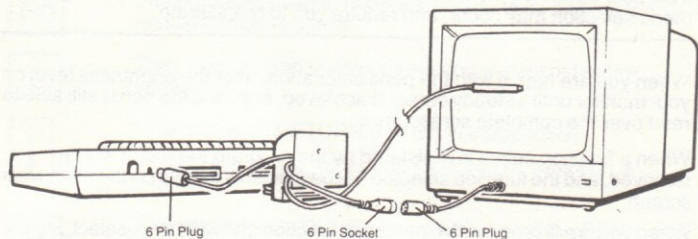# Light Pen
"PROFESSIONAL" / MARK II

USER MANUAL

Amstrad/Schneider
CPC464/664/6128

ELECTRIC STUDIO PRODUCTS

SETTING UP ("Professional" pen only — the Mark II pen simply plugs into the expansion port)

With the computer turned off, plug the interface unit into the EXPANSION port and connect the DIN leads as shown below.

6 Pin Plug   6 Pin Socket   6 Pin Plug

GRAPHIC SOFTWARE

Supplied free with this device is a graphic design package, this being one example of the many applications possible.

To use the package insert the disc into the disc drive, ensuring that the correct side will be read. Side A is for 6128 owners, side B is for 664/464 disc owners.

Type RUN"LOADER" and press [ENTER/RETURN]*

* The main key for entering information into the computer has a different name on some models in the range. On the 6128 this key, (NUMBERED 18 IN THE REFERENCE GUIDES), is labelled RETURN, while on the 664/464 it is labelled ENTER.

The program will then require you to select which mode package you wish to work with, and then load the selected software.

When loading is complete you will be asked to calibrate the light pen/cursor to your specific display equipment.

Pressing the CURSOR keys [←] & [→] will alter the position of the dot in relation to the pens nib.

The dot cursor should be calibrated to a position directly under the nib of the light pen. Try moving the pen to a different part of the screen to ensure the dot remains under the nib.

NOTE: MARK II ONLY

As the Mk II Light Pen is a character accurate device, the calibration of the dot cursor should be carried out very carefully. It should be noted that if the pen nib is between 2 character positions the dot will "flick" between them.

If the user calibrates the dot too far to the left or right of the nib, difficulties on menu selection may occur, and require you to re-calibrate.

When you are happy with the pens calibration, alter the brightness level on your monitor until a steady cursor is achieved, ensuring the pen is still able to read over the complete screen area.

When a function select is registered by the program the menu will be removed, and the function selected will be available for use on the main work screen.

When you are finished with a particular function and wish to re-select, simply press the "MENU CALL" key.

USING THE LIGHT PEN GRAPHICS SOFTWARE

Once you have completed the calibration section of the program the screen will clear and you will see the icon menu displayed on the right hand side of the screen.

Each symbol represents a function or sub-choice, so to select the function you require, place the pen to the screen and position the cursor to a central position over the appropriate symbol. Pressing the trigger will then select that function.

464/664 OWNERS

Due to the memory limitations of these models in comparison with the 6128, some specific functions have been provided in a separate program, these notably being SPRITE/SYMBOL DEFINE & ZOOM EDIT.

This separate program contains both the above functions and is intended for use either prior to starting work in the case of SPRITE/SYMBOL DEFINE, or after screen design work in the case of ZOOM EDIT.

The program therefore provides facilities for loading and saving screen files for use with the main package.

NUMERIC KEYPAD/FUNCTION KEYS

F1 – F9 Keys [f1] to [f9] on the numeric keypad are used to change the brush/nozzle size, while using BRUSH, SPRAY GUN, 4 WAY DRAW, & MIRROR DRAW.

These keys are also used to vary the form of the 4 BASIC TEXTURES, whilst in the texture mode.

F0 The [f0] key is used to restore a texture to its original form, should this be required.

. The [.] key is used to select a second subset of texture variations.

RETURN * See notes on RETURN/ENTER in Introduction.

Used to call up the menu when function re-selection is required.

R This key turns the RULER on/off while using the PEN function.

When the RULER is activated, all lines will be drawn in the axis selected by pressing the appropriate cursor control arrow key on the numeric function pad.

For example, after the RULER ON message is displayed press one of the 4 arrow keys. If the left or right arrow key is pressed the current y position will be set, and cursor movement will be restricted to the x axis. By holding down the spacebar you can then draw a straight freehand line.

