



BUYERS LABORATORY INC.

Field Test Report

A Buyers Laboratory Document Imaging Device Assessment

Xerox 4590

90 PPM Segment 5 Monochrome Device
Copy • Print • Scan



Performance Ratings*

Click ratings for details. Click ▲ to return to ratings.

Overall Rating.....	★★★★★
Value	★★★★
Ease of Use.....	★★★★
Copy Productivity	★★★★
Print Productivity	★★★★
Image Quality	★★★★
Multitasking	Lab Test Report Only
Utilities.....	Lab Test Report Only
Reliability	Lab Test Report Only
Feedback to Workstations	Lab Test Report Only
Toner Yield/Costs per Page	Lab Test Report Only

*Based upon a five-star rating system where five is the best.

Suggested retail price: \$56,400 base unit. (Complete specifications information for this unit, including pricing for accessories and options, is available through bliQ™, at www.buyerslab.com/bliq.)

Testing method: The unit's copy/print capabilities were tested using a Windows XP workstation with a crossover cable, the Xerox print controller and the Adobe PostScript 3 print driver (version 4.2.17). The crossover cable eliminates network traffic, allowing for optimal productivity of the unit.



Comparative Analysis

The new 90-ppm Xerox 4590 complements Xerox's other 90-ppm models, the CopyCentre C90 and WorkCentre Pro 90, but unlike those two models, the 4590 is aimed at both large networked offices and light-production environments such as in-house CRDs and quick-print shops. The two other models are a better fit for users who still need to rely upon enterprise solutions, such as Scan to PC Desktop, but users who don't need such solutions will benefit from the 4590's advanced finishing options, a high-speed scanner and extensive media sizes and weights. This compact, 90-ppm model offers standard copy, network print and scan functionality. Featuring 512 MB of non-upgradeable standard memory and a 40-GB hard drive that are both shared, the 4590 performed competitively in BLI's productivity testing in the field. For example, the unit's job stream efficiency was the highest among similarly equipped models.

Unlike the other Xerox products in this segment, the 4590 offers a 250-sheet dual-head document feeder that scans at up to 100 double-sided ppm in both simplex and duplex modes, helping to reduce the chance that misfeeds will occur and effectively doubling the speed of a DADF in

For a copy of
BLI's upcoming
Xerox 4590

Lab Test Report,
contact BLI at
(201) 488-0404

info@buyerslab.com
www.buyerslab.com





duplex mode, according to Xerox. In addition, users can feed 250 sheets into the bypass tray that accommodates paper sizes up to 13" x 19.2" and paper weights up to 140 lb. index. Further, the unit's maximum paper capacity is 8,225 sheets, the highest of similarly equipped models available, and paper can be drawn from up to eight sources. Additionally, the 4590 prints at 1,200-x-1,200-dpi resolution at its rated engine speed of 90 ppm and supports enhanced resolution of up to 2,400 x 2,400 dpi. The unit's developer yield (6 million impressions) is the highest among competitive models.

Also unlike the other Xerox products in this segment, the device features a standard finisher that offers 100-sheet, three-position stapling and a total capacity of 3,000 sheets. In addition, the standard finisher also offers two- and three-hole

Advantages

- A 250-sheet dual-head document feeder that scans at up to 100 double-sided ppm reduces the likelihood of misfeeds.
- The unit's efficiency when running BLI's job stream test, which simulates the type of traffic a typical device might experience in a real-world, multi-user environment, is the highest for similarly equipped models tested to date.
- Very good overall ease of use from the control panel as it is highly customizable. For example, the administrator can choose which features appear on the Basic Copying screen of the display (up to 10 can be chosen) and three hard keys can be customized to suit the work environment.
- The unit's job build functionality allows users to "build" a job that may require different settings, such as simplex copies that contain photos or duplex copies for different page ranges within a document.
- The PCL 6 print driver offers both a graphical display and a point-and-click interface. Further, advanced features such as scheduled print, proof print and secure print are available within both the print drivers.
- Less user intervention due to the unit's highest bypass, document feeder and maximum paper capacities among similarly equipped models, as well as the highest toner yield for the group.
- The unit can handle paper weights up to 140 lb. index via the bypass tray.

