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PSI Font Editor User Guide

by

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**Institute for New Generation Computer Technology**

PSI FONT EDITOR  
USER GUIDE

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## ABSTRACT

The PSI (Personal Sequential Inference) machine, the first major product of Japanese FGCS (Fifth Generation Computer Systems), is intended to provide a comfortable logic program development. As its bitmap display allows it, the PSI machine can use any kind of fonts for the comfort of its users. In addition to the various styles of characters provided by the machine, the user can create his own fonts by using the PSI font editor.

This paper is mainly a tutorial. It has been written for all the users of the PSI machine who wants to learn how to use the font editor quickly and efficiently. In addition to the tutorial, an appendix describes shortly the commands available.

This paper is also intended to be a testimony. It describes the functionalities of the first version of the PSI font editor, which has been designed, implemented and debugged in two months and a half by a non-Japanese, nonprofessional programmer.

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## CHAPTER 1

### INTRODUCTION

#### 1.1 ABOUT FONTS

Any computer terminal uses fonts for displaying characters. A font can be considered as a set of patterns that can be displayed on a screen. The most useful patterns are the usual character patterns: alphabet letters, type-writer characters, such as "@" or "&", and, more recently Kanji.

Usually, the patterns are stored somewhere in read-only memories, and cannot be modified nor augmented by the user. But the situation is different with bitmap displays, where the user has direct access to each point of the terminal screen. In that case, it is perfectly possible for him to define his own characters, if the current ones do not fit his own purposes (too big, too small, without bold or italics, without the right graphics pattern, ...).

The font editor is a program that allows the user to define his own fonts, save them in files, and use them later for text or graphics in any window.

#### 1.2 ABOUT STANDARDS

In a font, each pattern is associated to a code, through which it can be accessed. Of course, the nature of these codes and the way of associating them to patterns in a given font are largely arbitrary, as well as the patterns themselves. To put some order in this potential anarchy, several tentatives of standardization have been attempted. Two emerged from the struggle for conventional English language terminals (namely ASCII and EBCDIC standards), and one for Japanese language terminals. Each standard specifies the set of possible codes and the "meaning" of each code. For example, in English language standards, the set of possible codes is the set of integers from 0 to 255, easily represented by 8 bit words. In ASCII standard, the code (to be supplied) corresponds to the letter "a", but in EBCDIC standard, it is the code (to be supplied) which corresponds to this letter. Of course these standards are aimed to allow easy communications between computers, and control the correspondence between codes and control characters as well as between codes and displayed characters. Of

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course, for usual fonts at least, one is required to assign to the code of the letter "a" a pattern that looks like an "a".

In the case of Japanese language, up to several thousand characters are used. It is why the set of possible codes is much larger than for American standards. It has been chosen to be the set of integers from 0 to 65535, easily represented by 16 bit words.

The font editor of the PSI machine is adapted to the Japanese standards.

### 1.3 THE TWO MODES OF THE FONT EDITOR

Editing a font consists basically in editing a bitmap pattern, assigning a code to it, and storing both in this font. The couple (code,pattern) will be from now on referred as a "character".

So, please remember:

1. a code is an integer from 0 to 65535, easily represented as two 8 bit words, or, in other words, two integers from 0 to 255.
2. a pattern is a list of bitmap points that must be blackened on the screen when drawing it.
3. a character is a couple (code,pattern).

The font editor has two modes: namely the character mode and the pattern mode.

1. In the pattern mode, the user can define any bitmap pattern of any size, using the facilities provided by the editor. Since a bitmap dot is very small, a bitmap pattern cannot be edited as it is. The font editor automatically scales up the pattern, so that each dot becomes a square of several millimeters of width. It is then easy to edit the pattern using the mouse. Once the editing is completed, the pattern is scaled down to its real size, and sent to the character mode.
2. In the character mode, the user can associate a code to a new pattern and then store the newly formed character into the current font, by only using the mouse.

It is time now to use the font editor. There is no better way to learn how to use it than to try to use it.

## CHAPTER 2

### STARTING THE FONT EDITOR

#### 2.1 STARTING A PSI

Before starting a PSI, make sure it is really necessary. It is not necessary if the PSI is already running and if the font editor is already loaded in it. If the font editor is not loaded, you must stop the machine, and restart it, because the font editor has been written and cross compiled on the DEC20, and currently, the system does not support on time loading of cross compiled programs.

