Running CP/M
on the SPC/1 computer.

Danish Data Electronics A/S
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Running CP/M on the SPC/1
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1. Introduction.

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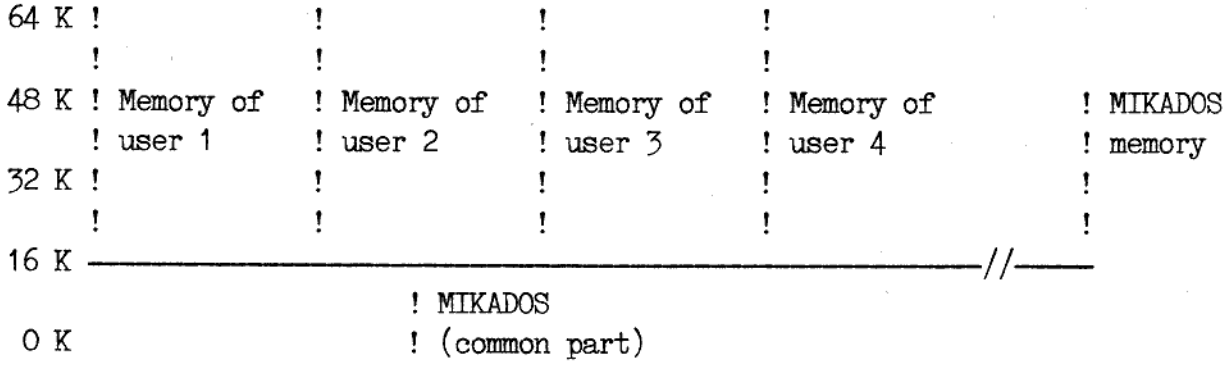
3.1 The concept of the MIKADOS operating system.

The MIKADOS operating system is a multi-tasking, multi user system. This implies that several users can run programs on the same Central Processor Unit (CPU) simultaneously. The CPU is in this manual called the MIKADOS CPU.

The MIKADOS CPU is a 8085 micro processor and thus has an address space of 64 Kbyte of memory. In a SPC/1 system, the first 16 Kbyte memory contains the part of the MIKADOS operating system, which is accessible to all users. The remaining 48 Kbyte address space memory is divided into several so-called banks, which means that the first user´s memory addresses 16 K - 64 K are different from the second user´s - and so forth. This creates the following memory structure:



In this way each user has access to the common part of the MIKADOS system (the root), but not to each other´s memory. Furthermore this, the MIKADOS operating system has its own memory bank with 32 Kbyte of memory - the so-called MIKADOS bank.

When the user 1 starts a program from his terminal on the computer, the program is assigned to this user´s memory bank. The program reserves memory bank 1, and no other program is allowed to run in that memory bank, until the first program is terminated.

3.2 The 8537 CP/M memory board.

To run CP/M programs on your terminal connected to the SPC/1 computer it is necessary, that the memory bank is not an ordinary 48 Kbyte memory module, but a 8537 CP/M memory board.

The 8537 memory board has 64 Kbyte memory and an associated 8085 CPU. This CPU is called "the local CPU" in this manual. The 8537 module works in two different manners:

When you are running a program under the MIKADOS operating system, then the 8537 module behaves just as a normal 48 Kbyte memory and the local CPU is not running.

But when executing a CP/M program the local CPU on the 8537 module runs and all the 64 Kbyte memory is available to the CPU. The local CPU is running the CP/M operating system, and it takes up the uppermost 7 Kbyte of memory - so 57 Kbyte memory is free to the CP/M programs.
The local CPU and the CP/M operating system is interpretted by the MIKADOS operating system as a ´normal´ program, which means that input from and output to the discs and the terminal and the printer are controlled by the MIKADOS operating system.

4.1 The contents of the delievered disc.

You will find the following MIKADOS files on the disc (or discs) which is enclosed in this package:

filename and type	Purpose
CPMSETUP (1, P)	The program used for setting up your CP/M system.
CPM (1, P)	The MIKADOS interface program to the CP/M operating system.
CPMCOPY (1, P)	A program used for copying 8" CP/M discs to or from a CP/M disc on the SPC/1 computer.
CPMBASE (C)	The basic CP/M disc. The contents of this disc is described in section 5.2.
CPMSYSTi (C)	The CP/M operating system belonging to terminal number i.
FCOPY (1)	MIKADOS Utility program used for copying files under the MIKADOS file system.

