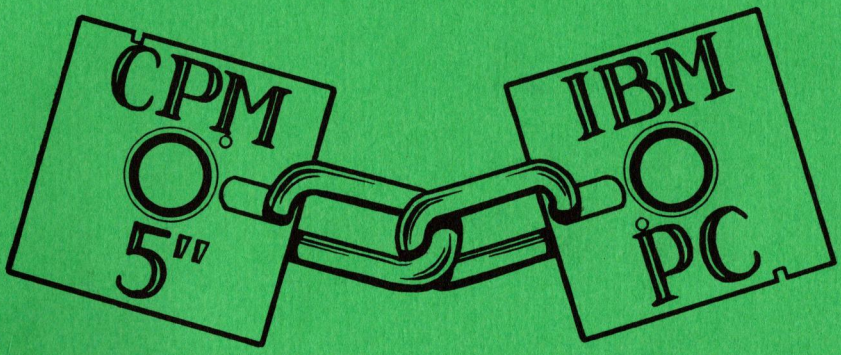
CPM / DOS CONVERSION



Link2CPM
HANDBOOK

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Table of Contents

1. GENERAL

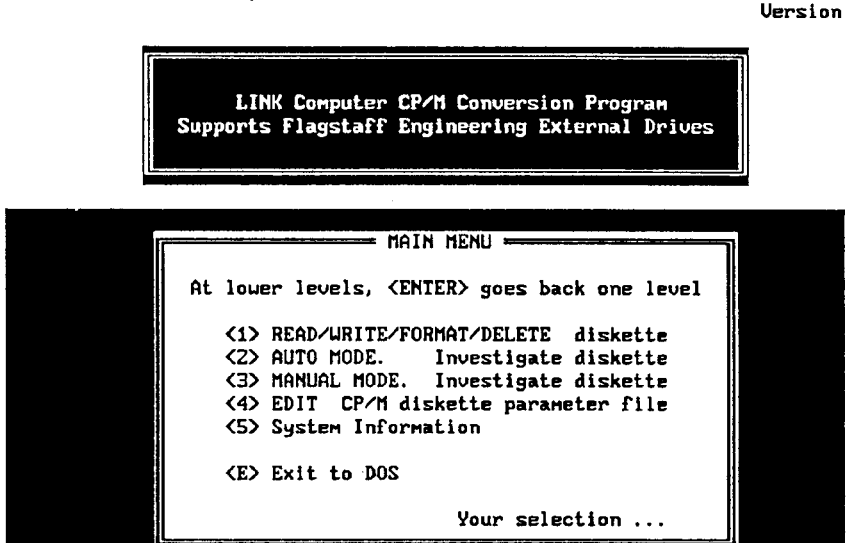
LINK2CPM is a diskette conversion utility for the IBM PC/XT/AT/PS2 and its clones. It can:

- **Automatically analyze any CPM diskette**
- **Read any CPM diskette including 300 and 360 rpm types and transfer data to DOS, to the screen or to a COM port**
- **Transfer data from DOS to any CPM diskette**
- **Format any CPM diskette**

If you have an AT, we recommend that a 40-track drive be installed as drive B:

The following diskette types are supported:

CPM-2 (sometimes known as CPM-80)
CPM-86
MPM-1
MPM-2
CPM-Plus (CPM-3)
MPM-86
CCP/M (Concurrent CPM)



The system functions are best described by taking a look at the MAIN MENU which comes up when the program signs on.

Each of the six selections is described briefly below. More complete descriptions are found in Section 3.

(1) Read/Write/Format/Delete

Once you have built up a library of parameter files, this will be the most commonly used selection. It is used to transfer files between the CPM object diskette and a DOS disk or diskette.

With this option, you can also format a CPM diskette or delete individual files on the diskette. Data from the object diskette can be directed to a DOS system disk, to the CRT (screen) or to the serial port.

(2) AUTO MODE. Investigate diskette

Choose this item when you have an unknown CP/M diskette for which a parameter file does not already exist.

Although the distribution diskette is furnished with a library of .CPM parameter files covering some of the more popular manufacturers, it is usually better to analyze the parameters of the unknown diskette and establish your own library file. In this way, there is no need to know the manufacturer or exact format of the disk in question.

Once the parameter file exists, the diskette can be read, written or formatted without having to analyze the diskette again.

(3) MANUAL MODE. Investigate diskette

This option is provided so that the technically-minded user can read and write specfic sectors on the diskette. It is not really necessary to the operation of the utility.

