



Test Report

MULTIFUNCTIONAL PRODUCTS
Sharp AR-M280NB IMAGER
28 PPM/SEGMENT 2
Copier/Printer/Fax/Scanner



Test period duration:
Three months, including
a 240,000 -impression durability test



Manufacturer:

Sharp Document Solutions Company of America
Mahwah, NJ
Made in Japan

Serial number: 265077448

Suggested retail price: \$8,195; \$17,310 as tested with the saddle-stitch finisher (\$3,095), three-hole punch unit (\$695), duplex module (\$450), eight-bin mailbox (\$995), 5-GB hard disk (\$1,095), network scanner expansion kit (\$1,095), PostScript 3 (\$395) and fax expansion kit (\$1,295).

Type: Console, CCD duplexing single-pass digital scanner, laser imaging, bond sheet paper, dry toner, dual-component developing system, heat and pressure fusing multifunctional device with standard copy and PCL 5e/6 printing and optional network connectivity, fax and scan capabilities.

Manufacturer's recommended monthly volume: Up to 160,000 impressions.

BLI's recommended monthly volume for optimum performance: Up to 75,000 impressions.

GENERAL APPRAISAL

An outstanding overall performer in BLI's tests, the Sharp AR-M280NB IMAGER proved to be highly productive, reliable and very easy to use in BLI's three-month evaluation. Offering a PCL 5e/6 print controller and a network interface in its standard configuration, the Sharp AR-M280NB was tested with the optional PostScript 3 upgrade. A 28-ppm Segment 2 unit, the Sharp AR-M280NB IMAGER, proved to be highly reliable, requiring no service other than two scheduled PM visits during its 240,000-impression test, translating to a Mean Impressions Between Service (MIBS) of 120,000 impressions. And it misfed just five times during the three-month test period, for a misfeed rate of one per 48,000 impressions.

continued

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General Appraisal *continued*

In addition to reliability, the very-well-designed AR-M280NB IMAGER displayed a number of strengths in testing. Chief among them is its strong productivity. While its overall efficiency rates are competitive in simplex copy mode, they are above average in the 1:2 duplex copy mode, well-above-average in the 2:2 duplex copy mode and well-above average in both simplex and duplex print modes. Moreover, its first-print-out (raster) time for the Word document used in the tests is faster than that of most Segment 2 models tested and raster times for all the other file types used in the tests were also good. First-copy times, at 8.9 seconds from the platen and 8.3 seconds from the document feeder, are competitive.

Contributing to its good overall productivity is its duplexing single-pass document feeder, which has dual scan heads to simultaneously scan both sides of an original in a single pass, resulting in very fast document feeding speeds of 46.8 originals in simplex mode, 46.2 originals per minute in 1:2 duplex mode and 30.3 originals (or 60.6 images) a minute in 2:2 mode. In addition, the document feeder provides a very short, straight paper path and resulted in noticeably quiet operation.

The test unit also produced output that received BLI's highest image quality rating for all types of output (text, line art, halftones and solids) in both print and copy modes and was very easy to use, with a very-well-designed touch-screen control panel that enables intuitive programming of copy, fax and scan jobs, provides good information on the status of jobs in queue and allows users to move jobs ahead in the queue. And in addition to providing the status of copy and print jobs in queue, a separate queue that lists scan, e-mail and fax jobs,

along with details on each, is also provided. In addition, a menu map can be printed from the control panel to help users locate desired settings. Contributing to its good overall ease of use are simple procedures for loading paper, replacing the toner cartridge, adjusting paper drawers for different sizes and removing misfeeds.

Another positive observation regarding ease of use of the AR-M280NB IMAGER observed in the tests is the excellent feedback to end users that is provided. The feedback includes device configuration information and paper supply and size status directly from the driver, visible to users from the Windows print screen at the point of need when sending the job, pop-up device status messages and job completion notification, audible alerts, as well as icon alerts on the toolbar to indicate when the unit needs attention. Moreover, e-mail alerts can be sent to various individuals upon the occurrence of certain conditions, which can be different for each individual. The unit's tested toner yield is also above-average for Segment 2 units tested.

The Sharp AR-M280NB IMAGER also offers excellent multitasking capabilities, enabling the programming ahead of an unlimited number of copy jobs while another copy or print job is in progress. In contrast, most other Segment 2 units tested do not offer the ability to program any copy jobs ahead and the minority that do are limited to a set number that usually does not exceed five. Adding to its flexibility is its ability to be simultaneously configured with both a saddle-stitch finisher and an eight-bin mailbox, as was the case in BLI's test. Also offered is a two-tray finisher.

continued

General Appraisal *continued*

Connectivity

While the Sharp AR-M280NB comes standard with PCL 5e/6 print capability and a network interface, the test unit was configured with the optional PostScript option and provided excellent overall print performance, including the already mentioned strong print productivity, efficient processing of all file types used in the tests and good print quality. Moreover, BLI test technicians observed that network configuration and installation of the drivers and utilities were highly automated procedures. Once installed, the drivers automatically detect configured accessories and display them on the driver, eliminating the need for an administrator to specify the information. Moreover, the graphical drivers are very well-designed and easy to use. Indeed, they are among the best seen to date in testing by BLI.

Performance of the Sharp AR-M280NB IMAGER as a scanner that can send hard-copy documents to destinations that include e-mail addresses, users' desktops, an FTP server and fax destinations, was also good. Bundled software allows administrators to easily set up the system for scanning on the network, while scan destinations can easily be programmed remotely via the Web utility or entered on the fly at the control panel via the QWERTY keypad. The bundled Sharpdesk software includes an OCR component that performed very well in the tests and allows users to view, print, store and sort scanned images, as well as manipulate them using features such as zoom, rotate, auto straighten, auto trim, drawing tools and stamps. The Sharp AR-M280NB IMAGER also provided good performance overall as a 33.6-Kbps fax, with a fast tested scan-to-memory speed,

simple programming procedures and good procedures for transmitting from memory when the size of the file exceeds memory capacity.

Shortcomings

BLI test technicians could find only a few minor shortcomings of the Sharp AR-M280NB IMAGER: 1) While it won't be an issue if the unit is configured with additional optional fax memory, transmitting from memory when the size of the file exceeds memory capacity was rated "Poor," as the unit automatically transmits the pages stored in memory. The remaining pages will have to be transmitted in a separate transmission, requiring an additional phone call. 2) Although it's expandable to a competitive 3,100 sheets, the unit's standard 500-sheet paper capacity is lower than that of most competitors in this range, and the unit lacks a cover mode. 2) While comprehensive, the documentation was rated "Fair," as most of the manuals lacked indexes.

