



**LABCHECK**

**Sharp AR-M450 IMAGER**  
Mono Laser Copier-Printer-Fax-Scanner

**Also Sold As:**  
**Sharp AR-P450 IMAGER**  
**Laser Printer**

END USER PERSPECTIVE: This LabCheck report, of the above named device, is designed to provide a Concise, Easy to Read, Independent Analysis of product performance based upon tests we have performed from the End-User's Perspective. We do not quote retail prices nor full product specifications within LabCheck reports as this information can be easily obtained via our DataCheck On-Line service at [www. BERTL.com](http://www.BERTL.com).

This LabCheck report provides User-Relevant test analysis and constitutes a Summary of the Product, its Position within its Target Sector and its Performance during Benchmarked Testing.

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**OVERALL SUMMARY**

**Pros**

Fastest 45ppm digital copier of all current copiers tested . Single pass duplex scanner unit (has 2 scan heads) delivered high duplex copy productivity and allowed a wider range of originals to be automatically duplexed than traditional document feeders.

Has the most flexible upgrade path of all MFP's from a copier company; starts as desktop printer and builds to fully functional copier, fax, scanner and printer. Good image quality in both print and copy modes.

Multiple next job copy reservation memories, no fixed number (depends upon disk space and requires optional hard drive).

Options include offset finishing with saddle-stitched booklet maker and 8 bin mailbox. Printer driver delivered true 'Rip One Print Many' and interacted properly with applications' print menu (most competing copier-printers did not ). Robust scanning solution with direct QWERTY key pad email transmission. F-Code Fax capabilities deliver high security fax capability.



**Sharp AR-M450 starts as printer upgrades to full MFP**

**Cons**

Acceptable but unexciting print speeds compared to alternative printers and copier-printers. Entry level print-only version (AR-P-450) version is expensive compared to alternative entry level 45 ppm laser printers. No A3/Ledger with standard / entry level printer.

The Sharp AR-M450 is one of two new sister products from Sharp (AR-M450 and AR-M350). Designed as a 45ppm copier printer (versus the AR-M350 which has an advertised speed of 35ppm), the Sharp AR-M450 is built more like a laser printer than a copier. As our illustration (above right) shows you can purchase a basic A4 / Letter capable desktop printer (AR-P450) which delivers an advertised 45ppm . From this base engine you can upgrade the AR-P450 in modules until you have a fully configured Multifunctional Device capable of faxing, scanning to network, printing and copying.

The Sharp AR-M450 is advertised at:

- 45 ppm mono
- 200Mhz processor
- 64MB RAM ungradable to 320 MB with optional 5GB HDD
- Less than 5.3 second time to first page
- 600 dpi, 1,200 dpi equivalent with smoothing technology
- PCL5e, PCL6 plus optional Emulated PostScript Level 3
- 1 x 500 sheet A4 / Letter paper cassettes
- 3,100 sheet maximum paper supplies
- Optional duplex printing
- Optional Multi-position / Saddle Stitch Finisher / Booklet-Maker & 7 bin / 8 catch area mailbin paper catch system
- Multifunction capabilities as a Copier, 33.6Kbp Fax, Scanner and Printer.
- F-Code Fax Communication (as defined by the ITU-T) allows machines made by different manufacturers to perform: Relay Broadcasting - your machine calls another machine to transmit a fax to a third machine (or reverse); Confidential Transmission - your machine calls another machine to transmit a fax to a confidential mailbox; Confidential Reception - A machine calls your machine to send a fax to a confidential mailbox in your machine; F-Code Memory Polling - A confidential polling operation between facsimiles of different brand.

The device tested by BERTL had the full 3,100 sheet paper supply, 62 Mb RAM, duplex unit, Booklet-Maker Finisher and Mailbins. BERTL's test analyst had no problems connecting to the Sharp AR-P450 with all tests being carried out in 100BaseT via a TCP/IP connection.