Shortcomings

- The Adobe PostScript 3 and PCL 6 print drivers do not have the same look and feel. For example, the Adobe PostScript 3 print driver does not offer a point-and-click interface. In addition, both print drivers do not offer a toner gauge. Further, all of the selections required for a typical print job are not available on the first tab of the print drivers.
- More service intervention required due to the unit's below-average drum life.





punching. The optional booklet finisher has an output capacity of 2,000 sheets and can fold and saddle-stitch up to 15 ledger-size sheets to create 60-page booklets. An optional folding unit that performs C-, Z- and engineering Z-folding is available for both finishers. Unlike most units in this class, which offer a post-sheet inserter as an option, users can insert full-color covers or pre-printed materials, such as embossed media, into black-and-white documents with a standard post-process inserter on both finishers.

The unit's compact design contributes to a shorter paper path that reduces the chance for misfeeds. In addition, the 4590's large control panel display is similar in look and feel to that of recent Xerox office products. For example, the 4590's display incorporates the All Services screen, which is customizable to give users one-touch access to functions such as scan to e-mail, scan to mailbox (up to 500 mailboxes) and stored programming (up to 40 jobs, each of which can contain up to 100 features). The unit also uses Xerox's emulsion aggregate (EA) toner, which results in improved image quality, higher rated toner yields and less waste, according to the company.

▲ Value Analysis



The Xerox 4590, configured as a copier/printer with Adobe PostScript 3 printing, saddle-stitch finishing, a DADF and a post-sheet inserter, has a suggested retail price (SRP) that is competitive among similarly equipped models available. In addition, the unit offers maximum paper (8,225 sheets), bypass (250 sheets) and DADF (250 sheets) capacities that are the highest for the group, as well as the highest toner yield (81,000 impressions). In addition, the unit's standard paper capacity (3,800 sheets) is competitive. BLI rates value by evaluating a unit's SRP in relation to its overall performance, paper handling, and user and service intervention (see Advantages/Shortcomings).

▲ Summary

Because of its outstanding ease of use, good overall value, as well as its overall competitive copy and print productivity, BLI gives the Xerox 4590 an overall Field Tested Rating** of **Four and a half Stars**.

***Note: The data presented in this Field Test Report was obtained from testing performed by BLI outside of our 10,000 sq. ft. test lab. BLI's Lab Test Reports contain the results of BLI's extensive in-house testing for reliability, multitasking, toner yield/cost per page and performance of additional functions and on additional platforms. Please contact BLI (phone 201-488-0404, or e-mail info@buyerslab.com) for information regarding when the Lab Test Report for this product will be available.*





- ▲ Ease of Use ★★★★★
- Control panel ★★★★★
- User maintenance ★★★★★
- Print drivers ★★★★★

Control Panel

Overall, ease of use from the 4590’s control panel is very good. The 4590’s control panel is highly customizable and the screens are well laid out and intuitive. The unit’s 10.4 inch control panel (used in BLI’s testing) features hard keys and a large, color touch-screen display. The contrast of the display is excellent, and a dial conveniently located on the left side of the control panel allows the user to make minor adjustments to the contrast level to accommodate various lighting situations. Further, the control panel can be tilted up and down, and the arm can be moved to different positions or it can be placed on either the left or the right side of the document feeder. However, the 4590 does not offer a Help hard key on the control panel, which BLI technicians consider a drawback. However, basic instructions are displayed for some of the features when programming jobs. A Review hard key displays the status of copy and scan features whose settings have changed from the defaults.

