4045XLPSTREAM

4045XLPStream implements an image stream for the Xerox 4045 Laser CP, a 300 dot-per-inch laser printer.

The printer can emulate one of two printers, the Xerox 2700-II laser printer or the Xerox/Diablo 630; the software can produce output for either.

The page size of the 4045 is 2550 pixels wide by 3300 pixels long in portrait mode, and 3300 x 2550 in landscape mode.

There are two communications ports on a workstation that are used most often for printing purposes; the RS232C port and the TTY port. They both use the RS232C standards for data communications, but they differ in that the RS232C port is buffered and, as such, is the preferred port for printing. Depending on the workstation and its options, there may also be a Centronics port available on a system.

4045XLPStream uses one of the corresponding printer (port) driver modules. Output may be sent directly to the 4045 printer via one of these modules, or to a file for printing later.

The 4045XLPStream software has been designed primarily for the RS232 port.

Non-USA model 4045's are supported. See the section "Using the 4045 as a Default Printing Host," for details.

Requirements

Hardware

The 1108 or 1109 must have the E-30 option kit installed to be able to use the RS232 port. (If the machine has a port labeled "RS232C" then it has the E-30 kit installed.) The TTY port is labeled "Printer."

On the 1186, the RS232 port is labeled DTE/COMM (it is on the C4 printed circuit board of the workstation), and the TTY port is labeled DCE/Printer on the same board.

The Centronics port is available only on the 1109 (an 1108 with the CPE-FP upgrade).

You'll also need an RS232 or a TTY cable to connect your computer to the printer.

4045 PROM and Software Compatibility

630 emulation mode only works with version 2.1 or higher of the 4045 PROMs. The version of the PROMs in your 4045 can be found by looking at the first number of the Revision number found on the upper left corner of the configuration sheet.

To receive the latest version of the PROMs, contact the local Xerox Service Representative.

To get the version number of the software, evaluate the variable `4045XLPSTREAM.VERSION` and record the value for future reference.

Software

Make sure the communications module you wish to use is in the currently connected directory, or in one of the subdirectories specified in `DIRECTORIES`:

> RS232 port uses `DLRS232C.LCOM`
>
> TTY port uses `DLTTY.LCOM`
>
> Centronics port uses `CENTRONICS.LCOM`

Installation

Software

Load the required `.LCOM` modules from the library. `4045XLPSTREAM.DFASL` should be loaded in the Interlisp Executive. All functions referenced in this document are therefore `IL:FN` if you are not using the Interlisp Executive.

If you plan to use TEdit, load it *before* loading 4045XLPStream, as 4045XLPStream redefines a TEdit function.

Note: Loading 4045XLPStream changes your `DEFAULTPRINTINGHOST` and `DEFAULTPRINTERTYPE` to set the 4045 as the default printer. This allows you to use the default hardcopy functions for printing.

4045 Emulation Mode Selection

The 4045 printer can normally emulate one of two printers: the Xerox 2700-II laser printer or the Xerox/Diablo 630.

Switch A-2 of the configuration cartridge determines the emulation mode:

> `On` = 630
>
> `Off` = 2700

Make sure this is the same as the software parameter setting (see below).

4045 Port Selection

Set the switches on the 4045 configuration cartridge according to the port you are using. The *Xerox 4045 Laser CP User Manual* gives details about switch settings.

If you are using the RS232 or TTY port, set the switches as follows:

> Bank A: switches 1,5,6 on
>
> Bank C: switches 1,4,5 on
>
> Bank B: switches 1,2,3,4,6 on
>
> Bank D: switch 4 on

If the Centronics port is being used, set switch A-1 off.

4045 Port Initialization

Upon loading the software, you are prompted for the port you wish to use for printing. The allowable responses are

R   RS232

T   TTY

C   Centronics

S   Server (in which the 4045 is connected to another 1108/86 and the current machine is printing to it via Ethernet)

D   The default port. The software then automatically loads the correct communications module for the port selected.

For more information on setting the default port, see the notes under "4045XLPStream Options" below.

Note: If you select option S (server), you must set the port by calling

```
(4045XLP.SET.PARAMETERS '((PORT . SERVERPORT))
```

where *SERVERPORT* is the port number of the server. See "Printing Using FTPserver," below.

Using the 4045 as a Default Printing Host

Printing Source or TEdit Files

Two system functions are available for sending files to a printer: LISTFILES and SEND.FILE.TO.PRINTER.

LISTFILES (*FILE1 FILE2 FILE3 etc.*) can be used to send a number of files to be printed. As shown here, all files would be sent to the default printer. As described in the *IRM*, this function calls SEND.FILE.TO.PRINTER for each of the files indicated in its list of arguments, and therefore each argument *FILEx* in the list can include values to set the various print options.

