

FINAL CARTRIDGE

III

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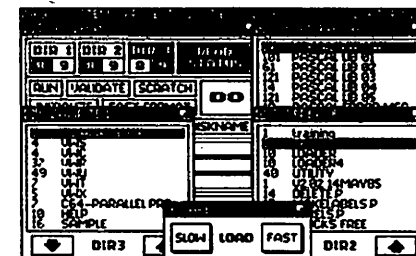
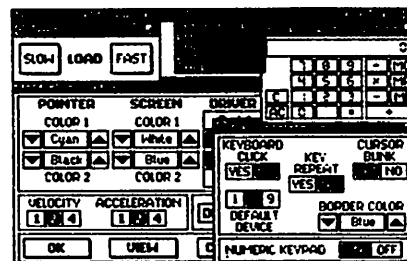
PREFACE

The Final Cartridge III is a development of Riska B.V. Home & Personal Computers.

The Final Cartridge III which consists of 64 K bytes in machine-code, offers many additional features apart from the DESKTOP, for example:

1. Many useful toolkit commands.
2. Easy to use disk commands.
3. 24K bytes extra memory in BASIC.
4. A tape turbo which loads and saves TEN TIMES faster.
5. A disk turbo which loads FIFTEEN TIMES faster, and saves SEVEN TIMES faster.
6. A built-in machine language monitor.
7. A disk monitor.
8. A Centronics printer interface to produce listings and high-resolution graphic screen dumps.
9. A built-in sprite killer.
10. A reset switch, which will enable you to regain control of your computer at any time, and an OLD command, which restores your BASIC program back after a reset or NEW.
11. A freezer facility which:
 - will dump programs to tape or disk.
 - allows you to pause a program.
 - allows you to make screendumps, including even sprites.
12. A built-in Notepad, enabling you to keep notes or create short documents.

The user interface, the windows and pull-down menus are based on ideas applied in the Apple Macintosh and the Commodore Amiga.



CONNECTING THE FINAL CARTRIDGE III

!!! ATTENTION !!!

Be sure you always turn off the computer before connecting or disconnecting the Final Cartridge III.

COMMODORE 64

Plug in the Final Cartridge III into the cartridge port of your computer (right hand side as you look from the front) with the LABEL UP. Turn on the computer and other peripherals as normal.

COMMODORE 128

Plug the Final Cartridge III into the cartridge port of your computer (right hand side as you look from the front) with the LABEL UP. Turn on the computer and other peripherals as normal. Your Commodore 128 will now boot up on Commodore 64 mode.

By pressing the reset button on the Final Cartridge III you enter the Commodore 64 mode. If you press the reset button on the Commodore 128, you enter the Commodore 128 mode. So it's not necessary to remove the Final Cartridge III if you want to use the Commodore 128 mode or CP/M mode.

If you turn on the computer with the Final Cartridge III inserted, it will go to desktop. This is described in DESKTOP.

If you want to work directly in BASIC, just hold down the <RUN/STOP> button while you turn on your computer.

If you don't get any message, and after pressing the reset button you still see nothing, then the Final Cartridge III is probably not correctly connected with the computer.

With older types of computers it's sometimes necessary to press the reset button (perhaps with the <RUN/STOP> or the <C=> key down) on the cartridge to start the Final Cartridge III.

!!! ALSO SEE THE CHAPTER REMARKS !!!

WINDOWS & MENUS

INTRODUCTION

Most facilities of the Final Cartridge III are supported by Windows & Menus. As not everybody will know everything about these subjects, we first explain some general things. Those who are not familiar with these subjects should read this chapter first.

GENERAL TERMS AND TECHNIQUES

USING THE POINTER

You use the pointer, the small arrow on the display, to point at the subjects you want to select. Moving the joystick/mouse moves the pointer. It is also possible to simulate the joystick with the use of the keyboard (<F1>: up; <F3>: down; <F5>: left; <F7>: right; <C=>: fire button). Although the Final Cartridge III supports both joystickports, we suggest you use joystickport 2. Unfortunately we can't do anything about the fact that some mice lock the keyboard (this is a hardware failure of the mouse), so it's sometimes necessary to disconnect the mouse.

If the pointer doesn't move the way you want or doesn't have the color you like, you can always change these settings using the Preferences tool. This is explained in Tools.

CLICKING AND SELECTING

Most commands of the Final Cartridge III are chosen by pointing at it on the screen and pushing the fire button of the joystick or the mouse. This is called clicking.

Choosing a command by pointing at it and clicking is called selecting.

MENUS

INTRODUCTION

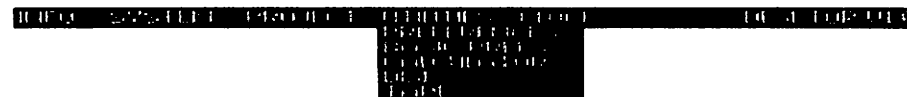
For most tools, there are menus that list choices you can make.

At the top of the screen you can find this menu bar:



In this menu bar are titles of menus, which you can choose at this moment.

To browse through the menus, just hold down the fire button while moving the pointer down along the menu bar. Without choosing an item, you'll get a look at the menu items that are available.



In some menus, not all menu items are available at all times. Menu items that you cannot choose appear as ghost items.

To choose one of the items you have to point at it (while keeping the fire button down). When the item you want to choose is highlighted you release the fire button.

COMMANDS AND OPTIONS

In menus, there are two kinds of items. Commands are items that you choose to perform an action. One example of a command is the calculator item in the utilities menu. You choose calculator to perform some calculations.

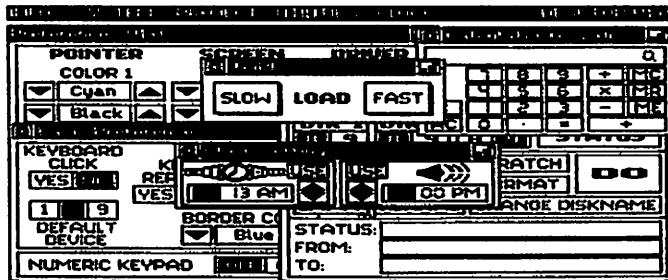
Options are choices that persist until you choose other, mutually exclusive, options. An example of an option is TIME in the clock menu (As long as TIME remains selected, the time is displayed in the menu bar). Options you've chosen are indicated by check marks to the right of the menu items.

WINDOWS

INTRODUCTION WINDOWS

A window is a small screen that appears within the screen (a newly opened window appears in front of any other windows with which it overlaps).

You even have the possibility to open several windows. But while all the windows in the screen can display information, only one window can accept information from you at a time. This window is called the selected window. To select a window, point anywhere within the window and click the fire button. You can recognize the selected window, because it is the upper window.

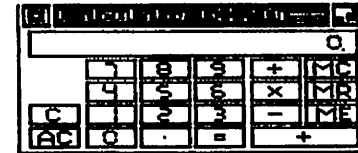


GADGETS

You move windows, close windows, etcetera with windows with the help of gadgets. You also use gadgets to communicate with the utilities. Here are some common gadgets found in windows:

Close gadget	To close a window
To-back gadget	To move windows behind other windows
String gadget	To enter text
Toggle gadget	To select options

You can find several of these gadgets in this picture.



Windows can contain all, some, or none of these gadgets. In addition, windows can contain other gadgets needed for a particular utility. For example, in the calculator window, each of the calculator's 'buttons' is a gadget.

SELECTING GADGETS

You can select a gadget by pointing at it and clicking. Toggle gadgets you select are highlighted. If by accident you select a wrong gadget you need to remove the pointer from the gadget, while keeping the fire button down, after which you can release the fire button.

DRAGGING WINDOWS

You drag a window by pointing anywhere in the window's drag bar, holding down the fire button, and moving the pointer. When you do so, you see four marks that suggest the corners of the window. By releasing the fire button you place the window.



MOVING WINDOWS IN FRONT OF OTHER WINDOWS

When windows overlap, one window appears in front of the others.

To move a window in front of other windows, you select the window. This window appears in front of the others, and is also active.

To move a window behind another, you select the to-back gadget of the window you want to move. Now this window appears at the back, and the window in front is automatically selected.



CLOSING WINDOWS

To close a window, you select the close gadget. You can find this gadget in most windows in the upper left-hand corner.

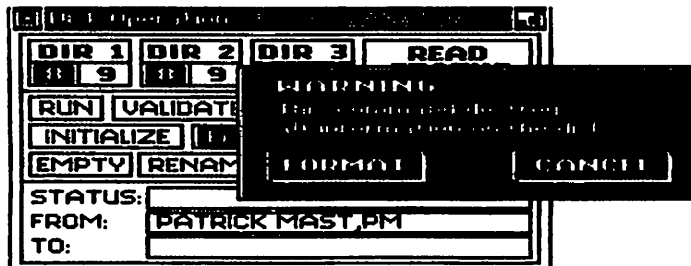


TALKING TO WINDOWS

When a utility needs a name, for example the name and ID of the disk you want to format, you have to use a string gadget. These gadgets have a cursor you can use to enter the name. To activate a string gadget you have to click when the pointer is inside the gadget. If you click outside the gadget the cursor disappears, and the gadget is no longer selected. To select the gadget again, point at it and click.

REQUESTERS

Sometimes it is necessary to make some inputs or to perform an important operation. This is done with requesters. For example, if you want to format a disk, a requester appears with options to continue or cancel the format command. You can see such a requester here:



Just after you respond to a requester, it disappears and the computer performs its operation. To respond to a requester, use the gadget or gadgets it provides. Mostly there is a gadget to continue the action, and a gadget to cancel the action.



DESKTOP

INTRODUCTION

Desktop is the most important part of the Final Cartridge III. From desktop you can exit to BASIC, the freezer, etc.

OPENING AND CLOSING THE DESKTOP

There are five ways to open the desktop:

1. Just turn on the computer with the Final Cartridge III inserted (always).
2. Select the item desktop from the system menu in BASIC.
3. In BASIC you can type the command DESKTOP.
4. From BASIC you reset the computer while holding down the <C= > key.
5. Select the item DESKTOP in the exit menu of the freezer.

