MICROTEK

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INTRODUCTION

MICROTEK is an image processing software package that enables you to operate Microtek Models-300 and 300A Intelligent Image Scanners with the Xerox 1108 and 1186 workstations. The Microtek MS-300, 300A, and MSF-300C are high-resolution optical scanners that can convert text, artwork, photographs, etc, into digital form for processing by computer. The digitized images that are output to the computer contain up to 300 black and white dots for every linear inch of the original document. Page size can be as large as 8.5 by 14 inches. Sophisticated firmware in this scanner enables the user to set the scanning area and control brightness, contrast, scaling, shading and other characteristics of the scanned images through simple commands transmitted from the 1108 or 1186. Two basic scanning modes are supported: Line Art mode for accurate capture of completely black-and-white material, and Halftone mode for faithful reproduction of material with varied shading. Mixed-mode scanning is also available.

With the MICROTEK software package you will be able to: Set the scanner to capture images of all kinds, with desired visual effects, and transmit them to the 1108/1186, save scanned images to disk, floppy or file server for later reloading to recreate images and print scanned images to a Xerox 4045 or 8044 laser printer.

SOFTWARE REQUIRED

MICROTEK.DFASL

MICROTEKPRINT.DFASL (if you have a Xerox 4045 or 8044 laser printer)

DLRS232C.LCOM

EDITBITMAP.LCOM

READNUMBER.LCOM

4045XLPSTREAM.DFASL (if you have a Xerox 4045 laser printer)

FONTS USED

MODERN 10, 12 BOLD

Other useful software for manipulating the scanned image:

Lispuser's Packages:

ACTIVEREGIONS, ACTIVEREGIONS2, AIREGIONS, FILLREGION

HARDWARE REQUIRED

Xerox 1108 with RS232C port (E-30 upgrade kit). It is also recommended that the 1108 have 3.5 meg of memory and a floating point processor (CPE board) to enable faster scanning and creation of bitmaps.

Xerox 1186. It is also recommended that the 1186 have 3.7 meg of memory.

Microtek MS-300, MS-300A, or MSF-300C Intelligent Image Scanner with optional serial port.

CABLE CONFIGURATION

Note that the cable configuration is DIFFERENT for the MSF-300C scanner. Plugging a standard RS232C cable into the MSF-300C DB25 connector may result in damage to the equipment.

RS232C Port (DTE)		**MICROTEK MS-300, MS-300A - DB25 Connector**	
Signal	Pin	Pin	Signal
FGround	1	1	FGround
TD	2	3	RD
RD	3	2	TD
SGround	7	7	Sground

Pins 5, 6, 8 and 20 are jumpered together on the RS232C port end of the cable.

RS232C Port (DTE)		**MICROTEK MSF-300C- DB25 Connector**	
Signal	Pin	Pin	Signal
TD	21	3	RD
RD	9	2	TD
Ground	5,7	7	Ground

DOCUMENTATION REQUIRED

Microtek MS-300, MS-300A, or MSF-300C Intelligent Image Scanner Operation Manual

LOADING MICROTEK

Make sure that DIRECTORIES contains the directory where the required software is located. When the file MICROTEK.DFASL is loaded, the item "MicrotekScanner" will be added to the Background menu. If you have a Xerox 4045 or 8044 laser printer load MICROTEKPRINT.DFASL. If you have a Xerox 4045 laser printer load 4045XLPSTREAM.DFASL. Your 4045 laser printer should be connected to the TTY/DCE port.

RUNNING MICROTEK

The process of running the Microtek scanner software consists of three phases: Scanner initialization, scanning, and creating a bitmap of the scanned image that can eventually be printed. Each of these are controlled by different menus within the Microtek Scanner Control Window.