4.2.1 Installation in systems with fixed discs

It is assumed in the following that the P1 disc in MIKADOS is a fixed disc - if not, then follow the installation directions found in section 4.2.2.

1. Start your SPC/1 computer.
2. Insert the delievered floppy disc into the disc drive (in the following named Px).
3. Press the ESCAPE key and the MIKADOS operating system will answer with a '>' on the screen.
4. Type "FCOPY:Px" followed by pressing the RETURN key.
5. Answer the question "Enter source disc identification" by typing "Px" followed by RETURN.
6. Type "P1" and RETURN as an answer to the next question : "Enter destination disc identification".
7. The question "Enter master file type" is answered by pressing a "*" (a star) and RETURN.

8. Now enter the names of the files on the delievered floppy disc one by one - except the FCOPY file. The CPMCOPY program shall only be copied, if your SPC/1 computer has a 8" disc drive, because the CPMCOPY program is only used for reading and writing 8" discs.
9. When all the files has been copied, the FCOPY program is terminated by pressing the ESCAPE key.

4.2.2 Installation in systems with floppy discs

If your SPC/1 computer has floppy discs only, then you shall follow this installation direction :

1. Start your SPC/1 computer.
2. Insert an empty floppy disc into disc drive P1.
3. Insert the delievered floppy disc into the second disc drive (in the following named P2).
4. Press the ESCAPE key and the MIKADOS operating system will answer with a '>' on the screen.
5. Type "FCOPY:P2" followed by pressing the RETURN key.
5. Answer the question "Enter source disc identification" by typing "P2" followed by RETURN.
7. Type "P1" and RETURN as an answer to the next question : "Enter destination disc identification".
8. The question "Enter master file type" is answered by pressing a "*" (a star) and RETURN.
9. Now you shall copy the CPMSYST1, CPMBASE, CPM and CPMSETUP files, by typing the names one by one followed by RETURN.
10. The FCOPY program is terminated by pressing the ESCAPE key and the floppy disc in P1 now contains the files, which are necessary for running CP/M.

Note : Always remember to insert the generated disc into disc drive P1 when you want to run the CP/M system, and you must never take the floppy disc out of P1, when you are running the CP/M system.
The same rule should be kept in mind in regard to the floppy discs with the files containing the logical CP/M discs. Never open the disc drive or replace the floppy disc, when you have started the CP/M system.
Danish Data Electronics disclaims the responsibility for any damage the CP/M system makes on your floppy discs, if you break these rules.

5.1 A CP/M disc.

There are 4 logical dics names A, B, C and D in the CP/M system. None of the CP/M discs are physical discs, but they are all implemented as coherent files in the MIKADOS file system, though they will appear as normal CP/M discs, when you are running the CP/M system.

It is only possible to create a CP/M disc by running the CPMSETUP program (as described in section 5.3), but you may copy a complete logical CP/M disc from one MIKADOS disc to another by using the normal FCOPY utillity program. The filetype of a MIKADOS file containing a logical CP/M disc is always "C".

5.2 The basic CP/M disc.

The MIKADOS file named CPMBASE contains the basic CP/M disc with all the standard CP/M programs. This disc contians 120 kbyte, but the disc is almost fully occupied by the following files:

PIP.COM	Periperal Interchange Program.
ED.COM	CP/M editor.
ASM.COM	CP/M assembler.
DDT.COM	CP/M standard debugger.
LOAD.COM	.COM file loader.
STAT.COM	System status program.
SUBMIT.COM	Batch processor.
XSUB.COM	Batch processor eextender.
DUMP.COM	File dump program.
DUMP.ASM	Dump program source.
GETPR.COM	The printer reservation program.
FREEPR.COM	The printer release program.
MIKADOS.COM	Program used to return from CP/M to MIKADOS.
CPMTRANS.COM	Program to transfer text files between a CP/M and a MIKADOS disc.

5.3 Running the CPMSETUP program.

The CPMSETUP program is started by pressing the ESCAPE key on the terminal keyboard. The MIKADOS operating system answers with a ">" on the screen and you shall now type "CPMSETUP" followed by pressing the RETURN key. Now the CPMSETUP program erases the screen and writes the following text:

```
--- CP/M setup program  v.1  ---

The program is able to :

1 - Assign the Mikados CP/M discs to your CP/M system.
2 - Assign or free a printer for your CP/M system.
3 - Create a new Mikados CP/M disc.

Select function ( 1, 2, 3 ) :
```

You select the function you want by typing the belonging number followed by RETURN. The three different functions are described in section 5.4 to 5.6.