**Weighing heavily in its favor and guaranteeing the Sharp AR-M450's 4-Star grading was its speed as a copier, which BERTL measured as the fastest 45cpm copier currently on sale.**

**Sharp AR-M450 Copier Productivity Table**  
 All speeds expressed in copies per minute (CPM) - Times measured to finisher output tray

	AR-M450	Printer-Copier 1	Copier-Printer 2	Copier-Printer 3	Copier-Printer 4	Copier-Printer 5
Advertised CPM	45	45	45	45	45	45
Copy Scanner Type	Face Down Single Pass Duplex	Face Down Single Pass Duplex	Face UP Two Pass Duplex	Face UP Two Pass Duplex	Face UP Two Pass Duplex	Face UP Two Pass Duplex
1 x 5 (1:1)	17.39	17.42	17.49	19.28	16.53	10.71
5 x 5 (1:1)	35.51	34.55	35.19	35.82	31.27	19.99
1 x 5 (1:2)	23.13	21.17	12.61	20.59	20.36	18.75
1 x 5 (2:1)	24.80	25.00	23.56	22.75	19.39	16.62
1 x 5 (2:2)	23.52	21.26	21.15	17.42	19.94	13.91
5 x 5 (2:2)	37.97	32.84	34.63	32.68	33.78	25.86
1 x 20 (2:2)	37.50	31.76	26.18	28.49	31.04	17.77
Average Copy Speed	28.55	26.28	24.40	25.29	24.62	17.66

**SINGLE PASS DUPLEX ORIGINAL SCANNING:** As the table above shows, the Sharp AR-M450 performed well on all copy tests and outpaced all four comparison 'Two Pass Duplex Scanning' multi functional devices from the copier industry. The only unit to come close to the Sharp AR-M450's performance was a recently launched 'Single Pass Duplex Scanning' printer based MFP built along similar lines to the Sharp AR-M450.

BERTL's timed tests indicate that 'Single Pass Duplex Scanning', as used by Sharp, is a more efficient copy method than the 'Two Pass Duplex Scanning' used in most copiers.

**VALUE FOR MONEY:** BERTL's 4-Star grade is based upon a fully configured Sharp AR-M450 MFP; when you select different configurations the value for money proposition alters, along with the functionality, as you add or remove optional items.

While this statement may apply to many printers and copiers, BERTL believes that it applies more to the Sharp AR-M450 than to most other products.

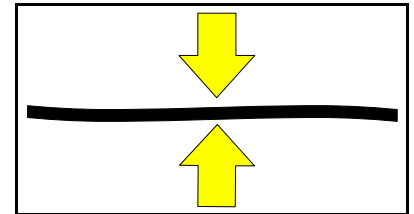
The entry level print-only Sharp AR-P450 looks pricey versus other 45 ppm desktop laser network printers. For less than the price of the entry level Sharp AR-P450 you can buy a 45 ppm desktop network printer that comes with two 500 sheet A3 / Ledger capable paper trays and duplex printing capability. In contrast, Sharp's entry level printer offers only A4 / Letter print capability via a single 500 sheet tray. If you want to add A3 / Ledger printing to the Sharp - you have to purchase an optional 500 sheet paper supply.

The basic AR-P450 does not include A3 / Ledger paper supply which comes as standard on third party 45ppm network printers.

To get A3/Ledger, on the Sharp, you must buy one to three additional 500 sheet A3 / Ledger paper trays.

The A3 / Ledger paper trays are several inches wider than the Sharp AR-P450's base printer engine and (as you can see from the photo on right) they look odd until you have upgraded to the point where you have bought virtually the full printing system. When fully configured, the Sharp AR-P450 is symmetrical with its finishing options filling the gap on the right side (see picture on page 2).

As you get closer to a fully configured system you get mail-bins, finishing, booklet making and the potential for high speed industrial strength copying, printing, fax and scanning which make the AR-M450 a good all rounder.



AR-M450 scans both sides of paper at same time



A4 / Letter Print engine sits on A3 / Ledger Trays

## COPIER FUNCTIONALITY

The scanner module is placed over the printer engine (as shown in the photo on page 2).