SCANNER INITIALIZATION

Set the Microtek scanner so that it is operating at 19200 baud by setting its internal DIP switches (See Microtek Operating Manual for details). Turn on the Microtek scanner. Select "MicrotekScanner" from the background menu and the Microtek Scanner Control window (figure 1) and Microtek Scanner Pagemap window (figure 2) will be created. (Note you may have do a control-E and retry if cursor flashes while trying to create the control window).The scanner pagemap window is used to select the area of the image to be scanned and to select the page length. The scanner control window is used to set all other scanner parameters, start and stop scanning as well as to initiate creation and printing of scanned image bitmaps. After these windows have been created, the RS232 port will be initialized to

19200 baud and an attention command will be sent to the scanner. If all cables are connected properly and the scanner is on, the message "MICROSCAN 300(A) V# is ready" will be displayed in the Microtek Status Window. If the cable is configured incorrectly or the scanner is not on or ready the messsage "Microtek Not Responding ... Check scanner and cable" will appear instead.

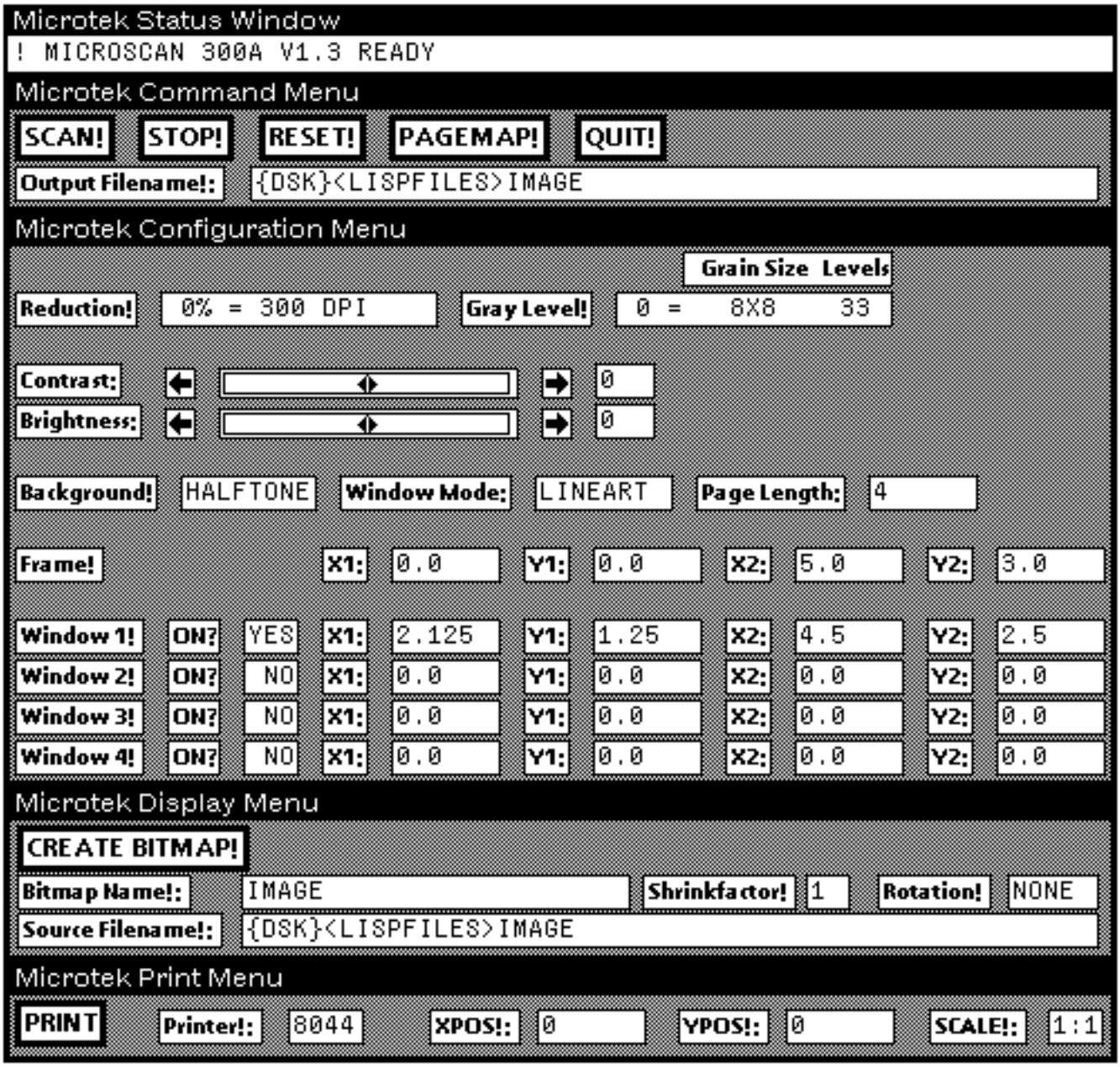

FIGURE 1 - MICROTEK SCANNER CONTROL WINDOW

Before scanning can be initiated, a number of parameters have to be set by the user via the Microtek Command Menu and Microtek Configuration Menu as follows:

