

SYSTEM 8000 under CP/M Plus
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Description of Package Components

Description of modifications

Updates since Ver. 1006-1233-126

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*****
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```

I M P O R T A N T N O T E ---> Please read this file

This file contains sum very important notes for your system. Please read it very carefully, because here you will find all updates not contained in your system-manuals. All notes you will find here are of the latest update. If you will find some differences between your manual and this description this description will be true. This is most important when creating a new system under gencpm.

P A T C H E S:

Some patches have been made by datentechnik oettle + reichler on original CP/M Plus files from Digital Research improving system performance and eliminating some little bugs. All patches have been made under use of Digital Researches OEM - manuals.

1. Patch 09/ INITDIR patch 02: 5/1/83
2. Patch 11/ HELP patch 03: 2/19/83
3. Patch 12/ CCP patch 02 5/1/83
4. Patch 13/ BDOS patch 02: 5/1/83
5. Patch 14/ PATCH patch 02: 8/26/83
6. Patch 15/ CCP patch 03: 3/7/84
7. Patch 16/ SHOW patch 01: 3/7/84
8. Patch 17/ DATE patch 01: 3/7/84
9. Patch 18/ SAVE patch 01: 3/7/84

You can be sure that all official patches suggested by Digital Research have been made from us.

F I L E S: =====

CP/M Plus is supplied by Digital Research on two eight-inch single-density IBM disks. One disk contains the essential files of the package, and the other contains auxiliary files. A third disk contains Bios Files and System-specific Utilities supplied by Datentechnik oettle & reichler. This 3-disk breakdown applies only to the standard 8" disk format, though; if you obtained the package on another format, the files might be differently arranged among the supplied diskettes.

Files with a plus (+) after their names are original CP/M Plus files delivered by Digital Research.

----- FILES -----		----- DESCRIPTION -----
READ.ME1		This file
AUTODPB1.ASM		Source of disk parameter headers, bases, xlt tables User can modify it to create a new cpm3.sys
AUTODPB1.REL		Bios Rel.-Module as autodpb0.asm
AUTODSK1.REL		Bios Rel.-Module performs disk I/O
BDOS3.SPR	+	Non banked Version of BDOS
BIOSKRNL.ASM	+	An example for a kernel BIOS
BIOSKRNL.REL		Bios Kernel Rel.-Module, controls other Bios-Modules
BNKBIOS.SUB		Submitfile to link the Bios-Modules
BNKBIOS3.SPR		Original banked Bios3 Version to use for GENCPM
BNKBDOS3.SPR	+	Banked part of banked BDOS
BOOT.ASM	+	An example for a Boot programm
BOOT1.REL		Bios Rel. Module, performs Cold and Warmboot
CALLVERS.ASM	+	An example programm
CCP.COM	+	The Console Command Prozessor of CP/M Plus
CHARIO.ASM	+	An example for Character I/O handling
CPM3E.SYS		CP/M-Plus System file for System 8010 - 8023 = ECP
CPM3C.SYS		CP/M-Plus System file for System 8030 - 8043
CHARIO1.REL		Bios Rel.-Module for Character I/O
COPYSYSN.COM		To create a new CP/M System disk, do not use
COPYSYS.COM		
COPYSYS.ASM	+	Source to copy system between two IBM-Drives
CPM3.LIB	+	Library that generates DPBases, Headers ...
CPMLDR.REL	+	The CCP and BDOS part of the CPM Loader
DATE.COM	+	To display and set Time and Date
DEVICE.COM	+	To change baudrates, logical to physical def.
DIR.COM	+	Displays Directory
DIRLBL.RSX	+	A resident system extension
DUMP.ASM	+	An example for a simple Dump Programm
DUMP.COM	+	A simple Dump programm