The copy control panel is solidly built along the lines of a 'traditional' digital copier; its functions well laid out and BERTL's analysts had no problem finding the various features required.

Several noteworthy points about the copier function:

1. **Single Pass Duplex Original Scanning:** The Sharp AR-M450 document feeder scans both sides of the original in one pass (there are two scanner heads; one on top and one on the bottom of the original). This is far quicker than on most copiers which still use mechanical document feeders. This is a huge benefit to users and resulted in copy speeds that exceeded competing copier based systems. Most copiers use a reversing document feeder, which scans the first side, flips the page over and feeds the page over the scanner unit for a second time. This places more wear and tear on the originals, reduces the types of document that can be copied in duplex, and, (due to its convoluted paper path) reduces the productivity compared to the Sharp AR-M450's straight paper path.
2. **Face Down Original Feeding:** The document feeder requires you to place pages in face down. This is the same as on virtually all fax machines therefore it should pose no problem to most users. However, some people with a mix of standard copiers and Sharp's AR-M450 users may have to take a few seconds at the copier to work out which orientation to use because many copier document feeders require originals to be put in face up versus the Sharp AR-M450 is face down. The reason why many copiers use face up original feeding goes back to mechanical analog units which could not output the printed documents face down but had to print the document backwards into the exit tray to deliver a correctly ordered document.
3. **Copy / Print Concurrency:** While data was being received at the printer, we could scan copy jobs.
4. **Concurrent Copying:** Copy concurrency on the Sharp AR-M450 was better than that offered by virtually all traditional copier manufacturers. Some 30-45 cpm copiers still offer no concurrency at all (i.e.: you can only scan a single job into memory) while others boast next job copy memories capable of holding up to 5 jobs. We could scan a virtually unlimited number of advance copy jobs into the Sharp AR-M450's print queue / memory with the only limitation being the RAM or hard drive capacity.
5. **Copy Speed:** The average copy speed of the Sharp AR-M450 was higher than all 45cpm copiers tested to date. Sharp AR-M450's single pass scanner gave it an edge, with copy speeds on jobs from double-sided originals running much more efficiently than other devices.
6. **Copy image Quality:** The general image quality from the Sharp AR-M450 unit was higher than we have seen from other copying solutions on printer based multifunctional products; most alternatives have been significantly poorer than their copier based counterparts. Sharp's solid blacks were to a high standard (1.31 black density) while greys were reasonable but a little grainy. In some places, greys had some banding / image drop off visible. This banding was also visible when copying originals which had colored shades.
7. **Tandem Printing:** One of the features that BERTL liked on the earlier Sharp mid-range digital copiers was their tandem print capability. Sharp included tandem printing as a standard item; if you had two Sharp copiers all you needed was a connecting cable to split jobs across two units to achieve higher speed and balance work between two copiers. We were therefore disappointed to find that Sharp have removed the tandem function from their new Sharp AR-M450.

## PRINTING

The print only version of the Sharp AR-M450 is called the Sharp AR-P450 (P for Printer - M for Multifunctional). In terms of printing and finishing, there is no difference between the fully configured AR-P450 and AR-M450 (it is the copier consul with its capabilities for copy, fax and scanning features that differentiates the AR-M450 from the AR-P450).

The AR-P450 / AR-M450 is targeted at medium workgroup and small networked departments where the Sharp AR-P450 / AR-M450 will come up against both high speed network printers and digital copier printers.

Printer Comparison Table (all results recorded in PPM)				
	Sharp AR-M450 Sharp AR-P450	Printer-Copier 1	Copier-Printer 2	Copier-Printer 3
Advertised Engine Speed	45 ppm	45 ppm	45 ppm	45 ppm
35 page Word 2000 document (1:1)	36.84	40.17	20.37	37.61
5 sets of 6 page Word Perfect (2:2)	32.14	33.26	17.3	36.71
Network Load Test	6.61	7.45	10.36	19.35
Average Print Speed across tests	25.19	26.96	16.01	31.22

As the table illustrates, the AR-P450 / AR-M450 was one of the slower printers. Both the Word Perfect and Network Load jobs involved more complex work, graphics and duplex on which the Sharp AR-P450 / AR-M450 slowed down. During the network load test, a series of simplex and duplex print files, combining color and mono files from multiple applications are sent to print. The test looks at how well the processor is able to cope with the transitions between different print job types and, as can be seen above, most printers slow considerably, with the Sharp suffering more than others.