Microtek Command Menu:

Output FileName Left buttoning on this item allows you enter the name of the file on disk, floppy or fileserver where the scanned data is to be saved. Be sure to type a carriage return to terminate this entry.

Microtek Configuration Menu:

Reduction Left button on the number next to the item Reduction and a menu will appear. Reduction can be changed from 0%, which corresponds to scanning at 300 dots per inch (DPI) to 75%, which corresponds to 75 DPI.

GrayLevel Left button on the number next to the item GrayLevel and a menu will appear allowing you to choose from a selection of gray levels based on grain size and number of gray levels within that grain size.

Contrast Left button on either the the left or right arrow to either decrease or increase the contrast setting.

Brightness Left button on either the the left or right arrow to either decrease or increase the brightness setting.

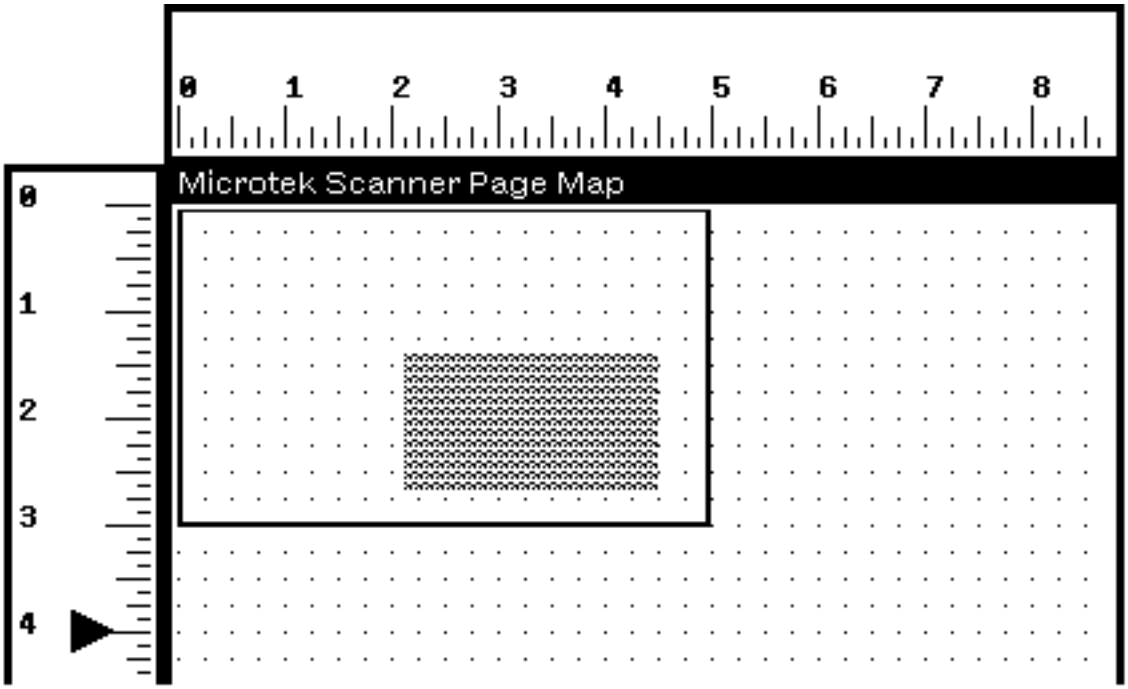

FIGURE 2 - MICROTEK SCANNER PAGEMAP WINDOW

BackGround Select either HALFTONE or LINEART as the primary scanning mode for the image. Line Art mode is for accurate capture of completely black-and-white material, and Halftone mode for faithful reproduction of material with varied shading.