When you have created and assigned the discs to your CP/M system or assigned a printer, then CPMSETUP program is terminated by pressing the ESCAPE key.

5.4 Creating a logical CP/M disc.

To create a logical CP/M disc you must select function 3 by pressing a ´3´ and RETURN. The text on the screen is now:

```
--- CP/M setup program  v.1  ---

Enter Mikados filename for new CP/M disc. (max 8 letters) :
```

Type the name of the file, which is going to contain the logical CP(M disc to create. The filename consists of up to 8 letters (or numbers).

```
On disc : P
```

This question shall be answered with the name of the disc; the name of the discs are "P1", "P2", "P3" etc. The next question:

```
Create a Mikados disc compatible to a 8" disc ( Y, N ) ?
```

shall be answered with a ´Y´ (for Yes), when you are copying CP/M files to / from your CP/M system (see chapter 8). The 8" compatible disc is awkward because the capacity of the disc is fixed. So you must enter a ´N´ (for No) followed by RETURN, and you can now decide the capacity of the CP/M disc in kilobyte:

```
CP/M disc parameters :
```

Total capacity of Mikados CP/M disc in kbyte (max 4096 kb) :

Enter the wanted disc capacity and press RETURN. Be aware that your disc sometimes gets a capacity up to 16 kb smaller than you asked for. This is due to the fact that the capacity must be a multiple of the disc blocksize. For instance you have entered a disc capacity of 301 kb - the capacity of this disc will be 300 kb, because the blocksize is 2 kb. In the following table you will find the connection between the disc capacities and blocksizes.

Disc capacity (kb)	Blocksize (kb)
16 - 256	1
257 - 512	2
513 - 1024	4
1025 - 2048	8
2049 - 4096	16

The capacity of a disc should be minimum 16 kilobyte.

The number of directory entries on the CP/M is the next to be decided. The user must enter one of the stated numbers and press the RETURN key, as an answer to the question:

Number of directory entries - Select one of following :
(32, 64, 96, 128)
Entries :

In a number of cases the user can´t decide the number of entries - it is governed by the disc capacity. The CPMSETUP program for instance writes :

Number of directory entries on disc : 32.

The CPMSETUP creates the disc and writes e.g. the following messages on the screen :

The Mikados CP/M disc : FTDISC:P2 is now created.
The directory is being initialized. - please wait.

Press RETURN to continue :

Press the RETURN key and the menu shown in section 5.3 reappears on the screen.

5.5 Assigning a disc to the CP/M system.

To assign the discs to your CP/M system enter a ´1´ in the menu in section 5.3 and press the RETURN key. The CPMSETUP program informs you about the discs assigned to your CP/M system.

The user has up to four logical dics in his CP/M system. The discs are named A, B, C and D. Each logical CP/M disc has a name - the name of the MIKADOS file containing the logical CP/M disc.

The CPMSETUP can for instance write the following on your screen:

```
--- CP/M setup program  v.1  ---

Terminal no. : 1.

Following discs are in your CP/M system :

 disc A : CPMBASE:P1       access rights : R/O
 disc B : FTDISC:P2        access rights : R/W
 disc C : CDISC:P          access rights : R/W
 disc D : Disc not connected.

Which disc do you want to change ( A, B, C, D ) :
```

In the example shown above the user has only assigned 3 discs to his CP/M system : A, B and C. The last disc (D) is not connected, i.e. the user has not specified a MIKADOS file belonging to the logical disc D. The logical disc A differs from the other 2 discs in the user´s access rights to the disc: The user is only allowed to read from disc A - not to write on this disc. "R/O" means "Read-Only" where as "R/W" means "Read-Write".

To change a disc assignment answer the qustion shown above with the name of the logical disc (A, B, C or D) and RETURN. The CPMSETUP program then asks the question :

```
Enter Mikados filename of the relevant CP/M disc :
```

Enter the filename of the disc containing the CP/M dics which you want to have access to in your CP/M system. The filename must be followed by a RETURN. If you want to disconnect the disc in your CP/M system, then do not write any filename - only press the RETURN key. If you try to disconnect disc A in your system, you will recieve a

warning from the CPMSETUP program and will be asked to reenter the filename.

The next question:

On disc : P

must be answered with the identification of the disc on which the file is stored.