ECHOVERS.ASM	+	An example for an RSX
ED.COM	+	The CP/M Plus Editor
ERASE.COM	+	To Erase Files
FD1797SD.ASM	+	An example for simple Disk I/O
FM.COM		To read strange disk formats
FORMATN.COM		To format a new disk
GENCOM.COM	+	To place RSX's
GENCPM.COM	+	To create a new CPM3 System
GENCPMC.DAT		System 8030-8043 configuration for use under GENCPM
GENCPME.DAT		System 8010-8023 configuration for use under GENCPM
GET.COM	+	To redefine Character Input
HELP.COM	+	Users Help
HELP.HLP	+	Date File for Help.com
HEXCOM.COM	+	Converts Intel hex format into command files
HIST.UTL	+	A Utility
INITDIR.COM	+	Init Directory for time stamps
LDRBIOS1.REL		The Bios-portion of the CPMLDR
LDRBIOS1.SUB		Submit-File to create a new CPM-Loader
LDRDPB1.ASM		The source for disk definitions of the loader-bios
LDRDPB1.REL		The Rel-File of ldrdpb0.asm
LIB.COM	+	A Library file manager
LINK.COM	+	The CP/M Linker LINK-80
MAC.COM	+	The CP/M Macro Assembler
MODEBAUD.LIB	+	A Library for Character I/O
MOVE.ASM	+	An example programm
PATCH.COM	+	To patch a drive
PIP.COM	+	Peripheral interchange programm
PORTS1.LIB		A library file that contains valid portadress
equates		
PORTS2.LIB		for System 8000
PUT.COM	+	To redefine console output
RANDOM.ASM	+	An example programm
RAMDISK1.REL		Bios modul how performs RAM-Floppy control
RENAME.COM	+	To rename files
RESBDOS3.SPR	+	Resident portion of banked BDOS
RGBTERM1.REL		Bios Rel.-Module, contains part of Character I/O and RGB-Terminal Software
RMAC.COM	+	The CP/M relocatable Macro Assembler
SAVE.COM	+	To save Files from the TPA
SCB.ASM	+	System control block definitions
SCB.REL		Assembled System Control Block
SET.COM	+	To define passwords, protections ...
SETDEF.COM	+	To define drive search chain ...
SHOW.COM	+	To show drive and directory characteristics

SID.COM	+	A Symbolic Debugger
SUBMIT.COM	+	To execute a group of commands
TIME1.REL		Bios Rel.-Module for Date and Time informations
TVI950.ASM		Source File for Ctr. and ESC-Sequences under RGB-Term
TVI950.REL		TVI950 compatible, user can modify it
TRACE.UTL	+	Bios Rel.-Module for RGB-Terminal definitions
TRACE.UTL	+	A utility
TYPE.COM	+	Types ASCII File on console
USRDEF1.ASM		Source user definable character I/O at Coldstart
USRDEF1.REL		Bios Rel.-Module for character I/O definitions
USRROUT.ASM		Source for user modifications on bios-calls
USRROUT.REL		Bios-Rel. Module with no Bios modifications
XFERN.COM		High speed disk backup
XREF.COM	+	Cross reference programm
Z80.LIB	+	A library to use Z-80 Op-Codes

NEW SYSTEM GENERATION

There are many ways for you to create a new CPM3.SYS file under System 8000.

1. Modification of space for drive buffers, hash tables etc. under GENCPM.
2. Adding new memory components, run GENCPM to adapt it.
3. Redefinition of disk layouts and login searching order. Modify the File AUTODPB1.ASM, assemble it using RMAC, link it with other modules using LINK, create a new CPM3.SYS File under GENCPM.

To adapt your new disk-format correctly you must also redefine the file LDRDPB1.ASM to create a new CPMLDR.

4. Redefinition of Character I/O's at Coldboot. Modify USRDEF1.ASM, assemble it, link it and run GENCPM.
5. Redefinition of Control and Escape Sequences of RGB-Terminal. Modify TVI950.ASM, assemble it, link it ...
6. Modifying Standard Bios Routines, adding some new facilities. Modify USRROUT.ASM ...