When you are sure you must start a PSI, put the power on, and wait for a prompt on the green control screen. The prompt is ">". Then enter "B" for "boot", and <CR>. When the boot operation is terminated, enter "deb" <CR>; the terminal will ask " ... (0/1)".

At that moment, you must find around you 5 floppy discs: namely, "EXEC", "WINDOW", "EDITOR", "SUPER", "font editor". You must then insert in the drive 1 of the PSI any of the first four floppies, and press "1" on the control terminal keyboard. If you have inserted, say, "EXEC", you will be asked for confirmation: "EXEC (Y/N)". Just press "y". When the first floppy has been read, the terminal will ask: "Another volume (Y/N)". Answer "y", and load the 4 other floppies exactly like the first one. The font editor floppy must be loaded the last.

When the last floppy is loaded, please do not answer "y" to the request "Another volume (Y/N)". (If you did, you just have to load the last floppy one more time).

Once you answered "n" to the request "Another volume (Y/N)", the system will ask for the date, that you must enter, and a lot of other things you can perfectly ignore by answering only <CR> to each of them.

At last a login message will appear on the PSI bitmap screen. So please log in.

## STARTING THE FONT EDITOR

### 2.2 INITIALIZING FILES

In the current version of the font editor, fonts are recorded in the directory ">sys>user>font". It means that before using the font editor, you had better make sure that this directory exists, and if not, create one.

The font editor keeps trace of the existing fonts and saves their names in the file ">sys>user>font>fonts.bin". So make sure that, if this file already exists, it has not been created by some other process. If there is none, there is no hurt: the font editor will just suppose that no font has been created yet.

### 2.3 STARTING THE FONT EDITOR

There are currently two ways of starting a font editor.

#### 2.3.1 From A Debugger

From a debugger process, enter:

```
:create(#font_executive,FE), :execute_orders(FE).
```

The program will run inside the debugger process. In that case, a single right click from the mouse will usually (\*) stop the font editor, and give the control back to the debugger. For restarting it, you just have to enter one more time:

```
:execute_orders(FE).
```

#### 2.3.2 As An Independent Process

From a debugger process, it is also possible to start the font editor as an independent process. For doing that, enter:

1. :create(#font\_editor,Instance).
2. :create(#process,Process).
3. :activate(Process,Instance).

In both cases, the start up of the system will take about 30 seconds.

-----

(\*) There are a few exceptions.



## CHAPTER 3

### A FIRST TRIP THROUGH THE FONT EDITOR

#### 3.1 SELECTING WINDOWS

You have now in front of you a screen full of windows: exactly 8. This is the display of the character mode of the font editor. If you are impatient to see the display of the pattern mode, look attentively to the menu that appears on the right of the screen. this menu proposes several things like: "EXIT", "DISC", "FLOPPY", and "EDIT". With the mouse, click left to select this menu, and then click on "EDIT". The pattern mode display will soon appears.

During the transformation, you have seen different new windows appearing and hiding the other ones. In total, the font editor is using 17 different permanent windows.

Among these windows, about one half is shown, and one half is hidden. Among the shown windows, one has a special role: it is the currently selected window.

There is one way to know which is the currently selected window when looking at the screen. Look at the bottom of the screen: there is one line indicating the name of the currently selected window. You may find at times difficult to understand which name refers to which window. Do not worry: a full description of the correspondence is given in Appendix A. Please have a look at it now, and come back here.

The font editor can only understand orders through the currently selected window. You know already how to select a window: simply by putting the mouse into it and clicking left in it. So, when you want to give an instruction to the font editor, you must first make sure that the window through which you want to communicate with the font editor is the currently selected window, or, if not, select it. Only then you can communicate correctly with the font editor.

This is an important point to keep in mind. A click of the mouse in a window may have two different meanings:

1. if the window is the currently selected window, the click will be a message to the font editor.

## A FIRST TRIP THROUGH THE FONT EDITOR

2. if the window is not the currently selected window, the click will be a message to the window manager. If it is a single left click, the window manager will select this window as the new currently selected window. Otherwise, the window manager will simply ignore the message.