(SEND.FILE.TO.PRINTER *FILE HOST OPTIONS*)

FILE is a Source or Tedit file.

HOST is '.4045XLP.

OPTIONS is an A-list of print options: #COPIES, DOCUMENT.NAME , and BREAK.PAGE , which prints a job description page between jobs.

Examples:

(SEND.FILE.TO.PRINTER 'MySourceorTEditFile)

Sends the file MySourceorTEditFile to the default printer (4045xlp after loading this module).

(SEND.FILE.TO.PRINTER 'MySourceorTEditFile NIL'(BREAK.PAGE T))

Sends the file MySourceorTEditFile to the printer and specifically print a job description page.

```
(SEND.FILE.TO.PRINTER 'MySourceorTEditFile NIL'(#COPIES 2
DOCUMENT.NAME "Another Wonderfully Printed Document from the
4045"))
```

Prints two copies of the file on the printer attached to the default port with the name given.

Printing Windows

Select HARDCOPY from the right-button menu of the selected window.

Note: If the 4045XLP is not the default printer, slide off to the right of the HARDCOPY andselect TO A PRINTER, then choose 4045XLP. You will only need to do this if DEFAULTPRINTINGHOST has been changed after loading this module.

Creating 4045XLP Master Files

4045XLP master files are files similar to Interpress master files in that they can be printed without further formatting. They can come from windows, bitmaps, and TEdit/Sketch files. To create a 4045XLP master from a window (including TEdit and Sketch windows), select HARDCOPY from the background menu, slide off to the right and select TO A FILE, and enter the name you wish for the master file with an extension of .4045XLP.

To create a 4045XLP master file for a bitmap, follow these steps:

```
(SETQ FOO (OPENIMAGESTREAM 'MYMASTERFILE.4045XLP))

(BITBLT MYBITMAP 0 0 FOO 0 0)

(CLOSEF FOO)
```

The file MYMASTERFILE.4045XLP can be printed at any time.

Printing a master file is easy. Evaluate

```
(SEND.FILE.TO.PRINTER 'MYMASTERFILE.4045XLP '4045XLP)
```

and it is printed without the delay for formatting.

Printing via FTPserver

The 4045XLPStream software has been designed to use the FTPserver module to print from remote machines on a local 4045 printer.

In the following example, server is the workstation physically connected to the 4045 and has the PUP Host Number 0#20#; client is connected to server by Ethernet . Both client and server have 4045XLPSTREAM.DFASL loaded.

Note: FTPServer and MiniServe implement simple PUP protocols on the network; they are described elsewhere in this manual.

To get the PUP host number of server, evaluate (PORTSTRING (ETHERHOSTNUMBER)) on server. If the number has not been set yet, the systemprompts you to enter it. Enter an octal number (1-376) that is given to you by your system administrator.

Load `FTPSERVER.LCOM` onto the server machine. Evaluate `(FTPSERVER)` on server to start the FTP Watcher process.

From the client you may use the server either as the default printing port, or to copy files to it.

Example:

To make server be the default printer for client, on the client machine evaluate

```
(4045XLP.SET.PARAMETERS (LIST (CONS 'PORT . {0#20#}
LPT:.4045XLP)))
```

You can also manually copy master files to the server machine:

```
(COPYFILE 'FOO.4045XLP '{0#20#}LPT:.4045XLP)
```

This will copy the 4045XLP master file to the server machine and automatically print it without any user intervention on the server machine.

Alternatively, when you select HARDCOPY - TO A FILE from the background (right-button) menu, you can enter `{0#20#}LPT:.4045XLP`, and the file prints immediately after formatting.

Changing Modes for International 4045s

A function allows owners of the international 4045 (non-USA model) to use the 4045xlpstream software.

`(4045XLP.CHANGE.MODE `*mode*`)`   [Function]

This function changes the internal parameters of the software to allow printing on A4 paper with the international fonts. *Mode* is a string (either `USA` or `INTERNATIONAL`); `USA` is the default. Do not use this function unless you have the international font set and A4 paper tray on a non-USA 4045. A4 page size is 2475 pixels wide by 3525 pixels high in portrait, and 3525 x 2475 in landscape mode.

4045XLPStream Options

4045XLPStream software implements an image stream interface to the 4045 laser printer. Users do not have to open a stream for the default printing code to work. The default printing code automatically opens the stream and closes it. The methods to access this stream are shown below. For more information on using image streams, see the *IRM*.

There are several options of 4045XLPStream that may be set by the user. Most users will not need to change from the default values. The variable options are stored in the variable `4045XLP.DEFAULTS`, which is an instance of the `4045XLP.PARAMETERS` record. The following functions will directly modify `4045XLP.DEFAULTS`, and thus the option settings.