To reset the desktop, press the keys <CTRL> & <SHIFT> & <SHIFT> simultaneously.

You can leave the desktop by going to BASIC, the freezer, etc.

USING THE DESKTOP

The commands in the desktop are chosen by pull-down menus. You can find this menu bar in desktop:



We discuss all the commands in the way they are displayed in the menus.

INFO

In this menu are commands that will show some information about the Final Cartridge III.

DESKTOP

This command will open a requester that will show the names of the designers of the Final Cartridge III.

VERSION

This command will open a requester that will show the version numbers of various parts of the Final Cartridge III.

SYSTEM

In this menu you can find some system commands.

BASIC

This command will close the desktop and go to BASIC, after you have responded to a requester. All BASIC extensions are described in the chapter BASIC.

FINAL KILL

This command will disable the Final Cartridge III. You can see that by the LED on the cartridge being turned off.

FREEZER

This command will activate the freezer. From there you can, among other things, make screendumps. You can continue Desktop by leaving the freezer with the Exit Run command. All freezer commands are described in the chapter FREEZER.

REDRAW

This command will redraw the screen, so that you can see all the windows that are displayed.

PROJECT

In this menu you can find some projects you can start.

NOTEPAD

This command will open the notepad. The notepad is described in the chapter TOOLS.

DLINK

This command will start future extentions from diskette.

TLINK

This command will start future extensions from cassette.

UTILITIES

In this menu you can find several utilities. The utilities are described in the chapter TOOLS.

CLOCK

In this menu you can find some commands in order to use the clock.

TIME

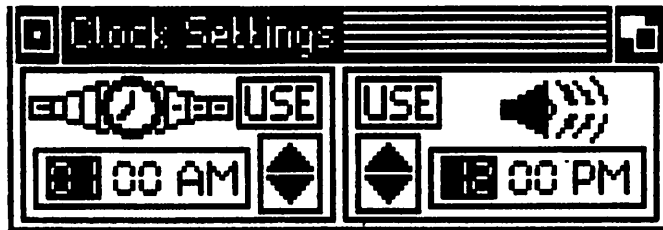
This option will display the time in the menu bar. If you select the option again, the time disappears.

ALARM

With this option you can set the alarm on and off. If the alarm is on, at the time you have set, it stays on until you turn it off. To stop the alarm from ringing you have to press any key.

SETTINGS

This command will open the clock settings window. This window, shown below, is divided into two parts: the left one is for the time, the right one is for the alarm.

**CHANGING THE TIME AND ALARM**

You can change the time and the alarm in exactly the same way. You first select the two digits you want to change, the first two for the hours and the last two for the minutes, and then you select the up or down gadgets. If you want to use the new time, select the use gadget.

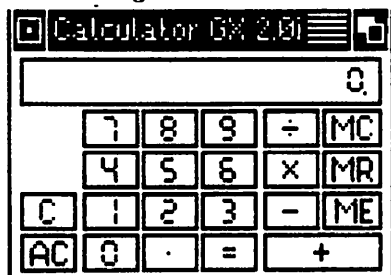
CHANGING THE TIME MODE

You can also change the time mode. By selecting the time mode gadget, just behind the minutes, you can choose between 12 or 24 hours mode.

TOOLS

In this part we will discuss the following tools:

CALCULATOR
PREFERENCES
DISK OPERATIONS
TAPE OPERATIONS
BASIC PREFERENCES
PRINTER SETTINGS
NOTEPAD



CALCULATOR

INTRODUCTION

The calculator is a standard four-function calculator you can use to add, subtract, multiply, and divide numbers. It also has a memory. You can enter the data using the pointer or the keyboard.

OPENING AND CLOSING THE CALCULATOR

You can open the calculator by selecting calculator from the utilities menu. When you do, a window for the calculator appears.

You can close the calculator window by selecting the close gadget in the upper left-hand corner of the calculator window.

USING THE CALCULATOR

In the calculator window, each of the calculator's 'buttons' is a gadget. When the calculator window is selected, there are two ways in which you can 'press a button':

1. Select the gadget.
2. Type the character shown in the gadget.

These are the characters you have to type:

Key	Gadget	Function
+	+	Addition
-	-	Subtraction
/	: -	Divide
*	X	Multiply
= or <RETURN>	=	Calculate
E	ME	Memory Enter
C	MC	Memory Clear
R	MR	Memory Recall
<CLR/HOME>	C	Clear
<SHIFT> & <CLR/HOME>		
<INSERT/DEL>	AC	All Clear
. or ,	.	Decimal Point

THE STANDARD FUNCTIONS

To get to know the standard functions, you can type the following examples:

Enter:	Screen:
AC	0
4	4
+	4
96	96
=	100
AC	0
999	999
:	999
3	3
=	333
AC	0
1000	1000
+	1000
-	1000
750	750
=	250

THE MEMORY

To get acquainted with the use of the memory, you can type the following example:

Enter:	Screen:
AC	0
MC	0
7.25	7.25
+	7.25
6.25	6.25
+	13.5
8.5	8.5
=	22
ME	M 22
:	M 22
4	M 4
=	M 5.5
MR	M 22
:	M 22
3	M 3
=	M 7.3333334

PREFERENCES

INTRODUCTION

Preferences is a utility that allows you to see and change many of the settings of your Final Cartridge III.

OPENING AND CLOSING PREFERENCES

You can open preferences by selecting it in the utilities menu.

You can close preferences by selecting the OK or cancel gadget.

FUNCTIONS

Using preferences you can change:

- The screen colors
- The pointer colors
- The pointer speed
- The pointer acceleration
- The driver port
- The driver

POINTER

You can change the colors of the pointer by selecting the up or down gadgets at COLOR 1 (for the inside color of the pointer) or at COLOR 2 (for the outside color of the pointer). You can change the colors by ascending or descending.

SCREEN

You can change the colors of the screen in exactly the same way as described at pointer. COLOR 1 is the foreground color, COLOR 2 is the background color.

DRIVER

You can change the joystick port, by selecting the corresponding gadget. You can also choose between a joystick or a mouse driver by selecting its corresponding gadget.

VELOCITY

The three settings for VELOCITY allow you to change the velocity of the pointer.

ACCELERATION

The three settings for ACCELERATION allow you to change the acceleration of the pointer.

DEFAULT

If you want to see the default settings, select DEFAULT.

VIEW

To examine your settings you select VIEW. The new settings will be active until you release the fire button.

OK

If you like the new settings just select OK to accept them. The preferences window is automatically closed.

CANCEL

If you want to return to the old settings, just select CANCEL. The preferences window is automatically closed.

DISK OPERATIONS

INTRODUCTION

The disk-operations window offers you the possibility to execute several commands on your disk, such as scratching a program or renaming it.

OPENING AND CLOSING DISK-OPERATIONS

You can open disk-operations by selecting disk from the utilities menu.

You can close disk-operations by selecting the close gadget in the upper left-hand corner of the disk-operations window.

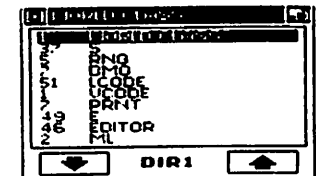
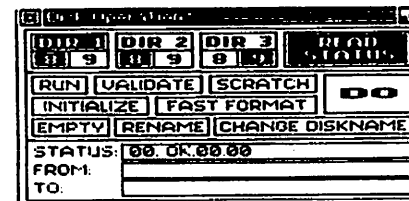
FUNCTION SUMMARY

The disk-operations window offers you the possibility to:

- Rename a program
- Run a program
- Rename a disk
- Fast format a disk
- Empty a disk
- Initialize a disk
- Validate a disk
- Scratch a program
- View directories (up to three at the same time!)

OPENING A DIRECTORY WINDOW

You can examine the directory by selecting one of the three DIR gadgets. (If you own two disk-drives, first select the right device number before you select the DIR gadget.) By choosing the DIR gadget from the disk-operations window, you open a window for the directory. At first the name of the new window is LOADING DIRECTORY, but after the directory has been loaded the name of the disk will appear as the name of the window.



BROWSING THROUGH THE DIRECTORY

If the directory is larger than the window can show, you can browse through the directory by selecting the up or down gadgets.

SELECTING A PROGRAM

You select a program by pointing to it and clicking. This program is also highlighted.

READING THE ERROR-CHANNEL

If you select the toggle gadget READ STATUS, the status of the disk-drive will be displayed after all the disk-operations you perform.

RUNNING A PROGRAM

You can run a program by using the following steps. First you select the program you'd like to run. Now you select the RUN gadget, and then you select the DO gadget, to execute the command. After you respond to the opened requester, the program is loaded using the disk turbo and run automatically.

VALIDATING A DISK

You select the right disk-drive on the active DIR gadget. Now you select the VALIDATE gadget, and then you select the DO gadget to execute the command.

If there's no active DIR gadget, drive 8 is chosen.

SCRATCHING A PROGRAM

You select the program you want to scratch. Now you select the SCRATCH gadget, and then you select the DO gadget to execute the command.

INITIALIZING A DISK

You select the INITIALIZE gadget, and then you select the DO gadget to execute the command.

If there's no active DIR gadget, drive 8 is chosen.

FAST FORMATTING A DISK

You put the disk to be formatted into your disk-drive. Now select the FAST FORMAT gadget. Then select the FROM string gadget to enter the name and ID of the diskette. Finally select the DO gadget to execute the command.

EMPTYING A DISK

Put the disk you want to empty into your disk-drive. Now select the EMPTY gadget. Then select the FROM string gadget to enter the name of the diskette. Finally select the DO gadget to execute the command.

RENAMING A PROGRAM

First select the program you want to rename. Now select the gadget called RENAME, and the name of the program appears in the string gadget FROM. In the FROM gadget you can see the name of the program as it is called now. By selecting the TO gadget you can change the name. Finally you have to select the DO gadget to execute the command.