Differences between **System 8010/23** and 8030/43:

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The main difference between these two system-configuration is the size of common-memory: The first systems runs under **EPC and therefore the common area starts at 0C000h (16k common memory)**. The second system under CPU needs only a common area from 4 kByte, this means the common memory region starts at 0F000h in this configuration. Therefore there exists two different CPM3.SYS Files and two different GENCPM.DAT Files. If you run GENCPM to create a new system GENCPM needs GENCPM.DAT as input file. On your disk you will find two files named

GENCPME.DAT	for use under System 8010/23 = ECP = mc-CP/M Rechner and
GENCPMC.DAT	for use under System 8030/43 = einzelne Karten für CPU Floppy und RAM.

Decide which system you run and rename one of the above files in

---> GENCPM.DAT

Only a such named file will work as input-file for GENCPM.

When GENCPM has finished it outputs a file named CPM3.SYS. Rename this file to

CPM3C.SYS	for use under System 8030/43 or
<u>CPM3E.SYS</u>	<u>for use under System 8010/23 ECP</u>

The CPMLDR will only accept these two filenames.

When running GENCPM be careful to observe the following notes:

* The top page of memory is page 0FBH, not page 0FFh. These last 1 kByte in common memory contains some very critical system routines which may never be changed. Its the Bootloaders responsibility to load this last 1k Block from 0FC00h till 0FFFFh correctly.

* Therefore the CSEG-region must be in the region of 0500h - 05FFh, to preserve a TPA of 60 kByte (0 - 0EFFFh). If you need more CSEG memory when adding own routines to the BIOS its not critical under System 8010/23. Your Top-TPA may range from 0C0h page - 0F0h page. Under System 8030/43 you may lower the TPA only in 4k (0F0h, 0E0h, 0D0h, 0C0h ...) steps by adpating the variable TPALEN in the USRDEF1-File.

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How to run GENCPM:
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Use GENCPM.COM and optional GENCPM.DAT to create a new CPM3.SYS file. Rename at start of GENCPM the DAT-File from GENCPME- or GENCPMC.DAT to GENCPM.DAT. Rename the output file of GENCPM from CPM3.SYS to CPM3E- or CPM3C.SYS. GENCPM needs the files RESBDOS3.SPR, BNKBDOS3.SPR and BNKBIOS3.SPR as input. Modifications on the default input data of GENCPM should be done very carefully, please refer to datentechnik oettle + reichler if you have any trouble with your new installation.

An example for standard System 8043 generation:

A>GENCPM

CP/M 3.0 System Generation
Copyright (C) 1982, Digital Research

Default entries are shown in (parens).
Default base is Hex, precede entry with # for decimal

Use GENCPM.DAT for defaults (Y) ?

/ Always use GENCPM.DAT for defaults after renaming the
GENCPME(C).DAT-File.

Create a new GENCPM.DAT file (N) ?

/ Be sure to preserve the original GENCPME(C).DAT-File.

Display Load Map at Cold Boot (Y) ?

/ If you want you can omitt this option.

Number of console columns (#85) ?

Number of lines in console page (#24) ?

/ Values for RGB-Terminal, adapt it if another terminal.

Backspace echoes erased character (N) ?

Rubout echoes erased character (N) ?

Initial default drive (A:) ?

Top page of memory (FB) ?

Bank switched memory (Y) ?

Common memory base page (F0) ?

/ Top page is always 0FBh, never change it ! The last 1k block from
0FC00h to 0FFFFh contains some very critical BIOS-routines loaded
by the Boot-Loader at System-Start-Up. The system is for bank-

switched applications only. Therefore answer always (Y) to this question.

The common memory base page is not critical under system 8010/23. This is hardware-dependent and always 0C0h. The TPA can have any value between 0C0h and 0FCh.