To change axis, simply press the appropriate cursor control arrow keys. (← or →) to lock the y axis, and (↑ or ↓) to lock the x axis.

The [CLR] key can be used to change the line colour, without having to return to the menu.

Pressing the [R] key again will turn off the RULER and return you to the freehand draw mode.

COPY (6128) only. Used to COPY the screen to memory prior to further alteration. For example you may have a good picture on the screen and wish to experimentally add things to it.

Pressing this key will store everything currently on the screen and so safely keep your basic picture intact, when using the DEL key. It should be noted that the screen is automatically stored to memory when the menu is called up.

DEL (6128) only. Used to delete the last action on of a drawing, by restoring the screen to its prior condition.

CLR

Used to change the current ink colour without having to call up the menu colour palette. As the key is pressed the border will flash to the new colour and then black.

F

Used to solid fill any area of the screen, starting from the current x,y position to a boundary.

The fill can be stopped at any time by tapping the trigger, thus allowing partial fills. You can also re-fill an area by selecting the new colour and re-triggering.

This function has an inbuilt safety mechanism to prevent picture destruction, when the user attempts to fill a non enclosed area. If the routine does not see a boundary on either side of its start position, the fill will abort. Should the fill encounter a broken boundary, and the paint spills to the screen edge, the function will stop with control returning to the user.

U

Used to unfill a solid area. This function can also be used to intelligently erase colours from the screen. To achieve this, position the cursor over the colour you require unfilled and press the key. You may stop the unfill action by tapping the trigger. It should be noted that the unfill works by filling with the paper colour.

T

Used to fill a screen area with a 2 colour texture. As in the paint fill function the routine requires an enclosed area and start to texture fill from the current x,y position.

The 2 colours used to create the textured fill will be those specified by the user with the TEXTURE DEFINE FUNCTION. Should the user not have defined a specific 2 colours, the fill will be executed using default settings.

It should be noted that the PAINT UNFILL will not work on a textured area.

ENTER

* See notes on ENTER/RETURN keys in Introduction.

Used as a switch for the LINE MASK function. If the mask is on then pressing this key will turn it off and vice versa.

W

Used to set the PAPER colour to white. This function is useful if inadvertently selecting BLACK as the paper colour from the menu before screen drawing is complete, and consequently experiencing a pen read failure.

CONTROL

This key is used to turn off the pen and switch control to the arrow cursor control keys. It should be noted that in some functions keyboard control is not available.

In these non-keyboard functions pressing the [CONTROL] key will have no effect.

BRUSH

This function behaves in the same manner as a real paint brush, in that the paint is applied in an up and down manner.

At any time while the brush is triggered on, you may change the paint colour with the [CLR] key.

The numeric keypad is used to change the width of the brush, and allows the user to vary the strip of paint being applied.

BOX

After selection from the menu, use the Light Pen to choose either [3] or [N].

If [N]ormal is selected, mark the top left, and bottom right hand corners of the box you require. Following this procedure will then draw a box around the two points, in the current ink colour.

If [3]D was selected, follow the procedure above to draw the first box. Repeat the procedure for the second box. On completion of the second box, the program will connect the two boxes to create the 3D effect.

The direction and realism of the 3D effect, will depend on the order, and positions, or the users set-points. Used creatively, this function can provide many box-type geometric shapes.

SOLID BOX

Use the same way as the NORMAL BOX function.

On completion of the box being drawn, it will then fill with the current ink colour.

TRIANGLE

As in the box function, you are asked to select, [N]ormal or [3]D. If [N] is chosen this will draw a triangle around three user set points.

If [3] was chosen, select an additional point for your second triangle. The program will then connect the relevant point of each triangle, to create a 3D effect. Again depending on the order and positions of the users set points, many different effects can be achieved.

REF. BACKGROUND

The dotted background is used to provide points of reference, for 3D plotting etc.

To remove the points in a non-destructive manner, re-select the function.

The only damage that may occur on removal of the background, is in the colours that have been used to draw, and which correspond to the colour of the dots themselves. We would advise therefore, that the reference background is off screen when not needed, and only called up to check or locate points while actually working on the screen.