Finally the user must answer the question:

Read only access (Y,N) :

with a 'Y' or a 'N' and a press on the RETURN key. The Read Only access to a disc makes it possible for multiple users to share a CP/M disc - for instance the disc with the different CP/M programs.

The new disc is connected to your CP/M system and you must now press RETURN:

Press RETURN to continue :

the menu shown in section 5.3 reappears on the screen.

Note: The capacity of a CP/M disc must be between 16 and 4096 kilobyte. The logical C and D discs must not be larger than 2048 kilobyte, where as there is no restrictions on the size of the A and B discs. If you try to assign a disc to the logical discs C or D, you will recieve the following error message:

disc C must not be larger than 2048 kbyte.

5.6 Assigning a printer to the CP/M system.

To assign a printer or to free a printer from your CP/M system, enter a '2' in the menu shown i section 5.3 and press the RETURN key. For instance the CPMSETUP will now write the following on your screen:

```
--- CP/M setup program  v.1  ---

Terminal no. : 1.

Printer no. was 2.

Select printer no. ( 1 - 4 or 0 for no printer)  :
```

Enter the number of the printer, you want to use in your CP/M system. If you do not want any printer then a '0'. The CPMSETUP program does not test whether the printer number is legal on your SPC/1 computer. If the number was illegal you will later recieve an error message from the GETPR (see section 6.5). The printer number must be followed by a RETURN. Depending on the chosen the printer number the CPMSETUP program writes:

```
There is now no printer for your CP/M system.
```

or

```
Printer 1 is now connected to your CP/M system.
```

The printer is assigned to your CP/M system and you must now press RETURN:

```
Press RETURN to continue :
```

the menu shown in section 5.3 reappears on the screen.

Note: Multiple users may share the same printer by assigning the printer to their CP/M system. When you are running the CP/M system you must reserve the assigned printer, before you are able to use it. The reservation is made by the GETPR program. To allow another user to use the printer too, you must release the printer when you no longer need it.

6.1 Starting the CP/M system.

Before you can start the CP/M system , you have to assign a printer and the logical discs you want, as described in chapter 5 of this manual. You may now start the CP/M operating system on your local CPU by pressing the ESCAPE key and entering "CPM" followed by the RETURN key. The MIKADOS CPU will now load the CP/M operating system into your memory bank and start your local CPU. The screen will meanwhile be erased and the following text is written on the first line of the screen :

"cp/m v. 2.2"

The CP/M system is now running and the CP/M operating system will write "A>" on your screen. You may now start a CP/M program or enter a CP/M command. The different control characters, commands and programs are described in section 6.2 to 6.4. The user can find a complete description of the CP/M commands and programs in the manuals mentioned in chapter 9.

6.2 CP/M control characters.

The Console Command Processor (CCP) of the CP/M operating system allows the following line editing functions:

Keystroke:	Action:
<- (backspace)	moves cursor one space back and erases previous character.
RUB (or DEL)	deletes character to the left of the cursor.
RETURN (or CR)	carriage return.
LINE FEED (or LF)	terminates input at the console.
ctrl-C	CP/M system reboot.
ctrl-E	a physical carriage return, but line is not sent.
ctrl-P	Starts or stops copying all console activity at the printer. (See section 6.5).
ctrl-R	Retypes current command line.

ctrl-S Stops console listning temporarily or start again.

ctrl-U Erases the entire line, type a '#' and await a new command.

ctrl-X Deletes all characters in the command line.

ctrl-Z String or field separator. Set End Of Input from console.

Note : The MIKADOS operating system looks after your CP/M system and this gives you the possibility of using an emergency brake to stop your CP/M system. If you type ctrl-C and the running CP/M program doesn't make any input/output to the discs / the terminal or the printer within one second, then the MIKADOS operating system will terminate your CP/M program by rebooting the CP/M system. The MIKADOS system will write "ctrl-c" on your terminal when this happens.
This facility makes it possible to stop a program, which is running in an endless loop.

6.3 A short introduction to the CP/M commands.

The built-in commands in the CCP of the CP/M operating system are :

A: Select disc A as optional disc.

B: Select disc B as optional disc.

C: Select disc C as optional disc.

D: Select disc D as optional disc.