Pricing Analysis And Summary

BLI's retail pricing analysis reveals that the Sharp AR-M280NB IMAGER is priced higher than the average for units in the 23- to 33-ppm range. Cost per page for supplies could not be evaluated as pricing is determined by individual dealers and an estimated price was not provided by Sharp. Based on its outstanding overall performance in the tests, which clearly shows it to be at the head of its class, the Sharp AR-M280NB IMAGER is highly recommended by BLI for offices in need of a multifunctional product with copy, print, scan and fax functions for monthly volumes of up to 75,000 impressions.

continued

General Appraisal *continued*

Copy Quality:

Text: **Good**
Line art: **Good**
Halftones: **Good**
Solids: **Good**

Print Quality:

Text: **Good**
Line art: **Good**
Halftones: **Good**
Solids: **Good**

Ease of use: **Good**

Ease of maintenance: **Good**

Estimated waste: **Low**

Estimated downtime: **Low**

Misfeeds: **5**

Misfeed rate: **1 per 48,000 impressions**

**Total service calls
(including PMs):** **2**

MIBF: **Not applicable**

MIBS: **120,000 impressions**

Toner yield: **30,553 impressions
(at 6% coverage)**

TEST RESULTS AND OBSERVATIONS

Test equipment: BLI's dedicated test network, consisting of Windows NT 4.0 servers, Microsoft Exchange server, Windows 98, 2000 and XP workstations, 10BaseT/100BaseTX network switches and CAT5 cabling.

Reliability

PMs/Malfunctions	Service Required	Meter Count (Impressions)	Impressions Between Service
Meter count (beginning of test)		0	
PM	Performed PM	83,509	
PM	Performed PM	160,400	76,891
End of test period		240,000	
Total Misfeeds/Misfeed Rate	5 / 1 misfeed per 48,000 impressions		
Service Calls	0		
PMs	2		
Total Service Calls (including PMs)	2		
M.I.B.F. ¹	Not applicable		
M.I.B.S. ²	120,000		
¹ Mean Impressions Between Failures (To obtain this number, BLI divides the total number of impressions produced during the test period by the number of service calls required. In actuality, it reflects the average number of impressions produced without a malfunction.)			
² Mean Impressions Between Service (To obtain this number, BLI divides the total number of impressions produced during the test period by the number of service calls, including preventive maintenance calls, required. In actuality, it reflects the average number of impressions produced without a service call.)			

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TEST RESULTS AND OBSERVATIONS *continued*

Maintenance

The organic drum, cleaning blade and developer are service-replaceable and are each expected to last for 80,000 impressions. The upper and lower fuser rollers each have an expected life of 160,000 impressions and are replaced by service. PMs are performed every 80,000 impressions. (Unless otherwise noted, all the above consumables that would normally be replaced during the course of this test met or exceeded the life expectancy specified by the vendor.)

User-Replaceable Consumables

Toner cartridge: Priced by dealer. Manufacturer's rated yield, 27,000 pages at 6% page coverage.

Ease of replacing toner cartridge: Good. The user must first open the front cover, lower the cartridge latching mechanism and then slide the toner cartridge out of the machine. Although the user must remove the sealing tape from the new cartridge before installing it, replacing the toner cartridge was an easy and clean procedure.

Toner replacement possible during a print/copy run: No.

TESTED TONER YIELD/ COST PER PAGE

Toner Yield (Impressions)	Impressions Per Gram
30,553	39.6
Toner Cost Per Page	Supplies Cost Per Page*
1.085¢	1.302¢*

Toner cartridge net weight: 771.4 grams.

* Cost per page for toner and supplies could not be calculated since pricing is set by the dealer and was not provided by Sharp.

Ease of Operation

Documentation: Fair. Seven printed manuals were included when configured as tested (one copying operation manual, one printer operation and general information manual, one network scanner manual, one operation manual for facsimile, one key operator's guide, one operation manual titled "Read this document before installing this product," which includes instructions for adding toner and a listing of the other manuals and their purpose) and one network scanner expansion kit manual, which includes the license keys for the scan software. Also included are four CD-ROMs (one for the printer utilities, one for the printer server card, one for the PostScript 3 printer expansion kit and one for the scanner utilities). Although comprehensive information is provided, most of the manuals do not offer a table of contents and they lack indexes.



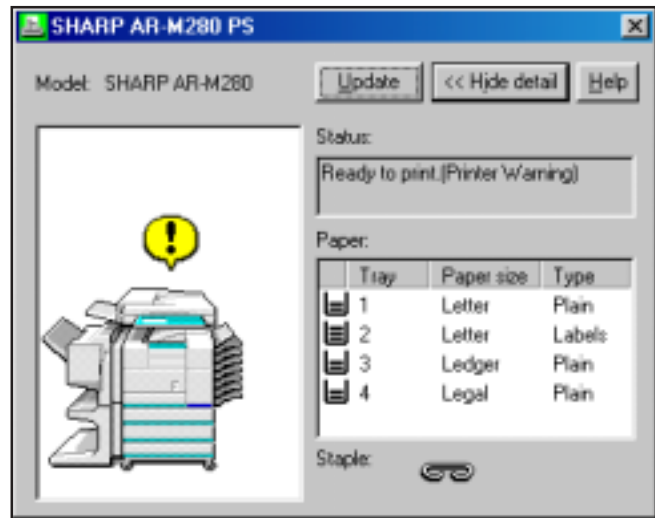
Sharp AR-M280NB IMAGER Control Panel

TEST RESULTS AND OBSERVATIONS *continued*

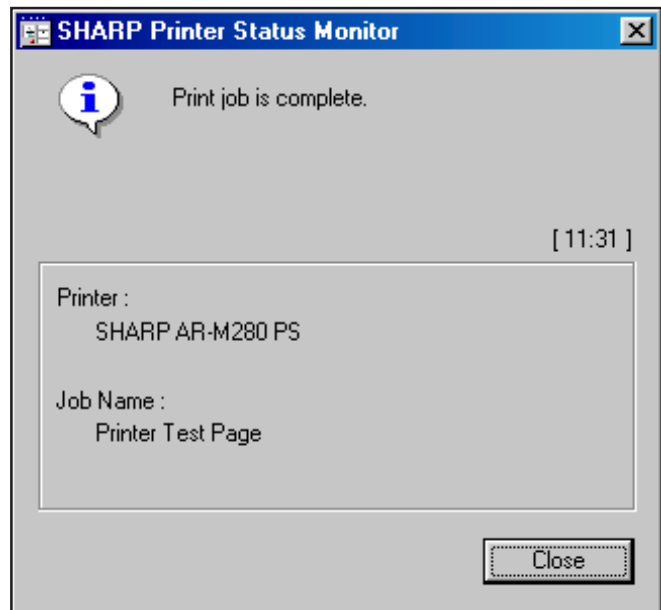
Ease of use Good. The 6-1/8" x 2-3/8" touch-sensitive LCD control panel, which is adjustable for brightness, was very intuitive, with very clear, easy-to-read text. Separate hard keys are used to select job status information and for copy, scan and print menus that were easy to navigate for programming and usage. Programming/entering e-mail addresses was also easy using the QWERTY touch-screen keypad. Installation of the device on a network and setup of the drivers is highly automated and the drivers are very easy to use.