The control panel display consists of five tabs (Basic Copying, Image Quality, Scan Options, Output Format and Job Assembly). With the exception of finishing, all of the features required for a typical copy are located on the Basic Copying tab of the display, including exposure, paper selection, duplexing and reduction/enlargement. Selections for finishing are located under the Output Format tab. Functions can be assigned and removed within the All Services screen. Similar to the setup of the control panels on some of Xerox’s current office products tested by BLI, the 4590 allows the administrator to choose the main screen of the display to suit the environment. Further, the administrator can customize the Basic Copying screen to hold up to 10 highly used selections. For example, the selection for Folding is the last selection on the Output Format screen, but users can customize this feature to appear on the Basic Copying screen if it is frequently used. In addition, three hard keys (Copy, Custom 2 and Custom 3) on the control panel also allow for further customization.



The 4590 control panel’s arm can be moved to different positions or it can be placed on either the left or the right side of the document feeder.

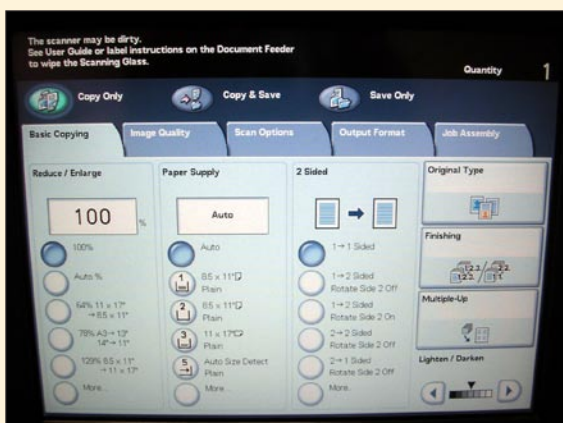
The Image Quality tab provides users with an array of features to enhance the document image quality. For example, Original Type allows users to reproduce copies of a document at a more faithful image quality by selecting the document type that matches the document. Selections include Light Text mode and Lightweight Originals mode. Light Text mode detects faint text or images in the original and automatically adjusts its scanning density to clearly record these portions, while other text and image areas are scanned normally. Lightweight Originals mode sharpens images on thin media that would otherwise be blurred due to the translucent quality of the original media. Users can also select from seven density levels between lighter and darker, and select from five sharpness levels between softer and sharper.



The user presses the Job Status hard key on the control panel to access the 4590's job queue, which displays information regarding current and pending copy and print jobs. The queue identifies the user, indicates the total number of pages and sets in a job, counts up the number of pages and sets in a copy job as they are completed and counts down the number of pages and sets in a print job as they are completed. In addition, as soon as a job begins processing, a box containing job information such as quantity, original count, total number of pages and orientation of the job is displayed on the screen. Complete and incomplete jobs can be viewed on the Completed Jobs tab. The user presses the Job Review hard key to review the details of the job in progress, including the number of originals in the job, the number of sheets completed (accounts for duplex), the number of sets completed and the total number of sets programmed.

The Machine Status hard key allows the user to view the status of each paper drawer (percentage filled, paper size and paper type), machine information, billing meter/print reports and consumables status, and also allows the user to overwrite the hard drive. Reports that can be printed include Auditoron Administration, Job Counter, Copy Mode Settings, Print Mode Settings and Mailbox List. While the electronic meter count available at the control panel only displays the total count of the unit, the user can access the total number of prints, copies and scans via the CentreWare Internet Services Web-based utility.

Additional and advanced features are located under the Scan Options, Output Format and Job Assembly tabs. The Output Format tab gives users access to booklet creation and covers. Users are offered a choice of no covers, front covers or front and back covers. Users can also designate whether covers are left blank or printed on. Users can also add a stamp, page numbers and dates on documents to be copied. A blank sheet can also be output inserted as a separator between copied transparencies. Users are



The administrator can customize the Basic Copying screen to hold up to 10 highly used selections.