**Tandem Printing:** A feature that BERTL liked on the earlier Sharp digital copier-printers was their ability to tandem / split print jobs between two connected printers without the need to purchase additional software or hardware. Unfortunately tandem is no longer supported on the new Sharp AR-P450 / AR-M450.

**Secure Printing:** Like many copier-printers, Sharps AR-M450 includes virtual (hold in memory) mailboxes which can be used for security or for print / proofing convenience.

By entering a PIN code users prevent their documents from being printed until / unless an authorised person is present at the printer to collect the document.

The user simply keys the PIN into the copier control panel at the printer. When configured as a printer only, you enter the PIN via a small LCD panel on the printer.

The screenshot shows a 'Job Control' window with the following elements:

- Retention:** A group box containing four radio buttons: 'Normal Print', 'Hold After Print', 'Hold Before Print', and 'Proof Print' (which is selected).
- PIN:** A text input field with a masked value 'XXXXXX'.
- Account Number:** A text input field with a masked value 'XXXXXX'.
- Default Job ID:** A text input field with the value 'BERTL'.
- User Name:** A text input field with the value 'BERTL'.
- Job Name:** A text input field with the value 'LabCheck Report'.
- Always Use This ID:** A checkbox that is currently unchecked.
- Notify Job End:** A checkbox that is checked.
- Defaults:** A button in the top right corner.

**Auto Booklet Making:** Throughput speeds via the booklet maker are shown in the following table. For ease of reference we include booklets produced by two methods: (1) electronically via the printer driver and (2) manually from printed originals scanned through the document feeder. BERTL's preference was for electronically generated booklets which were produced at a higher speed per set than copier based booklets.