Control panel status messages/Job access: A print job status display on the control panel displays all the print and copy jobs in the machine's queue in groups of five at a time (the user can scroll down to view more jobs in increments of five jobs per screen), indicating the originator of the print job, the time and date the job was sent, the paper size selected, the number of pages and the job status ("Printing" or "Waiting"). A separate queue is also maintained for scan to e-mail, Internet fax and walk-up fax jobs, along with the status and current progress of each job (e.g., e-mail address, start time, page(s) and status), which is very rare for multifunctional units, particularly in this range. A walk-up user can use the "stop/delete" key to stop or delete any job in the print queue (i.e., there are no security requirements). Any copy or print job residing in the machine's job queue can be prioritized to be printed immediately after completion of the current job.

Feedback to PC workstations: Good. End users can receive pop-up messages and audible alerts from the Printer Status Monitor utility. When an error occurs, the icon in the system tray changes in color from green to red to prompt the user for attention. See "Networking and connectivity" under "Performance of Printer Functions." In addition, the system can be set up to automatically send e-mail alerts to various individuals (e.g., a key operator, dealer or service technician) upon the occurrence of certain conditions, which can be different for each individual.



Printer Status Monitor Machine Status Details



Print Job Status Screen

TEST RESULTS AND OBSERVATIONS *continued*

Pop-up status/error messages: Yes.

Audible alerts: Yes.

Icon alerts: Yes.

Device status: Yes, via pop-up messages (off-line, paper jam, toner low, toner empty, paper empty, cover open, printer error and paper low) and via audible messages.

Print job status: Pop-up job completion notification.

Paper supply gauge from driver/utility/Web: Yes/Yes/No. Each paper source indicates the approximate amount of paper in the drawer.

Paper size status from driver/utility/Web: Yes/Yes/No.

Always-on-top status information: No.

Ease of removing misfeeds: Good. Non-clamshell design; 14 misfeed locations, including the finisher.

Ease of loading paper: Good.

Ease of adjusting paper drawers: Good.

Auto paper-size detection: Yes.

Operator error: None.

Throughput Capabilities/Materials

Paper output: Tested with optional saddle-stitch finisher. All output is face down and in correct page order to either tray.

Ability to process self-adhesive address labels: Avery #5351 labels performed satisfactorily in the tests. Labels can be run from the bypass tray and tray two only, both of which are optional, and must be output to the top output tray of the mailbin stacker.

Ability to process transparencies: 3M-PP2500 clear transparencies performed satisfactorily in the tests. Transparencies can be run from the bypass and tray two only, both of which are optional.

Ability to process envelopes: The Sharp AR-M280NB can copy and print onto envelopes, which can be fed through the multipurpose drawer.

SHARP AR-M280NB MULTITASKING EVALUATION						
Secondary Function Primary Function	SEND FAX	SEND E-MAIL	RECEIVE FAX	PRINT	SCAN	COPY
SEND FAX	Yes	Yes	No ¹	Yes	Yes	Yes
SEND E-MAIL	Yes	Yes	Yes	Yes	Yes	Yes
RECEIVE FAX	Yes	Yes	No ¹	Yes	Yes	Yes
PRINT	Yes	Yes	Yes	Yes	Yes	Yes
SCAN	Yes	Yes	Yes	Yes	Yes	Yes
COPY	Yes	Yes	Yes	Yes	Yes	Yes

¹ The phone line is busy with primary function. (2)

NOTE: (X) indicates number of occurrences.

A "Yes" indicates that the user can initiate the secondary function while the primary function is taking place and that no further user intervention will be required for the secondary function to take place.

Multitasking (More Than Two Functions/Jobs)

Note: In addition to a single-user multitasking test, which evaluates a unit's ability to initiate or perform one function while another function is already in progress (see chart above), BLI also tests a multifunctional product's ability to handle multiple jobs that would be likely to stack up in a multi-user networked environment. Depending on the number of different functions, three to six different job matrixes are run on each multifunctional device. The job streams within each matrix are designed to test not only for concurrent operation of various functions, but also to uncover peculiarities pertaining to multitasking as it relates to various software programs (Adobe Acrobat, Adobe PageMaker, Microsoft Word 2000, Microsoft Excel and PowerPoint), paper sizes, copy/print job sizes and copy/print modes (e.g.,

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TEST RESULTS AND OBSERVATIONS *continued*

simplex, duplex, finishing).

Mode priority: Copy mode is the default mode for the control panel for walk-up users. Print and copy jobs are handled in the order in which they are received. It should also be noted that a walk-up user can prioritize jobs by moving them ahead of other jobs in the copy/print queue.

Interrupt: A copy or print job can be interrupted using the "Interrupt" key (found in the touch-sensitive copier menu) to perform a copy job using all machine features. The interrupted job immediately resumes after completion of the copy job.

Memory allocation: Copier and printer memory is shared; fax memory is separate. The number of jobs that can reside on the device is limited only by memory capacity and disk size. Any copy or print job residing in the machine's job queue can be prioritized to be printed immediately after completion of the current job. Scan jobs are immediately processed.

While the standard fax memory is 2 MB, the unit was tested with an additional 8 MB of optional memory, increasing the fax memory to 10 MB.

Program ahead (reserve copy job) while copying: Yes. In testing, BLI technicians found that multiple jobs, limited only by memory capacity, can be programmed and reserved while another job is being copied. Scan jobs are immediately processed.

Program ahead (reserve copy job) while printing: Yes. Multiple copy jobs, limited only memory capacity, can be programmed while a print job is in progress. Scan jobs are immediately processed.

Device/feature contention issues: None.

Performance of Copier Functions **Copy Quality**

Density of solid black copied image (based on eight readings corresponding to eight different locations on the original):

Density of original: Range, 1.71 to 1.77 (on a scale of 0 to 2.5, with 2.5 being as dark as would be possible under most circumstances).

Density of copy: Range, 1.35 to 1.40 (on a scale of 0 to 2.5, with 2.5 being as dark as would be possible under most circumstances).

Density range for copiers tested to date: 0.96 to 1.63.

Copy quality:

Text: Good

Line art: Good

Halftones: Good

Solids: Good

Copier Productivity

Copying speed (8-1/2" x 11" copies):

First-copy time from the platen (times were the same regardless of the automatic modes selected): 8.9 seconds.

First-copy time from the document feeder (times were the same regardless of the automatic modes selected): 8.3 seconds.