RENAMING A DISK

Put the disk to be renamed into your disk-drive. Now select the RENAME DISK gadget, after which the name of the disk appears in the FROM gadget. In the FROM gadget you can see the name of the disk as it is called now. By selecting the TO gadget you can change the name. Finally you have to select the DO gadget to execute the command.

SEVERAL DIRECTORY WINDOWS AT THE SAME TIME

The possibility to open several directory windows at the same time is made for the following application: by opening several directory windows at the same time, you can examine and compare directories of different disks. If you want more directory windows on the screen, select another DIR gadget to open the corresponding directory window.

ATTENTION

If you work with more directories, you can only perform commands on the directory indicated by the active DIR gadget.

To read a new directory in a window already opened, select the DIR gadget every directory window has.

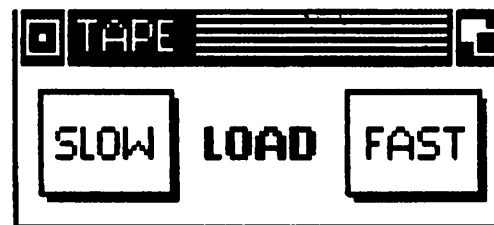
TAPE

INTRODUCTION

Using this window, you can load a program from tape.

OPENING AND CLOSING TAPE

You can open tape by selecting tape from the utilities menu.



You can close tape by selecting the close gadget in the upper left-hand corner of the tape window.

USING TAPE

The tape window offers you two gadgets to load tape programs: SLOW to load a tape program at normal speed; FAST to load a program using the built-in turbo.

BASIC PREFERENCES

INTRODUCTION

In this window you can change settings that are useful in BASIC, such as key repeat. These settings are only active in BASIC.

OPENING AND CLOSING BASIC PREFERENCES

You can open basic preferences by selecting basic preferences from the utilities menu.

You can close basic preferences by selecting the close gadget in the upper left-hand corner of the basic preferences window.

USING BASIC PREFERENCES

Basic preferences offers you several gadgets to change the following settings:

KEYBOARD CLICK

By selecting this option, every time you press a key you will hear a click.

KEY REPEAT

This option will make all keys repeat.

CURSOR BLINK

Selecting this option you disable the cursor blink.

DEFAULT DEVICE

Here you can choose your default device number.

BORDER COLOR

Here you can choose the border color you want.

NUMERIC KEYPAD

If you disable this option, you can't use the numeric keypad of the Commodore 128.

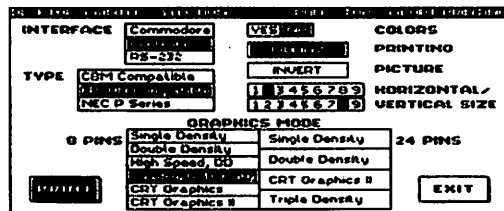
PRINTER

INTRODUCTION

Using the printer window, you have the ability to make screendumps. Before you make a screendump, you can change the type of the printer, interface, print direction, etc. All these possibilities are offered by the print window.

OPENING AND CLOSING THE PRINT WINDOW

You can open the print window by selecting Settings in the Print menu of the freezer.



You close the print window by selecting the exit gadget.

FUNCTION SUMMARY

Using the print window, you can change the following settings:

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EXIT	23
PRINT	23
!! ABORT PRINTING !!	23

Using these settings you can adjust the Final Cartridge III to your printer. We already examined some printers, which are listed below.

INTERFACE

Using the gadgets you can choose between:

- Commodore The screendump is transmitted using the serial cable to the printer.
- Centronics The screendump is transmitted using a parallel cable to a Centronics printer.
- RS-232 The screendump is transmitted using a parallel cable to a serial printer. See the chapter remarks!

TYPE

Using the gadgets you can choose between:

- CBM Compatible The screendump is made using Commodore control codes.
- EPSON Compatible The screendump is made using EPSON control codes.
- NEC P Series The screendump is made using special NEC control codes.

PICTURE

By selecting the inverse gadget you can print the screendump inverse.

COLORS

Using this gadget you can choose if you want the screendump in black & white or in colors on your color-printer.

PRINTING

Using this gadget you can print a screendump in the normal horizontal way or sideways.

You can choose this option if your screendump wouldn't fit on the paper in the normal way.

HORIZONTAL / VERTICAL SIZE

Using these gadgets you can change the horizontal and vertical size of the screendump. This way you can make small and large screendumps.

The numbers are proportions, so if you use 2 instead of 1 your screendump will be twice as big. Attention !!! Selecting between different graphics modes also changes the size of the screendump.

If your screendump is too large for normal printing, then you have to choose printing sideways.

GRAPHICS MODES 8/24 PINS

Using these gadgets you can choose the graphics mode of your printer.

The left column is for 8-pin printers, and the right one is for 24-pin printers. Not every printer has all the modes; if you want to see which modes your printer has, you can verify this in our printer manual. There you can also find a detailed description of the graphics modes.

Using different graphics modes you can change the density of your printer. Density is usually expressed in dots/inch. The greater density you want, the longer the printing will take.

The different modes supported by the Final Cartridge III are:

Single Density	This uses 60 dpi, 8 or 24 pins.
Double Density	This uses 120 dpi, 8 or 24 pins.
Triple Density	This uses 180 dpi, 24 pins.
Quadruple Density	This uses 240 dpi, 8 pins.
High Speed, DD	This uses 120 dpi, but at normal speed (they skip half of the dots).
CRT Graphics	This uses 80 dpi, 8 pins.
CRT Graphics II	This uses 90 dpi, 8 or 24 pins.

EXIT

Using this gadget you will leave the print window and return to the desktop.

PRINT

Using this gadget, you give the command to print using your settings. You can continue after the printing has stopped.

!! ABORT PRINTING !!

You can abort the printing process by pressing the <RUN/STOP> button on your Commodore. This will stop the output of data to your printer. However, printers which have a buffer may continue for some time.

PRINTERS TESTED

The following printers have been tested with the Final Cartridge III using these settings.

Printer	Interface	Type
Star NL-10 (CBM)	Commodore	EPSON Compatible
Star NL-10 (IBM)	Centronics	EPSON Compatible
Star NL-10 (Cent)	Centronics	EPSON Compatible
Epson EX-800	Centronics	EPSON Compatible
Brother M 1509	Centronics	EPSON Compatible
Brother M 1709	Centronics	EPSON Compatible
NEC P6	Centronics	NEC P Series
OLIVETTI DM 105	Centronics	EPSON Compatible
PANASONIC X-P1081	Centronics	EPSON Compatible

PRINTER CABLES

If you want to connect a Centronics or RS-232 printer to your Commodore, you need a special cable. This cable is available through your dealer.

NOTEPAD

INTRODUCTION

With the Notepad tool, you can keep notes or create short documents.

OPENING AND CLOSING NOTE PAD

You can open the Notepad by selecting the notepad item in the PROJECT menu of the desktop.

You can close the Notepad by selecting quit in the project menu.

USING THE NOTEPAD COMMANDS

You can choose the notepad commands from pull down menus. At the top of the screen you will find a menu bar.

We will discuss the commands in the order in which they are displayed in the menus.

PROJECT

In this menu are commands to load, save or print the notes.

NEW

With this command you can empty the notepad.

LOAD

With this command you can load a document from disk. You enter the name of the document using the string gadget of the requester.

TLOAD

With this command you can load a document from tape in exactly the same way as described in LOAD. After you have typed the name you have to press PLAY on tape.

SAVE

With this command you can save your document to disk. You enter the name of the document using the string gadget of the requester.

TSAVE

With this command you can save a document to tape in exactly the same way as described in SAVE. After you typed the name you have to press RECORD & PLAY on tape.

PRINT

With this command you can print your document.

QUIT

With this command you close the notepad and return to the desktop.

FILE**TOP OF FILE**

With this command you can directly go to the top of your document. You can also do this by pressing <CLR/HOME>.

REDRAW

This command will redraw the screen.

FREEZER

This command will activate the freezer. The only way to return from the freezer is to select the Exit Run command of the freezer.

SCREEN

In this menu are several commands to change the way in which the text is displayed.

WORDWRAP

This option activates the wordwrap.

BOLD

This option will display the whole text in bold type.

LINE

In this menu are several commands that change the distance between the lines.

SPACEx

By selecting a different space command, you change the distance between the lines.

ENTERING TEXT

You can enter the text in the usual way.

EDIT FUNCTIONS

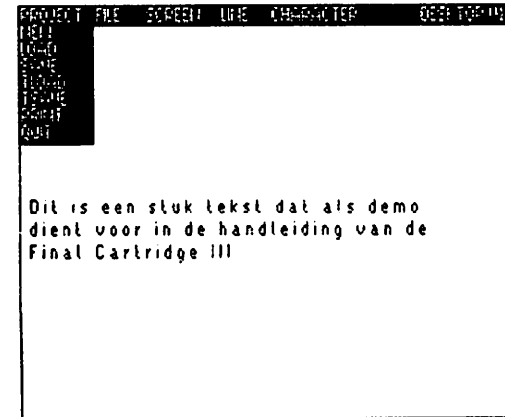
With the cursor-control keys you can move the cursor in the usual way:

One character left or right.

One line up or down.

The <INST/DEL> key removes the character left of the cursor.

It is also possible to move the cursor with the pointer. You point at the place you want the cursor and click.



BASIC

INTRODUCTION

In the BASIC mode you can make a program in BASIC as you are used to. In this mode the computer works as it does without the Final Cartridge III.

The Final Cartridge III does offer you some extensions, however, such as:

1. Scrolling BASIC programs
2. A printer interface
3. Screendumping
4. A tape/disk turbo
5. The use of pull-down menus
6. The use of almost 30 extra BASIC commands

ENTERING AND LEAVING THE BASIC MODE

You can enter the BASIC mode by:

1. Holding down the <RUN/STOP> key while you turn on or reset your computer.
2. Selecting the BASIC item in the SYSTEM menu from the desktop.
3. Selecting the BASIC item from the freezer.