Under System 8030/43 you can lower the common memory base page in 4k steps by adapting the variable TPALEN in the USRDEF1-File. On these systems the common memory base page must always have the same value as the TPA of your system. This means when you lower the CMBP to 0E0h you must lower too the TPA to this value.

Long error messages (Y) ?

/ Answer (Y) or (N) to this question. A (N) preserves little memory space but.

Accept new system definition (Y) ?

Setting up Allocation vector for drive A:
Setting up Checksum vector for drive A:
Setting up Allocation vector for drive B:
Setting up Checksum vector for drive B:
Setting up Allocation vector for drive C:
Setting up Checksum vector for drive C:
Setting up Allocation vector for drive D:
Setting up Checksum vector for drive D:

/ In the standard BIOS-Version there exists 4 physical drives (A-D) and one logical drive E (RAM-Floppy). Delete the entries in the drivetable and disk para.-header if you have less drives and you want to preserve memory space. See more in AUTODPB1.ASM. The Bios allocates automatically buffer for allocation and hashing for drive E. No checksum buffer is required for RAM-Floppy (not removable!).

*** Bank 1 and Common are not included ***
*** in the memory segment table. ***

Number of memory segments (#1) ?

/ The standard bios is adapted for 2 memory banks (128k). Therefore there is one free memory bank (0) for the CPM-System. If you have more than 128k Byte memory the standard bios uses this memory as RAM-Floppy. Under adapting the variable RAMBNK in the USERDEF1-File you can define the starting bank for RAM-Floppy for example to bank 4. Then there are three banks (0,2,3) for the CP/M-BDOS. The rest of memory from bank 4 to x is in this case for RAM-Floppy.

CP/M 3 Base, size, bank (A9,47,00)

Enter memory segment table:

Base,size,bank (31,78,00) ?

/ Note in bank 0 is a copy of the CCP using memory space from 0 - 0CFF . Starting at 0D00 there is a 9 k Bios-Track-Buffer for Multi I/O. The length of the Track-Buffer is determined by the greatest track-length of your drives. In the std. Bios-Version the grt. track-length is 9k (9x1024 Byte). Lower the trackbuffer if using other Formats. F.e. if you use only 5 1/4 Zoll drives a track buffer of 5 k (5x1024 Bytes) is sufficient. Therefore in std. bios bank 0 starts at 3100 for the CP/M system.

CP/M 3 Sys A900H 4700H Bank 00
Memseg No. 00 3100H 7800H Bank 00

Accept new memory segment table entries (Y) ?

Setting up directory hash tables:

Enable hashing for drive A: (Y) ?
Enable hashing for drive B: (Y) ?
Enable hashing for drive C: (N) ?
Enable hashing for drive D: (N) ?

/ Enable hashing for those drive you often use. However enable hashing costs some memory space. If you work only with two drives (A, B) its logical to disable hashing for the rest of drives.

Setting up Blocking/Deblocking buffers:

The physical record size is 0400H:

/ GENCPM uses the disk-parameter entries in the disk parameter header to allocate buffer space for each drive. The maximum physical sector size is 1024 Bytes (400h). Therefore you should prevere to work mainly with those formats who have a sector size of 1k (5x1024 or 9x1024). To work with other formatted disks would result in loss of memory space because a buffer is not full filled.

Available space in 256 byte pages:

TPA = 00F0H, Bank 0 = 0070H, Other banks = 0000H

Number of directory buffers for drive A: (#4) ?

Available space in 256 byte pages:

TPA = 00F0H, Bank 0 = 005FH, Other banks = 0000H

Number of data buffers for drive A: (#4) ?
Allocate buffers outside of Common (Y) ?

Available space in 256 byte pages:

TPA = 00F0H, Bank 0 = 004FH, Other banks = 0000H

Number of directory buffers for drive B: (#4) ?

Available space in 256 byte pages:

TPA = 00F0H, Bank 0 = 003FH, Other banks = 0000H

Number of data buffers for drive B: (#15) ?

Allocate buffers outside of Common (Y) ?