(4) Edit CP/M Parameters

In all probability, this item will be used only rarely. If, for example, you have constructed a parameter file using item 2 and later discover that one of the parameters is incorrect, you can update the library file using the editor. See Section 3.3. The edit function is also useful for comparing the parameter files of two diskettes.

(5) System Information

This is a help function which describes the various allowable hardware configurations for the PC/XT and the AT. There is also a short explanation of the difference between a physical and a logical drive. This information is also in the READ.ME file and in Section 4.

(E) Exit to DOS

This option exits to the Disc Operating System (DOS).

2. GETTING STARTED.

The distribution diskette contains the following files:

LINK2CPM.EXE	Main program
????????.CPM	CPM parameter files
LINK2CFG.EXE	Configuration program for drives and screen
READ.ME	Latest Info

If you have a hard disk, insert the distribution diskette in drive A:, and copy all the files over to the hard disk. You may want to keep these files in a separate sub-directory called for example \CPM.

```
C:\CPM COPY A:*.* C:
```

Start the utility by typing:

```
LINK2CPM (Enter)
```

The program is copy protected using Cop's Copylock, which is also a product of Link Computer. The first time LINK2CPM is executed after a cold boot, it will ask for the master diskette in drive A:

```
*** Insert key disk in A: and press ENTER (or drive letter)
```

From the MAIN MENU, you move downwards through the hierarchy by choosing menu items. You can move back to an earlier menu by hitting **Enter** or in some cases ESC. You can escape to DOS at any time by using CTRL-C.

LINK2CPM is configured from the factory to run on PC/XT's and AT's having the most popular configurations, that is:

- **1) An AT with one or two high-density drives or with one high-density and one 360K drive.**

- **2) A PC/XT with one or two 360K drives.**

If you are running LINK2CPM on an AT or compatible, it is a good idea to equip it with a 360K drive.(the type used by the PC/XT). With this drive installed, you are assured the proper writing of 40-track CPM disks. You will also be able to exchange DOS diskettes with a PC/XT.

If your AT is equipped with a 3 1/2 inch drive, or if you are using Flagstaff's external floppy driver board, you must run the LINK2CFG configuration utility. If you have any combination of 1.2 M-byte and 360 K-byte drives and are using the normal internal floppy controller, you need not run the configuration program.

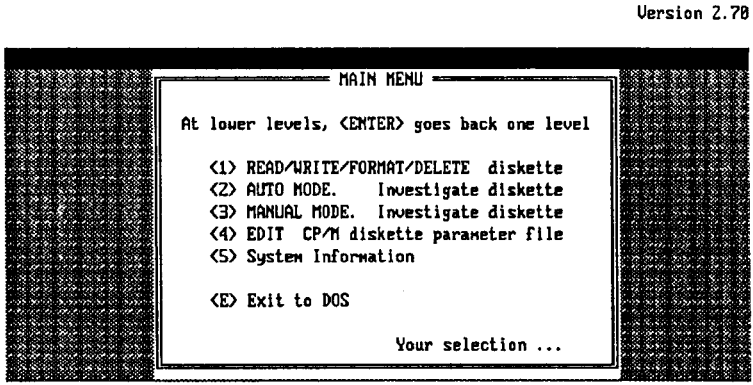
If you have a PC/XT equipped with the usual one or two 360 K-byte drives, you need not run the configuration program. If however, you have a 3-inch drive, an 8-inch drive, or a 5-inch, 80-track drive, you must configure using LINK2CFG.

Note that you cannot read 80-track CPM diskettes (a very common type), on a PC/XT unless you install an 80-track drive on the machine.
When installing a new drive, you must also tell DOS that it exists by running SETUP.
If you are using Flagstaff external drives, be sure to install FLAGDISK.SYS in your CONFIG.SYS. A typical example using four external drives is as follows:
DEVICE = FLAGDISK.SYS (1=8U, 2=5U, 3=HDU, 4=3U)

Also, these drives will not be recognized if the automatic configuration is set to "Y". See Section 4.1 for information on configuring the external drives.LINK2CPM is configured for monochrome screens. Run LINK2CFG to change the default colors as described in Section 4.3.

3. MAIN MENU

The MAIN MENU is the first menu displayed when the system is started up, and you will always return to this menu after an operation is completed.

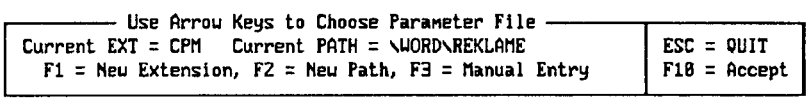


The various selections are described below.