4045 Parameter Names and Values

The following is a list of legal parameter names and values:

> SLUG   Either an integer `0-255`, or `NIL`; default is `NIL`. This controls the
> image to be printed when the stream code sees a character it

cannot print. `NIL` indicates print a slug (black box), a number indicates print the corresponding character.

LANGUAGE Must be either `630` or `2700`; default is `2700`. This controls the default mode of the stream code. Must be set to the same value as the printer.

The 4045 can implement either 2700 protocols or 630 emulation modes. The mode may also be set when opening the stream by using the MODE option. Make sure switch A-2 on the printer's configuration cartridge corresponds to the mode the software is using.

PORT Must be a valid pot for use in printing; default is {RS232}. Controls the default printing port.

Note: May be set to a network address for remote printing. See "Printing Using FTPServer" for more information.

MESSAGESTREAM A window, stream or `NIL`; default is the prompt window. Controls where messages are sent during the printing process. If it is a window or a stream, messages about the status of the job during printing are printed to the destination given here. Otherwise the messages are suppressed.

PRINTERRORS A flag, `T` or `NIL`; default is `NIL`. Controls the collection and printing of any printing errors encountered. If it is `T`, a summary page listing any problems found is printed at the end of a job.

PRINTHEADER Either a string, `T` or `NIL`; default is `NIL`. Controls the printing of a header page describing the job being printed. `T` indicates print the page, `NIL` indicates not to print the page. If it is a string, it indicates to use this string as the title of the header page.

WINDOWTITLE Either a string or `NIL`; default is `NIL`. Controls the default title for windows that are printed using the default hardcopy method. If it is a string, the title used is this string; otherwise "Window Image" is used as the title.

LANDSCAPE Either `T` or `NIL`; default is `NIL`. Controls the default paper orientation of the stream. `T` indicates landscape (sideways), `NIL` indicates portrait orientation.

The orientation may also be changed when opening the stream by using the `LANDSCAPE` or `PORTRAIT` options.

Note: If the variable `4045XLP.DEFAULTS` is non-`NIL` before loading 4045XLPStream, the default values is not initialized to the above settings.

Programmer's Note: You can set the default values for all these items by setting `4045XLP.DEFAULTS` to an instance of the `4045XLP.PARAMETERS` record before loading this module.

Set Parameters

(`4045XLP.SET.PARAMETERS` *PARAMETERS*)   [Function]

Sets any valid parameter for the 4045. *PARAMETERS* should be an A-list of the form

```
((PARAMETER . VALUE) (PARAMETER . VALUE) ...)
```

For example, to set the default printing port and the default mode, while leaving all other values as they were, you would evaluate:

```
(4045XLP.SET.PARAMETERS (LIST (CONS PORT '{TTY}) (CONS
LANGUAGE 630)))
```

Get Parameters

(4045XLP.GET.PARAMETERS *PARAMETERS*)   [Function]

Returns the value of any of the parameters listed.

PARAMETERS should be a list of the values you wish to check. If *PARAMETERS* is NIL, it returns the current settings of all the options.

Example:

```
(4045XLP.GET.PARAMETERS '(SLUG LANGUAGE PORT))
```

Returns a list similar to the following (depending on the current settings):

```
((SLUG NIL) (LANGUAGE 2700) (PORT {RS232}))
```

Get, Set Parameters via Inspector Window

An alternate way of showing and changing the parameters for the stream is to call (INSPECT 4045XLP.DEFAULTS) and select AS AN A-LIST from the pop-up menu. This produces an inspector window with the parameter name on the left and its value on the right. To set a parameter, select it in the inspector window using the left mouse button, then press the middle button and select SET. A window will prompt you for the new value of the parameter selected.

Examples

4045 image streams are created by the OPENIMAGESTREAM function.

Opening a 4045 Stream

```
(SETQ 4045STREAM (OPENIMAGESTREAM '{CENTRONICS}.4045XLP))
```

Creates a stream to the 4045 connected to the workstation's Centronics port.

```
(SETQ 4045STREAM (OPENIMAGESTREAM '{RS232} '4045XLP))
```

Creates a stream to the 4045 connected to the workstation's RS232 port.

```
(SETQ 4045STREAM (OPENIMAGESTREAM '{RS232}.4045XLP))
```

Creates a stream to the 4045 connected to the workstation's RS232 port. Notice that the type need only be included as an extension to the port name.

```
(SETQ 4045STREAM (OPENIMAGESTREAM NIL NIL '(MODE 630)))
```

Creates a stream to the default printer (4045) connected to the default port specifically in 630 mode.

```
(SETQ 4045STREAM (OPENIMAGESTREAM NIL '4045XLP '(MODE 2700)))
```

Creates a stream to the 4045 connected to the workstation's default port specifically in 2700 mode.

```
(SETQ 4045STREAM (OPENIMAGESTREAM NIL NIL '(LANDSCAPE T)))
```

Creates a stream to the defaultprinter (4045) connected to the workstation's default port in LANDSCAPE orientation.

```
(SETQ 4045STREAM OPENIMAGESTREAM NIL NIL '(PORTAIT T)))
```

Creates a stream to the default printer on the default port in portrait mode.