You can stop the BASIC mode and select another option by:

1. Selecting DESKTOP in the SYSTEM menu to go to the DESKTOP.
2. Typing DESKTOP to go to the DESKTOP.
3. Resetting the computer while holding down the <C= > key. This will bring you to the DESKTOP.
4. Pushing the freeze button to go to the FREEZER.
5. Selecting FINAL KILL to turn the Final Cartridge III off, and go to the original computer.
6. Typing KILL to turn the Final Cartridge III off, and go to the original computer.

EXTENSIONS OF BASIC

SCROLLING

Just like with the monitor, you have the possibility to scroll your BASIC programs. This is done by pressing the cursor keys. You can scroll a program after you have listed a small part of it, by pressing the cursor-up key if the cursor is at the top of the screen, or the cursor-down key if the cursor is at the bottom of the screen. You will notice that the preceding or following part of your program is automatically displayed.

EDIT FUNCTIONS

The Final Cartridge III offers you several extra edit functions, which make editing a program a lot easier.

To make scrolling down much easier, you can (by pressing the keys <CTRL> & <CLR/HOME> simultaneously) move the cursor directly to the left bottom corner of the screen.

By pressing the keys <CTRL> & , you delete the characters after the cursor to the end of the line.

By pressing the <C= > key, you freeze the output to the screen. This is very useful to stop the list command.

PRINTER INTERFACE

Using the Final Cartridge III you can also print on non-Commodore printers. The Final Cartridge III is provided with a Centronics printer interface. To connect a Centronics printer you need a special cable which is available through your local dealer. You can use the Centronics interface from BASIC by using the extended OPEN command.

LOW-RESOLUTION SCREENDUMP

It is possible to make a low-resolution screendump directly from BASIC. This is done by pressing the keys <CTRL> & <RETURN> simultaneously.

TAPE TURBO

The Final Cartridge III is provided with a tape turbo, which loads and saves programs 10 times faster. This turbo is fully compatible with most commonly used turbos. You also have the possibility to load and save at normal speed.

The tape commands are:

LOAD 'name'	load at normal speed
SAVE 'name'	save at normal speed
LOAD 'name',7	load using the turbo (10 times faster)
SAVE 'name',7	save using the turbo (10 times faster)

DISK TURBO

The Final Cartridge III is also provided with a disk turbo. The turbo loads programs 15 times faster, and the turbo saves programs 7 times faster.

The usual commands already use the turbo, but by using the new disk commands, you don't have to type ',8'.

New diskcommands:

DLOAD	
DSAVE	
DAPPEND	
DVERIFY	All these commands are discussed in Extra BASIC Commands.

PULL-DOWN MENUS

From BASIC it is possible to use pull-down menus. In these menus you can find all the extra BASIC commands. To use the pull-down menus in BASIC you have to press the fire button (this is the only difference between the pull-down menus in desktop and BASIC), after which the menu bar will appear.

You will find detailed descriptions of the commands further on.
Attention! FINAL KILL = KILL

EXTRA BASIC COMMANDS

With the Final Cartridge III inserted in your computer, you can use almost 30 extra BASIC commands. You can use these commands in two ways:

- You can type them
- You can use them in your programs.

Of all the commands we give

- the name of the command
- the syntax of the command

The first line shows the full command.

The second line shows the abbreviation. You can type the lower case characters in the usual way, but you have to press the <SHIFT> key to enter the upper case characters.

[] Square brackets indicate optional parts of the command. Do not type the brackets.

< > Angle brackets enclose information that you must provide, such as the name of a program, etc. Do not type the brackets.

/ This sign indicates that you must choose between various possibilities.

- the function of the command
- an example of the command
- some remarks on the command

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APPEND

Syntax: APPEND ['<file-name>'] [, <device>]
aP ['<file-name>'] [, <device>]

This command offers you the possibility to add subroutines you have on tape or disk, to a program that's already in memory.

Example: APPEND 'file-name' for tape
APPEND 'file-name',8 for disk

Remarks: Because the original line numbers are unchanged, you may have to renumber the new program.

ARRAY

Syntax: ARRAY
aR

This command will list the contents of the arrays you are using in your program.

Example: ARRAY

Screen: ARRAY
A\$(1) = 'HALLO'
A\$(2) = 'TEST'

AUTO

Syntax: AUTO [<linenumber> [, <increment>]]
aU [<linenumber> [, <increment>]]

This command will automatically number your program, making the typing in of programs much faster and easier.

Example: AUTO 10,5 The computer starts at line 10, and as soon as you press <RETURN> the computer gives the next line number: 10 + 5 = 15.
AUTO This is the same as AUTO 100,10
AUTO 200 This is the same as AUTO 200,10

Remarks: To stop the AUTO command just press <RETURN> without entering a command.

If you have a program that ends at line 1000, you can use AUTO 1010,10 to add lines to the program.

You can also use this command to insert lines.

BAR

Syntax: BAR [OFF]
bA [oF]

This command will disable or enable the possibility to call the pull-down menus.

Example: BAR enables the pull-down menus
BAR OFF disables the pull-down menus

Remarks: This command is built in to make the Final Cartridge III also compatible with other programs from BASIC. If a program doesn't work, try it again after you used the BAR OFF command.

DAPPEND

Syntax: DAPPEND ['<file-name>']
dA ['<file-name>']

This command is the same as APPEND 'file-name',8.

Example: DAPPEND 'part2' adds 'part2' to the program in memory
DAPPEND adds the first program on disk to memory

Remarks: By using this command you don't have to use the addition ',8'.

DEL

Syntax: DEL ['<first-line>]-[<last-line>]
dE ['<first-line>]-[<last-line>]

This command will delete parts of your program

Example: DEL 100-200 will delete the lines from 100 up to 200
DEL 250- will delete the lines from 250
DEL -100 will delete the lines up to 100
DEL - will delete the program

Remarks: DEL is short for DELETE.

DESKTOP

Syntax: DESKTOP
deS

This command will leave BASIC and return to the DESKTOP.

Example: DESKTOP this will return to DESKTOP

Screen: DESKTOP
ARE YOU SURE (Y/N)?

Remarks: Before you go to desktop be sure you have saved your program, or the DESKTOP will wipe out what is in the BASIC memory. That's why the computer first asks you 'ARE YOU SURE (Y/N)?'. You enter your choice by pressing <Y> or the fire button to leave BASIC or <N> to continue.

DLOAD

Syntax: DLOAD ['<file-name>']
dL ['<file-name>']

This command will load a program from disk using the built-in turbo. In this way programs are loaded 15 times faster than normal.

Example: DLOAD 'test' loads the program 'test' from disk
DLOAD loads the first program from disk

Remarks: By using this command you don't have to use the addition ',8'.

DLOAD 'name' is the same as LOAD 'name',8,1

If you are not using this command in a program, you can also press <F5>, which has the same effect as typing DLOAD.

DOS

Syntax: DOS' [<diskcommand>]/[<devicenumber>]
dO' [<diskcommand>]/[<devicenumber>]

This command will let you find out what kind of error has occurred when the red light on your disk is flashing. You can also use this command to give diskcommands or change to the other disk.

Example: DOS' will read the ERROR-channel
DOS'\$ will display the directory of the disk
DOS'NO:name,id' will format a disk
DOS'V will validate a disk
DOS'9 now all the diskcommands will go to the drive using devicenumber 9

Remarks: DOS 'N:RISKA,BV' is the same as the following sequence of commands:
 OPEN 15,8,15 <RETURN>
 PRINT#15,'N:RISKA,BV' <RETURN>
 The diskcommands are described in your disk manual. If you are not using this command in a program, you can also press <F8>, which has the same effect as typing DOS''.

DOS''\$

Syntax: DOS''\$
 dO

This command will display a directory of the disk on the screen WITHOUT wiping out the program currently in memory.

Example: DOS''\$ this shows the contents of your disk

Remarks: If you are not using this command in a program, you can also press <F7>, which has the same effect.

By using the function key <F7> with this command you first clear the screen.

DSAVE

Syntax: DSAVE '<file-name>'
 dS '<file-name>''

This command will write a program to disk using the built-in turbo. In this way programs are saved 7 times faster than normal.

Example: DSAVE 'test' writes the program 'test' to disk

Remarks: By using this command you don't have to use the addition ',8''.

If you are not using this command in a program, you can also press <F6>, which has the same effect as typing DSAVE''.

DUMP

Syntax: DUMP
 dU

This command will show you a list of all the normal variables and their present values.

Example: DUMP will dump all the normal variables

Remarks: To dump the arrays, use the command ARRAY.

DVERIFY

Syntax: DVERIFY ['<file-name>']
 dV ['<file-name>']

This command will compare the program on disk named 'file-name' with the one currently in memory. If the two programs are the same then the computer returns with the usual 'READY' prompt, but if there are any differences then a 'VERIFY ERROR' is given.

Example: DVERIFY 'test' will compare the program 'test' on disk with the one in memory
 DVERIFY will compare the first program on disk with the one in memory

Remarks: DVERIFY is the same as VERIFY 'file-name',8. But by using this command you don't have to use the addition ',8''.

FIND

Syntax: FIND ['<text>']/[<BASIC command>]/[<variable>]
 fI ['<text>']/[<BASIC command>]/[<variable>]

This command will search the whole program for a string, word or command and list every line in which it occurs.

Example: FIND 'test' will list every line containing the string 'test'
 FIND POKE 53280 will list every line containing the command POKE 53280
 FIND Z will list every line containing the variables Z, Z%, Z\$, indexed or not
 FIND Z\$ will list every line containing the variable Z\$, indexed or not
 FIND Z% will list every line containing the variable Z%, indexed or not
 FIND 9 will list every line containing a 9 such as:
 POKE 19,0; POKE 12,191; z = 0.192 etc.
 FIND will list all lines

KILL

Syntax: KILL
 kI

This command will disable the Final Cartridge III. Only the freezer still works, but you will return to the standard Commodore 64 unless you leave the freezer through the monitor.

LIST

Syntax: LIST [[first-line]-[last-line]]
LI [[first-line]-[last-line]]

This command will list your BASIC program, but has now been improved so that any list protections which may be included in a BASIC program will be overruled.