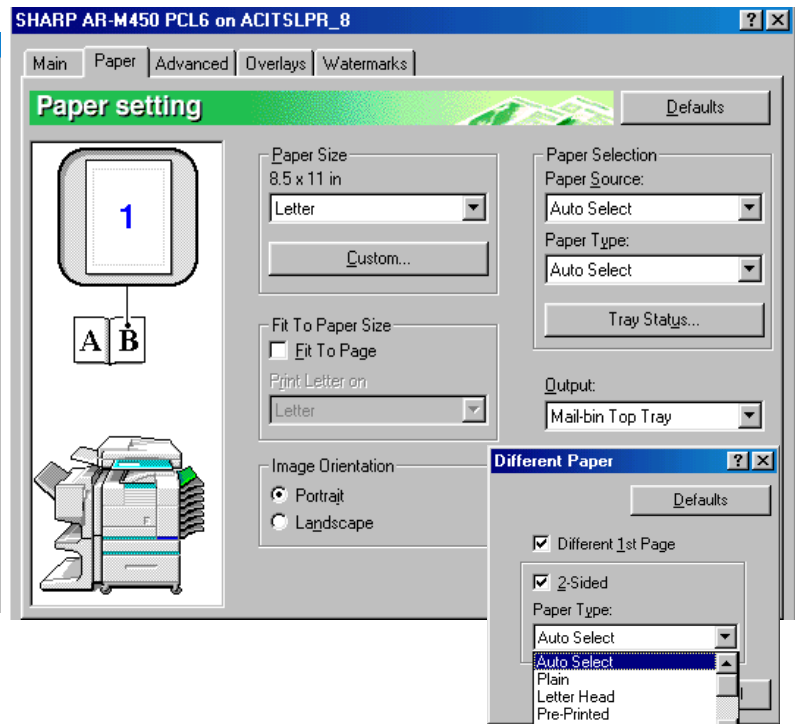
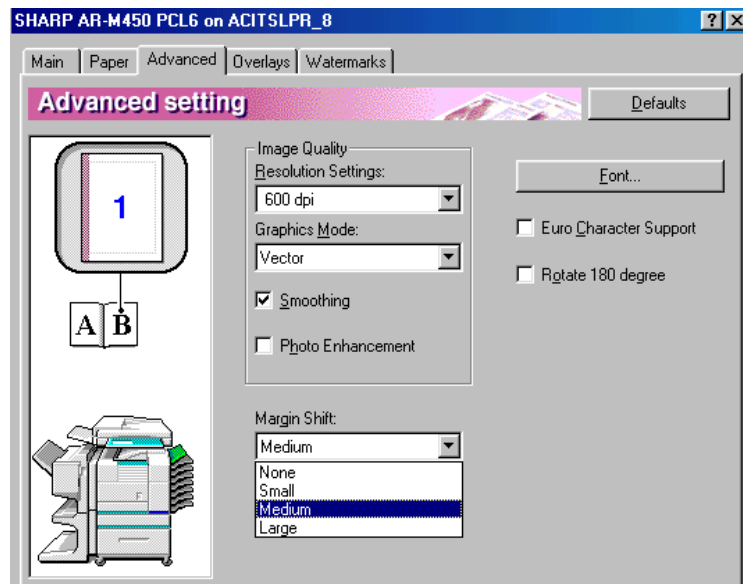
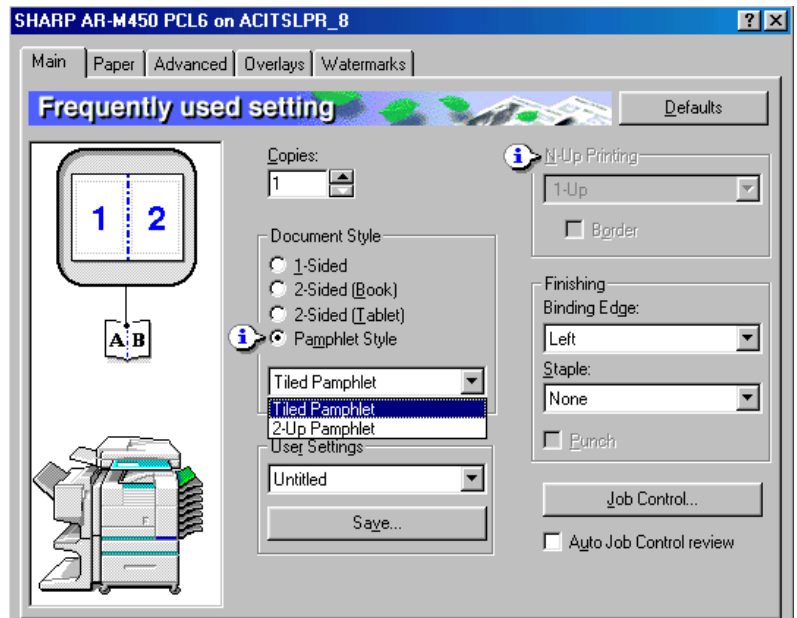
Booklet-Making (Magazine Style) - 20 page booklet, folded, with 2 position center staple				
Job Ticket Details / Job Produced	Via Print Driver		Via Copier Scanner	
	Ist Set Out	Repeat Sets	Ist Set Out	Repeat Sets
Time to print booklets	120 secs	31 secs	81 secs	54.6 secs
Number Per Hour	113 Booklets per hour		65 Booklets per hour	

**Printer Driver:** The Sharp AR-P450 / AR-M450 printer driver is well laid out with a pleasant overall feeling and easy to follow graphic displays showing your selections.

Automatic Booklet-Making was simple to set up. All you do is click 'Pamphlet Style', 'Tiled Pamphlet' and then select Stapling. The term 'Tiled Pamphlet' seemed a bit odd but the graphical guides / images instantly show what it means (see diagram) to make it easier to follow.