DIR Display names of the files on a disc.
Syntax: DIR d:filename.typ
Examples:
```
A>DIR
A>DIR B:
B>DIR C:MYFILE.TEX
A>DIR PROGRAM.*
A>DIR PROG???.PRN
```

ERA Erase a file or a group of files.
Syntax: ERA d:filename.typ
Examples: A>ERA MYFILE.BAK
B>ERA A:LETTER.*
A>ERA B:*.* (Erase all files)

REN Change the name of a file on a specified disc.
Syntax: REN d:newname.typ=oldname.typ
Examples: A>REN LETTER1.LST=LETTER2.PRN
A>REN C:NEWFILE=OLDFILE

SAVE Save N times 256-byte blocks on the disc from the Transient Program Area (TPA). (This area start at location 0100h).
Syntax: SAVE N d:filename.typ
Examples: B>SAVE 3 X.COM
A>SAVE 10 B:X.Y

TYPE Display contents of an ASCII text file on the screen.
Syntax: TYPE d:filename.typ
Examples: A>TYPE READ1.ASM
C>TYPE A:LETTER:DAT

A short introduction to the CP/M programs.

All the CP/M programs are loaded from a disc before execution.

ASM A two-pass assembler, which can assemble 8080 assembly language statments and produce both an object and a print file.

DDT The DDT program is used for interactive testing and debugging of 8080 programs generated in the CP/M enviroment.

ED ED is the CP/M line editor, and is used to create and alter source (-text) files.

LOAD From an object file the LOAD program produces a memory image file, which can be subsequently executed.

PIP PIP copies files, combines files and transfers files between the peripheral devices as the discs, the console and the list device (the line printer).

STAT STAT writes infomation on the console about discs, files and the pheripheral devices. The STAT program can also change the dics and file attributes.

SUBMIT The SUBMIT program starts execution of a file of CP/M commands, thus allowing CP/M commands to be batched together for automatic processing.

XSUB XSUB lets also programs using buffered input, such as ED, run in SUBMIT files. XSUB must appear as the first statement in a submit file.

6.5 Reserving the printer.

When the CP/M system has been started on your local CPU, then you are not able to have a text written out on the printer.

If you want to use the printer, which you chose with the CPMSETUP program (see section 5.4), then you must make a reservation of the printer in the MIKADOS system. This allows many users running CP/M on the same SPC/1 computer to share a printer by reserving the printer only, when it is to be used.

You reserve the printer by starting the GETPR program, which are found on the basic CP/M disc: Write "GETPR" followed by RETURN. The GETPR program will then write the following text on the terminal:

"RESERVATION OF THE PRINTER IN MIKADOS.
THE PRINTER IS NOW RESERVED BY THE CP/M SYSTEM."

and now you can have text written out on the printer.

The printer reservartion means that no one else than you is able to use the printer. This reservation will be in function until you release the printer again (see section 6.6) or leave the CP/M system (see section 6.7).

The GETPR program may write one of the following two error messages:

"RESERVATION FAILED. THE PRINTER IS RESERVED BY ANOTHER USER."

which means that another user has reserved the printer in the MIKADOS system. You have to wait for the printer to be released, before you can reserve the printer.

"ERROR IN RESERVATION OF THE PRINTER.
ILLEGAL PRINTER NUMBER OR PRINTER RESERVED ALREADY BY THE CP/M SYSTEM."

two different reasons may cause this error message: The first reason is, that the MIKADOS system does not have a printer with the number you have specified to the CPMSETUP program. Secondly two subsequent calls of the GETPR program will result in this error message, if you haven´t released the printer in between the two calls.

Note : When you have reserved the printer, you may have text written on the printer by leading output to the list device (LST:). The ctrl-P function will cause all subsequent console output to be copied to the list device, until the CP/M system reboots or ctrl-P is typed again. If you have not reserved the printer before you type ctrl-P then the console output will be copied to a dummy device.

6.6 Releasing the printer.

The printer is reserved by calling the GETPR program, and the printer will remain reserved by your CP/M system until:

1) You call the FREEPR program or
2) Leave the CP/M system (see section 6.7).

The FREEPR program is found on the basic CP/M disc and is started by typing "FREEPR" followed by RETURN on the terminal. The FREEPR program then writes the following:

```
"RELEASE OF THE PRINTER IN MIKADOS
 THE PRINTER IS NOW RELEASED BY THE CP/M SYSTEM."
```

and all output to the list device (LST:) will now be transported to a dummy device again.