/ Note we gave drive B the most buffer space. Try to work mainly with this drive or adapt it to your configuration.

Available space in 256 byte pages:

TPA = 00F0H, Bank 0 = 0002H, Other banks = 0000H

Number of directory buffers for drive C: (#0) ?

Share buffer(s) with which drive (A:) ?

Available space in 256 byte pages:

TPA = 00F0H, Bank 0 = 0002H, Other banks = 0000H

Number of data buffers for drive C: (#0) ?

Share buffer(s) with which drive (A:) ?

Available space in 256 byte pages:

TPA = 00F0H, Bank 0 = 0002H, Other banks = 0000H

Number of directory buffers for drive D: (#0) ?

Share buffer(s) with which drive (A:) ?

Available space in 256 byte pages:

TPA = 00F0H, Bank 0 = 0002H, Other banks = 0000H

Number of data buffers for drive D: (#0) ?

Share buffer(s) with which drive (A:) ?

The physical record size is 0080H:

Available space in 256 byte pages:

TPA = 00F0H, Bank 0 = 0002H, Other banks = 0000H

Number of directory buffers for drive E: (#4) ?

Available space in 256 byte pages:

TPA = 00F0H, Bank 0 = 0000H, Other banks = 0000H

Accept new buffer definitions (Y) ?

```
RESBIOS3 SPR  F600H  0600H
BNKBIOS3 SPR  D600H  1A00H
RESBDOS3 SPR  F000H  0600H
BNKBDOS3 SPR  A800H  2E00H
```

/ Now be sure on system 8030/43 that the start of RESBDOS3-Portion
(=end of TPA) is conform with the variable TPALEN in the USRDEF1-
File. On systems 8010/23 this is not critical.

*** CP/M 3.0 SYSTEM GENERATION DONE ***

Now you have a new CPM3.SYS File on your Disk. Rename it to CPM3E(C).SYS
and place it with CCP.COM to a new Disk using PIP or COPYSYSN. Be sure
to have a copy of the Loader on the system tracks of this new disk. If
not use COPYSYSN to do this.

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How to assemble and link modified Bios-Files:

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Modify the standard Bios Files:

AUTODPB1.ASM
TVI950.ASM
USRDEF1.ASM
USRROUT.ASM

if you want using ED or any other Editor. Be sure to have a copy of the original ASM-Files if any troubles with your modification occurs. Then run RMAC to create a new relocatable REL-File ready to link under LINK. Now link your new REL-File with other Bios-Modules using LINK, SUBMIT and BNKBIOS.SUB. Note that the order to link the modules is urgent.

Urgent link Example:

A>SUBMIT BNKBIOS

--->

```
link bnkbios3 [b] = bioskrn1, time1, boot1, autodpb1, ramdisk1, autodsk1,
                  tvi950, chario1, scb, usrdef1, rgbterm1, usrROUT,...
```

Thus the linker produces a new system page relocatable BNKBIOS3.SPR-File ready for use under GENCPM.

Important Note:

The Code-Section of the BNKBIOS3.SPR File (CSEG) must not exceed 1.5 kByte to get a TPA of 60 kByte. The CSEG region printed out by the linker should be within the region of 0500 - 05FFh. If not you must adapt under system 8030/43 the label 'TPALEN' in the USRDEF0.ASM file. Under system 8010/23 you can lower the TPA without troubles up to 0C0h.

The linker message should appear as follows (if not otherwise defined in TPALEN) :

ABSOLUTE	0000	
CODE SIZE	05XX	(0000 - 05XX)
DATA SIZE	...	(0600 - XXXX)
COMMON SIZE	0000	

Then run GENCPM to create a new CPM3.SYS File using the input files RESBDOS3.SPR, BNKBDOS3.SPR and BNKBIOS3.SPR !