Printing a front page onto a different paper source (ie: for letter headed first sheets) is included but you can not select a back cover nor inserts from the printer driver.

The Sharp AR-P450 / AR-M450 print driver is suitable for printing standard business documents but lacks the advanced document production and re-print on demand options found within some competing 45 ppm devices.



**Finishing Options:** BERTL were impressed by the finishing options on the Sharp. Most users will find the finishing more than adequate for their needs, especially because the AR-P450 / AR-M450 offers an 8 bin mailbox unit, multi position stapling, hole punching, offsetting and automatic saddle-stitch booklet making. Most copier based printers at this level of the market offer saddle-stitch automatic booklet making options but it is rare on network printers.

Sharp go one step further than many MFP manufactures because they offer both virtual mailboxes and physical mailboxes. The 8 bin mailbox unit fits onto the right side of the print engine while the other finishing options fit onto the left side of the printer (see photo on page 2). This means that you can have the printer set up with both the finisher and mailboxes.

While virtual mailboxes are better than having no mailboxes at all, the fact remains that physical mailboxes are far more efficient at separating and storing work from different people / departments; here's why:

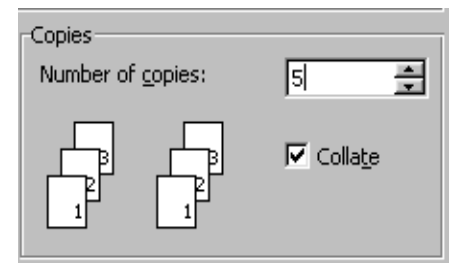
- **Physical Mailboxes:** Users / Departments have their own output area and collect printed pages when they want to walk to the printer. The pages are output as soon as the job arrives at the printer, this means that work is printed and awaiting collection when the user arrives at the printer. The pages do not fall into a general pile of documents and are less likely to be removed or mixed with other people's documents. Security is low because anyone can read the pages.
- **Virtual Mailboxes:** Security is high because only authorised users can access the documents. However, productivity is low. Users must walk to the printer and enter their PIN code to release the documents. The documents then go into the print queue and are printed when the printer is free. This means that an idle printer will print the job quickly but a busy shared network device may have many jobs in the queue. The user must stand around waiting for their work or go back to their desk and return later (which counteracts security).
- **Banner Sheets:** A banner sheet separates documents but does not stop pages getting mixed up with other documents at the printer nor does it stop pages from being removed by other users. Banner sheets also slow down printing (most printers treat the banner sheet as a separate job to be printed) while wasting paper and toner. If the pattern of work is mainly short documents (ie: one page, etc), the paper usage may be doubled with a banner sheet while toner costs rise.

**Bandwidth Usage:** Bandwidth usage was a bit of a mixed bag with some good points. On standard word processing documents the Sharp AR-M450 was better than virtually all other digital-copier printers. However, on more complex / graphical documents the Sharp AR-M450 created larger files than some competing units.

One of the things that BERTL liked best about the Sharp AR-M450 was that it is one of the only copier-printers tested that interacts properly with the application which produces the document.

To understand this issue you must consider the fact that there are two print menus used to produce a printed page. In the application (ie: Word) there is a print menu which offers basic functionality. For many people this is as far as they go when printing a document. If the printer has been configured to the users preference they can choose all of the basic print commands from this menu.

Having chosen to print multiple sets (ie: 5 copies) of a document some applications automatically default to 'collate' mode within the print menu, while others offer you the choice of ticking a box for collation. By clicking on 'Properties' the user can go to a second print menu which contains similar options plus additional capabilities that are configured by the printer manufacturer. Within this second (and deeper) print menu there exists an additional collation or grouping command/option.



Microsoft Word  
Print Menu - Multicopy Default

Some copier-printers and some network printers have not been programmed to properly interact with the first print menu (the main one presented to the user when printing a document). A common error is the failure to correctly interpret the collation command.