MEM

Syntax: MEM
mE

This command will display the memory categories of the BASIC memory.

Example: MEM will list the memory category

Screen: MEM
BASIC 38911 BYTES
PROGRAM 2 BYTES
VARIABLES 0 BYTES
ARRAYS 0 BYTES
STRINGS 0 BYTES
FREE 38909 BYTES

MON

Syntax: MON
mO

This command will activate the machine-language monitor which is built into the Final Cartridge III. Full details on how to use this excellent feature are given in the chapter MONITOR.

MREAD

Syntax: MREAD <memory location>
mR <memory location>

This command will read 192 bytes of memory from the given memory location onwards. Using the MWRITE command you can transfer these bytes to the 24K of RAM which normally lies 'under' the ROMs.

Example: FOR I = 0 TO 4
MREAD \$0400 + I * 192
MWRITE \$A000 + I * 192
NEXT I This will transfer the screen to the extra RAM.

Remarks: It is possible to transfer to all memory locations, but these commands are intended to use the 24K of RAM which normally lies 'under' the ROMs. This extra memory can be used as a storage medium for large amounts of information, such as variables, text and graphics screens, reference tables etc. The 24K of extra RAM is located at:

\$A000-\$BFFF = 8K BASIC interpreter
\$C000-\$CFFF = 4K free RAM
\$D000-\$DFFF = 4K VIC, SID and I/O
\$E000-\$FFFF = 8K kernel

To transfer the 192 bytes the Final Cartridge III uses the tape-buffer.

MWRITE

Syntax: MWRITE <memory location>
mW <memory location>

This command writes the 192 bytes you read with the MREAD command on the given location.

Example: FOR I = 0 TO 4
MREAD \$A000 + I * 192
MWRITE \$0400 + I * 192
NEXT I This will restore the screen.

Remarks: See MREAD.

OLD

Syntax: OLD
oL

This command will restore a BASIC program after a reset or NEW.

Remark: This command works as long as you haven't started to type in a new program or to load one.

OPEN

Syntax: OPEN <file-num>, [device] [, <address>]
oP <file-num>, [device] [, <address>]

This command opens a channel for input and/or output to a peripheral device, but is extended by the Final Cartridge III for Centronics printers.

Example: OPEN 1,4,2 This secondary address allows you to use all normal ASCII codes.
 OPEN 1,4,3 This allows you to use all ASCII codes, as well as the control codes used by your printer.
 OPEN 1,4,9 This allows you to print all Commodore graphics and control codes.
 OPEN 1,4,10 This does the same as OPEN 1,4,9 but in reversed print.

Remarks: To list a program to a printer, you can use:
 OPEN 1,4,9: CMD 1: LIST (After printing you should close your printer channel again with PRINT#1: CLOSE1)

You can also use the new PLIST command.

ORDER

Syntax: ORDER
 OR

This command will order your BASIC program. It's possible that after a (D)APPEND command the line numbering isn't correct. By using this command all lines are inserted at the proper place.

Remarks: You can use this command after an APPEND, DAPPEND or RENUM command.

PACK

Syntax: PACK
 PA

This command will pack the program in memory. After you packed the program you can save it. You can run a packed program in the normal way.

Remarks: The program you want to pack should start at 0801 (hex). A lot of programs are already packed, so if you use it on those programs they will only become bigger. Also see UNPACK.

PDIR

Syntax: PDIR
 pD

This command will print the directory.

Example: PDIR this will print your directory

Remarks: This command does the same as the following sequence of commands:
 LOAD '\$',8
 OPEN 1,4: CMD 1: LIST
 PRINT#1
 CLOSE1

PLIST

Syntax: PLIST
 pL

This command displays the listing on the printer.

Example: PLIST

Remarks: This command does the same as the following sequence of commands:

```
OPEN 1,4: CMD 1: LIST
PRINT#1
CLOSE1
```

RENUM

Syntax: RENUM [<linenumber> [, <increment>]]
 rE [<linenumber> [, <increment>]]

This command will renumber the lines of a BASIC program. Using this command you can create room to insert lines, or you can renumber a program after an APPEND command.

Example: RENUM 10,5 will renumber a program, starting with line 10 using an increment of 5.
 RENUM is the same as RENUM 100,10
 RENUM 300 is the same as RENUM 300,10

Remarks: This command also takes care of any GOTOs and GOSUBs, and is very useful when you are writing your own programs as it allows you to tidy up the line numbers.

TRACE

Syntax: TRACE [OFF]
 tR [OFF]

This command will display each line of your BASIC program while it is being executed when you run the program. It will continue tracing until you use the command TRACE OFF.

Example: TRACE will trace your BASIC program
 TRACE OFF will stop tracing your BASIC program.

UNPACK

Syntax: UNPACK
 uN

This command will unpack a program which was packed by the Final Cartridge III.

Remarks: See also PACK.

\$

Syntax: \$<hexadecimal number>

This command allows you to use hexadecimal numbers in your programs, just as you would use decimal numbers. To tell the computer that a particular number is in hexadecimal it should be preceded by a \$ symbol.

Example: A = \$0F Variable A gets the value 15
 POKE \$D020,A The border becomes grey
 SYS \$FCE2 This resets the computer.

FREEZER

INTRODUCTION

The LEFT button at the back of the Final Cartridge III is the freeze button. Pressing this button will freeze all programs.

After you press the FREEZE button the Final Cartridge III allows you to execute several special commands such as making a backup copy of your tape or disk program. Also see the chapter remarks!

HOW TO START AND STOP THE FREEZER

You can start the freezer in the following three ways:

1. Select the freezer item in the desktop system menu.
2. Select the freezer item in the BASIC system pull-down menu.
3. Press the freeze button on the back of the Final Cartridge III.

You can leave the freezer in the following two ways:

1. You select one of the exit commands.
2. You select one of the reset commands.

USING THE FREEZER

After you started the freezer a menu bar will appear. In this menu you don't use a pointer. You can browse through these pull-down menus in the following two ways:

1. Using the joystick. Going left or right, you can browse through the different menus. Going up or down you browse through the menu items. Pressing the fire-button selects a command.
2. Using the keyboard. With the cursor keys (only together with the shift key on the right if necessary) you can move in the same way as described above. Pressing the <F7> key you select a command.

SUMMARY FREEZER COMMANDS

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BackUp

The Final Cartridge III has a built-in facility to allow you to make backup copies of your tape and disk programs. Please note that this facility is only for your own personal backups, and is not designed to allow you to copy programs illegally

The backups you make can be loaded even without a Final Cartridge III.

But if you want to load a backup without a Final Cartridge III, be sure that you didn't make a backup after you activated the sprite killer, the joystick port changer or the autofire (these special facilities need a Final Cartridge III).

BackUp Disk

This command will make a backup copy of your software to disk at normal speed.

BackUp Tape

This command will make a backup copy of your software to tape at normal speed.

BackUp FDisk

This command will make a backup copy of your software to disk at high speed.

BackUp FTape

This command will make a backup copy of your software to disk at high speed.

GAME

This menu is built in to make it easier to play games. It offers you a sprite killer, a joystick port changer and an auto fire. About twenty seconds after you activated a command the program continues. Unfortunately it is possible that the software disables a Game command; in that case then you have to select that command again.

Game Sprite I

This command will disable the sprite to sprite detection. Please remember that not all games use sprites or sprite detection registers, so don't be surprised if you still get killed. If a game doesn't use the sprite detection registers, there's nothing we can do to disable the sprite killing.

Game Sprite II

This command will disable the sprite to background detection.

Game Joyswap

This command will select the other joystick port. By using this command, you don't have to change the joystick from port one to port two (or vice versa) if a game uses the other joystick port.

Game Autofire

This command will transform a normal joystick to an expensive auto fire joystick. This is very useful for Invader games. Every time you hold down the fire button, it automatically keeps on firing.

Colors

This menu is built in to change the colors of the screen.

Colors BackGnd

This command will change the background color.

Colors ForeGnd

This command will change the foreground color.

Colors Border

This command will change the border color.

Print

This menu is built in to make screendumps, watch the frozen screen, and reactivate the Centronics printer-interface.

Print Settings

This command will open the print window to allow you to make screendumps. This window is described in the chapter TOOLS.

Print View

This command will make it possible to see the screen you're going to print. After you have chosen this command you can use the joystick or the cursor keys to scroll the screen up or down, then a new menu bar appears.

This new menu bar offers you the possibility to change the colors of the screen. The commands are:

Print View Border

This command changes the border color (It increments register 53280 (D020 Hex)).

Print View ForeGround

This command changes the foreground color (It increments the left nibble of the color memory; in hires it increments the right nibble of the screen memory).

Print View BColor0

This command changes the background color 0 (It increments register 53281 (D021 Hex)).

Print View BColor1

This command changes the background color 1 (It increments register 53282 (D022 Hex)).

Print View BColor2

This command changes the background color 2 (It increments register 53283 (D023 Hex)).

Print View BColor3

This command changes the background color 3 (It increments register 53284 (D024 Hex)).

Print View Exit

This command exits View; you return to the freezer pull-down menus.

Print Set

This command reactivates the Centronics printer interface. It resets the printer vectors just in case a program overwrites the Centronics driver.

Reset

This menu is built in to reset the computer and start it up in a special way.

Reset Kill

This command will reset the computer and start it up as the standard Commodore. (It will leave the Final Cartridge III off).

Reset Zero Fill

This command will reset the computer and clean the memory before it starts up. It leaves the Final Cartridge III on. Using the start up will save memory in a backup.

Reset CBM64

This command will reset the computer and start it up as the standard Commodore. (It will leave the Final Cartridge III on)

Exit

This menu is built in to exit the freezer.

Exit Run

This command will continue the frozen program.

Exit Monitor

This command will start the monitor.

Exit Desktop

This command will leave the freezer and start the desktop.

THE MONITOR

INTRODUCTION

The monitor of the Final Cartridge III is quite unique, as it has four functions: machine language monitor, disk monitor, character monitor, sprite monitor.