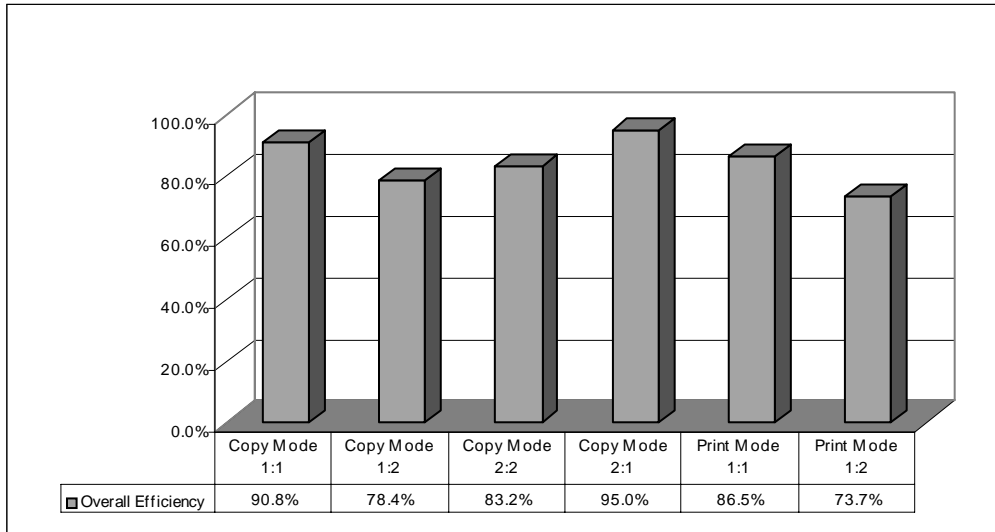
TEST RESULTS AND OBSERVATIONS *continued***COPY/PRINT EFFICIENCY FOR 1, 5, 10 AND 20 SETS**

Copy 1:1					
Sets	Min.	Sec.	PPM	Efficiency	Overall Efficiency
1	0	27.7	21.7	77.4%	77.4%
5	1	55.7	25.9	92.6%	85.0%
10	3	43.31	26.9	96.0%	88.6%
20	7	20	27.3	97.4%	90.8%
Copy 1:2					
Sets	Min.	Sec.	PPM	Efficiency	Overall Efficiency
1	0	29.7	20.2	72.2%	72.2%
5	2	14.8	22.3	79.5%	75.8%
10	4	26.2	22.5	80.5%	77.4%
20	8	45.9	22.8	81.5%	78.4%
Copy 2:2					
Sets	Min.	Sec.	PPM	Efficiency	Overall Efficiency
1	0	50.3	23.9	85.2%	85.2%
5	4	22.1	22.9	81.8%	83.5%
10	8	38.4	23.1	82.7%	83.2%
20	17	9.8	23.3	83.2%	83.2%
Copy 2:1					
Sets	Min.	Sec.	PPM	Efficiency	Overall Efficiency
1	0	49.9	24.0	85.9%	85.9%
5	3	41.8	27.1	96.6%	91.2%
10	7	15.6	27.5	98.4%	93.6%
20	14	23.2	27.8	99.3%	95.0%
Print 1:1					
Sets	Min.	Sec.	PPM	Efficiency	Overall Efficiency
1	0	33.55	17.9	63.9%	63.9%
5	1	59	25.2	90.0%	77.0%
10	3	46.28	26.5	94.7%	82.9%
20	7	19.82	27.3	97.4%	86.5%
Print 1:2					
Sets	Min.	Sec.	PPM	Efficiency	Overall Efficiency
1	0	36.92	16.3	58.0%	58.0%
5	2	20.42	21.4	76.3%	67.2%
10	4	30.18	22.2	79.3%	71.2%
20	8	48.18	22.7	81.1%	73.7%
Efficiency is tested using a 10-page document. In print mode, jobs are sent using the PostScript driver at 600-dpi resolution.					

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TEST RESULTS AND OBSERVATIONS *continued*

OVERALL COPY/PRINT EFFICIENCY



BLI obtains the overall efficiency for each copy/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.

Performance of Printer Functions

General: The Sharp AR-M280NB was tested as a network printer using the standard 10/100BaseT Ethernet network interface.

Print Quality

Text: Good

Line art: Good

Halftones: Good

Solids: Good

Density of solid black printed image (based on four readings corresponding to four different locations on the original): Range, 1.28 to 1.34 (on a scale of 0 to 2.5, with 2.5 being as dark as would be possible under most circumstances).

Density range for laser/LED printers tested to date: 1.00 to 1.67.

Applications compatibility (units are tested for compatibility with Microsoft Word 2000, Microsoft PowerPoint 2000, Adobe PageMaker 7.0, Adobe Photoshop 7.0 and Adobe Acrobat 5.0 using 25 application test files, which contain text, graphics, halftone images, tables, etc., enabling BLI technicians to evaluate memory usage, file processing, font-rendering and grayscale capability): Good.

Print drivers: Configured as tested with the optional PostScript 3 kit, the Sharp AR-M280NB included PCL 5e, PCL 6 and PostScript 3-compatible print drivers for Windows 95/98, 2000, NT 4.0, Me and Windows XP Professional. Support is also provided for Mac OS 8.5 through 9.1. The print drivers tested (for Windows 98 and XP) were well-designed and easy to use. They are all very similar in layout and appearance and include all the features necessary for most typical jobs selectable from the main screen. Moreover, the device's configuration is automatically detected and fed back to workstations through the print drivers, with-

TEST RESULTS AND OBSERVATIONS *continued*

out an administrator having to manually specify this information. In addition to offering selections for secure printing and the ability to save frequently used settings, the drivers feature a paper gauge that lets users know how much paper is available, toner-save mode, the ability to assign a user name and password for management/tracking purposes,

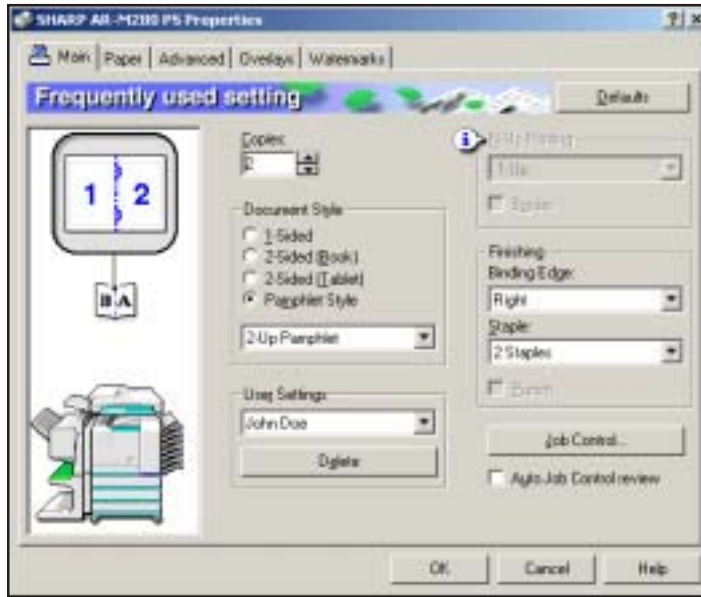
margin shift and a selection to be notified of job completion via pop-up messaging. Any differences in functionality are highlighted below.