3.1 (1) Read/Write/Format/Delete diskette

When this option is selected by pressing (1), a directory of all parameter files on the harddisk is displayed.

ADL1010	ADLER	ALTOS	ALTOS5	AMSTRAD	ANKER	ATOMIC
BBC	BONDWELL	CCPM	CPM86	CR-8	CR16	CR7
DIPLOMAT	ETU250	ETU300	FOX	FREDERIK	GALAXY2	GALAXY3
GEMINI	IBM3740	IBMCPM86	ICL	ITT3030	JAMES	JAMES3
JET	KAYPRO	KONTRON	KTEKST	LINOTYPE	MM	MPM86
MPM_HD	NANO	NEXOS	OSBORNE	OTRONA	P3800	PARTNER
PICC702	PICC01	PICC02	PICCOLO	RAINBOW	SE1041	SIEMENS1
SIEMENS2	SIKRING	SSK2	SSSD	SUPER35	SUPER40	SUPERB
TEST	TEST86	TESTKONT	TVI803	TXTPOINT		



Parameter files provided by Link Computer have the extension CPM. If you want to use another extension, which may be the case if you have a very large number of files and want to differentiate between for example 40-track and 80-track types, press F1 and change the parameter file extension.

```
Enter New EXTENSION ..

Current EXT = CPM   Current PATH = C:\WORD\REKLAME
              Press ENTER alone for no change.
```

If the parameter files you want to use reside in another subdirectory, press F2 and specify the path:

```
Enter New PATH ..

Current EXT = CPM   Current PATH = C:\WORD\REKLAME
              Press ENTER alone for no change.
```

You also have the option of entering the file name manually; Press F3:

```
Parameter file name..
```

If you enter a parameter file name which is not found in the current specified path, the program will search the PATH (as defined in your AUTOEXEC.BAT).

If you do not have a parameter file for the disk in question, press ESC to return to the main menu, and run the AUTO MODE investigation. Otherwise, select the file name

corresponding to the desired disk type. You are then asked to insert the object disk:

```
        ***  Diskette selected:  PARTNER .CPM  ***

   The selected disk is a 5-inch, high-density type.

The present configuration shows no available drive.
Press Enter to continue _
```

If this message appears, either you do not have a drive which can physically read the object diskette, or else you have simply neglected to configure the drive so that LINK2CPM can recognize it. See Section 4. After correcting this problem the prompt will look like this:

```
        ***  Diskette selected:  PARTNER .CPM  ***

The selected disk is a 5-inch, high-density type.
Insert diskette in Drive A
            Ready? (Y/ ) ..
```

You should now insert the CP/M object diskette if you have not already done so. If you answer No or Enter, you go back to the PARAMETER DIRECTORY. If you answer Yes, a new menu will appear.

```
        ***  Diskette selected:  PARTNER .CPM  ***

              (1) Read CP/M file
              (2) Write CP/M file
              (3) Delete CP/M file

              (4) Format CP/M diskette

                      Your selection ..
```

Here you have the possibility of manipulating CPM diskettes in various ways if you already have a .CPM parameter file.

If you have a CPM diskette with unknown parameters, you must first run the Auto Investigate Option (2) on the MAIN MENU.

3.1.1 (1) Read CP/M file

At this point the program attempts to read the directory of the object disk according to the parameter file selected. A diskette which does not match the parameter file will give various errors, depending on what type of mismatch occurs. There can for example be a TPI mismatch which means that the program is expecting 40 tracks or 80 tracks and finds that the diskette does not have the expected number of tracks.

When the program is satisfied, it displays:

```
        Directory for Object Disk
       ----------------------------
FIL1     .
 Disk Capacity: 0788k     Free: 0410k

 --- File name ... FIL1_
```

Notice that the capacity of the disk is shown. This is actual user capacity, not including directory space and system tracks.

You may enter an ambiguous file name if you want to read more than one file. See appendix C for a complete description of ambiguous file names.

After the file name has been accepted, you are asked to insert the object disk, and the OUTPUT MENU appears.

```
Output Menu
-----------

(1) Send to MSDOS disk
(2) Send to console
(3) Send binary (8 bit) to COM port
(4) Send text   (7 bit) to COM port
(5) Hexdump to console

    --- File Destination ... 1

-- Destination drive (A/B/C/ /P) ..
```

You can now choose where you want the file or files to be sent. Option 1 further asks about the destination drive and you can send the file to any drive, except of course, the one being used to read the object diskette.