Using the machine language monitor we can communicate directly with the computer in machine language. The great advantage of machine language is that it is much faster than BASIC.

The machine language monitor provides you with several extra commands which greatly simplify machine language programming. Some function keys can also be used while you're working with the machine language monitor.

For example, using the disk monitor you can examine or change the memory of the disk-drive.

Using the character monitor you can examine and change characters. In this way you can design your own characters.

Using the sprite monitor you can examine and change sprites. In this way you can design your own sprites.

HOW TO START AND LEAVE THE MONITOR

You can start the monitor in four different ways:

1. In BASIC you type the command MON.
2. In BASIC you press the function key F2 (<SHIFT> + <F1>).
3. In BASIC you select monitor in the system pull-down menu.
4. In the FREEZER you select MONITOR.

After that you will be shown a display of the various registers, looking like this, for example:

```
C*
  PC  IRQ  BK  AC  XR  YR  SP  NV#BDIZC
.;AB20 EA31 07 85 FF 06 F9 *.*.*.*
```

You can leave the monitor simply by typing X (from Exit) and pressing <RETURN>.

GENERAL TERMS AND TECHNIQUES

PROMPT

The monitor uses a prompt. The prompt is the point on the screen after which you can type all your commands.

MEMORY REPRESENTATION

Memory can be filled with various data. The data may be numbers, texts, programs, characters and sprites. The Final Cartridge III offers you the possibility to see the memory of all those different kinds. To explain what we mean, we will show you the same memory in different representations:

```
.:2000 48 41 4C 4C 4F 20 44 49 HALLO DI Value Representation
.'2000 HALLO DIT IS EEN TEST V/D FC III Text Representation
.]2000 *.*.....*.....*.*..... Sprite Representation
.[2000 *.*..... Character Representation
.,2000 48 PHA Program Representation
```

SCROLLING

In every kind of representation you have the possibility to scroll the memory. By scrolling upwards if the cursor is at the top of the screen, or downwards if the cursor is at the bottom of the screen, you can examine the other memory locations in the same representation. Using this technique it's easy to examine a large part of memory. You only need to ask for a small part of the memory you want to examine, and by using the scrolling technique you can examine the other parts.

CHANGING

With the Final Cartridge III, it is easy to change data in the memory. You only need to type the new data over the existing data, and after you have pressed <RETURN> the new data is accepted. In the following lines the underlined data could be changed:

```
.:2000 48 41 4C 4C 4F 20 44 49 HALLO DI Value Representation
.'2000 HALLO DIT IS EEN TEST V/D FC III Text Representation
.]2000 *.*.....*.....*.*..... Sprite Representation
.[2000 *.*..... Character Representation
.,2000 48 PHA Program Representation
```

BANK SWITCHING

Your Commodore is provided with several ROMs. Using the bank switch command, the letter O, you can turn the ROMs on and off. This is called bank switching because you switch between several banks of memory. In the register display you can see what bank you're in at that moment. For more details you should read the explanation of the O command.

MODES

If you have a disk-drive, you can work with two kinds of memory: the memory of your computer, and the memory of the disk-drive. That's why there are two modes: the computer-mode (mode 1), and the disk-mode (mode 2).

SWITCHING BETWEEN MODES

The monitor automatically switches to mode 1. All commands that work with memory use the memory of the computer.

You can recognize this mode because in the register display the current bank is displayed.

To switch to the memory of the disk, you use the OD command. All commands that work with memory, now use the memory of the disk-drive.

You can recognize the disk-mode because in the register display the letters DS indicate the selected bank.

To return to the computer mode, you can use the O command (or O followed by the number of the bank you want to work in).

KINDS OF COMMAND

To make clear whether a command works with the memory of the computer or with the memory of the disk-drive, we will speak about Computer commands and Disk-drive commands.

To distinguish them you will find a C for Computer command or D for Disk-drive command in the descriptions below. If they can be used with either memory, both letters are given.

FUNCTION KEYS

When using the monitor, the following function keys are active:

F3 Scrolling upwards
F5 Scrolling downwards
F7 Displaying directory

SUMMARY MONITOR INSTRUCTIONS

Here follows a summary of all the commands that are available in the monitor. Each command is described below.

A	Assemble	47
C	Compare Memory	47
D	Disassemble	47
EC	Edit Character	48
ES	Edit sprites	48
F	Fill memory	49
G	Go	49
H	Hunt memory	49
I	Interrogate	50
L	Load	50
M	Memory display	51
O	Bank switching	51
OD	Disk monitor	52
P	Print memory	52
R	Registers display	52
S	Save memory	53
T	Transfer memory	53
X	Exit	54
#	54
\$	54
@	54
*R	Read Block	54
*W	Write Block	55

All the addresses and numbers are given in hexadecimal. If we speak about decimal numbers, we say so.

A Assemble Asembling machine language programs

Syntax: Axxxx mnemo [operand]
xxxx = the start address
mnemo = the machine-language instruction
operand = the operand for the instruction

This command will allow you to write your own machine-language programs.

Example: AC000 LDA #\$00 This will put the command LDA #\$00 in memory location C000

Remarks: If you are writing more than one line, you only have to give this command once. The computer calculates the next memory location for the next instruction, so you only need to type the instruction (followed by the operand).

When you have finished just press <RETURN>. Now the monitor accepts all the other commands again.

Kind: C,D.

C Compare Memory Comparing blocks of memory

Syntax: C xxxx yyyy zzzz
xxxx = the start address of the first block
yyyy = the end address of the first block
zzzz = the start address of the second block

This command will compare one block of memory with another, and inform you of the differences, if any. The numbers being displayed are the memory locations which are not the same. So if you were to compare two blocks of memory that are identical then nothing would be displayed on the screen.

Example: C 1000 1FFF 4000 This will compare the block from 1000 to 1FFF with the block from 4000 to 4FFF.

Remarks: You need not give the ending address of the second block, as the computer will calculate this for you.

Kind: C,D.

D Disassemble Disassembling machine language programs

Syntax: D xxxx yyyy
xxxx = the start address
yyyy = the end address

This command will disassemble a machine language program (or, in other words, will convert it from a hard-to-understand list of numbers into a more readable list of commands).

Example: D 3000 300A This will disassemble a program starting at memory location 3000 and ending at 300A.

Screen: .D 3000 300A
., A9 00 LDA #\$00
., 8D 20 DO STA \$D020
., A9 00 LDA #\$00
., 8D 21 DO STA \$D021
., 00 BRK

Remarks: To start disassembling a long program, you may just type D followed by the start location. This will disassemble one command only, and to continue you use the scrolling technique.

Kind: C,D.

EC Edit Character

Syntax: EC xxxx yyyy
xxxx = the start address
yyyy = the end address

This command will show you the memory as a character. You have the possibility to change the character by typing '*' if you want to set a bit, or '.' to clear a bit.

Example: EC 2000 2008 This will show the memory from 2000 to 2008 as a character.

Screen: .EC 2000 2008
.[2000 ..****..
.[2001 ..**..*..
.[2002 ..**..*..
.[2003 ..**..*..
.[2004 ..**....
.[2005 ..**.....
.[2006 ..****..
.[2007 ..*.....

Kind: C,D.

ES Edit sprites

Syntax: ES xxxx yyyy
xxxx = the start address
yyyy = the end address

This command will show you the memory as a sprite. You have the possibility to change the sprite by typing '*' if you want to set a bit, or '.' to clear a bit.

Example: ES 2000 2008 This will show the memory from 2000 to 2008 as a sprite.

Screen: .ES 2000 2008
.[2000 *****.***.***.
.[2003 *****.***.***.
.[2006 *****.***.***.
.[2009 *****.***.***.
.[200C *****.***.***.
.[200F *****.***.***.
.[2012 *****.***.***.
.[2015 *****.***.***.
.[2018 *****.***.***.

Kind: C,D.

F Fill memory Filling an area of memory

Syntax: F xxxx yyyy zz
xxxx = the start address
yyyy = the end address
zz = the value you want to fill the memory with

This command will quickly fill an area of memory with a number.

Example: F 3000 4000 00 This will fill the memory locations 3000 to 4000 with the value 00.

Remarks: This command is often useful to quickly fill an area of memory you want to use for programming. Now you can easily locate your program.

Kind: C,D.

G Go Running machine language programs

Syntax: G xxxx
xxxx = the start address

This command will begin to execute a machine-language program starting at the memory location given.

Example: G 3000 This will start a program at location 3000.

Kind: C,D.

H Hunt memory Hunting for numbers or strings

Syntax: H xxxx yyyy z1 z2 z3/'<text>'
xxxx = the start address
yyyy = the end address
z1 = the values you're looking for
text = the string you're looking for

This command will search through a block of memory for a number, a group of numbers or a text string. All the memory locations in which the number, numbers or string occur, will be displayed.

Example: H 1000 8000 A9 00 This will search from 1000 to 8000 for the values A9 00
H 2000 F000 'FINAL' This will search from 2000 to F000 for the string 'FINAL'

Remarks: This command allows you to search for a particular part of a program. By entering the values A9 00, it will search for the instruction LDA #\$00.

Kind: C,D.

I Interrogate

Syntax: I xxxx yyyy
xxxx = the start address
yyyy = the end address

This command will show the memory as text. Now you can also change the memory by typing the text you want.

Example: I 2000 203F

Screen: . I 2000 203F
'2000 HALLO THIS IS A TEST OF FC III

Remarks: This command allows you simply to enter text in your own machine language programs.

L Load Loading machine language programs

Syntax: L '<file-name>',[,yyyy]
x = the device number 01 for tape
08 for disk
yyyy = the start address

This command will load a program.

Example: L 'test',01 This will load the program called test from tape

Example: L 'test',08 The same for disk
L 'test',08,2000 The same for disk, but relocated, so now starting at location \$2000.

Remarks: By giving a start address you can relocate a program in memory. This is very useful to connect several small machine language subroutines to each other. Now, you can also examine auto-boot programs by relocating them.

A relocated load is only possible if you are using a disk-drive.