When print driver programmers have not properly integrated the print driver with the first print menu (in the application) the print driver creates a gigantic single data file that contains as many copies of the document as were sent to print.

This means that instead of getting a 25 page document with a command to print 100 copies in duplex mode, the print driver may erroneously produce a single 2,500 page duplexed document which in turn creates the following problems:

- Massive use of bandwidth
- Documents that are too big for the stapler units to staple
- Multiple documents treated as one document resulting in incorrect finishing
- Page 1 of the second copy is printed on the back of page 25 (as page 26 of 2,500) which makes the document unusable.

Most copier-printers have this limitation and do not accurately recognize the collation command. In many cases the manufacturer tells users that the application collation option must be disabled and that users should use the automatic collation capability built within their drivers. To use this facility users must remember to select the group printing mode rather than accepting the application / drivers default settings.

This may remove the problem 'if and when' people remember to circumvent the limitation in the printer driver.

However, in the real world people work in general office environments with untrained staff, temporary workers and users who can not remember how to disable problems / bugs, or limitations, in the printer driver. The result is increased use of network bandwidth, paper, time and resources which can be a real problem.

**Sharp's AR-M450 does not have this limitation and operated properly. This makes Sharp's AR-M450 one of the only copier-printers on the market to work properly. When we printed multiple sets of a document we always got the same size print file regardless of how we sent the job to print. The effect on the network can be seen in the following table.**

Printer Bandwidth Comparison Table All jobs sent to print using default / most likely settings					
	Sharp AR-M450 Sharp AR-P450	Digital Copier 1	Digital Copier 2	Network Printer	Network Printer
35 page Word 2000 document	425 Kb	1.09 Mb	311 Kb	594 Kb	720 Kb
5 Page Acrobat PDF File	8.92 Mb	15.7 Mb	6.33 Mb	4.53 Mb	9.71 Mb
Network Load Test	19.96 Mb	36.00 Mb	14.08 Mb	10.65 Mb	22.74 Mb
50 copies of above documents / tests collated at application's print menu	19.96 Mb	1,800.00 Mb	704.00 Mb		

From the above test results you can see how the programming / design of the Sharp print driver offers significant bandwidth reduction versus many competing third party products.

**Printer Image Quality:** Image quality was good across all applications. Greyscales were reproduced smoothly and photographs were printed without the jagginess seen on some competing units. Fine lines and small text font sizes were printed clearly. Four point text was clearly legible when interpreting black and blue. Green and red broke up a bit and only yellow was illegible. Reverse block printing of white text on solid backgrounds was clear, with no toner clash or shadowing at boundaries.

**Remote Diagnostics and Bi-directional Feedback:** Via **Sharp Monitor** users can check the status of the print engine, receive job completion notifications, be notified of paper-out, toner-out, paper jams or receive 'device-notification' in the form of a pop-up screen. There is also **Sharp Printer Administration**, from this Network Administrators can monitor all devices on a TCP/IP network provided they are SNMP compliant. The administrator can: view default settings, view clicks and will receive "Pop up" alert messages.

At key operator / administrator level the Sharp AR-M450 has a neat email notification system. From the Administrative setup we could set up two types of alerts to be sent to between 1 to 3 email groups of email addresses. By 'groups of email addresses' we mean that you can enter more than one, comma separated, email address into each of the 3 email address boxes in the following format:

mark@bertl.com; joe@service.com; kate@toner.com

Paper Jams, Toner Low, No Toner, Paper Out, Service Required and Preventative Maintenance Required messages could be sent to up to 3 separate groups of people (ie: key operator, service agent, toner supplies). We could also select each level of alert separately.

For example (1) a local user could be notified when the Sharp AR-M450 has a 'Paper Jam, Toner Low, No Toner or Paper Out' (to prompt them to sort out the issue) while (2) the admin manager could receive only the messages telling them when service or PM was required and (3) the service agent could be emailed to say that Service or PM was required.