The Machine Status hard key allows the user to view the status of each paper drawer, machine information, billing meter/ print reports and consumables status.





offered a choice of no separators, blank separators, blank separators plus distribution sets or no separators plus distribution sets. The unit's job build, located under the Job Assembly tab, provides users with two types of functionality. The Large Volume Document touch key is a benefit when the document consists of more than 250 pages (the capacity of the document feeder). In addition, the Build Job touch key enables users to apply different settings to each section of a document so that it outputs all at once, instead of having to copy the document in separate sections. The Sample Set feature allows users to print out the first set of a multi-set job once it has been programmed to ensure that the settings are correct before outputting the job in its entirety.

Job Flow Templates, which was not enabled on the tested unit's All Services Screen, allow the user to set up templates for document distribution of various types, including e-mail addresses, fax numbers and servers on the network. These allow the user to distribute documents to large groups simultaneously and via different methods. Job Flow Templates can also be associated with a mailbox, so every time a user sends a document to a mailbox, it is automatically distributed to the pre-programmed group.

Throughput Capabilities and Materials

Standard paper supply	Sources	4
	Total capacity	3,800 sheets
	Paper sizes	8-1/2" x 11" for the first and second drawers 5-1/2" x 7-1/2" to 13.0" to 19.2" for the third and fourth drawers
	Weights	16 lb. bond to 80 lb. cover
Bypass	Capacity	250 sheets
	Paper sizes	4" x 6" to 13.0" x 19.2"
	Weights	16 lb. bond to 140 lb. index
	Automatically detects paper and paper size?	Yes
Document feeder (standard DADF)	Capacity	250 sheets
	Paper sizes	5" x 8" to 11" x 17"
	Weights	16 lb. bond to 110 lb. index
Maximum paper supply	Sources	8
	Total capacity	8,225 sheets
	Paper sizes	4" x 6" to 13.0" x 19.2"
	Weights	16 lb. bond to 140 lb. index
Media types	Labels, transparencies, envelopes and tab extensions	





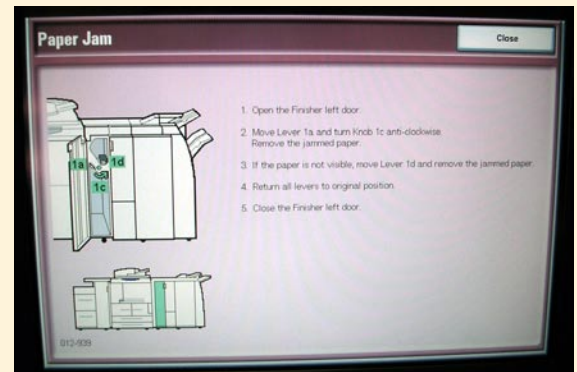
User Maintenance

Overall, adjusting the paper size in the 4590 is simple. Users can pull open the drawers without having to press any buttons when loading paper. The first and second drawers hold letter-size paper only, and drawers three and four are user-adjustable and are equipped with sliding width and length guides, which are preferred to removable guides that can be misplaced. The user must squeeze the width guide in order to slide it to the appropriate position within the drawer. In addition, a sensor in each drawer detects changes in paper sizes. The paper plate in the LCT automatically lowers when users open the drawer. The bypass tray is intelligent, as it detects when paper has been loaded and registers the paper size, leaving users to simply confirm the auto detect mode default setting.

The procedures for clearing misfeeds are simple. When a misfeed occurs, graphical and text-based information on the control panel walk the user through the process of removing the misfed sheets section by section, starting with the finisher. The user must complete all of the steps on the screen, including closing the corresponding door, before the display clears and moves to the next problem area. However, some sections are numbered the same, so the user may need to check the display for instructions. The last section the user is instructed to clear is the main body of the device.



Misfeed Access Areas

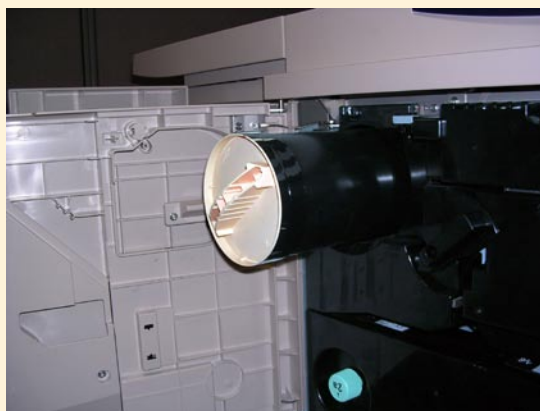


Graphical and text-based information appears on the control panel when a misfeed occurs.