Option 2 sends the file to the screen. Non-text files can also be sent to the screen without any problem, since control characters are filtered out. This can be useful for examining code which has embedded messages. Activating CTRL-S stops the display. CTRL- Q starts the display again. A long display can be aborted by pressing any other key.

Options 3 and 4 send the file to the serial port, the difference between the two being that option 4 removes the parity bit (bit 7) and will stop if an End-Of-File character (1AH) is seen.

Option 5 dumps the file to the console in hexadecimal with ASCII translation.

3.1.2 (2) Write CP/M file

Option 2 asks you to fill in the name of the file to be transferred from DOS to the CPM diskette. Ambiguous file names are accepted.

You will then be asked to insert the object disk in the proper drive. If you want to write a 40-track diskette and the machine is not equipped with a 40-track drive, a warning will be issued.

An 80-track drive writes a track which may be too narrow to be read without error on a 40-track drive. However, you can override this warning and write anyway. In some cases, depending on drive alignment and diskette quality, this will be O.K. Link Computer can supply a program called SAFE360 which improves the chances of doing this successfully.

3.1.3 (3) Delete CP/M file

Option 3 displays the disk directory and asks for the name of a file to be erased on the object diskette. Wild card characters are allowed in the file name. Enter goes back to the previous level as usual and no file is erased.

3.1.4 (4) Format CP/M diskette

This procedure is self-explanatory.

3.2 (2) AUTO MODE. Investigate diskette

Use this option when you have an unknown CP/M diskette for which there is no .CPM parameter file. You must first specify the disk size:

```
--- AUTOMATIC ANALYSIS ---

What is the size of the unknown disk: 5, 3, or 8-inch? ... :
The current configuration shows no drive available
Press Enter to continue
```

Otherwise, you are prompted:

```
Insert unknown diskette in Drive A

Ready? (Y/ ) ..
```

If you answer N or ENTER, you are returned to the main menu. If you answer Y the program will attempt to automatically construct a parameter file which can then be used to read and write the unknown CPM diskette. In some cases, the program will be unable to find all the parameters. This may occur when a diskette is completely full or when there are too few files on it. Ideally, the test diskette should be freshly formatted and then filled to appoximately 2/3 capacity.

If the program cannot determine all parameters, (for example the type of double-sided diskette), it will stop the examination and ask you to take a guess at the parameter in question before continuing.

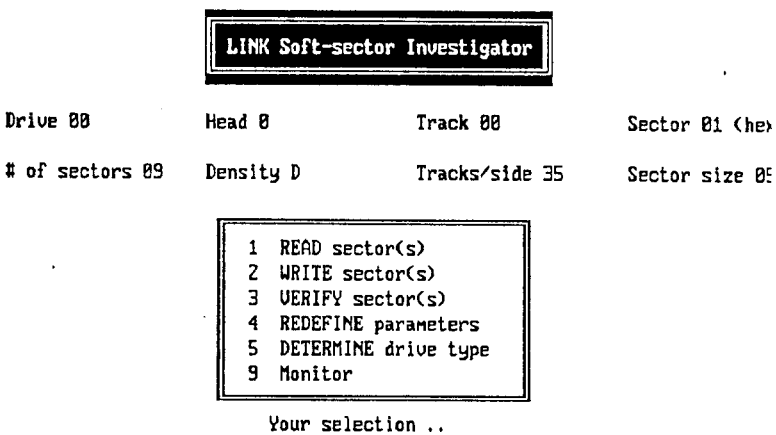
In case of a serious problem (e.g. a non-CPM diskette), the program will stop. If you find that you cannot generate a parameter file for a particular diskette, Link Computer will investigate the diskette and provide a parameter file for a minimal fee. A sample program display follows:

```
                    **** AUTO PARAMETERS ****
Sector size ..... 0512          Density ..... D
Track/Inch (TPI) ..... 48       Max Track ..... 39
Starting sector ..... 01        Number of sectors .... 08
Sides type ..... 01             DIR start track ..... 01
DIR side ..... 00               Inverted data ..... N
Skew value ..... 01
.. SECTOR LIST :
01 02 03 04 05 06 07 08
No. of DIR sectors ... 04       Cluster word ..... N
Clusters per line .... 16       No. of DIR clusters .. 01
Sectors per cluster .. 04       Extent per line ..... 02
Save parameters as file name ..
```

At this point, you should assign a name to the parameter file which will then be saved to disk. If the file already exists, the program will ask if you want to delete it. If not, you can assign a different name to the parameter file you just made. If you do not want to save the parameters, will return you to the main menu.