SHARP AR-M280NB PRINT DRIVER FEATURES

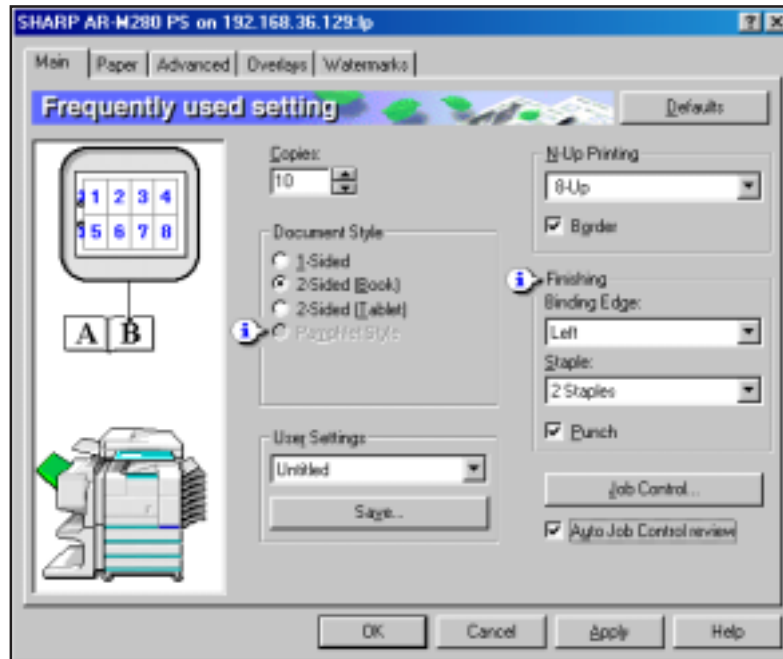
Features	Windows 98 PCL 5e	Windows 98 PCL 6	Windows 98 PostScript 3	Windows XP PCL 5e	Windows XP PCL 6	Windows XP PostScript 3
Auto Feature/ Device Detection	Yes	Yes	Yes	Yes	Yes	Yes
Booklet Printing	Yes	Yes	Yes	Yes	Yes	Yes
Collate Sets	Yes*	Yes*	Yes*	Yes*	Yes*	Yes*
Max Paper Sources Per Job	2**	2**	2**	2**	2**	2**
Mirror Image	No	No	Yes	No	No	Yes
Negative Image	No	No	Yes	No	No	Yes
N-up Printing	2 to 8	2 to 8	2 to 8	2 to 8	2 to 8	2 to 8
Overlays	Yes	Yes	Yes	Yes	Yes	Yes
Paper Gauge	Yes	Yes	Yes	Yes	Yes	Yes
Print and Hold	Yes	Yes	Yes	Yes	Yes	Yes
Proof Print	Yes	Yes	Yes	Yes	Yes	Yes
Quantity Selection	Up to 999	Up to 999	Up to 999	Up to 999	Up to 999	Up to 999
Reduction/ Enlargement	Auto	Auto	Auto	Auto	Auto	Auto
Resolution Modes	300 x 300 600 x 600 dpi	300 x 300 600 x 600 dpi	600 x 600 dpi	300 x 300 600 x 600 dpi	300 x 300 600 x 600 dpi	600 x 600 dpi
Save settings	Yes	Yes	Yes	Yes	Yes	Yes
Secure Printing	Yes	Yes	Yes	Yes	Yes	Yes
Watermarks/ Custom Watermarks	Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes

*Although there is no selection for collation, multiple sets of a multiple-page job are automatically collated.

TEST RESULTS AND OBSERVATIONS *continued*



Windows XP Professional PostScript 3 Print Driver



Main PostScript 3 Print Driver For Windows 98

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TEST RESULTS AND OBSERVATIONS *continued*

Send once/print many: Yes. Multiple sets of a multiple-page document are automatically collated, eliminating the need for a “collate” selection in the print driver.

Simultaneous RIP and print: Yes. The unit demonstrated simultaneous RIP-and-print capability in testing and was able to store multiple files. In most cases the engine runs continuously with no slowdown between jobs.

Print Productivity

TESTED RASTER TIMES / PRINT SPEEDS

Windows 2000	Word	PageMaker	Photoshop	Acrobat	Photoshop
File Type	Text	Graphic/Text	Graphic	Graphic/Text	Graphic
File Extension	.DOC	.PM6	.TIF	.PDF	.JPG
Pre-Raster File Size	114 KB	116 KB	20 MB	426 KB	248 KB
Post-Raster File Size	26.5 KB	76.8 KB	52.2 MB	577 KB	1.20 MB
First-Page Time (Seconds)	11.36	14.53	92.79	18.77	15.6
Speed Excluding First Page (PPM)	27.97	28.12	27.80	27.88	27.96
Speed Including First Page (PPM)	25.94	25.58	16.27	24.61	24.98

Manufacturer's rated speed: 28 ppm.

All files are printed in a quantity equal to twice the manufacturer's rated speed for the device. The print speeds were tested at 600 dpi using the PostScript print driver.

First-page time indicates the time it took to RIP, image and deliver the first page of the test document set to the output tray.

Speed excluding first-page time indicates the time for printing the entire set of test originals, excluding first-page RIP and print times.

Speed including first-page time indicates the time for printing the entire set of test originals, including first-page RIP and print times.

Networking and connectivity: BLI technicians installed the Sharp AR-M280NB, configured with its standard PCL 5e/PCL 6 controller and network interface card and the PostScript 3 print option, on BLI's dedicated test network using a Windows NT 4.0 server and Microsoft Mail Exchange server. Network configuration, as well as installation of the print driver and administrative and monitoring utilities, was easier than with many network devices, as the four CD-ROMs include auto-install utilities that simplify installation of the programs.

Administrative utilities: Included utilities consist of the Printer Status Monitor, which is used to provide feedback to end users' workstations; SPrint2000, which is used for creation of the printer port; and an embedded Web utility (see “Web-based administration”).

Auto run for administrative utility/print driver installation:

Yes/Yes. When loading the utilities onto a workstation, they will automatically start upon startup of Windows. When loading the drivers from a CD, an autorun file on the CD starts the loading procedure for the install of the drivers.

Job log/accounting: Yes. Provided the unit is configured with the optional hard drive, the system allows for tracking of print usage.

Password protection/access rights: Yes. There are two levels of access rights—one for an administrator and one for users.

Document manipulation: No.

TEST RESULTS AND OBSERVATIONS *continued*

Automatic port creation: Yes, via the bundled SC-Print2000 printer installation program, which automatically locates Sharp output devices on the network.

Manipulate order of print jobs in queue/print priority levels: No, however, walk-up users can prioritize copy and print jobs via the control panel.

Network configuration from control panel/utility/Web: Yes/Yes/Yes.

Job status: Pop-up job completion notification.

Remote manipulation of device/print job settings: No/No.

Multiple device monitoring: Yes, via the Printer Status Monitor utility.

File downloading: No.

Consumables monitoring: None, however an e-mail can be sent to the admin, key operator and to the dealer.

Preview or thumbnail image of file: No.

Web-based administration: The embedded Web utility offers basic device status information such as a listing of current settings and error messages and allows NIC card setup and programming of destinations for scanning and for faxing.