Now try to select some windows, and check the correspondence between each window and the name that appears in the bottom of the screen (remember the Appendix A). Select each window at least twice. Try, as an exercise, to avoid sending any message to the font editor when doing it.

### 3.2 CREATING A PATTERN

#### 3.2.1 Basic Drawing Facilities

Select now the largest window of the screen, and then, click left anywhere you want. You will see a black square appear around the position pointed by the mouse. Please move the mouse and draw several black squares.

Now you probably want to draw a real character pattern. First of all, you want to clear the display. Look at the menus at the left of the screen. When you find "CLEAR", please select this menu, select "CLEAR" in it, check it is working as expected, and select back the main window.

Now you can begin to draw a pattern of your choice. You will rapidly find that clicking each point separately is slow and boring. So please select the top left menu, and in it select either "LINE" or "SQUARE". Then select back the main window, click left with the mouse to see what happens.

You probably want now to erase some dots, without clearing all the screen as you did before. This is quite easy to do. Click double left, wait a second or two (it is hard for the system to understand double clicks if you enter a single click just afterwards), and then draw squares as you did before. On white squares, nothing happens; but black squares are erased. You are now using an eraser.

Now, click double left one more time, and try again. This time white squares become black, and black squares white. If you want to come back to the initial state, you just have to click double left one more time.

Instead of double left clicks, you can as well use the top left menu "BLACK", "WHITE", and "INVERSE" commands.

## A FIRST TRIP THROUGH THE FONT EDITOR

### 3.2.2 The "DRAW" Command

Now, please clear one more time the screen, look at the menus on the left, select the one with the "DRAW" command, then click on this command and select back the main window. Now click left. You will see a black square appearing around the position pointed by the mouse. Without clicking anything else, please move the mouse and see what happens. You can draw simply by moving the mouse.

In this mode, you can use the mouse as you would have used a pen and an eraser. You can write with a pen a continuous line, then lift it, move it, and write another continuous line a little farther. You can do the same with the mouse. Clicking right will have the effect of lifting the pen. Try it. For putting back the pen on the paper, you just have to click right one more time. Try it several times.

When your pen is on the paper, you can replace it by an eraser just by clicking middle. Try it. To take your pen back, you just have to click middle one more time. If you find that this eraser is too small, you can select a bigger one by clicking right. Try it.

When you have decided it is time to try something else, you have to quit the draw mode. This is quite easy to do. You just have to click left, or if you find it more convenient, to move the mouse outside the main window. However it does not work when the pen is lifted. So, please put the pen on the paper or take the eraser before quitting.

### 3.2.3 Cutting And Storing Pattern Parts

You may think that one of the patterns you have already drawn has one very good part that you want to save somehow, for reusing it later.

This is quite easy to do. Select the menu in which the command "CUT" appears, click on this command, and select back the main window. You are in the cut mode now. Fix in your mind a rectangular area which contains the part you want to save. Then click left on one of the corners of this rectangle, and left again on the opposite corner of this rectangle. Now look at the horizontal window on the top of the screen. This window contains a lot of small boxes. In the first box on the left, you can see the result of the cutting operation.

All these boxes are pattern registers. Select this top horizontal window, and click left on any empty box. You have saved the whole pattern into that register. Do it two or three times, and now clear the whole pattern, using the "CLEAR" command as you did before.

Select again the top horizontal window, and click left on a box, a full one this time. One of the patterns that you saved before has safely come back.

What happens if you click left on a full box when the main window is not cleared? Try it. The pattern contained in the selected register has come back into the main window, but the previous pattern contained in the main window has not been lost: it has been safely

## <sup>A</sup> FIRST TRIP THROUGH THE FONT EDITOR

stored into the first box on the left. By the way, if you have clicked left on the first box on the left, you have merely exchanged the contains of this box with the contains of the main window.

Moreover, the pattern that was previously stored in the first box on the left has not been lost. To retrieve it, you must first clear the main window, and then click left on the first box on the left. Do it and see what happens. In that case, the first register on the left is not given anything in the exchange. Instead of displaying nothing, it remembers the previous pattern that once has been stored in it, if any. In fact, it is working like a stack. You can store in it as many patterns as you want.