3.3 (3) MANUAL MODE. Investigate diskette

This option is included for users who have a technical interest in diskette formats. It is not necessary to the operation of the utility.



Diskette sectors can be read, written or verified.

To select the drive, head, track, etc., use number 4 which moves the cursor up to the parameter fields. Move between fields using the four cursor keys. Change fields by typing in new values or viewing the possible values by the use of the + and - keys. Move within a field using Ctrl-S, Ctrl-D or backspace or tab and backtab.

You cannot leave a field which contains an illegal value.

When the sector has been read, select (9) to go to the monitor. A concise help menu appears, and you can display the sector by using the (D)isplay function. "R" followed by Enter returns to the menu.

3.4 (4) Edit CP/M diskette parameter file

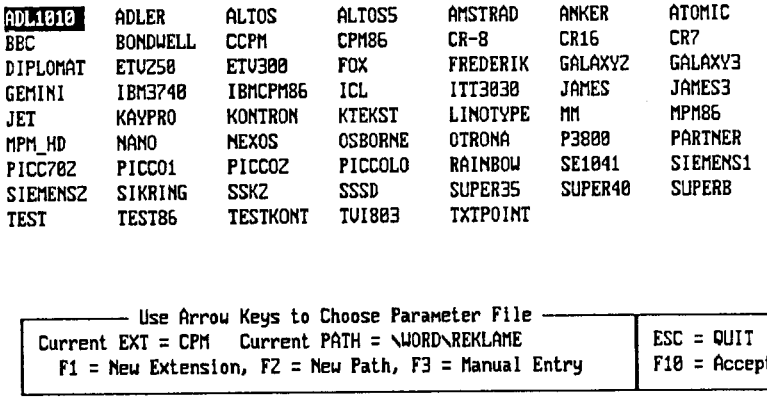
This menu item allows you to examine and change .CPM parameter files. Some popular parameter files are supplied by Link Computer, but it is best and easiest for the user to generate these automatically by using option 2 on the MAIN MENU.

Generally, this option is used by customers who have a technical interest in the specific format of a CPM diskette or to compare the files generated from 2 diskettes.

The menu looks as follows:

```
                ========================================
                  Link Computer CP/M PARAMETER EDITOR
                ========================================

                *** Diskette selected:  TEST    .CPM  ***

Disk size 5       Density D          Sides type 3       DIR track 02
DIR side 0        Sector size 0512   Max track 34       Num DIR clus 02
Sectors/clus 04   Clus/line 08       Clusword Y         Ext/line 01
Invert N          DIR offset (HEX) 00
Sector list (HEX): 01 03 05 07 09 02 04 06 08

                   (1)  LOAD .CPM parameter file
                   (2)  SAVE current parameters
                   (3)  EDIT current parameters

                              Your selection ...
```

Number 1 displays all parameter files (with the .CPM or currently selected extension) in the default directory. They are listed on the screen without the extension:



See Section 3.1 for a complete discussion of the extension and path.

When you have entered the file name and returned to the menu, the new diskette name and parameters will be displayed.

If you want to change any of these parameters, select number 3, and the cursor will move up into the parameter field.

Move between fields using the four cursor keys. Change fields by typing in new values or viewing the possible values by the use of the + and - keys. Move within a field using Ctrl-S, Ctrl-D or backspace or tab and backtab.

After an editing session, the modified parameter file can be saved on the DOS disk by using selection 2. You may use the same name or a new name if you want to keep the old file intact.

3.5 (5) System Information

Most users (those with an AT having only 5-inch drives, or those with a PC/XT having only 360K drives) need not concern themselves with the system information. It is, however,

necessary for those using non-standard configurations and/or external Flagstaff drives. This information is also found in the READ.ME file.

3.6 (E) EXIT

Use this option to exit to DOS. You can also exit to DOS at any time by using Ctrl-C.

4.0 CONFIGURING LINK2CPM

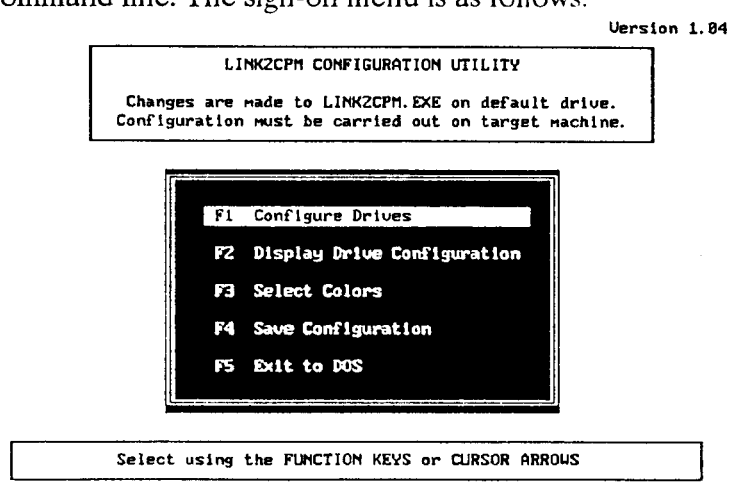
On the distribution disk, LINK2CPM is configured for monochrome screens and for automatic drive configuration. Read the following to see if you can use the default configuration.