The procedures for replacing toner on this unit are simple and clean. The user can load toner while the device is running, as the toner reservoir holds enough toner to output approximately 5,000 impressions and the toner is housed separately from the main body of the device. The cartridge has to be unlocked and turned to be replaced, which is clearly marked on the door.



Replacing toner on the 4590 is simple and clean. In addition, users can load toner while the unit is running.

Print Drivers

A Xerox network print controller that supports Adobe PostScript 3 and PCL 5e/6 printing, and includes scanning capability, is standard. The controller offers a 750-MHz processor and shares the 512 MB of memory and 40-GB hard drive with the copier.

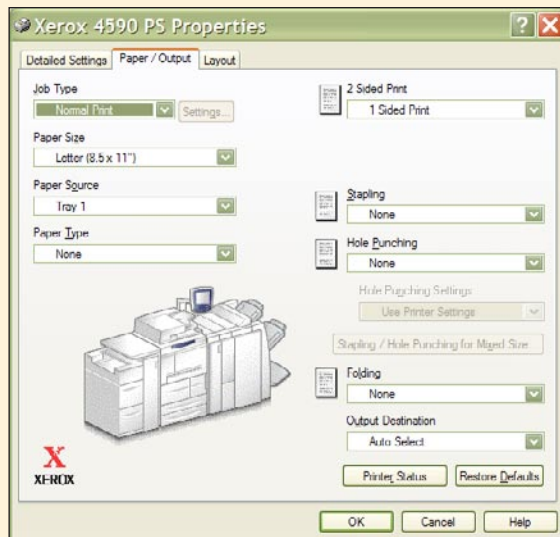
Overall, ease of use from the print drivers is very good. Both the Adobe PostScript 3 driver and PCL 6 driver of the print controller automatically detect and display the device's configuration, eliminating the need for the administrator to manually specify this information. In addition, both the Adobe PostScript 3 and PCL drivers are graphical and easy to use. The features offered on both drivers are similar but the drivers have slightly different layouts. For example, two of three tabs in the Adobe PostScript 3 print driver, which was used in the field test, are graphical, as the user makes selections within each tab using either check boxes or pull-down menus; the third, the Detailed Settings tab, is text based. Further, only some of the features required to program a typical print job are located on the Paper/Output tab of the Adobe PostScript 3 print driver, including paper source, duplex and staple. In order to select quantity and collate, the user must select the Detailed Settings tab. In contrast, all PCL 6 tabs are graphical. The PCL 6 driver offers a selection



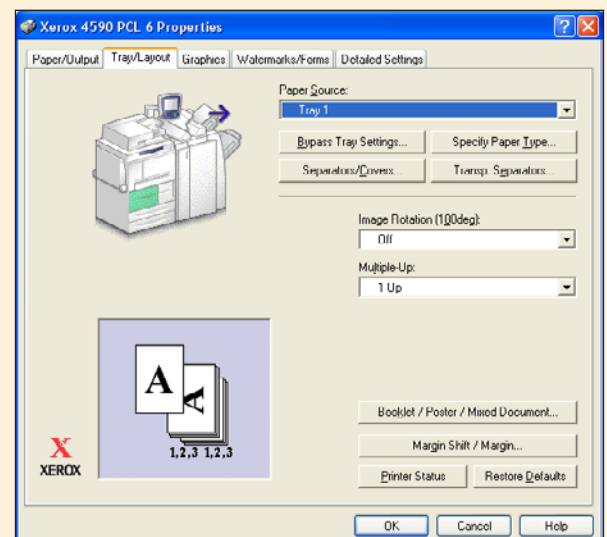


for quantity on the main tab, but not a selection for paper source, which is found on the Tray/Layout tab. While the PCL 6 print driver enables users to point and click on a graphical image of the device to select various job settings, the Adobe PostScript 3 print driver does not. However, the Adobe PostScript 3 print driver does display a graphical image of the document settings, including staple, hole-punch and booklet mode. Both the Adobe PostScript 3 and PCL 6 print drivers offer consumables feedback, such as printer status and paper gauge, but no toner gauge. Selections for finishing options from the Adobe PostScript 3 print driver are available when users select the Layout tab. BLI technicians found booklet programming from the Layout tab to be very easy.