But of course you will probably prefer to see what has been stored. For that, use the other registers.

After a while, they will all be full, and you will need to make some place before going on. There are two ways of doing it:

1. you can overwrite on any register (except the first on the left) by clicking middle on it.
2. or, more radically, you can clear all the registers by clicking double middle on any of them.

Please use these facilities several times until they become familiar to you. And do not forget to select a window before clicking the mouse in it.

### 3.2.4 The Black And The Grey Planes

Since you began to draw patterns, you must have been wondering about some of the commands proposed by the menus on the left side of the screen, like "MOVE BLACK", "MOVE GREY", "SWAP", or "ADD". Please select the menu proposing "MOVE BLACK", click left on "MOVE BLACK", select the main window, and consider you want to move the pattern that is displayed. For moving all the pattern, you just have to indicate the move of one point of your choice. So choose a point, click left on it, choose the destination point of this point, click left on it, and check the result. Please move the pattern several times.

It is time now to use the "SWAP" command. Please do it (with a pattern displayed in the main window, if you want to see something). Looking at the result, you understand now what "BLACK" and "GREY" mean. Use the "SWAP" command several times.

The main window can display two patterns at the same time: a grey pattern and a black pattern. Please "SWAP" so that the display contain only a grey pattern, and draw a new pattern. Draw it on white squares as well as on grey squares, and look at the result. Now "SWAP" again two or three times, use "MOVE", "MOVE BLACK", and "MOVE GREY", and check if everything is working as expected. Do it several times: these

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commands are important, and must become familiar to you.

You can now easily guess what the "ADD" command is doing: it is adding the grey pattern to the black one. Try it.

A common way of using these facilities is the following. Given a pattern, you want to modify the relative position of the two parts of this pattern. Using the "CUT" command, you save separately these two parts. Then you clear everything, load from the register one of the part, use the "SWAP" command, and load the other part. Now one part is the grey pattern and the other is the black pattern. You can move them independently, and "ADD" the grey pattern to the black one once their relative position is the desired one. Please try it several times.

### 3.2.5 The Box

You have probably noticed the two adjacent rectangles which lie in the middle of the main window. In fact, they must be thought of as a rectangle, cut somewhere in the middle by a horizontal line. This rectangle, together with the horizontal line, forms what is called the box of the main window. The horizontal line itself is called the base line.

Until now, the box have seemed to be rather useless. Indeed, it does not interfere with any pattern drawing process. Its role is to make you remember that the pattern you are drawing will be a character pattern in a font.

When using a font for writing a line of characters, you are usually concerned with the alignment of the characters, as well as their relative sizes. You may decide, for example, that all the characters of the font must be less than 15 squares wide and less than 20 squares high. But it is quite cumbersome to be obliged to count on the screen the width and the height of each pattern you draw. A much easier way to do it is to use the box.

The base line correspond to the line on which the character patterns will be aligned when the font is used. Usually, the patterns are written just above this line; but some common characters, like the "g", the "j" or the "p", may require a pattern that goes under the base line. It is why the base line is also important.

Once you decided the shape you want to give to the box, select the main window, and click middle near any line of the box, and see what happens. Try both sides of all the five lines of the box. It is also possible to move the box, by clicking double middle near the exterior border of the box. Try it too.

After some manipulations, you will like to know the size of the box, without being obliged to count it on the screen. So please enter the command "REAL SIZE" and look at the window in the bottom left of the screen, the one next to the last one. It displays the values of three parameters. Their meanings are:

## A FIRST TRIP THROUGH THE FONT EDITOR

1. width : the width of the box, in number of squares
2. height : the height of the box
3. bias : the distance separating the base line in the middle of the box from the bottom line of the box

Be careful that the values of the parameters are not transmitted to the display each time you modify the shape of the box. To be sure the displayed parameters do correspond to the present shape of the box, please enter the command "REAL SIZE".

Now remember the following important point: what will be given to a font to form a new character is not the pattern that appears in the main window, but only the part that lies inside the box. Please draw a pattern now, that goes half inside and half outside the box, enter the command "REAL SIZE", and look at the bottom left window. You can see there the pattern that will be really sent to the font as a character pattern.