COPY

Mark top left hand, and then bottom right hand corners of an imaginary box, around the area of the screen you wish to "COPY". As you set the bottom right hand corner, the defined area of screen will be stored. Moving the cursor to the desired position and pressing the trigger will then print an exact copy of the area of screen, previously defined. Subsequent trigger presses will print the same image at the current cursor position. There is a maximum limit to the size of the area that can be stored for memory purposes. It should also be noted that the defining of the area to be copied, must be carried out as above; that is, left hand top, and then bottom right hand.

DRAG

Define the screen area you wish to drag in the same manner as the "COPY" function above. On the second trigger press the defined area of the screen will follow the cursor as it is moved around the screen. Pressing the trigger the third time will fix the image at its current position on the screen. Again due to memory limitations, there is a maximum size limit to the area of screen that can be dragged.

ZOOM

(6128) only. Used to zoom an area of screen for inspection/ editing. After selection from the menu, position the cursor to an approximate central position on the image you wish to magnify and press the trigger. While in the zoom function the trigger will set blocks, the [DEL] key will unset/erase blocks.

To return to the main work screen, press the "MENU CALL" key.

464/664 OWNERS

Due to the requirements of this function to store the main work screen, this function is not available within the main package, but supplied as a separate program.

POSITION CURSOR

P

Used to re-enter the cursor calibrate routine with the [←] and [→] keys being used to alter the dots position relative to the pens nib. Please note that no text will be printed as in the initial calibrate part of the program.

To leave this function, call up the main menu.

H

This function is a means of escape from the main menu should the user require it. When selected the menu is removed with only the TEXTURE FILL, FILL, UNFILL, and other keyboard operations active.

COLOUR MASK

Will change any "on screen" colour to another. To use this function, first select the new colour from the colour palette on the menu, then select the COLOUR MASK function. Move the cursor so that it is positioned over the colour on screen that you wish to "colour change", pressing the trigger will then change the colour currently under the cursor, to the required new colour.

You may also use the [CLR] key to change colours whilst actually in the function.

Please note that this function is not used in the mode 2 module.

4 WAY DRAW

Use in the same way as BRUSH, PEN, etc. but providing 3 extra drawings relative to the light pens position. This function is very useful for drawing frames around the screen edges.

FLECK COLOUR PRINT

FC

This function is used in the same manner as the FILE DISPLAY Option. Using keys 1 and 2 you may move the fleck patterns through the display window.

An almost infinite number of textures is available using the FLECK COLOUR PRINT file. Best results will be achieved by holding down the trigger while moving the cursor.

Providing that you do not scroll the file, a consistent texture will be printed under the cursor.

Try scrolling the file a little to the left, and repeat the above procedure to print it to the screen.

The print routine used by FLECK COLOUR PRINT & FILE DISPLAY copies the area of the file by the indicator arrow, directly to the screen. Therefore any movement of the files on display will alter the texture actually printed.

To leave this function press the "MENU CALL" key.

TEXTURE 1

Behaves as the BRUSH function but prints a texture to the screen. There are 4 basic texture types available to the user from the main menu. After selection, pressing the trigger turns the function on/off. While the function is on, the numeric key-pad is used to vary the texture being printed.

Pressing keys 1 to 9 on the key-pad will alter the texture type.

The zero key will restore the texture to its original basic shape and form.

TEXTURE 4

A basic texture type. See TEXTURE 1 for details on functions operation.

SPRAY GUN

Provides a spray can effect and used in the same manner as the BRUSH function. The numeric keypad is used to select nozzle size, with the CLR key used to change colour without returning to the menu.

CIRCLE

First mark the centre of the circle at the desired screen location with the trigger, then move the cursor to the required radius point. Pressing the trigger will then plot the circle.

SOLID CIRCLE

As above, but filled with the current ink colour.

LINE

After selection you are required to select [N] or [P] by placing the selection cursor over the letter, and pressing the spacebar.

If [N] is chosen then the function is that of an elastic line from point 1 to point 2.

If [P] is chosen then the function is that of a "pinned" elastic line, with an elastic line being drawn from the last set point to the current pen position, with each trigger press.

GRID BACKGROUND

Provides a grid reference background.

See REF. BACKGROUND for non-destructive removal.

PEN

This function provides a 1 pixel nib for freehand drawing. Holding down the spacebar puts the pen to the paper, releasing the spacebar allows movement around the screen with the pen off the paper.

