copyright (c) 1981 Microsoft
Data    0100   1500    < 5120>
42042 Bytes Free
[0000   1500       20]

A>>MAC SYSGEN                                     CP/M 2.2 SYSGEN utility
CP/M MACRO ASSEM 2.0
04E7
005H USE FACTOR
END OF ASSEMBLY

A>>LOAD SYSGEN
FIRST ADDRESS 0100
LAST ADDRESS 04BF
BYTES READ    03BE
RECORDS WRITTEN 08

A>>MAC SYSGEN3                                   CP/M 3 SYSGEN utility
CP/M MACRO ASSEM 2.0
0878
009H USE FACTOR
END OF ASSEMBLY

A>>LOAD SYSGEN3
FIRST ADDRESS 0100
LAST ADDRESS 0835
BYTES READ    06F5
RECORDS WRITTEN 0F
```

## Making Image File using DDT (CP/M 2.2)

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A>DDT

DDT VERS 2.2

-IBOOTER.HEX

-RC700

adding C700h to the 4200h ORG of BOOTER code loads  
BOOTER into RAM starting at 0900h

NEXT PC

09E8 0000

-ICPM22.HEX

-R3500

adding 3500h to the D600h ORG of the CCP loads  
CP/M into RAM starting at 0B00h

NEXT PC

2133 0000

-ICBIOS.HEX

-R2000

adding 2000h to the 0100h address output by L80 loads  
BIOS into RAM starting at 2100h

NEXT PC

3500 0000

-GO

G zero – not "oh"

A>SAVE 52 GENIECPM.COM

save the CP/M image we created

A>DDT GENIECPM.COM

looking at what we made

DDT VERS 2.2

NEXT PC

3500 0100

-L900

verify BOOTER code starts at 0900h

0900 LXI H,4250

0903 LXI D,FED1

0906 LXI B,0006

0909 ??= ED

090A ORA B

090B MVI A,0A

090D STA FEE9

0910 MVI B,15

0912 MVI E,00

0914 PUSH B

0915 LDA 4256

-DB00

verify the CCP of CP/M starts at 0B00h

0B00 C3 5C D9 C3 58 D9 7F 00 43 6F 70 79 72 69 67 68 .\..X...Copyrigh

0B10 74 20 31 39 37 39 20 28 63 29 20 62 79 20 44 69 t 1979 (c) by Di

0B20 67 69 74 61 6C 20 52 65 73 65 61 72 63 68 20 20 gital Research

0B30 20 20 20 20 00 00 00 00 00 00 00 00 00 00 00 00 .....

0B40 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....

0B50 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....

0B60 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....

0B70 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....

0B80 00 00 00 00 00 00 00 00 08 D6 00 00 5F 0E 02 C3 .....

0B90 05 00 C5 CD 8C D6 C1 C9 3E 0D CD 92 D6 3E 0A C3 .....

0BA0 92 D6 3E 20 C3 92 D6 C5 CD 98 D6 E1 7E B7 C8 23 ..> .....

0BB0 E5 CD 8C D6 E1 C3 AC D6 0E 0D C3 05 00 5F 0E 0E .....

-L2100

verify the BIOS jump table is at 2100h

2100 JMP F0D9

2103 JMP EC36

2106 JMP ECE0

2109 JMP ED05

210C JMP ED23

210F JMP ED41

2112 JMP ED5D

2115 JMP ED72