The running of the FREEPR program may result in the following message, when you haven´t called the GETPR program first or the reservation made by GETPR failed:

```
"ERROR IN RELEASE OF PRINTER.
 PRINTER WAS NOT RESERVED BY THE CP/M SYSTEM."
```

6.7 Returning from the CP/M system to MIKADOS.

The CP/M operating system was loaded into your memory bank and the local CPU was started by the MIKADOS CPU at the time you typed CPM (see section 6.1). The local CPU will continue to run the CP/M system, until you decide to leave the CP/M by calling the MIKADOS program, which is found on the basic CP/M disc. The MIKADOS program writes:

"RETURN TO MIKADOS
PRESS <CTRL-C> TO OMIT OR <RETURN> TO CONTINUE : "

on the terminal and you return to the MIKADOS operating system by pressing the RETURN key. If you regret that you have called the MIKADOS program, you may escape by typing ctrl-C and the CP/M system only reboots.

6.8 CP/M error messages.

You may receive one of the following error messages from the CP/M operating system due to an error found by the Basic Disc Operating System (BDOS). You have to give a receipt for the error message by depressing the RETURN key before the CP/M system will continue to reboot.

"Bdos Err On x: Select"

You have tried to select a disc x, which did not exist in your CP/M system. The disc name must be A, B, C or D, and the selected disc must be connected. By running the CPMSETUP program you may choose which discs are to be in the CP/M system (see section 5.3).

"Bdos Err On x: R/O"

The program you are running have tried to write on disc x, which is "write protected" by the CP/M system. You can protect a disc against writing by using the STAT program or by using function 28 in BDOS. This protection continues until the next reboot of the CP/M system.

"Bdos Err On x: Bad Sector"

When the CP/M system have tried to read or write a sector on disc x, it recieved an error code from the MIKADOS operating system at the conclusion of the disc operation. A lot of different reasons may

cause this error code: a permanent error on the disc, a physical write protection of the disc or perhaps a MIKADOS file system error.

Note : If you chose in the CPMSETUP program to have Read Only access to a disc, then you will get the BDOS error "Bad Sector" and not the "R/O" message. This is due to the fact, that the CP/M system does not know that the disc is "write protected" and tries to write on the disc. The MIKADOS system refuses this and returns an error code to the CP/M system.
The Read Only facility in the CPMSETUP program makes it possible for many users to share a program disc (see section 5.3).

7. How to transfer text files between MIKADOS and CP/M.

Text files can be transfered between a logical CP/M dics and a MIKADOS disc by the CPMTRANS program. The CPMTRANS program is written in Pascal MT+ and is found on your basic CP/M disc (see section 5.2). To run the CPMTRANS program you must start the CP/M system on your terminal (see section 6.1). If the CPMTRANS program is on the current disc you can enter "CPMTRANS" to start the program - otherwise you must enter the disc name too.

7.1 Transferring from CP/M to MIKADOS.

When you have started the CPMTRANS program the following text is written on the screen:

```
--- CP/M transfer program v.1 ---

Do you want to transfer a text file to or from Mikados ?
Enter T (for To) or F (for From) :
```

Enter 'T' and press the RETURN key and the CPMTRANS program will write the following text on the screen:

```
Transfer a text file TO Mikados from a CP/M disc.

Enter name of CP/M text file :
```

Answer the question by entering the name of CP/M file containing the text to be transferred to the MIKADOS disc. Press the RETURN key and answer the last two questions:

```
Enter name of Mikados file :

on disc : P
```

by entering the name of the MIKADOS file and the disc identification of the MIKADOS file. The filename must be up to 8 characters and can only consist of letters or numbers. The user must conclude each answer by pressing the RETURN key.

Now the CPMTRANS program for instance writes the message :

```
DTFILE on P2 is now open.
```

and starts to transfer the contents of the CP/M text file to the MIKADOS file. While this transference takes place on the CPMTRANS program keeps the user informed by writing the following message on the screen:

```
Transferring line : 30
```

When the file has been transferred the CPMTRANS program terminates by writing the following on screen:

```
End Of File found.

124 lines has been transferred with no errors.
```

If the CPMTRANS program has found illegal characters in the file or the length of a line was too long, the program will write the following messages on the screen before terminating:

```
Warning : Number of illegal characters in file : aa
```

and

```
Warning : Number of lines cutted off to 78 characters : bb
```

These warnings are due to the restrictions described in section 7.3.