a) AT's and Compatibles

If your AT has any combination of 1.2 M-byte drives and/or 360 K-byte drives, you can use the default automatic configuration. If you are using an internal 3-inch drive, or one or more of Flagstaff Engineering's external drives, then set AUTOCONFIG to 'N', and configure the drives as described in Section 4.1.

b) PC/XT's and Compatibles

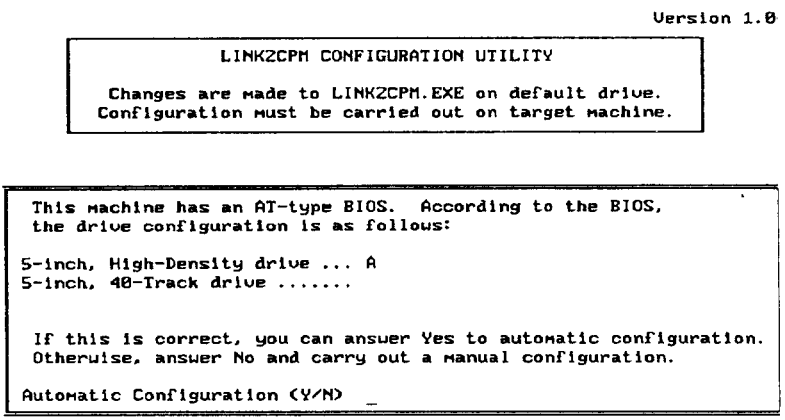
If your PC/XT has one 360 K-byte drive, the program will carry out all CPM operations on drive A. If it has two 360k drives, drive B will be used as the CPM drive. If your machine has a 3-inch, 8-inch or 5-inch 80-track drive installed, run the LINK2CFG configuration program. If you want to change the screen colors or the drive configuration, enter LINK2CFG on the command line. The sign-on menu is as follows.



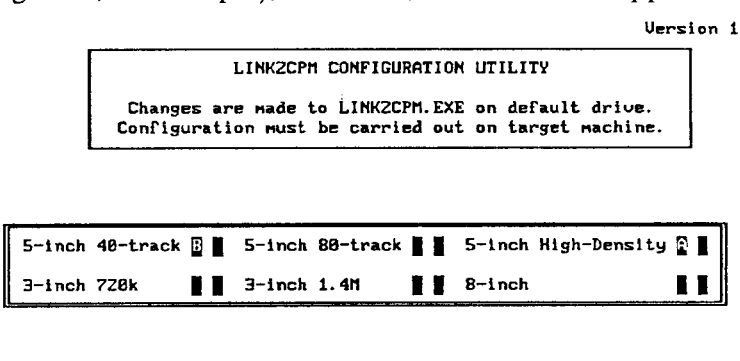
Each menu point is covered in the following 5 sections.

4.1 Configure Drives

Press F1 or move the selector bar to the top selection and press ENTER. The program will try to find out what the physical setup of the machine is and displays a message something like the following.



If the information presented is correct, enter Y and you will be returned to the main menu. If the information is incorrect or incomplete (external drives cannot be automatically recognized,for example), answer N, and this menu appears.



Enter the desired drive letters, and press F10. You are now prompted.

```
                                                    Version 1.04

  You have now selected the LOGICAL drive letters.

  Would you like the program to automatically
  assign the PHYSICAL drives ? ..... (Y/N)
```