Pagelength Move the cursor to the vertical ruler of the page map (figure 2). The cursor will change to a right pointing triangle. Position this triangle and left-button to select the pagelength. The page length will also show up in the configuration menu. The page length should be set so that it is longer

than the actual page length of the document to be scanned. Otherwise you will get a paper jam message at the completion of scanning. The minimum page length is 3 inches and the maximum page length is 14 inches.

Frame The scanning frame is an area within the document that will be scanned. The maximum scanning frame is 8.5" by 14". Left button on the item Frame and you will be prompted to sweep out an area on the scanner page map to select the primary area to be scanned. The horizontal and vertical rulers and the page map grid dots can be used as a guide in determining the dimensions of the scanning frame. When the the scanning frame has been swept out, a box of the scanned area will be drawn on the page map and the actual X and Y coordinates of the top lefthand corner and lower righthand corner will appear next to corresponding items on the configuration menu (See Figure 2).

Windows 1- 4 Windows are areas within the scanning frame that are scanned in a different mode from the rest of the frame. If LINEART mode is selected as the background, all material in any windows you set will be scanned in Halftone mode, and vice versa.

The method used to set the windows is similar to that used to set the scanning frame except that you first need to specify whether the window is to be selected or not. This is done by left buttoning on the YES/NO indicator next to each window. A menu will pop-up and will allow you select "yes" or "no". After making your selection, left buttoning on the appropriate Window # will cause you to be prompted to sweep out an area within the scanning frame. Each selected window will be displayed and have a unique shade to it (See Figure 2). The only restriction is that the scanning mode must not change more than twice in one 8.5" horizontal scan line. Thus, if two windows lie across the same scan line they must extend to the edges of the page setting area. (Note that material to the left and right of the frame is scanned but not transmitted to the 1108.) You can select different windows for halftone vs lineart mode by switching between backgrounds. The item above WINDOW1 indicates which window mode is selected. An illegal window setting will result in an error message when you attempt to scan. Also note that the windows will be displayed on the scanner pagemap only if there is a "yes" next to the window number.

SCANNING

After the Microtek scanning parameters have been initialized, the document to be scanned should be placed in the scanner top-first with the image to be scanned facing away from the user. Scanning is initiated by left-buttoning SCAN on the Microtek Command Menu. The software first creates a scratch file in {CORE} for storage of the incoming data. It then sends the scanning parameters to the scanner and if all are valid the scanning process starts as indicated by movement of the rollers. You have up to 5 minutes to insert a document before the scanner automatically stops. After scanning has been completed you will be notified in the status window that it is saving the core file to the file specified in Output Filename. It takes approxiamtely 20 minutes to scan an 8.5" x 11" document at 300 DPI.

You may stop the scanning at any time by selecting STOP. The document will be ejected and the scanner reset. You can also explicitly reset the scanner by selecting RESET. This closes the scanner scratch file if it is open, sends a reset command to the scanner and then sends the attention command. If everything is reset properly, you will get the message "MICROSCAN 300(A) V# is ready" in the status window.

CREATING BITMAPS OF SCANNED IMAGES

The Microtek Display Menu is used to create bitmaps from a file that contains scanned data. Select SOURCE FILENAME and enter the name of the file that contains the scanned data. Select BITMAP NAME and enter the name of a variable that you would like the bitmap bound to. **Be sure to type a carraige return to terminate the entry of each of these items.** Left button on the number next to

SHRINKFACTOR and choose a factor by which you want the bitmap shrunk. The default value is 1. Left button on the item next to ROTATION and choose how you want the scanned image to be rotated. The default is "none." After these items have been set, you can then select CREATE BITMAP to start the bitmap creation process. The status window will be updated as it proceeds to create the bitmap and finally, you will be prompted to sweep out a scrollable window to display the bitmap. NOTE: Depending on the size of the bitmap, rotation may take a "very" long time and will look like your machine has frozen...be patient, it will come back. If you desire to save the bitmap(s) on a file you can do the following:

```
(SETQ filenameCOMS '((VARS bitmapname1 bitmapname2 etc))).
(MAKEFILE '{device}<directory>filename)
```