7.2 Transferring from MIKADOS to CP/M.

When you have started the CPMTRANS program the following text is written on the screen:

```
--- CP/M transfer program v.1 ---

Do you want to transfer a text file to or from Mikados ?
Enter T (for To) or F (for From) :
```

Enter 'F' and press the RETURN key and the CPMTRANS program will write the following text on the screen:

```
Transfer a text file FROM Mikados to a CP/M disc.

Enter name of Mikados file :
```

The question is answered by typing the name of the MIKADOS file, which contains the text to be transferred. The answer must be followed by RETURN. The next question:

on disc : P

is to be answered with the disc identification of the MIKADOS file. Finally the user must answer the question:

Enter name of CP/M text file :

Enter the name of CP/M file which is to contain the text transferred from the MIKADOS file and press the RETURN key.

If the CP/M file already exists on the disc, the CPMTRANS program will ask the following question:

Warning : xxxxx exists already - delete (Yes,No) :

The user must now enter a 'Y' if the CP/M file is to be deleted or 'N' if he wants to prevent the file from being deleted. The answer must be followed by a press on the RETURN key.

Now the CPMTRANS program for instance writes the message :

DTFILE on P2 is now open.

and starts to transfer the contents of the MIKADOS text file to the CP/M file. While this transference takes place on the CPMTRANS program keeps the user informed by writing the following message on the screen:

Transferring line : 30

When the file has been transferred the CPMTRANS program terminates by writing the following on screen:

End Of File found.

189 lines has been transferred with no errors.

If the CPMTRANS program has read illegal characters in the file or the length of a line was too long the program will write the following messages on the screen before terminating:

Warning : Number of illegal characters in file : aa

and

Warning : Number of lines cutted off to 78 characters : bb

These warnings are due to the restrictions described in section 7.3.

7.3 Restrictions in the use of CPMTRANS.

Two restrictions are laid upon the contents of the text files being transferred:

1. A line in the text file must not contain more than 78 characters. This is due to the fact, that the word processing system WordWork can´t edit text with lines longer than 78 characters. If the CPMTRANS program reads a line, which is too long, the line will automatically be cutted off to 78 characters.

2. Only printable characters are allowed in the file i.e. characters with a decimal value between 32 and 126. A character with a value outside this range is not transferred. The LF and CR characters (decimal value 10 and 13) found in the end of each line in a CP/M text files are ignored - i.e. the characters will not be treated as illegal. The horizontal tab character (HT - decimal value 09) is not transferred from a CP/M file to MIKADOS, but replaced with blanks. This insertion of spaces is performed in the way that corresponds to the way the tab key moves the cursor to the next column evenly divisible by 8.

When the CPMTRANS program is creating a new file in the MIKADOS file system, the number of sectors in each extent of this file is 10. This limits the size of the MIKADOS file to 610 sectors.

8.1 The standard 8" CP/M disc.

To enter a program from a software distributor the program must be supplied on a 8" IBM 3740 single sided single density diskette. The diskette organization must be as follows:

track/sector - track/sector		Reserved for:
00 / 01	01 / 26	The CP/M operating system and cold start loader
02 / 01	02 / 16	The disc directory
02 / 17	76 / 26	Data.

The characteristics of the diskette must be:

128 Byte record Capacity
243 Kilobyte Diskette Capacity
64 Directory Entries of 32 byte each
8 Records / Extent
128 Records / Block
26 Sectors / Tracks
2 Reserved Tracks

The logical to physical sector translation must be :

Logical	Physical	Logical	Physical	Logical	Physical
1	1	2	7	3	13
4	19	5	25	6	5
7	11	8	17	9	23
10	3	11	9	12	15
13	21	14	2	15	8
16	14	17	20	18	26
19	6	20	12	21	18
22	24	23	4	24	10
25	16	26	22		

8.2 Copying to your SPC/1.

To copy CP/M programs to your CP/M system from a standard 8" CP/M disc, - your SPC/1 must be supplied with a 8" diskette drive. The MIKADOS operating system on the SPC/1 computer has to control the drive as an IBM 3740 diskette drive (MIKADOS disc type 'I').

Before you are able to copy the contents of the 8" standard CP/M disc, you have to create a 8" compatible CP/M disc on your SPC/1 computer. This is decribed in section 5.4.