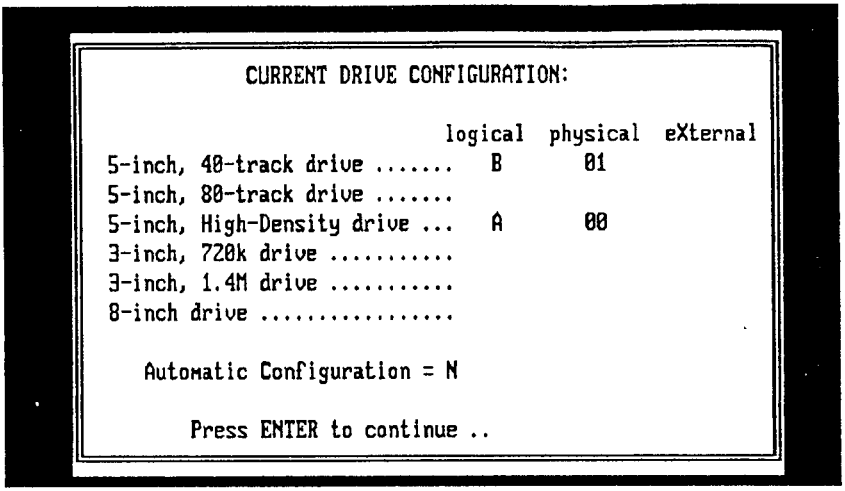
At the point, you can choose to have the LINK2CFG program make its best guess as to what physical drive numbers correspond to the letters you have assigned. Or, by answering N, you can enter them yourself.

```
                                                    Version 1.04

  You have assigned DRIVE A
  The most probable physical drive number is 00
  Press ENTER to accept this, or enter the desired drive number
```

For a discussion of logical drive letters and physical drive numbers, see Appendix F

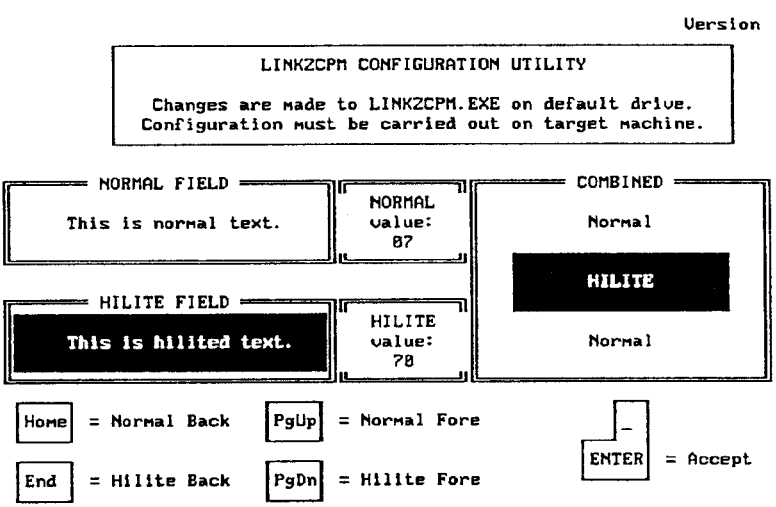
4.2 Display Drive Configuration

This selection shows the current configuration of LINK2CPM, or if you have carried out the configuration described above in Section 4.1, it will show these values. Note that these new values do not go into effect until you have saved them by using function 4. See Section 4.4 below.



4.3 Select Colors

LINK2CPM is delivered as a monochrome program. Use the four keys named below to select the desired foreground and background colors.



4.4 Save Configuration

When the drive and color configurations have been completed. Press F4 or use the bar and press ENTER.

```
CONFIGURATION COMPLETE

Press ENTER to continue ..
```

4.5 Exit to DOS

If you change either the drive or color configuration and then attempt to exit without saving the new values, you will be prompted:

```
Exit without saving current configuration? (Y/ ) ..
```

APPENDICES

Appendix A. Parameter File Source Listing

A sample source listing for a CPM parameter file is shown below.

```
DSKSIZE     DW  "5"        ;"3","5", or "8"
DENSITY     DW  "D"        ;"S" = single, "D" = double, "Q" = quad
SIDES       DW             ;0 = SS,1 = DS (cylindrical)
                           ;2 = DS CONTINUE SIDE 1 on TRK 0
                           ;3 = DS CONTINUE SIDE 1 on MAX TRK
SID1CMP     DW  1     ;    always set to 1
DIRTRK      DW  1          ;ACTUAL PHYSICAL DIRECTORY TRACK
DIRSIDE     DW  0          ;DIRECTORY START SIDE (0 OR 1)
SKSIZE      DW  400H
MAX.TRK     DW  79         ;HIGHEST PHYSICAL TRACK NUMBER ;
                           ;on ONE SIDE
#DCLUS      DW  2          ;NO.of DIR CLUSTERS
SK.CLS      DW  2          ;SECTORS PER CLUSTER
CLS.LIN     DW  8          ;NO. of CLUSTERS per DIRECTORY LINE
CLS.WRD     DW  "N"        ;"Y" for CLUSTER WORD on DIR LINE,
                           ; else "N"
EXT.LIN     DW  1          ;NO of EXTENTS/ DIR LINE (usually 1 OR 2)
INVERT      DW  "N"        ;"Y" for INVERT, "N for NO INVERT DATA


            DW  0               ;RESERVED
            DW  0               ;RESERVED


SKTBL       DW  1,2,3,4,5       ;SECTOR LIST FOR ONE SIDE
            DW  -1              ;END LIST
```

Appendix B. Error Messages

1) Directory Error.