Performance of Standalone Fax Functions

Fax scanning speed: The average scanning speed, obtained from scanning three originals using standard resolution and normal contrast settings; timing begins when the start key is pressed and continues until the last page exits onto the exit tray.

Fax scanning speed with 4% original: 2.03 seconds per page; range for fax machines tested to date 1.61 to 14.94 seconds.

Fax scanning speed with 12% original: 2.03 seconds per page; range for fax machines tested to date 1.61 to 26.11 seconds.

Memory capacity: The fax option for the Sharp AR-M280NB was equipped with 2 MB of standard dedicated fax memory (upgradable to 10 MB) which, in testing held 39 pages of a 12% original in standard mode (BLI uses a 12% original in determining memory capacity).

Transmitting after a failed communication: Good.

Transmitting when the size of the file exceeds memory capacity: Poor. When the size of the file exceeds memory capacity, the Sharp AR-M280NB transmits only the pages stored in memory. The additional pages remain in the document feeder and will have to be transmitted in a separate transmission requiring an additional phone call. In contrast, some units scan additional pages into memory as memory becomes available during the same transmission, eliminating the need for an additional phone call.

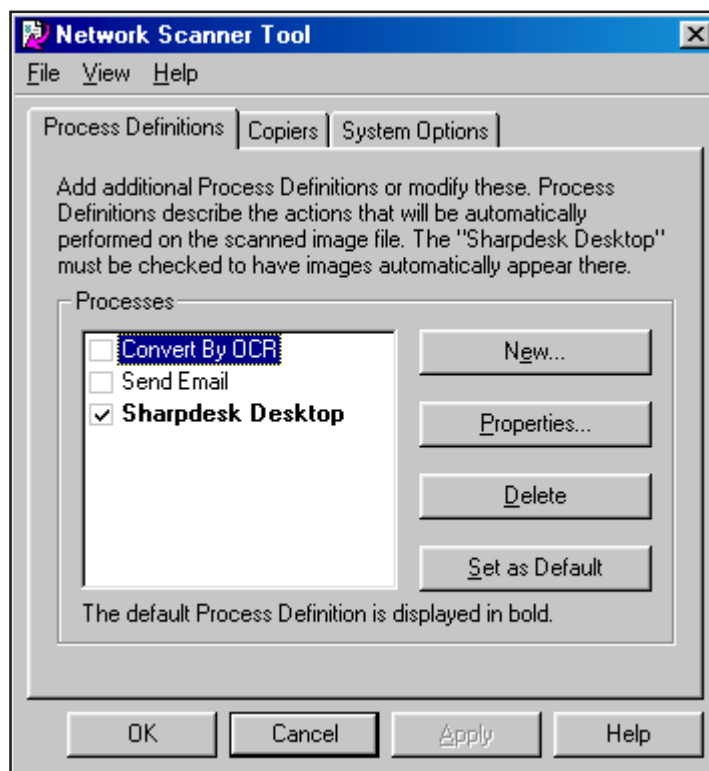
TEST RESULTS AND OBSERVATIONS *continued*

Performance of Scanner Functions

Configured as tested with the optional network scanner expansion kit, the Sharp AR-M280NB offers scan to desktop or FTP server, e-mail and Internet fax. Bundled with the scan option is the Network Scanner Tool utility and Sharpdesk software, which are contained on one CD-ROM.

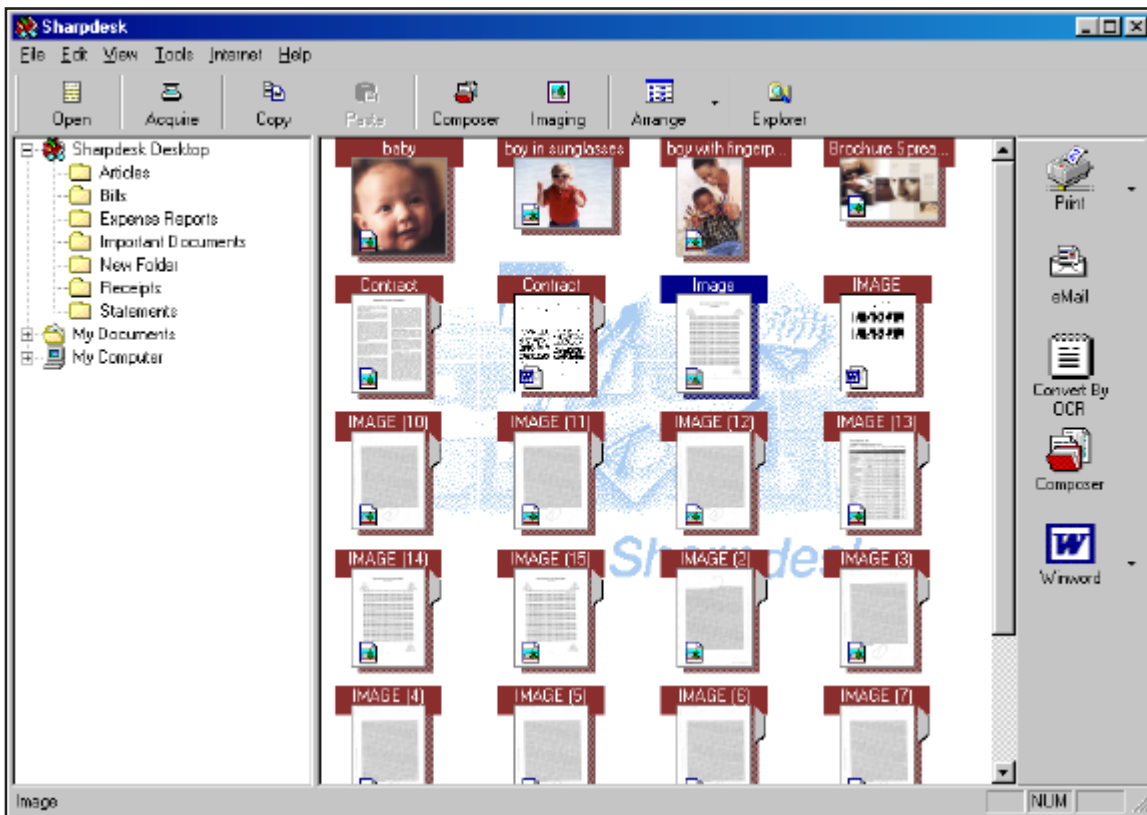
The Network Scanner Tool Configuration utility is used to configure the device(s) for scanning on the LAN, while Sharp's Web utility allows the creation of user-defined destinations for e-mail, desktop scanning, FTP server locations,

groups and fax destinations that upload to the Sharp AR-M280NB to appear as control panel choices. Destination attributes that are user-definable include image processing (despeckle, straighten, auto crop), convert by OCR (single column, multi-column, text and pictures, text only) and quality (letter, dot-matrix, degraded quality). Scan destinations can also be deleted and edited using the Web page.