It is time now to learn how to create a character from a pattern, and how to save it in a font.

### 3.3 SAVING A CHARACTER INTO A FONT.

#### 3.3.1 Saving A Pattern

Please put a grey pattern and a black pattern into the main window, be careful they do lie inside the box, and enter the "CHAR MODE" command.

Once the character mode display is completely shown, look at the two bottom right windows. The upper one displays the grey pattern, while the lower one displays the black pattern.

Now select one of these two windows, and click left in it. Doing that, you have selected the pattern inside this window. Then select the main window, (this time the main window of the character mode display), and click somewhere inside it, but not in the top left corner. A window will appear, asking for a font name: enter one name using the keyboard, and type <CR>. You have created your first font.

Now the display has been modified, and the pattern you selected has been drawn somewhere in the main window. Please do the same with the other pattern: select its window, then select it by clicking left in its window, select the main window, and click somewhere in it (not yet in the top left corner). This time you will not be asked anything, and the main window will promptly display the second pattern.

Now select a pattern in the main window by clicking left on it. A rectangle will appear around it. And then select an empty position. Look at what happened. The pattern has been copied. If you want to destroy the pattern at the original position, you just have to select an

## A FIRST TRIP THROUGH THE FONT EDITOR

empty position and then select the position of the pattern you want to destroy.

And if you think now that one of the patterns you have drawn is not exactly the one you wanted, you can bring it back to the pattern mode and modify it very easily. For doing so, what you have to do is to select the pattern to be modified in the main window, then select the bottom right window of the screen and click left in it. The pattern to be modified is then copied in the bottom right window. If you now enter the "EDIT" command, you will be back in pattern mode, and the pattern you want to modify will be displayed there as the black pattern.

### 3.3.2 Choosing A Code

As you probably noticed already, in the main window, patterns are displayed in rows and columns. At each row corresponds a number, written in hexadecimal, displayed in the vertical window at the left of the screen; at each column corresponds another number, written also in hexadecimal, displayed in the horizontal window at the top of the screen. In fact, when you selected before a position for loading a pattern into the main window, you selected at the same time a row number and a column number. From these numbers, the font editor computed the code to be associated to the pattern, to form a new character. The rule for computing the code is very simple: you take the row number, you multiply it by 256, and you add the column number to the result.

$$\text{Code} = (\text{row number}) * 256 + \text{column number}.$$

Remember that this font editor is adapted to the Japanese standards, in which codes are 16 bit words, or, if you prefer, integers between 0 and 65535.

As you have already guessed, there are exactly 256 rows and 256 columns to be displayed. But it is not possible to display all of them in the screen. If you want to access to a row or a column which is not displayed, you have to enter one of the scrolling commands: "<", ">", "^", "v". Try all of them, and see what happens.

### 3.4 SAVING FONTS

Now that your font is finished, or that you want to stop for today, you want to save your new font on a file. It is quite easy. Enter the command "DISC". A menu will appear, and you just have to select "save into file". The name of the current font will then appear, and you will be asked for confirmation. That is all.

## A FIRST TRIP THROUGH THE FONT EDITOR

### 3.5 LOADING FONTS

For loading a font, at first you must make sure that you know the name of the font you want to load. For checking names, please call a font manipulator, using the system menu. Clicking double right will always make the system menu prompt out. Then list the directory: `>user>sys>font.`

Looking in this directory, it is easy to get the names of the fonts already recorded. The font editor create two files for each font. For example, if you saved a font called: "font\_test", these two files are :

1. "font\_testhd.bin" , where "hd" stands for "head"
2. "font\_testpat.bin", where "pat" stands for "pattern".

Once you know the name of the font you want to load, enter the "DISC" command, select "load from file", enter the name of the font, and look at the result.

Once a font has been loaded, it can be edited, by adding new characters or modifying old ones, as indicated before.

The only thing you need to learn now is how to use the fonts you have created in a window.