The colour of the ink can be changed using the [CLR] key whenever the spacebar is not being pressed.

The RULER function can also be switched on/off while using the PEN function. (Details of the RULER function can be found in the KEYBOARD USAGE section of this manual.)

SCREENS

NOTE: 6128 only — not available on 464/664. After selection from the menu, "SCREENS" will be displayed in the message window and then removed.

You may then press keys [3], [4] or [5] on the main keyboard, to store the current screen contents to storage areas 3, 4 and 5 respectively.

You are then free to clear the screen knowing you have a copy resident in memory.

All drawing and design work take place on screen 1, with screen 2 being used for delete last function, this leaves 3 blocks which you may use within the program.

This function can be used in conjunction with SPRITE/ICON define to define a specific set of symbols for your own design requirements.

Pressing the "MENU CALL" key will exit the function and call the menu.

WINDOW SCROLL

After selection, define the window in the same manner as COPY, DRAG, etc, that is top left then bottom right x,y points. When the 2 points have been set the window will scroll in the direction indicated by the placing of the light pen to the screen.

Placing the pen near the left hand side of the screen will scroll the window to the left.

Placing the pen near the top of the screen will scroll up, placing at the bottom will scroll down.

The left and right hand scrolls are fairly quick regardless of the window size, however, a large window will be much slower when scrolling up or down.

WORDS

W

After selection, place the cursor at the point on the screen you wish the text to begin, and then trigger.

The program will treat the keyboard as a typewriter.

All text will be in one colour, but you may change it to any other using the COLOUR MASK function. To leave this function, press the "MENU CALL" key.

MENU FLIP

M

This function is used to flip the menu display to the other side of the screen and vice versa, to accommodate both left and right handed users of the package.

VERTICAL MIRROR DRAW

Behaves as the PEN function, but with a second pen plotting a mirror image, above/below the cursor pen position.

DEFINE SPRITE/SYMBOL

(6128 only). After selection from the main menu the screen display will be replaced with a character cell design grid, for you to define your symbol/sprite.

Operation of the function is same as the ZOOM function, with the trigger setting blocks, and the [DEL] key erasing blocks.

When you have finished work on the symbol/sprite, pressing the menu call key will restore the main work screen. The symbol you have just created will be as a sprite, positioned at the current x,y.

By moving the pen over the screen you can position the sprite and "fix" its position with a trigger press. By repeating this whole process you can define your own specific symbol set, prior to actual design work, care should be taken when actually "fixing" the sprite on the main screen, so as to not erase any previous work.

464/664 OWNERS

Due to the requirements of this function to store the main work screen, this function is not available within the main package, but supplied as a separate program.

FILE DISPLAY

FD

On selection, the resident symbol file will be displayed in the message window area.

Using keys [←] and [→] you may scroll the symbols through the window. The desired symbol should be placed next to the arrow indicator.

Any symbol shape at this position in the window will then be printed at the current cursor location, with each trigger press.

To leave this function, press the "MENU CALL" key.

TEXTURE 2

Type of texture. See TEXTURE 1 for notes on use of this function.

BACKGROUND AND COLOUR

BC

This function provides the user with information relating to the current paper and ink colour in use. On selection the two numbers are flashed into the message window and specify PAPER COLOUR — INK COLOUR.

TEXTURE/PSEUDO COLOUR DEFINE

This function allows you to "mix" 2 of the colours from the menu palette to create a coloured texture, or pseudo colour.

After selection from the menu a mixing palette will be displayed in the centre of the screen, and comprises 3 small square boxes.

Move the selection cursor on the main menu and select by trigger press, colour 1. This colour will then fill the first small box in the mixing palette to that colour. Repeat the process to select your colour 2.

Once 2 colours have been selected, the third box in the mixing palette will display the resulting texture/colour. If you are happy with the result press the "MENU CALL" key to escape the function.

The [DEL] key can be used to wipe the mixing palette and allow re-selection of colour combinations.

Once defined this 2 colour texture is available as a fill routine by pressing [T] on the main keyboard. The same 2 colours will also be used when the [MASK] switch is used with the PAINT BRUSH, SPRAY CAN, etc.

Please note that this function is not used in the mode 2 module.