Network Scanner Tool

TEST RESULTS AND OBSERVATIONS *continued*



SharpDesk

A scan destination is accessed by pressing the “Image Send” key on the control panel. One destination may be selected at a time (some devices allow for multiple). The user may either adjust settings via the scan menu’s touch-sensitive keys for “Exposure,” “Resolution,” Original Size” (auto, manual, two-sided and rotate 90 degrees) and “Format” (TIFF, TIFF-F, PDF, G3 and G4), or may simply select the “Address Directory” key and then choose from the preset addresses for e-mail, Internet fax, FTP or desktop destinations and press the “Start” key without changing any settings. The document is then scanned and transmitted over the network to the designated destination.

Sharpdesk software allows the user to view, print, copy, store, rename and delete images. Images can be sorted according to name, date, size or type. Drag-and-drop icons are used to print, e-mail, convert to OCR and view/open scanned images in common office application such as Imaging for Windows. The built-in viewer includes features such as zoom, remove dots, auto straighten, auto trim, auto sharpness, and rotate, as well as editing features such as drawing tools, touch-up filters and stamps. The software also allows combining of files of different types into a single document. One criticism noted was that the procedure for registering

TEST RESULTS AND OBSERVATIONS *continued*

for installation of the scanning software was found to be cumbersome, requiring entering the serial number of the device as well as a code on a label on the machine into a registration screen at a Web site, and then waiting approximately 15 minutes to receive licensing codes needed for the installation of the software.

OCR (Optical Character Recognition): Good. Documents are scanned and OCR'd using Sharpdesk Desktop software, which incorporates OCR, and automatically opened into the default application (e.g., Microsoft Word). A scan of the ITU-T Test Document #1 (also called the "Slerexe letter") produced no text errors and no formatting errors—results that are among the best for products tested to date.

PERFORMANCE OF TESTED SPECIAL FEATURES

Stored Job Functions

Satisfactory. When configured with the optional hard drive, users can send print jobs, which may be passcode-protected, to storage on the device, which can be output from the control panel. There is no provision for scanning jobs into storage on the device for later printout.

Duplexing Single-Pass Feeder

Satisfactory. The standard duplexing single-pass feeder (DSPF) will automatically scan both sides of a duplex original simultaneously when duplex copying is selected. The feeder holds up to 50 sheets ranging in size from 5-1/2" x 8-1/2" to 11" x 17". Acceptable paper weights, 15 to 34 lbs.

Document feeding speeds (8-1/2" x 11" originals; speeds were the same regardless of the automatic modes selected):

1:1 copy mode: 46.8 originals per minute.

1:2 copy mode: 46.2 originals per minute.

2:2 copy mode: 30.3 originals, or 60.6 images, per minute.

2:1 copy mode: 30.2 originals, or 60.4 images, per minute.

Duplexing

Satisfactory. The optional trayless duplex unit supports unlimited duplexing of sheets ranging in size from 8-1/2" x 11" to 11" x 17" and in weight from 16 to 28 lbs.

Saddle-Stitch Finisher

Satisfactory. The saddle-stitch finisher has two trays. The top tray will automatically offset each set and three-hole punch and/or staple sets in either copy or print mode. The lower tray is used for saddle-stitching and folding. The top offset tray holds up to 1,000 5-1/2" x 8-1/2" to 8-1/2" x 11" 20-lb. sheets or 500 sheets ranging in size from 8-1/2" x 14" to 11" x 17". The lower folding finisher tray holds 100 sheets and will fold and staple up to 10 sheets to make booklets of up to 40 pages. Acceptable paper weight for the top tray, 16 to 54 lbs.; acceptable paper weight for the lower tray, 17 to 34 lbs. Maximum stapling capacity, 50 sheets. Each sheet is automatically three-hole punched when exiting the machine.

ENVIRONMENTAL SPECIFICATIONS

Electrical system: 120 V, 60 Hz, AC, 12 amps. The unit tested had a three-wire cord (grounded), 6' and 7" in length, and carried UL approval for the United States and Canada.

Paper fault: None. (Georgia-Pacific Spectrum Xerographic Bond and Georgia-Pacific GeoCycle recycled paper containing 30% post-consumer fiber were used in this test unit.)

PHYSICAL SPECIFICATIONS

DIMENSIONS AND WEIGHTS

Copier/Accessories:	Height	Width	Depth	Weight
Unit	43-15/16"	32-17/32"	26-31/32"	215 lbs.
Saddle-Stitch Finisher	39-3/8"	28-9/32"	23-3/4"	86 lbs.

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8/03

BACKGROUND INFO

Dataquest Segment 1
 SRP (USA; Canada): \$4,995/\$4,995*; Info not avail
 Manufacturing Status: New
 Domestic Intro Date: August 2002/March 2003
 OEM: Sharp (Japan)
 Also Sold As: None

Distribution: Dealers
 Mfr's Rec Mo Vol: Up to 50,000 copies

TYPE

Monochrome copier, MF
 Configuration/Scanner: Console, digital
 Toner: Dry, dual component

GENERAL SPECIFICATIONS/PAPER HANDLING

First-Copy Time: 4.8 sec
 Multicopy (Ltr/Lgl/Ldgr): 20/12/10 cpm
 Warm-Up Time: 40 sec
 Std Paper Source(s): Dual drawer
 Std Paper Capacity: 500/500 sheets
 Paper Weights: 15 to 21 lbs
 Bypass/Paper Weights: 100-sheet/14 to 34 lbs
 Max Paper Sources/Capacity: 5/2,100 sheets
 Max Original Size: 11 x 17
 Min/Max Output Size: 5-1/2 x 8-1/2/11 x 17
 Scan/Copy Resolution: 400 x 400 dpi/600 x 600 dpi
 Std/Max Copier Memory: 16 MB/272 MB
 Duplex: Auto (1:2,2:2,2:1)
 Capacity/Paper Sizes: Unlimited/5-1/2 x 8-1/2 to 11 x 17
 Document Feeder: Std RSPF
 Speed/Capacity: 20 opm/40 orig
 Paper Weights: 15 to 23 lbs
 Sorter (Bins/Capacity): None
 Stapler Sorter: None
 Bins/Stapling Capacity: Not applicable
 Stapling Positions: Not applicable
 Finisher: Opt finisher
 Tray/Stapling/Position(s): 1,100/30/1
 Other: Std electronic sorting; std offset stacking; opt job separator tray; opt finisher has two trays (1,000/100)

CONTROL PANEL

Keypad
 Quantity Selector: 1 to 999 (0 to 9 keypad)
 Message Display: Yes
 Help Key: No

OPTIONS

500-sheet drawer: \$595
 Dual 500-sheet drawers: \$795
 Finisher: \$1,795
 Job separator: \$50

MAINTENANCE

Fuser Rollers: Two
 Yield: 150,000/300,000
 Cleaning Blades: Cleaning blade
 Yield: 50,000
 Other: Info not avail
 Yield: Info not avail
 Fuser Oil: Not required
 PM Schedule: 50,000