### 3.6 USING FONTS

Once a font has been saved into a file, you can use it to write characters in any window. For doing so, you have to:

1. Find the name of the font you want to use.
2. From a debugger or from a program, enter the following:  
:`create(#general_font,Font,Font_name), :set_font(Window,Font).`

From now on, when you draw characters in the window Window, the characters drawn will be the characters of the font Font. Different methods to draw characters in a window are listed here:

```
:write(Window, Character_code)
:draw_string(Window,X,Y,double_bytes:{Code_1,Code_2,
...,Code_n})
:write_line(Window,double_bytes:{Code_1,Code_2, ...,Code_n})
:write_lines(Window,double_bytes:{Code_1,Code_2, ...,Code_n})
```

The failure of any of these methods means that one of the codes put as arguments is not associated with any pattern in the font currently used. For more details about these methods, please refer to



## A FIRST TRIP THROUGH THE FONT EDITOR

the window system user guide.

## APPENDIX A

### WINDOW NAMES

Here is a list of the names of the different windows of the font editor two mode display.

#### CHARACTER MODE DISPLAY

top left menu: "^" and "v"	font_multiple_select_multi_column
top right menu: "<" and ">"	font_multiple_select_multi_column
horizontal window on top	horizontal_code_display_window
vertical window on the left	vertical_code_display_window
main menu on the right	font_multiple_select_menu
upper pattern display window	pattern_display_window
lower pattern display window	pattern_display_window/2
main window in the middle	font_display_window

#### PATTERN MODE DISPLAY

top left menu (brush menu)	font_multiple_select_multi_column
"CHAR MODE", "HELP" menu	font_multiple_select_multi_column
"CLEAR", ..., menu	font_multiple_select_menu/2
"CLEAR BLACK", ..., menu	font_multiple_select_menu/3
"CLEAR GREY", ..., menu	font_multiple_select_multi_column
parameters display window	font_multiple_select_multi_column
bottom left pattern window	display_sample_window
window with registers on top	pattern_registers_window
main window in the middle	edit_pattern_window

APPENDIX B  
FONT EDITOR COMMANDS

B.1 RIGHT CLICKS

Unless specified otherwise, right mouse clicks have the following effects:

1. single right click: stops the font editor. If called from a debugger, enter: :execute orders(FE) to restart it. Nothing will be lost.
2. double right click: displays the system menu.

B.2 CHAR MODE

B.2.1 Top Left Menu: "^" And "v"

1. The command "^" scrolls one page of font display, bringing the top to the bottom.
2. The command "v" scrolls one page of font display, bringing the bottom to the top.

B.2.2 Top Right Menu: "<" And ">"

1. The command "<" scrolls one page of font display, bringing the left to the right.
2. The command ">" scrolls one page of font display, bringing the right to the left.

## FONT EDITOR COMMANDS

### B.2.3 Main Menu On The Right

1. The "EXIT" command stops the font editor, saves the currently edited font, and kills all the windows used for the display.
2. The "CREATE" command creates a new font. This font becomes the currently edited font.
3. The "DISC" command proposes two options: to save the currently edited font into a disc file, or to load a previously edited font from a disc file.
4. The "FLOPPY" command is not yet implemented.
5. The "EDIT" command makes the program enter the pattern mode.

### B.2.4 Upper Pattern Display Window

Clicking left in this window has one of the following effects:

1. If a character has been selected before in the font display window, the pattern of this character is loaded in this window.
2. otherwise, an internal flag is examined: if it is already set, it is reset to 0; if not, it is set.

### B.2.5 Lower Pattern Display Window

(see upper pattern display window)

### B.2.6 Main Window In The Middle

Clicking left in this window has the following effects:

1. If the internal flag of the lower pattern display window (which corresponds to the black pattern in the pattern mode) is set, the pattern contained in this window is loaded in the current font, associated with the code pointed by the mouse.
2. otherwise, if the internal flag of the upper pattern display window (which corresponds to the grey pattern in the pattern mode) is set, the pattern contained in this window will be loaded in the current font, associated with the code pointed by the mouse.

## FONT EDITOR COMMANDS

3. otherwise, if another code is currently selected, the pattern associated to that code is copied and associated to the code currently pointed by the mouse. Both codes are then deselected.
4. otherwise, if the code pointed by the mouse is not currently selected, it is selected; if it is the currently selected code, it loses its selected status.

### B.3 PATTERN MODE

#### B.3.1 Top Left Menu (brush Menu)

The commands of this menu modifies the effect of a single left click in the main window.