ELLIPSE

After selection a trigger press will draw an ellipse using the current cursor position as it's centre. The critical dimensions of the ellipse may then be altered in the same manner as the WINDOW SCROLL function, (placing the light pen near one of the 4 screen edges).

A second trigger press will then fix the ellipse in its current form. It should be noted that due to the time taken to plot the ellipse, the trigger [spacebar] response may feel a little sluggish and not respond as usual.

It is advisable therefore to hold down the trigger until the audible beep is heard which indicates that the trigger press has been registered.

SOLID ELLIPSE

RAYS

After selection the message window will display [N] or [F] — to select, use the light pen to position the cursor over the required option and press the spacebar.

If [N] is chosen the function is that of lines drawn from a set x,y position. After setting the first point, each trigger press will draw a line from that point, to the current light pen position. To reset this initial x,y point you must return to the menu and reselect the function.

If [F] is chosen the function provides a "fan" effect. A trigger press will fix the centre point to the current x,y position and start to draw rays from that point, to the current cursor position. Some very nice effects can be achieved by using the [CLR] key to change colour while using this function.

DOT

Each trigger press will set a point in the current ink colour, at the cursor position.

ERASER

Behaves in a similar manner to the pen function, but paints in the background colour, thus acting as an eraser.

For erasing large areas, select the COPY function and copy a blank area of screen. Then erase where required by printing with the copied blank area.

LAYERING

(6128 only). 464/664 unused.
This function provides the facility to "merge" a screen storage area with the main work screen, (screen 1).

After selection from the menu "LAYERING" will be displayed in the message window and then removed. You may then press keys [3], [4] or [5] to "merge" the respective stored screen with the main work screen.

The way that the screens are merged can be set to either "AND"/"OR"/"XOR" mode by pressing the [f0] key.

Experimentation with this function after using the SCREENS function, can produce some very interesting and useful effects, e.g. overlaying the 2 sides of a printed circuit board, trying different backgrounds with the same set of characters, etc.

The [DEL] key is used to restore the main work screen's contents, with the "MENU CALL" key calling the menu and leaving the function.

CLEAR SCREEN

Will clear the current screen. USE WITH CARE, as this is an immediate function.

CO-ORDINATE DISPLAY

Turns the x,y co-ordinate display option on/off. When on, the current x,y position will be displayed at the bottom of the screen and be updated while the spacebar is not being held down.

It should be noted that this function does not preserve the area of screen under the x,y display, and as such should not be on when not actually required. This function will also slow down program operation.

ELASTIC SHAPES

E

This function provides four basic geometric shapes.

Upon selection you are required to choose from [D]iamond-[P]entagon-[H]exagon-[O]ctagon, using the light pen to position the selection cursor over the required initial, and pressing the trigger to select.

After returning to the work screen, a trigger press will draw the selected shape at the current x,y position indicated by the light pen's position on the screen.

Once the shape is being drawn/erased on the screen, you may alter its critical dimensions using the same process as outlined in the WINDOW SCROLL function.

When you are happy with the shape you can "FIX" it to the screen by pressing the spacebar. As with the ELLIPSE function, if the shape is very large the response to a trigger press may seem sluggish, so the same method of holding down the spacebar until an audible recognition of the action has been heard, should be adopted.

HORIZONTAL MIRROR DRAW

XX

Behaves in the same manner as VERTICAL MIRROR DRAW, but with the second pen plotting in a horizontal plane.

REVERSE/FLIP

▶◀

After selection, [F] OR [R] will be displayed in the message window. Select [F] if you wish to flip, (turn upside down), or [R] if you wish to reverse, mirror.

Mark the top left, and then bottom right hand corners, of the area of screen you wish to alter.

The marking of the bottom right hand corner executes the specified action.

Using these FLIP and REVERSE options, an area of screen can be mirrored, flipped, or mirrored and flipped. As the action takes place on the image itself, it is worth making backup copies with the COPY function prior to experimentation.

FILES

FL

This selects the saving and loading functions provided within this package. Follow the screen prompts displayed in the message window to load or save graphic screens.

Disc users must ensure that there is a disc present before attempting to load/save pictures, as error trapping this event is only provided on some models of the computer.

File names should not be more than 6 letters, or less than 1 letter long.

TEXTURE 3

Type of texture. See TEXTURE 1 for notes on the use of this function.