Advanced features available in the Adobe PostScript 3 print driver include secure print, sample print and delayed print. The PCL 6 print driver also offers advanced features such as secure print, scheduled print and proof print, as well as Mailbox Print, which allows the user to store the electronic file in one of the 500 mailboxes on the device. When the unit is fully configured, the user is able to select up to three paper sources from the Adobe PostScript 3 print driver for a single print job to insert front and back covers, but only two sources when “separators” are selected. In addition, users can select up to four paper sources from the PCL 6 print driver for a single print job, so that different paper could be used for the front cover, back cover and inserts.



Paper/Output Tab of the Adobe PostScript 3 Print Driver



The PCL 6 print driver enables users to point and click on a graphical image of the device to select various job settings.





- ▲ Copy Productivity ★ ★ ★ ★
- First-copy time ★ ★ ★ ★
- Copy efficiency ★ ★ ★ ★

First-Copy Time

The 4590's first-copy times from both the platen and document feeder are competitive for similarly equipped models tested to date, at 5.3 seconds and 6.3 seconds, respectively.

First-copy time measures the time it takes for the first copy to be produced after the Start button is pressed. The test is conducted using BLI's test original with 6% page coverage, using normal contrast and standard resolution and with all auto features off.

Copy Efficiency

The 4590's copy efficiency is competitive for similarly equipped models tested to date in all three modes tested, at 78.8% in 1:1 mode, 71.2% in 1:2 mode and 79.2% in 2:2 mode.

BLI tests a unit's copy efficiency (the percentage of the rated speed at which the unit operates when producing real-world jobs) by making one, five, 10 and 20 sets of a 10-page document in three copy modes: 1:1, 1:2 and 2:2. BLI obtains the overall efficiency for each copy mode by averaging the efficiency ratings (derived by dividing the tested speed of the device by the rated speed and then multiplying by 100) for each run length. The closer the rate is to 100%, or if it exceeds 100%, the more efficient the unit.

Booklet Copy

BLI technicians found the procedures for programming booklet copies from the control panel to be good overall. Six keystrokes are required to program a booklet copy job. The correct paper size and copy mode are automatically selected. However, step-by-step instructions are not available to guide users. The unit's efficiency when producing 30 sets of a 16-page document output in booklet mode is competitive among similarly equipped models, at 73.1%. It completed the job in seven minutes and 17.75 seconds, running at 65.8 cpm. The closer the efficiency rate is to 100%, or if it exceeds 100%, the more efficient the unit.





- ▲ **Print Productivity** ★★★★★
- Print efficiency ★★★★★
- Job stream ★★★★★

Print Efficiency

The 4590's print efficiency is competitive for similarly equipped models tested to date in simplex mode, at 64.9%. However, the unit's print efficiency is below average for the group in duplex mode, at 60.2%.

BLI tests a unit's print efficiency by printing one and 20 sets of a 10-page document. Print jobs are sent using the Adobe PostScript 3 driver at 600-dpi resolution. BLI obtains the overall efficiency for each print mode by averaging the efficiency ratings (derived by dividing the tested speed of the device by the rated speed and then multiplying by 100) for each run length. The closer the rate is to 100%, or if it exceeds 100%, the more efficient the unit.