1. In "dot" mode, only one dot is drawn.
2. In "line" mode, the dot pointed by the mouse, as well as the one on the left and the one on the right, is drawn.
3. In "square" mode, the dot pointed by the mouse, as well as the eight adjacent dots, is drawn.
4. In "black" mode, all the dots to be drawn are blackened.
5. In "white" mode, all the dots to be drawn are whitened.
6. In "inverse" mode, all the dots to be drawn are inverted, from black to white or from white to black.

#### B.3.2 "CHAR MODE", "HELP" Menu

1. The command "CHAR MODE" has the editor come back to the character mode.
2. The command "HELP" is not implemented yet.

#### B.3.3 "CLEAR", ..., Menu

1. The command "CLEAR" clears both the grey and the black patterns of the main window.

## FONT EDITOR COMMANDS

2. The command "MOVE" moves both the grey and the black patterns of the main window. To input the translation vector, you must click left in the main window twice: once on the origin point and another time on the destination point. To abort, click middle instead of clicking left.
3. The command "SET SAMPLE" allows you to write up to 10 characters of the current font in the bottom left window. The input must be in the following format: Code\_0, Code\_1, ..., Code\_n.
4. The command "REAL SIZE" displays the part of the black pattern which lies inside the box of the main window, and resets the parameters, displayed on the bottom left part of the screen, to the values computed from the present shape of the box.
5. The command "SCALE" allows you to change the size of the squares in the main window. The default value is set to 20. The possible values are integers from 5 to 25.

### B.3.4 "CLEAR BLACK", ..., Menu

1. The "CLEAR BLACK" command clears the black pattern of the main window.
2. The "MOVE BLACK" command moves the black pattern of the main window. It must be used the same way as the "MOVE" command is.
3. The "ROTATE" command is not implemented yet.
4. The "REFLECT" command is not implemented yet.
5. The "CUT" command cuts the part of the black pattern of the main window which lies inside a rectangle to be specified, and stores the result in the first register at the left of the registers window, on top of the screen. To specify the rectangle, click left on two opposite corners of the rectangle in the main window. To abort, click middle.
6. The "DRAW LINE" method is not implemented yet.
7. The "DRAW" method allows the drawing of a pattern simply by moving the mouse in the main window. For starting it, click left. For suspending the black writing, click right. For stopping the suspension, click right again. For quitting the draw mode, stop the suspension if suspended and click left. For erasing, stop the suspension if suspended, and click middle. For writing again, click middle again. For erasing faster, click right when erasing.

## FONT EDITOR COMMANDS

### B.3.5 "CLEAR GREY", ..., Menu

1. The "CLEAR GREY" command clears the grey pattern of the main window.
2. The "MOVE GREY" command moves the grey pattern of the main window. It must be used the same way as the "MOVE" command.
3. The "ADD" command adds the grey pattern to the black pattern in the main window.
4. The "SWAP" command exchanges the black pattern with the grey pattern in the main window.

### B.3.6 Window With Registers

1. Clicking double middle anywhere in this window clears all the registers.
2. Clicking middle on one of the registers, except the protected register (the one at the left), loads the black pattern of the main window into the register, erasing the previous contents.
3. clicking left on a full register loads the contents of this register into the main window, where it is display as the black pattern. The previous black pattern, if any, is saved into the protected register. (The protected register is not really a register but a stack).
4. clicking left on an empty register, except the protected one, loads the black pattern of the main window into this register.

### B.3.7 Main Window In The Middle

1. Clicking left in this window draws a dot or several dots according to the current drawing mode.
2. Clicking middle near any line of the box moves this line of one square in the direction indicated by the mouse position.
3. Clicking double middle near the exterior of the box moves the box of one square in the direction indicated by the mouse.

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1		P I	SI	PSI										CREATE
2		PSI	P I	SI										DISC
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CHAR MODE HELP																			
CLEAR MOVE SET SAMPLE REAL SIZE SCALE																			
CLEAR BLACK MOVE BLACK ROTATE REFLECT CUT DRAW LINE DRAW																			
CLEAR GREY MOVE GREY ADD SWAP																			
Width 13 Height 19 Bias 3																			

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