This can mean that the harddisk is full, though usually it indicates that a file name contains an illegal character. Note that certain characters which are allowed in CPM file names are not allowed in DOS names. LINK2CPM automatically replaces the following characters when transferring from CPM to DOS character

CPM character	DOS character
[	{
]	}
/	-

2) File Not Found.

The operator has entered a file name which does not exist on the disk. No harm is done. Just re-enter the correct name.

Other error messages may appear from time to time. These are usually of a technical nature and are meant to be an aid to the Link Computer staff in spotting possible bugs in the program.

Appendix C. Ambiguous File Names

The simplest way of indicating a file name is to enter the whole name including the extension, e.g. FILE1.TXT. However, you may be interested in reading all files which have the extension .TXT. In this case, enter *.TXT.

If you have a series of files which are called, for example TEXT1, TEXT2, TEXT3 and so on, you can indicate these by typing TEXT?, where ? is then understood by the program as a "wild card".

If you want to read all files starting with "P", enter P*.*. If you want all files starting with "F" and having the extension .ASM, then enter F*.ASM. Or you could also write F???????.ASM (Note 7 question marks). Remember that CPM and MSDOS file names can have a maximum of 8 letters plus a 3 letter extension.

Appendix D. Copy Protection

Two identical distribution diskettes are supplied with the LINK2CPM System. These diskettes are copy protected by "Cop's Copylock" which is also a product of Link Computer.

You can make backup copies of the diskette and are strongly urged to do so.

The distribution diskette must be inserted the first time the LINK2CPM program is run. After that, it can be removed and will not be needed unless the system is cold-booted (power on/off or system reset).

If a distribution diskette fails, it can be exchanged for a new one by sending the defective master to Link Computer.

Appendix E. Trouble Shooting

It may prove impossible to read certain diskettes with LINK2CPM. There can be various reasons for this:

The most usual problem is simply that the unknown diskette is not a CPM diskette. In some cases, Link Computer can furnish a program to read non-CPM diskettes, for example from a Compugraphic typesetter.

The diskette may be a single-density type. The PC/XT/AT and its clones do not support single-density.

If a diskette has been written on a 100 TPI (tracks per inch) drive, it cannot be read on a normal 96 TPI or 48 TPI drive. You can, of course, install a 100 TPI drive on your machine.

You can also experience difficulty reading disks which have been formatted and written on machines with poorly adjusted drives. If this problem occurs with a 40-track diskette, it may help to read it on a 80-track drive.

The diskette may be hard-sectored. Some CP/M systems exist on hard-sectored diskettes. In order to read these diskettes, a special hard-sector system is required. Check with Link Computer for prices.

Appendix F. Physical And Logical Drives

The floppy disk controller card on an AT can control 2 floppy drives while the controller on a PC/XT can control 4 drives. These drives are addressed by the controller as drive 0,1,2 or 3. These are the PHYSICAL drive numbers. The drive names A,B,C and so on are LOGICAL drives which are recognized by the DOS. For example, a computer may have 2 internal drives, 1 external drive, a hard disk and a RAM disk.

The logical drive arrangement in this case would probably be:

A:	floppy drive 0
B:	floppy drive 1
C:	hard disk
D:	RAM disk
E:	floppy drive 2

Note that while the floppy drives have physical drive numbers 0,1,2, they are assigned to logical drives A,B,E.

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Other Products from Link Computer.

• CopyLock II	Protection of PC Programs against unlicensed copying.
• Safe360	Safe writing of 360K diskettes using 1,2MB drives.
• Compu2PC	Writes and Reads CompuGraphic MCS diskettes on a normal PC.
• HotKey	Makes .com and .exe files resident.
• StringACE	String conversion program, advanced and easy to use.
• LinkBBS	A professional Bulletin Board System.
• HaloCVU	Picture Conversion from Dr. Halo to Texas CVU 6000
• Com2EXE	Changes a .COM file into an .EXE file.
• LinkBOX	Protocol Conversion box for 3780 and 3270 communication.

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