```
2118 JMP ED8D
211B JMP ED9C
211E JMP EDB2
-GO
```

A>**SYSGEN GENIECPM.COM**

write the new image to boot tracks (if desired)

## Notes (CP/M 2.2)

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Once you have assembled and linked the source files (and the .hex files aren't deleted), the source files don't need to be assembled again unless you have changed a source file.

Once you have created the image file (e.g., GENIECPM.COM), you can specify the image file name on the DDT command line and perform the "I" and "R" step for only the file you have updated. For example, if you've made a change to the CBIOS, the following steps update the BIOS in the existing GENIECPM.COM file.

A>**DDT GENIECPM.COM**

DDT VERS 2.2

-**ICBIOS.HEX**

-**R2000**

NEXT PC

3500 0000

-**GO**

adding 2000h to the 0100h address output by L80 loads  
BIOS into RAM starting at 2100h

G zero – not "oh"

A>**SAVE 52 GENIECPM.COM**

save the CP/M image we updated

## Making Image File using DDT (CP/M 3)

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A>**SAVE**

Issue CP/M 3 SAVE command before session to be saved

A>**DDT**

DDT VERS 2.2

-**IBOOTER.HEX**

-**RBF00**

adding BF00h to the 4200h ORG of BOOTER code loads  
BOOTER into RAM starting at 0100h

NEXT PC

01E8 0000

-**ICPM22.HEX**

-**R2D00**

adding 2D00h to the D600h ORG of the CCP loads  
CP/M into RAM starting at 0300h

NEXT PC

1933 0000

-**ICBIOS.HEX**

-**R1800**

adding 1800h to the 0100h address output by L80 loads  
BIOS into RAM starting at 1900h

NEXT PC

2D00 0000

-**GO**

CP/M 3 SAVE - Version 3.1

SAVE dialog automatically comes up when DDT exits

Enter file (type RETURN to exit): **GENIECPM.COM**

Beginning hex address **0100**

Ending hex address **2CFF**

A>**DDT GENIECPM.COM**

looking at what we made

DDT VERS 2.2

NEXT PC

2E00 0100

-**L100**

verify BOOTER code starts at 0100h

0100 LXI H,4250

0103 LXI D,FED1

0106 LXI B,0006

0109 ??= ED

010A ORA B

010B MVI A,0A

010D STA FEE9

0110 MVI B,15

0112 MVI E,00

0114 PUSH B

0115 LDA 4256

-**D300**

verify the CCP of CP/M starts at 0300h

0300 C3 5C D9 C3 58 D9 7F 00 43 6F 70 79 72 69 67 68 .\..X...Copyrigh

0310 74 20 31 39 37 39 20 28 63 29 20 62 79 20 44 69 t 1979 (c) by Di

0320 67 69 74 61 6C 20 52 65 73 65 61 72 63 68 20 20 gital Research

0330 20 20 20 20 00 00 00 00 00 00 00 00 00 00 00 00 .....

0340 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....

0350 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....

0360 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....

0370 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....

0380 00 00 00 00 00 00 00 00 08 D6 00 00 5F 0E 02 C3 .....

0390 05 00 C5 CD 8C D6 C1 C9 3E 0D CD 92 D6 3E 0A C3 .....

03A0 92 D6 3E 20 C3 92 D6 C5 CD 98 D6 E1 7E B7 C8 23 ..> .....

03B0 E5 CD 8C D6 E1 C3 AC D6 0E 0D C3 05 00 5F 0E 0E .....

-**L1900**

verify the BIOS jump table is at 1900h

1900 JMP F0D9

1903 JMP EC36

```
1906 JMP ECE0
1909 JMP ED05
190C JMP ED23
190F JMP ED41
1912 JMP ED5D
1915 JMP ED72
1918 JMP ED8D
191B JMP ED9C
191E JMP EDB2
```

**-GO**

A>**SYSGEN3 GENIECPM.COM**

write the new image to boot tracks (if desired)

## Notes (CP/M 3)

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Once you have assembled and linked the source files (and the .hex files aren't deleted), the source files don't need to be assembled again unless you have changed a source file.

Once you have created the image file (e.g., GENIECPM.COM), you can specify the image file name on the DDT command line and perform the "I" and "R" step for only the file you have updated. For example, if you've made a change to the CBIOS, the following steps update the BIOS in the existing GENIECPM.COM file.

A>**SAVE**

CP/M 3 SAVE command before session to be saved

A>**DDT GENIECPM.COM**

DDT VERS 2.2

**-ICBIOS.HEX**

**-R1800**

adding 1800h to the 0100h address output by L80 loads  
BIOS into RAM starting at 1900h

NEXT PC

2D00 0000

**-GO**

G zero - not "oh"

CP/M 3 SAVE - Version 3.1

SAVE dialog automatically comes up when DDT exits

Enter file (type RETURN to exit): **GENIECPM.COM**

Beginning hex address **0100**

Ending hex address **2CFF**

A>