PAPER COLOUR SELECTION

This function is used to change the paper to the required colour.

When using the Light Pen you will find that some paper colours do not allow the Light Pen to respond correctly. Most problems will be encountered with the 8 darkest colours, therefore it is recommended that you do the bulk of your picture using a lighter background.

Prior to saving your finished screen, you can flip through the available backgrounds to see which one looks best.

More details on the Light Pen's working colours can be found in the introduction, at the front of the manual.

Should you select a dark colour and experience a pen read fail on the menu, press the [W] key to restore the paper colour to white.

SCREEN DUMPS TO PRINTER

Supplied with this package is a separate program for producing a "hard copy" of your ESP screen designs.

After you have finished your design and have saved it to tape/disc (remembering to make a note of its file name!), reset your computer, ensure that you have the correct tape/disc in the ready to read position, type RUN"DUMP" and press the [RETURN/ENTER] key*

The dump program will then offer you 3 printer options, DMP1, EPSON TYPE 1, and EPSON TYPE 2. Press the appropriate key to indicate your printer type and follow the program prompts for the file name.

Ensure that the disc/tape with your ESP picture is in a ready position, enter the file name input and the program will load and then print out your picture.

The technical reasons for providing 2 Epson choices is beyond the scope of this manual, but should you have an Epson-compatible printer which will not dump using Epson Type 1, repeat the procedure and select Epson Type 2.

It must be stressed that these Epson routines are designed to work with EPSON & EPSON-COMPATIBLE PRINTERS AND WILL GIVE UNPREDICTABLE RESULT ON NON FULLY EPSON-COMPATIBLE PRINTERS.

DISPLAYING SAVED SCREENS WITHOUT THE PACKAGE

When you use the file function from the main graphics program to save a screen design, the package saves a short program with the screen.

This program contains all the information required by your computer, to display the screen in the correct mode, and with the colours the same as when designed.

To display the screen on its own the following method is used.

```
10   X=ANYWHERE IN RAM MEMORY
20   SET MEMORY TO X-1
30   LOAD"(NAME OF SCREEN WHEN SAVED FROM MAIN
     PACKAGE).ESP",X
```

The real display program could look something like this ...

```
10   X=30000
20   MEMORY 29999
30   LOAD"CAR.ESP",29999
40   GOTO 40
```

USING THE LIGHT PEN IN YOUR OWN SOFTWARE

Supplies with the ESP graphics package is a Machine code routine for obtaining the X and Y co-ordinates of the light pen from Basic, thus allowing you to write your own software to work with the pen.

The read routine when loaded, resides at memory location &A000, is &140 bytes in length, with the call address being &A000.

To load the routine insert the correct disc/tape side supplied and type the following ...

MEMORY &999F:LOAD"XYREAD"

This will then install the read routine for you to use with your own software.

To obtain the x,y co-ordinates for use by your own program the following must be noted.

The routine when called from basic will return the x and y values to basic variables x,y so you do not need to PEEK the results from memory locations. To achieve this the routine requires the basic variables x and y to be integers.

EG:

```
10   MODE 1:INK 0,26:INK 1,0
20   DEFINT x-y:x=0:y=0:XYREAD=&A000
30   CALL XYREAD,@x,@y
40   LOCATE 2,2:PRINT x;y
50   GOTO 30
```

When the program executes the call to XYREAD the resultant x and y values are placed in the integer variables @x and @y, so your basic program can then act on them.

MARK II light pen owners will obtain character position values, while "PROFESSIONAL" light pen owners will obtain pixel values.

Both types of pen users should note that if any screen "rolling" occurs, these values will not match the pens actual position on the screen. To reset the routines operating offset, a MODE command must be executed.

If you do write any software to work with an ESP light pen, and would like to see your program published, please send in a copy for evaluation along with some form of instruction sheet.

We are particularly interested in Specific Use Graphic Systems, 3D & CAD/CAM packages, Electronic design and testing software, engineering and architecture, even games software which uses the pen for control.

All evaluations are carried out in the strictest confidence to protect your software ownership rights, and we will return all tapes/disc along with our evaluation results.

Our special thanks to PRIDE UTILITIES
for their co-operation in the development
of the software provided with this
package.
Our thanks also to Steve Thomas of
Pride for his personal involvement.

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