Now the CPMCOPY program is started by pressing the ESCAPE key and entering "CPMCOPY" followed by a RETURN. The screen on your terminal is erased and the following text appear on the screen:

```
--- CP/M copy program v.2 ---

Do you want to copy to or from a 8" CP/M disc ?
Enter T (for to) or F (for from) :
```

Enter a ´F´ and press the RETURN key. The content on the screen is now:

```
--- CP/M copy program v.2 ---

Copy from a 8" CP/M disc to a Mikados disc (file).

Enter disc id. of 8" disc : P
```

The disc identification of the 8" diskette drive shall now be entered followed by a RETURN. The next question to answer is:

```
Enter filename of CP/M disc (max 8 letters) : ´);
```

with the name of the MIKADOS file, which is the 8" compatible CP/M disc you want to save the CP/M programs on. You must only enter the filename (max. 8 letters). The next question :

```
On disc : P
```

is to be answered with the MIKADOS identification of the disc, which contains the MIKADOS file CP/M disc (file).

The CPMCOPY program now copies the contents of the 8" CP/M disc to the logical CP/M disc in the MIKADOS file system. The user is being kept informed about the copying:

```
Copying track no. : 12
```

The contents of the disc are copied, when track number 76 has been copied - The CPMCOPY program ends with the message:

CPMCOPY succesfully terminated.

You can now assign the 8" compatible disc to your CP/M system (see section 5.5). The copied CP/M programs are available and can be runned on your system.

If you answer any of the questions the CPMCOPY asks by pressing the ESCAPE key, the CPMCOPY program terminates with the message:

CPMCOPY aboted.

8.3 Copying from your SPC/1.

It is possible to copy CP/M files from your SPC/1 to another computer. If your target computer is a SPC/1 too, then all you have to do is to copy the MIKADOS file, which contains the CP/M disc with the wanted files. The MIKADOS utility program FCOPY is able to copy the MIKADOS file to a diskette, which can be moved to another SPC/1 computer.

If you are to copy a CP/M file from your system to a computer from another manufacture, it is necessary to use the standard 8" CP/M disc, described in section 8.1. Thus your SPC/1 must be supplied with a 8" diskette drive. The MIKADOS operating system on the SPC/1 computer has to control the drive as an IBM 3740 diskette drive (Mikados disc type 'I').

Before you are able to copy the CP/M files to the 8" CP/M disc, the files must be copied to a 8" compatible CP/M disc on your SPC/1 computer. This is done by using the CP/M program called PIP. (If you do not have a 8" compatible disc on your SPC/1, one can be created by using the CPMSETUP program - see section 5.4).

Now the CPMCOPY program is started by pressing the ESCAPE key and entering "CPMCOPY" followed by a RETURN. The screen on your terminal is erased and the following text appear on the screen:

```
--- CP/M copy program v.2 ---

Do you want to copy to or from a 8" CP/M disc ?
Enter T (for to) or F (for from) :
```

Enter a 'T' and press the RETURN key. The content of the screen is now:

```
--- CP/M copy program v.2 ---

Copy from a Mikados disc (file) to a 8" CP/M disc.

Enter filename of CP/M disc (max 8 letters) : ');
```

Enter the name of the MIKADOS file, which is the 8" compatible CP/M disc you want to copy the CP/M files from. You must only enter the filename (max. 8 letters). The next question :

```
On disc : P
```

is to be answered with the identification of the MIKADOS disc, which contains the MIKADOS file CP/M disc (file). Finally the question:

```
Enter disc id. of 8" disc : P
```

is answered with the disc identification of the 8" diskette drive followed by a RETURN.

The CPMCOPY program now copies the contents of the logical CP/M disc to the 8" CP/M disc. The user is being kept informed about the copying:

```
Copying track no. : 12
```

The contents of the disc are copied, when track number 76 has been copied - The CPMCOPY program ends with the message:

```
CPMCOPY succesfully terminated.
```

You can now assign the 8" compatible disc to your CP/M system (see section 5.5). The copied CP/M programs are available and can be runned on your system.

If you answer any of the questions the CPMCOPY asks by pressing the ESCAPE key, the CPMCOPY program terminates with the message:

```
CPMCOPY aboted.
```

9. References.

A complete description of the CP/M commands and programs are found in the following documention, which are published by the Digital Research. Together with this manual you have recieved a copy of the manuals:

1. AN INTRODUCTION TO CP/M FEATURES AND FACILITIES
2. CP/M 2 USER´S GUIDE
3. ED: A CONTEXT EDITOR FOR THE CP/M DISK SYSTEM - USER´S MANUAL
4. CP/M ASSEMBLER (ASM) - USER´S GUIDE
5. CP/M 2 INTERFACE GUIDE
6. CP/M DYNAMIC DEBUGGING TOOL (DDT) - USER´S GUIDE
7. CP/M operating system - COMMAND SUMMARY