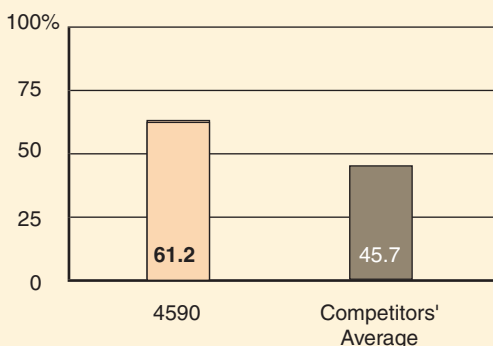
Booklet Print

BLI technicians found the procedures for printing booklets from the print driver very easy. To program booklets, the user selects the Layout tab, and then Booklet Creation, Booklet Output Size. The unit's efficiency when printing 30 sets of a 16-page Acrobat PDF file output in booklet mode from the Adobe PostScript 3 print driver is competitive among similarly equipped models, at 71.8%. It completed the job in seven minutes and 25.78 seconds, running at 64.6 ppm. The closer the efficiency rate is to 100%, or if it exceeds 100%, the more efficient the unit.

Job Stream

The 4590's efficiency rate when printing BLI's job stream is the highest for similarly equipped models tested to date, at 61.2%. The unit completed the job stream in 20.69 seconds, running at 55.1 ppm.

Job Stream Efficiency (in percent)





BLI's job stream includes Word documents, Outlook e-mail messages, Excel spreadsheets, PowerPoint, HTML and Acrobat PDF files. This test simulates the type of traffic a typical device might experience in a real-world, multi-user environment. All of the files are sent to the printer as a group, at which time the stopwatch begins; timing ends when the last page of the last file exits the device. Job stream efficiency is determined by the percentage of the rated speed at which the unit operates when producing real-world jobs. The closer the rate is to 100%, or if it exceeds 100%, the more efficient the unit.

▲ Image Quality



Copy

Black solids are rated very good. Copy density was competitive for 600-dpi multifunctional devices, although slight mottling was visible. Black text is also rated very good. Black halftone patterns and range are rated excellent. Grayscale was visible from 15% (which is the minimum coverage level of the original) to 100%, with minimal graininess and distinct change between levels. Line art was rated good, as lines were slightly broken and blended together.

Print

Black text was rated very good. Solids are rated very good, as print density is above average for 600-dpi multifunctional devices. However, some mottling was visible. Line art is rated good, as fine lines were choppy and broken. Black halftone patterns and range are also both rated good. Grayscale was evident from 1% to 95%, but the pattern was grainy.

Multitasking

Reserves

The number of copy jobs that can be programmed while a copy or print job is in progress is limited only by the memory of the device.

Interrupt

To pause a copy or print job in progress in order to perform an immediate copy job, the user selects the Interrupt hard key on the control panel and is able to access most





features required for a typical copy job, including the DADF, multiple sets, duplexing and finishing. During testing, this unit automatically returned to non-interrupted copy and print mode in approximately 59 seconds and restarted the job that was interrupted without user intervention. This would be beneficial in a networked environment where many jobs would likely be waiting in the queue. Some units do not automatically return to non-interrupted mode; others return to non-interrupted mode but do not restart the interrupted job until the Start key is pressed.

Other Features

Scan

The 4590 offers standard 600-dpi network scanning at 100 ipm in both simplex and duplex modes, according to Xerox. Users can scan to e-mail, desktop (though not via the Scan to PC Desktop software package that is available for the Xerox WorkCentre Pro 90 model), FTP, SMB, templates and job flow sheets. Scan to e-mail functionality includes LDAP support, which enables users to enter the first few characters of the recipient's address, upon which the device automatically searches a mail server on the network and displays a list of matching names. In addition, users can scan to 500 mailboxes/folders on the hard drive. Further, Automatic Job Flow Scanning enables users to simplify repetitive tasks by saving the settings of frequently used scan jobs for reuse. Users can also archive sensitive data using 14.6 GB of the hard drive for document storage.