PRINTING BITMAPS OF SCANNED IMAGES TO A XEROX LASER PRINTER

If you have the package MICOTEKPRINT loaded you will have a MicrotekPrint Menu under your display menu (See Figure 1). Select BITMAPNAME on the display menu and enter the name of the bitmap that you would like to print. To select where on the page the bitmap is printed, left button XPOS and YPOS and enter a number. For the 4045 laser printer the values of XPOS can be between 0 - 2550 and YPOS, between 0 - 3300. 1" = 300 print units o 4045 . For an 8044 Interpress laser printer the values of XPOS can be between 0 - 21590 and YPOS, between 0 - 27940. 1" = 2540 Interpress units. The scale that an image is printed at is dependent upon its initial scanned reduction/DPI. You can increase or decrease the scale at which the bitmap is printed by buttoning on the number next to the item SCALE and selecting a scaling factor. On an 8044 Interpress printer a scale of 8:1 will magnify an image by 8 times on printing , 1:1 will print at true size and 1:8 reduce the image by 8 times. Values in between are also available. On a 4045 laser printer only a limited number of scale factor are availble and is dependent upon the original scan reduction as shown in the table below.

REDUCTION (%)	RESOLUTION (DPI)	SCALES ALLOWED
0	300	1:1, 2:1, 4:1
5	285	1:1, 2:1, 4:1
10	270	1:1, 2:1, 4:1
15	255	1:1, 2:1, 4:1
20	240	1:1, 2:1, 4:1
25	225	1:1, 2:1, 4:1
33	200	1:1, 2:1, 4:1
35	195	1:1, 2:1, 4:1

REDUCTION (%)	RESOLUTION (DPI)	SCALES ALLOWED
40	180	2:1, 1:1, 1:2
45	165	2:1, 1:1, 1:2
50	150	2:1, 1:1, 1:2
55	135	2:1, 1:1, 1:2
60	120	2:1, 1:1, 1:2
67	100	1:1, 1:2, 1:4
70	90	1:1, 1:2, 1:4
75	75	1:1, 1:2 , 1:4

Select PRINT to initiate the printing process. NOTE: The amount of reduction that you will be able to do is dependent upon the number bits that were originally scanned in. If you make the scale too small nothing will be printed out.

OTHER ITEMS AND GENERAL COMMENTS

On the Microtek Command Menu, left buttoning the item PAGEMAP will alternately open and close the scanner pagemap window. Left buttoning on the item QUIT will close the input and output streams to the scanner, shutdown the RS232C port and close the scanner pagemap and control windows. The following icon will be displayed if you shrink the Microtek Scanner Control window.

The Microtek Pagemap window will close when you shrink the Microtek Scanner Control window and has to be expicitely opened when the Microtek Scanner Control window is expanded again. This is done by buttoning on PAGEMAP in the Microtek Command Menu window.

Within Interlisp you normally cannot create bitmaps larger than approximately 2.1 million pixels (about 1400 x 1400). The Microtek scanner software allows you to create bitmaps much larger than this but at the cost of using a correspondingly large amount of virtual memory. If you are near your maximum vmemsize, as determined by comparing (VMEMSIZE) to (VOLUMESIZE 'volumename) , there is a good chance you could crash your system if you create a very large bitmap...caveat emptor. In addition you will not be able to call the function EDITBM to edit bitmaps larger than 2.1 million pixels

The reduction % used to scan the original image is stored on the property list of the atom that the bitmap is bound to. It is saved as the property "Resolution" and is in %. This is used to determine the appropriate values that will make an image 1:1 when printed. If you attempt to print a bitmap to an Interpress printer that was not created by use of the Microtek scanner software you will be prompted to enter a scale explicitely. The following table indicates the 8044 laser printer scale used for scanned images and can be used as a guide when attempting to print bitmaps not created by the Microtek software.

REDUCTION (%)	RESOLUTION (DPI)	SCALE
0	300	.240
5	285	.252
10	270	.266
15	255	.282
20	240	.300
25	225	.320
33	200	.360
35	195	.369
40	180	.400
45	165	.439
50	150	.480
55	135	.533
60	120	.600
67	100	.720
70	90	.800
75	75	.960

Further information about the Microtek scanner can be obtained from:

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