Kind: C.
M Memory display Looking at the memory

Syntax: M xxxx yyyy
 xxxx = the start address
 yyyy = the end address

This command will display the contents of a block of memory, both in hexadecimal format and, where possible, as a character (i.e., a letter, number or graphic symbol). The contents of these locations will then be displayed on the screen. The first number on each line (which is a four-digit number) is the memory address in hexadecimal. The eight two-digit numbers are the contents of that memory location and the seven memory locations following it. At the end of each line is a series of eight characters. The eight two-digit numbers are the ASCII codes of these characters.

Example: M 2000 2010

Screen: .M 2000 201F
 .:2000 48 41 4C 4C 4F 20 44 49 HALLO DI
 .:2008 54 20 49 53 20 45 45 4E T IS EEN
 .:2010 20 54 45 53 54 20 56 2F TEST V/
 .:2018 44 20 46 43 20 49 49 49 D FC III

Remarks: To start looking at a large part of the memory, you may just type M followed by the start location. This will display only the contents of this location, and of the seven memory locations following it. To continue you can scroll.

Now you can also change the contents by changing the values displayed.

Kind: C,D.

O Bank switching

Syntax: Ox (The letter O followed by a value)
 x = is a value from 1 to 7

This command will switch on and off the ROMs of the Commodore. In this way it will be possible to use all of the 64K.

You can also use this command to return from the disk monitor.

The different values will switch the following ROMs.

Va \$0000-\$7FFF \$8000-\$9FFF \$A000-\$BFFF \$C000-\$CFFF \$D000-\$DFFF \$E000-\$FFFF
 1. 0-32767 32768-40959 40960-49151 49152-53247 53248-57343 57344-65535

00 RAM	RAM	RAM	RAM	RAM	RAM
01 RAM	RAM	RAM	RAM	RAM	RAM
02 RAM	RAM	BASIC	RAM	CHAR-ROM	KERNEL
03 RAM	RAM	BASIC	RAM	CHAR-ROM	KERNEL
04 RAM	RAM	RAM	RAM	RAM	RAM
05 RAM	RAM	RAM	RAM	I/O-REG	RAM
06 RAM	RAM	BASIC	RAM	I/O-REG	KERNEL
07 RAM	RAM	BASIC	RAM	I/O-REG	KERNEL

Explanations:

CHAR-ROM Character ROM
 I/O-REG Input/Output-Register and Timer (CIA#1 and CIA#2)
 KERNEL The Operating System (kernel)

OD Disk monitor

Syntax: OD

This command will switch to the disk monitor. Now all the commands that use memory, use the memory of the disk-drive.

Remarks: To return to the memory of the computer, you only have to type O.

P Print memory Printing machine language

Syntax: P

This command will change the output to the printer when you use commands like D 1000 10A0 or EC 2000 2030. To change the output to the screen again, type another P.

Kind: C.

R Registers display Looking at the registers

Syntax: R

This command will give a display of the various registers. The status register is even displayed bit by bit. You also have the possibility to change the values.

Example: R

Screen: .R
 . PC IRQ BK AC XR YR SP NV#BDIZC
 .C000 EA31 07 06 56 EA FC *.*.*.*

Remarks: These registers are:
 PC = Program Counter
 IRQ = Interrupt ReQuest
 BK = The current bank
 AC = Accumulator
 XR = X Register
 YR = Y Register
 SP = Stack Pointer
 N = The Negative Flag of the Status Register
 V = The Overflow Flag of the Status Register
 # = (Not used)
 B = The Break Command Flag of the Status Register
 D = The Decimal Mode Flag of the Status Register
 I = The Interrupt Disable Flag of the Status Register
 Z = The Zero Flag of the Status Register
 C = The Carry Flag of the Status Register

If you're writing your own interrupt routine, you only have to change the address of the current interrupt routine in the register display. In this way, you need not write a little program that changes the interrupt vector.

S Save memory Saving machine language programs

Syntax: S '<file-name>',xx,yyyy,zzzz
 XX = device number 01 for tape
 08 for disk
 yyyy = the start location of the program
 zzzz = the end location of the program + 1

This command will save your machine language program to either tape or disk.

Example: S 'test',01,1000,2000 This will save the memory from 1000 to 1FFF as a program called 'test' on tape.
 S 'test',08,1000,2000 The same for disk.

Remarks: Note that you have to give the end address plus 1.

Kind: C

T Transfer memory Transferring blocks of memory

Syntax: T xxxx yyyy zzzz
 xxxx = the start address of the block
 yyyy = the end address of the block
 zzzz = the start address where it should go to

This command will copy a block of memory from one place to another.

Example: T 2000 3000 9000 This will copy the block from 2000 to 3000 to 9000 - A000

Remarks: The computer calculates the end address.

Please note that you cannot transfer a block of memory within itself.

Kind: C,D

X Exit Leaving the monitor

Syntax: X

This command will leave the monitor

Converting decimal to hexadecimal

Syntax: # <number>
 number = the decimal number you want to convert.

This command will convert the decimal number given, to hexadecimal.

Example: # 53281 This will convert 53281, and will display \$D021

\$ Converting hexadecimal to decimal.

Syntax: \$ xxxx
 xxxx = the hexadecimal number you want to convert.

This command will convert the hexadecimal number given, to decimal.

Example: \$ D021 This will convert D020, and will display 53281 (decimal).

@ Disk commands

Syntax: @[<diskcommand>]

This command will display the ERROR channel, or give a disk command.

Example: @ this will read the ERROR-channel
 @\$ this will show the directory
 @N:name,id this will format a disk

Remarks: This command does the same as the BASIC command DOS''.

***R** Read Block

Syntax: *R xx yy zz
 xx = the track number of the block
 yy = the sector number of the block
 zz = the location in memory where the block has to start (zz is equal to zz00)

This command will read a block from the diskette and place it in the computer's memory. There you can examine and change it.

Example: *R 12 00 CE this will read the first block of the directory and place it in memory starting at location CE00
*R 12 00 this will read the first block of the directory and place it in memory starting at location CFO0 (now it uses the default memory locations)

Remarks: If no memory location is given, it is placed at \$CFO0 (52992 decimal).

Kind: C.

*W Write Block

Syntax: *W xx yy zz
xx = the track number of the block
yy = the sector number of the block
zz = the location in memory to get the block from (zz is equal to zz00)

This command will write a block (back) to the diskette.

Example: *W 12 00 CE this will write the block from CE00 to CEFF to disk as the first block of the directory
*W 12 00 this will write the block from CFO0 to CEFF to disk as the first block of the directory (now it uses the default memory locations)

Remarks: If no memory location is given, the block is supposed to be at \$CFO0

Kind: C.

REMARKS

INTRODUCTION

In this chapter you can find several remarks on the Final Cartridge III. You will see why certain features do not always work so that you will have a fuller understanding of the Final Cartridge's capabilities.

REMARKS ON THE FREEZER

It sometimes takes a while before the freezer menu is displayed.

Never freeze while the disk-drive is running.

As far as we are aware, the freezer will make backup copies of any program. However, with the new protection methods being developed we cannot guarantee this will always be the case.

BACKUP

Always start from a 'clean' machine. Since programs are saved in a compacted form, this will make sure that nothing unnecessary is saved. Use the Reset Zero Fill from the freezer before you load the programs you want to backup.

Frozen programs will always be saved in two parts under the name FC and -FC (this is done to make the backup copies compatible with the Final Cartridge II). You can, of course, rename your program if it was saved on disk but you must rename both parts. It is important to rename the second part with a - before the name and both parts MUST have the same name.

Backup copies you make of the Final Cartridge III don't work.

Tape backup copies must be loaded using the built-in turbo, or a comparable turbo in order to be loaded without the Final Cartridge III.

To make sure that the backup copies also work without the Final Cartridge III, it is recommended that you freeze those programs with the cartridge turned off (by the kill command).

Sometimes it may be necessary to reset the disk-drive before you make a backup.

PRINT

Unfortunately we were not able to intercept all raster interrupts, so that it's possible that some screens aren't printed correctly.

GAMES

If you activated the autofire, and you froze again, you can only leave the freezer by Autofire and not by Exit Run.

REMARKS ON THE DESKTOP

Although the Final Cartridge III uses none of the computer's memory, the desktop does. That's why you're warned before you leave the desktop.

REMARKS ON THE RESET

The reset switch will allow you to recover control of your computer at any time.

If you press the Commodore <C= > key while you reset, you go to desktop.

If you press the <RUN/STOP> key while you reset, you go to BASIC.

By pressing reset, you go to the current mode (BASIC or DESKTOP).

REMARKS ON BASIC

PACKER

A lot of programs are already packed, so if you use it on those programs they only become bigger.

REMARKS ON MICE

Unfortunately we can't do anything about the fact that some mice lock the keyboard (this is a hardware failure of the mouse), so sometimes it's necessary to disconnect the mouse.

We recommend that, if it's possible, you use the mouse in joystick mode. A mouse doesn't work in the freezer.

REMARKS ON THE DISK TURBO

In order to prevent problems with older disk-drives and bad diskettes, we reduced the disk turbo to 15 times normal speed. The time difference is minimum, and it avoids a lot of annoyance.

Many commercial disk-based programs are protected and have special loading routines. It is impossible to over-ride these loading routines, and so the Final Cartridge III will not attempt to do so. This means that the Final Cartridge III will load as much as possible at 15 times normal speed, and then allow the loader to take over loading at normal speed. However, this problem can be overcome by re-saving the program using the freeze facility.

Final Cartridge III Manual Supplement

On these pages you find supplements of the Final Cartridge III's manual. There are also some new commands which were not implemented during the first printing of the manual.

PAGE 19 At the foot of the paragraph OPENING A DIRECTORY WINDOW. This is a supplement.

To read a new directory in an already opened window, select the read gadget in the right bottom corner of a directory window.

PAGE 19 Between the paragraphs SELECTING A PROGRAM and READING THE ERROR-CHANNEL. This is a new paragraph.