The optional FreeFlow® SMARTsend® software digitizes scanned documents and then sends them to multiple preprogrammed destinations in a single scan. Destinations include e-mail addresses, network folders or FTP servers. SMARTsend can also convert documents into various file formats such as PDF and Excel files, and its OCR feature enables users to search printed documents by key words or phrases.

Security

Two types of authentication are available for the 4590: direct authentication and network authentication. Direct authentication uses the information stored in the machine to manage authentication. Network authentication uses user information from a remote account server to manage authentication. This allows the administrator to manage local access (copy, scan, mailbox, job flow templates and print) and remote access (via the CentreWare Web utility) to the unit. In addition, secure printing is standard with the network printing option, and requires users to enter a PIN at the device to release a scanned document. The optional Data Security Kit offers image overwrite and data encryption. With image overwrite, after each copy, print and scan job is completed, the area on the hard drive where data was stored is overwritten up to three times, ensuring against restoration or retrieval of

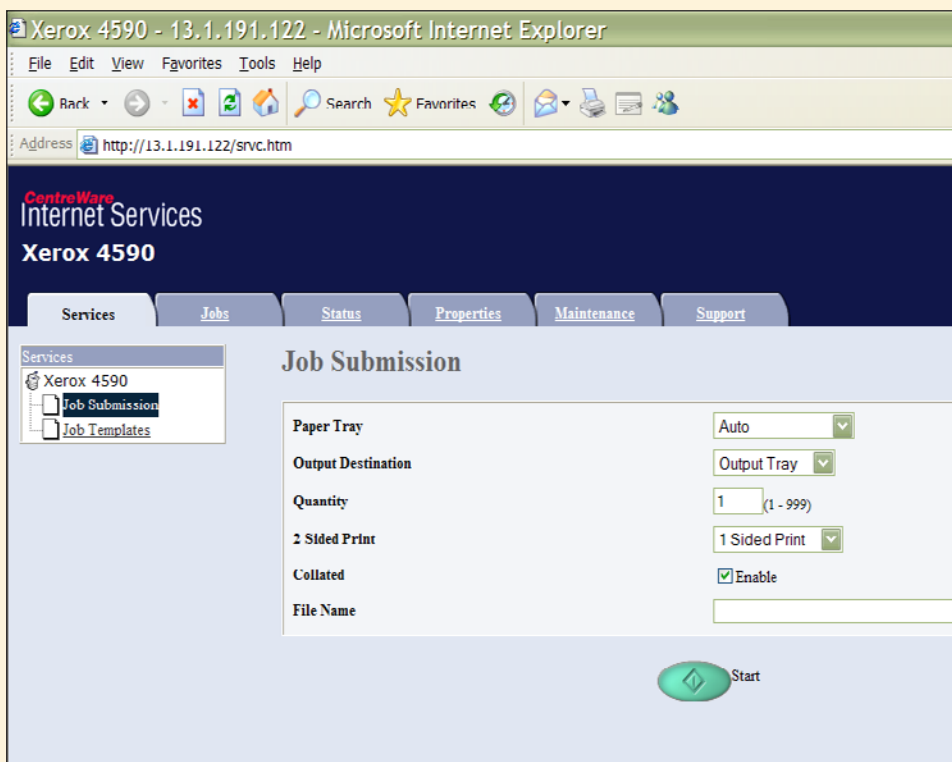




confidential data. With the data encryption feature, an administrator can enable the automatic encryption of all temporary or permanent jobs and settings data stored at the device.

Administrative Utilities

The 4590 offers a modified version of CentreWare workflow applications that have the same look and feel as the tools available for some other Xerox products. CentreWare Internet Services is a Web-based utility that allows users to view status of the device and the paper trays and consumables. Users can also access mailboxes remotely. Administrators can manage the device remotely, and can change settings of the device. For example, the administrator can change tray priorities and custom paper remotely. In addition, a job accounting kit enables administrators to keep track of who is accessing the device and the number and types of jobs processed.



The 4590's Web-based utility enables users to view status of the device and consumables.

(This report has been reprinted with the written permission of Buyers Laboratory Inc.)