SUPPLIES

Photoconductor: Organic drum
 Yield: 50,000
 Price: Priced by dealer
 Toner: 745g ctrdg
 Yield: 25,000
 % Coverage: 6%
 Price: Priced by dealer
 Developer: 395g btl
 Yield: 50,000
 Price: Priced by dealer



COPIER FEATURES

Automatic Features: AES, AMS, APS, ASO, ATS
 Book Copy: Std Job Time: No
 Booklet Mode: Std Language: No
 Color: No Margin Shift: Yes
 Copy Control: 50 Neg/Pos: Yes
 Covers: No OHP Interleaving: No
 Editing: No Photo Mode: Yes
 Energy-Save: Yes Poster Mode: No
 Erase: No Preset R/E: 5R,5E
 Image Insert: No Program Ahead: No
 Image Overlay: No Sheet Insertion: No
 Image Repeat: Yes Stamping: No
 Image Rotate: Yes Timer: No
 Interrupt: Yes 2-in-1: Std
 Job Build: No XY Zoom: Yes
 Job Programs: 9 Zoom Range: 25 to 400 (1%)
 Other Features:
 Scan once, print many; 2-in-1, 4-in-1 modes

ADDITIONAL INFORMATION

Dimensions (H x W x D): 25.5" x 24.5" x 23"
 Weight: 92.2 lbs
 Power Requirements: 120 V, 12.5 A
 Dedicated Outlet: Not required
 Energy Star-Compliant: No
 Operating Noise Level: 66 dB

COMMENTS

*The AR-M208N features an updated driver that allows for duplex printing. This upgrade is available for the AR-M208 through local authorized dealers

Info not avail = Info not provided by MFR. Specs were obtained from manufacturer/distributor and not confirmed by BLI testing.
 (FAD IMAGE #12562)

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MULTIFUNCTION MODES

<i>Copier:</i>	Std	<i>Fax:</i>	Opt
<i>Internet Fax:</i>	No	<i>Network Fax:</i>	No
<i>Network Printer:</i>	Opt	<i>PC Fax:</i>	No
<i>Printer:</i>	Std	<i>Scanner:</i>	Opt

CONNECTIVITY SPECIFICATIONS

<i>Operating System Support:</i>	Mac 8.51, UNIX, Win 9x, NT 4.0,*
<i>Parallel Interface:</i>	Std
PC Fax/Print/Scan:	No/Yes/No
<i>Serial Interface:</i>	None
PC Fax/Print/Scan:	Not applicable
<i>USB Interface:</i>	Std
PC Fax/Print/Scan:	No/Yes/Yes
<i>Network Interface:</i>	Opt Ethernet
Interface Type:	10/100BaseT
LAN Fax/Print/Scan:	No/Yes/Yes
<i>Networks Supported:</i>	
NetWare:	Yes
Windows NT:	Yes
AppleTalk:	Yes
UNIX:	Yes
AS/400:	No
Other:	None

FACSIMILE SPECIFICATIONS

<i>Scanner Technology:</i>	CCD		
<i>Compression Method:</i>	MH/MR/MMR/JBIG		
<i>Modem Speed:</i>	33.6 Kbps		
<i>Max TX Resolution:</i>	406 x 391 lpi		
<i>Gray Scale/Halftones:</i>	256 levels		
<i>Std/Max Fax Memory:</i>	2 MB/10 MB		
<i>Min/Max Orig Size (W x L):</i>	Info not avail/11 x 17		
<i>Max Paper/Print Width:</i>	11/11		
<i>Effective Scanning Width:</i>	11		
<i>Correct-Order Output:</i>	Yes		
<i>Batch Files:</i>	Yes	<i>Polling:</i>	Yes
<i>Battery Backup:</i>	Yes	<i>Relay Request:</i>	Yes
<i>Confid TX/RX:</i>	Yes/Yes	<i>Smoothing:</i>	Yes
<i>Dual Lines:</i>	No	<i>Timers:</i>	Yes
<i>Multi Access:</i>	Yes	<i>Transfer Hub:</i>	No

Dialing Capabilities

Broadcasting (Groups/Dest):	50/200		
Redial (Attempts/Intervals):	14/3 min intervals		
One Touch:	50	Speed Dial:	300
<i>Other:</i>			

CONNECTIVITY/MF OPTIONS

<i>PCL 5e/6 print controller:</i>	\$1,695
<i>Super G3 facsimile kit:</i>	\$1,795
<i>PostScript 3 kit:</i>	\$395
<i>10/100 network interface card:</i>	\$595
<i>AR-NS2 network scanner expansion kit:</i>	\$1,095
<i>Barcode font kit:</i>	\$595
<i>Sharpdesk (1-user license):</i>	\$233
<i>Sharpdesk (5-user license):</i>	\$500

INTERNET FAX SPECIFICATIONS

<i>TX/RX:</i>	Not applicable
<i>Fax-To-E-Mail:</i>	Not applicable

PC/NETWORK FAX SPECIFICATIONS

<i>Connection Type:</i>	Not applicable
<i>Type:</i>	Not applicable
<i>TX/RX:</i>	Not applicable

PRINTER SPECIFICATIONS

<i>Engine Mfr/Model:</i>	Sharp/AR-M208
<i>Compatibility:</i>	IBM PC, Mac
<i>Speed:</i>	20 ppm
<i>Max Print Area:</i>	11 x 17
<i>Enhanced Resolution:</i>	1,200 x 600 dpi
<i>Unenhanced Resolution:</i>	600 x 600 dpi
<i>Std/Max Printer Memory:</i>	Shared*
<i>Controller Mfr/Model:</i>	Not applicable
Processor/Bits/MHz:	Not applicable
PDL/PCL:	Not applicable
<i>Controller Mfr/Model:</i>	Sharp/AR-P11**
Processor/Bits/MHz:	MIPS/64/200
PDL/PCL:	PCL 5e/6, opt PostScript 3
<i>Controller Mfr/Model:</i>	Not applicable
Processor/Bits/MHz:	Not applicable
PDL/PCL:	Not applicable
<i>Other:</i>	*Std host-based JBIG print controller shares copier memory; **std/max memory for AR-P11 is 32 MB/288 MB; Mac OS support w/opt AR-P11 controller

SCANNER AND IMAGE MANAGEMENT SPECIFICATIONS

<i>Connection Type:</i>	Network
<i>Technology/Speed:</i>	CCD/Info not avail
<i>Max Resolution:</i>	400 x 400 dpi
<i>TWAIN/ISIS Compatible:</i>	Yes/No
<i>Scan/Image Software:</i>	Opt Sharpdesk

<i>OCR Software:</i>	Opt Sharpdesk
<i>File Mgmt Software:</i>	Opt Sharpdesk
<i>Scan-To-E-Mail:</i>	Yes

Other: Send to desktop and FTP; Sharpdesk software comes standard with the opt scanner expansion kit

COMMENTS

*Also 2000, Me, XP

<i>Sharpdesk (50-user license):</i>	\$2,450
<i>Sharpdesk (100-user license):</i>	\$3,650

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