SORTING A DIRECTORY

With the Final Cartridge III it is possible to sort a directory. You can do this by following the next steps: open a directory window (1) in which you select the sort gadget. If you now select a program (2) you can by using the up or down gadgets move the program to another place. If it's on the place you like (3), select another program to move until all programs are placed in the way you like. You can even add an empty line in the directory. This is done by selecting the program directly above where you want to insert the line (4,5). After the whole directory is sorted you select again the sort gadget, after which a requester is opened to ask if you're sure to place the new directory on the disk (6). If you are, the directory is written on the disk (7).

PAGE 24 At the foot of the paragraph TESTED PRINTERS. This is new.

You can expand the list of tested printers with the Commodore MCS 801 color printer. You choose Commodore as interface, CBM compatible as type, and select YES at COLORS.

PAGE 24 At the foot of the paragraph !! ABORT PRINTING !! there will be a new paragraph.

SPECIAL PRINTER FUNCTIONS

Normally spoken you can control the printer from the printer window, but by Poking some values in memory location \$DC0C (hexadecimal) several special functions can be used. Of course you have to type these values before you load the program where you want to make a screendump from. If you don't want to use these special functions, you don't have to POKE. The values that perform the special functions are described below.

POKE \$DC0C,\$FF No Centronics check.

Normally spoken the Final Cartridge III always looks for a Centronics printer, but by Poking \$FF into \$DC0C you disable that check.

POKE \$DC0C,\$FE RS-232 Printing.

By Poking the value \$FE into \$DC0C the screendump is sent using the user port to a RS-232 printer.

Final Cartridge III Manual Supplement

Before we discuss the last functions, we have to explain something about EPSON control codes to print screendumps. There are two kinds of control codes to print screendumps. There are control codes like <ESC>"*" CHR\$(x) n1 n2 m1 m2 ..., in which the value of x is different for different graphic modes. But also control codes like <ESC> "X" n1 n2 m1 m2 ..., in which capital X is one of the following capitals: K, L, Y, Z to suggest several graphic modes. With the Final Cartridge III we use the control codes like <ESC> "X" n1 n2 m1 m2 ..., because almost all printers support these control codes (most printers even support both control codes). Unfortunately there are several printers that only support the other control codes, and that's why we made it possible by Poking the values \$30 to \$36 in memory location \$DC0C to use the other control codes. The meaning of these values and other information about EPSON control codes is found in the manual of your printer.

POKE \$DC0C,\$30 Printing in Single Density.
POKE \$DC0C,\$31 Printing in Double Density.
POKE \$DC0C,\$32 Printing in High Speed, Double Density.
POKE \$DC0C,\$33 Printing in Quadruple Density.
POKE \$DC0C,\$34 Printing in CRT graphics.
POKE \$DC0C,\$35 Printing in Plotter graphics.
POKE \$DC0C,\$36 Printing in CRT graphics II.

PAGE 25 At the foot of the paragraph PRINT there will be a new paragraph called RECOVER.

RECOVER

After QUIT, NEW or LOAD your text is lost, but by using this command you can get it back.

PAGE 26 At the foot of the paragraph BOLD there will be a new paragraph called PROPORTIONAL.

PROPORTIONAL

This option makes it possible to choose between proportional or normal characters. To work with columns you should disable proportional.

PAGE 26 At the foot of the paragraph EDIT FUNCTIONS there will be a new paragraph called SPECIAL FUNCTIONS.

SPECIAL FUNCTIONS

It is possible to use a special function in your text. For the time being we implemented the printer function Form Feed. You can enter this function by typing the < > (left arrow) key. This character will also be shown on the screen, but while printing your text a Form Feed is

Final Cartridge III Manual Supplement

given at this place. The text following the left arrow will be printed on a new page.

PAGE 36 Between the BASIC commands MWRITE and OLD. This is a new command.

OFF

Syntax: OFF
 OF

This command makes it possible to disable the extra BASIC commands, without disabling the Final Cartridge III itself. The disk & tape turbos, and the printer-interface still work.

Remarks: You have to choose this command to work with TOOLKIT programs or programs who define their own character set.

PAGE 38 Between the BASIC commands RENUM and TRACE. This is a new command.

REPLACE

Syntax: REPLACE <command1>,<command2> / "text1","text2"
 reP <command1>,<command2> / "text1","text2"

This command makes it possible to replace a text or a BASIC command in whole your program.

Example: REPLACE PRINT#1,PRINT
 This replaces the PRINT#1 statements by normal PRINT statements.
 REPLACE "FC3","Final Cartridge III"
 This replaces the text FC3 by Final Cartridge III.

PAGE 58 At the foot of the paragraph REMARKS ON THE DISK TURBO. This is new.

It seemed that the first version of the Final Cartridge III didn't work well with SPEEDDOS computers. We corrected this in later versions.

FINAL CARTRIDGE III

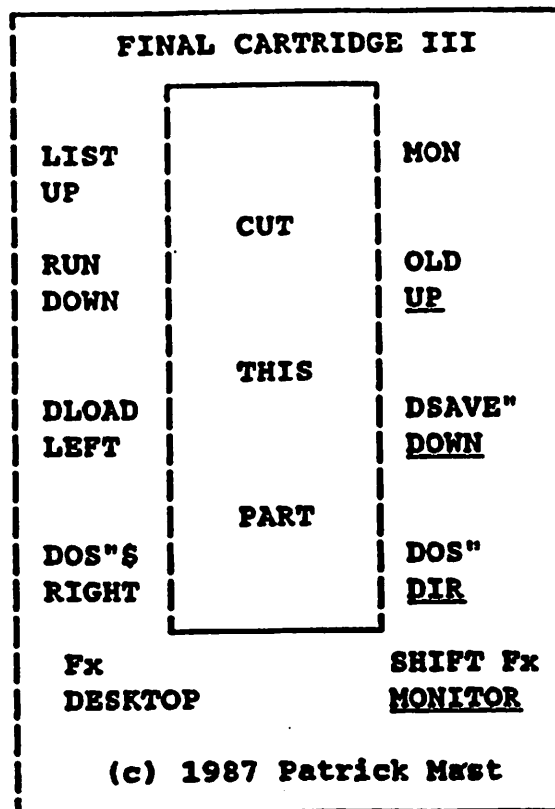
!!! READ THIS FIRST !!!

In this box you will find the Final Cartridge III, the manual and a binder for the manual.

Below you will find a description how you can fix the manual.

- 1 Open the top and bottom of the box.
- 2 Cut the top and bottom slaps off.
- 3 Remove the right side from the box.
- 4 Now you have the cover of the manual (the front, left-side and back of the box).
- 5 In the binder, you stick in the cover, you can fasten the manual.

Below you find a plate that fits over the function keys of your Commodore 64. On the plate are the functions the keys have in the various modes of the Final Cartridge III. You can cut it out and place it over the keys.



On these pages you find supplements of the Final Cartridge III's manual. There are also some new commands which were not implemented during the first printing of the manual.

PAGE 20 At the foot of the paragraph OPENING A DIRECTORY WINDOW. This is a supplement.

To read a new directory in an already opened window, select the read gadget in the right bottom corner of a directory window.

PAGE 21 Between the paragraphs SELECTING A PROGRAM and READING THE ERROR-CHANNEL. This is a new paragraph.

SORTING A DIRECTORY

With the Final Cartridge III it is possible to sort a directory. You can do this by following the next steps: open a directory window (1) in which you select the sort gadget. If you now select a program (2) you can by using the up or down gadgets move the program to another place. If it's on the place you like (3), select another program to move until all programs are placed in the way you like. You can even add an empty line in the directory. This is done by selecting the program directly above where you want to insert the line (4,5). After the whole directory is sorted you select again the sort gadget, after which a requester is opened to ask if you're sure to place the new directory on the disk (6). If you are, the directory is written on the disk (7).

PAGE 26 At the foot of the paragraph **TESTED PRINTERS**. This is new.

You can expand the list of tested printers with the Commodore MCS 801 color printer. You choose Commodore as interface, CBM compatible as type, and select YES at COLORS.

PAGE 28 At the foot of the paragraph **BOLD** there will be a new paragraph called **PROPORTIONAL**.

PROPORTIONAL

This option makes it possible to choose between proportional or normal characters. To work with columns you should disable proportional.

PAGE 29 At the foot of the paragraph **EDIT FUNCTIONS** there will be a new paragraph called **SPECIAL FUNCTIONS**.

SPECIAL FUNCTIONS

It is possible to use a special function in your text. For the time being we implemented the printer function Form Feed. You can enter this function by typing the < > (left arrow) key. This character will also be shown on the screen, but while printing your text a Form Feed is given at this place. The text following the left arrow will be printed on a new page.

PAGE 39 Between the BASIC commands **MWRITE** and **OLD**. This is a new command.

OFF

Syntax: **OFF**
 OF

This command makes it possible to disable the extra BASIC commands, without disabling the Final Cartridge III itself. The disk & tape turbos, and the printer-interface still work.

Remarks: You have to choose this command to work with **TOOLKIT** programs or programs who define their own character set.

PAGE 42 Between the BASIC commands **RENUM** and **TRACE**. This is a new command.

REPLACE

Syntax: **REPLACE <command1>,<command2> / "text1","text2"**
 reP <command1>,<command2> / "text1","text2"

This command makes it possible to replace a text or a BASIC command in whole your program.

Example: **REPLACE PRINT#1,PRINT**
 This replaces the PRINT#1 statements by normal PRINT
 statements.
 REPLACE "FC3","Final Cartridge III"
 This replaces the text FC3 by Final Cartridge III.

PAGE 63 At the foot of the paragraph **REMARKS ON THE DISK TURBO.** This is new.

It seemed that the first version of the Final Cartridge III didn't work well with SPEEDDOS computers. We corrected this in later versions.

Optional Printer Cable

The Final Cartridge III can function well
as a parallel printer interface.

All you need is a parallel printer cable #506-03.

To order your printer cable
send \$19.95 + \$3.00 S&H

(NJ & NY residents add appropriate sales tax)

To: **H&P Sales**
P. O. Box 1204
Maplewood, NJ 07040

Sorry, no COD's