Note: You must close the stream to make it print. Make sure to close all streams to the 4045 that you open.

Using a 4045XLP Stream

In the above cases, we set the variable 4045STREAM to a 4045 image stream. Once we have done that, the image stream can thereafter be used as the destination of any graphics operation.   Here are some examples of operations that may be performed on a 4045XLP image stream:

```
(BITBLT (WHICHW) NIL NIL 4045STREAM 0 0)
```

Places an image of the window, in which the cursor is, at position (0,0) on the 4045's page.

```
(DRAWLINE 500 500 3000 500 30 NIL 4045STREAM)
```

Draws a line 30 spots (1/10 inch) wide from position (500,500) to position (3000,500).

```
(DSPNEWPAGE 4045STREAM)
```

Causes the current page to be printed and a new one to be started.

Note: This will not have any immediate effect unless you are forcing output immediately to the port. This is unadvisable as it will not allow other tasks to complete until the current stream is closed.

```
(PRINTOUT 4045STREAM "Hello world" T)
```

Prints the string "Hello world" on the 4045's page, followed by a carriage-return/line-feed.

```
(CLOSEF 4045STREAM)
```

Closes the open 4045 image stream and sends the last page to the printer. Make sure you close all open 4045 image streams! If the output was to the default printer and default port, evaluating this will cause the file to be printed.

Resetting 4045XLPStream

Occasionally, the 4045XLPStream software may become frozen. If this happens, evaluate the function (4045XLP.RESET) which will reset the stream software.

Note: Use this function only when you are positive that nothing else is printing or hardcopying, as it may damage the state of the last job sent.

Limitations

4045 Fonts

The current version of 4045XLPStream does not use fonts other than Titan 10. Documents will print in Titan 10 and Titan 10 Bold only. Source files print in landscape mode, and regular printing in landscape mode is supported.

Multiple Streams

Do not open multiple streams to the communications ports. It could cause a fatal crash of the port that is connected to the 4045 (ie. for every OPENIMAGESTREAM you did, do a CLOSEF).

Printing Speed

Using the TTY port for printing large bitmaps or SKETCHs is slow due to the nature of the port.

Scale factors

SCALEDBITBLT on the 4045 supports scale factors of 1, 2, and 4 only. Since the display screen has a resolution of 72 dots per inch and the printer's resolution is 300, a scale factor of 4 means that the bitmap has the same size on the paper as it has on the screen. Scale factors of 2 and 1 make the printed image proportionally smaller (i.e., 1/2 and 1/4 size, respectively).

Notecards

If you are using NoteCards, load NOTECARDS-4045XLPPATCH.LCOM.

TEdit

Be sure to load TEdit before 4045XLPStream, as there is one TEdit function that is redefined by 4045XLPStream.

The LANDSCAPE function in the TEdit Page Layout Menu does not work with this version of software. If you want to print a TEdit document in landscape, proceed as follows:

Change the TEdit margins. To do this, open a Tedit window, GET the file, and bring up the Page Layout Menu. Change the Margins fields to LEFT: 4.5, RIGHT: -10.0, TOP: 19.0, BOTTOM: 3.2 and apply this to all pages (First & Default, Other Left and Other Right).

PUT the modified-for-landscape file and call it LANDSCAPEFILE.TEDIT.

Open an image stream to the printer in landscape mode by evaluating

```
(SETQ MYSTREAM (OPENIMAGESTREAM NIL NIL '(LANDSCAPE T))
```

Do the actual hardcopy by evaluating

```
(TEDIT.HARDCOPY (OPENTEXTSTREAM 'LANDSCAPEFILE.TEDIT) MYSTREAM
NIL NIL NIL '(LANDSCAPE T))
```

After all this is done (there will be a message in the prompt window "Formatting for print... xx pgs done."), you must close the printer file before it will print, so evaluate

```
(CLOSEF MYSTREAM)
```

SingleFileIndex

If you are using SingleFileIndex, when calling the SINGLEFILEINDEX function, just specify {lpt} as the destination file, instead of {lpt}.4045xlp.

Sketch

The current version of this module does not support the printing of documents created with the REVERSE feature in Sketch (black/white inversion). There will be a printed output, but not a correct one.

Also, it will not bury a black box by means of a white one; that is, BURY does not erase bits.

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