HOW TO CREATE A NEW CPMLDR:

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The CPMLDR is a simple non-banked CP/M System how resides on the reserved system tracks of your system-disk. Its purpose is to load the file CPM3C(E).SYS from the data-tracks of the system-disk, put the banked portions of CPM3C(E).SYS in banked memory and to put the non-banked portions in common memory. The CPMLDR consists of two parts: First part is the CPMLDR-BDOS how controls the second part, the CPMLDR-BIOS. The CPMLDR-BDOS is supported from Digital Research as a relocatable File named CPMLDR.REL . The BIOS-Portion is also relocatable and consists of two parts LDRBIOS1.REL and LDRDPB1.REL. The module LDRDPB1.REL is user definable similar to the AUTODPB1.REL-File. If you install a new diskformat you must redefine the file LDRDPB1.ASM in the same manner as AUTODPB1.ASM to create a new LDRDPB1.REL file.

Assemble the modified file LDRDPB1.ASM using RMAC:

```
A>RMAC LDRDPB1.ASM
```

Then link the new file with the two other loader modules using LINK:

```
A>SUBMIT LDRBIOS1
```

```
---->
```

```
link cpmlldr1.400 [l4000] = cpmlldr, ldrbios1, ldrdpb1
```

Note the load adress of the CPMLDR1-File is always 4000h. At this adress the Bootloader places the CPM-Loader and starts it. After creating a new CPMLDR put it onto the system tracks of your new system disk using COPYSYSN:

```
A>COPYSYSN CPMLDR1.400
```

* NEW FEATURES AND FACILTIES SINCE VERSION 1006-1233-0126 *

1. Baudrates: From now on all baudrates from 50 to 19200 will be supported. On systems 8010/23 there is one exception: Baudrate 19200 is only a very fare approximation and will result in 23000 Hz.
2. Protocols: The new CBIOS-3 supports a hardware-protocoll using the I/O-Lines RTS and CTS. CTS enables the transmitter of the system. An external unit can stop with this line the data-stream from the system. The other line RTS function as enabler for the adapted terminal to say stop inputing data to the system. The system activates RTS when ready to receive data from an external unit and deactivates it when not ready. At system start-up the XON-XOFF BIOS protocol is disabled.

3. Special Key-Functions:

There exists two special user-definable key codes (See in USRDEF1.ASM-File):

TIME-KEY: When inputed this code from the console device the CBIOS will not return this code to your application. Instead to this it reads out current time and returns this to your programm in the following form:

TIMKEY: -----> HH:MM:SS

DATE-KEY: When this code is inputed the CBIOS-3 will return current date to the programm:

DATKEY: -----> DD:MM:YY

If you dont wish these functions you can switch it off by inserting a '-1' at the appropriate codes.

4. Aborting invalid disk-select:

When selecting an invalid or switched-off drive this would result in a system-hang-up because of BIOS waiting for the ready-state of such a drive. You can abort this drive-polling by typing a special key ('BRKKEY' std. ^C) and the BIOS will return an error message to you (try it!).

5. Aborting device polling:

The same system-hang-up will occur when selecting a non-ready output device, f.e. a printer who has been switched off or not installed. In these cases you can input again the 'BRKKEY' to abort the polling. Note there is some delay until BIOS checks for a user-input of this break-

key. If you abort output to this device by break-key BIOS will erase this device-entry from the device-tabele. Note no special error-message will occur in this case.

6. COPYSYSN:

COPYSYSN supportes from now on no setting of the year-field in the BIOS. Instead of this there is a entry in the USRDEF1-File who contains current year.

7. Standard-Formats:

We have changed our standard format for Mini-Disk-Drives

5.25 Zoll from 9 x 512 ----> 5 x 1024

and for 8 Zoll komp. Mini-Drives from
15 x 512 ---> 9 x 1024

Please choose from now on these formats to work this. You will find these are the best because of great disk-capacity and fastest disk-access (1024 Byte / sector).

8. Others:

Please see for more informations in the USRDEF1-ASM file. There you will find still some other new functions.