The second level of email notification could include pages printed and other service / unit status information (ie: receive monthly page counts to prepare invoices) which is sent direct to (1) the service agent's engineers, (2) service agent's accounts department and (3) the local admin manager. This level of message is a timed event which can be set to be emailed every X days, every X weeks on (Day of Week) or every X months on (date).

The service level emailing is a good feature and saves a lot of time and effort. However, while the key operator may diligently respond to email and maintain the copier/printer there is always the chance that they do not read their email regularly, are out of the office, etc.

## FAX FUNCTIONALITY

The Sharp AR-M450 offers optional fax capability through the copier consul. We could scan / fax documents through the document feeder or place them on the flat bed copier glass. This meant that we could send multiple page documents very easily and also fax difficult originals such as pages of bound files, books, larger documents and so forth. Sending a fax from the copier consul could not have been easier, the control panel is designed along the lines of a standard fax / copier and we just entered the number and our document was sent like a standard dedicated fax machine.

**Secure Fax Transmission / F-Code:** The Sharp AR-M450 is the first (currently only) departmental MFP to support F-Code secure fax transmissions / receipts. F-Code Communication is a standard defined by the ITU-T which allows machines made by different manufacturers to perform the following operations. Supported secure / F-code functions include:

- Relay Broadcasting - your machine calls another machine to transmit a fax to a third machine (or reverse)
- Confidential Transmission - your machine calls another machine to transmit a fax to a confidential mailbox
- Confidential Reception - A machine calls your machine to send a fax to a confidential mailbox in your machine
- F-Code Memory Polling - A confidential polling operation between facsimiles of different brands.

Even if you do not need secure transmissions, there is a lot going for the Sharp AR-M450 fax capabilities. Like most copier based fax systems you get high speed scanning of originals up to A3 / Ledger size.

Because the Sharp AR-M450 has single pass scanning you can scan both sides of a duplex original for faxing much quicker than on traditional document feeders. The dual scan / single pass duplex scanner also allows you to scan a wider range of originals than is possible on all other copier based MFP fax systems.

BERTL especially liked the book fax mode. This let BERTL analysts place a book flat on the copy glass while the Sharp AR-M450 automatically copied each side of the book's pages separately, stored the pages in memory and faxed the final document.

While the Sharp AR-M450 fax delivered what the average office needs from a fax machine it only has one fax line. We were also disappointed because we could not find a way to print direct / send electronic documents from our PC screen straight to fax.

The Sharp AR-P450 does not support 64Kbps / ISDN transmission. This is unlikely to worry many users because the take up for 64Kbps and ISDN is not that high and you need to have a 64Kbps / ISDN fax at the other end.

Main Fax Features	
Transmission Time	2 Seconds
Compression Method	JBIG
Modem Speed	33.6Kbps *
Transmission Mode	Super G3 / G3
Communication Line	PSTN, PBX
Phone Lines	1
Resolution Settings	400 DPI max.
Auto Dial Keys	500
Broadcasting	300 locations
Document Sizes	Statement - Ledger
Paper Sizes	Statement - Ledger
Max. Memory Jobs	50
F-Code Communication	Transmit / Receive
ADF Capacity	50 sheets
Memory (std / with opt.)	2 MB / 10 MB

## SCANNER BASED OPTIONS (SCANNING & COPYING)

For simplicity we start our evaluation **from the user terminal** where we were presented with the following applications:

**Sharpdesk** is Sharp's desktop management program for the scanning options. From Sharpdesk we could browse, save or retrieve jobs using the standard Windows filing system. All arriving scan jobs were automatically placed onto the desktop of Sharpdesk as thumbnail images with a linked name and file date. This meant that we did not have to go looking for any documents nor rely upon a coded index system (a common limitation on some competing units) across the network. With Sharpdesk we could instantly see the documents at a glance and to open the document to full size we simply double clicked it. This opened 'Imaging for Windows' which is a standard component within Windows. It is worth noting that some competing products have nothing comparable to Sharpdesk but make you browse to the copier hard drive, retrieve a coded document blind (ie: no thumbnail image), copy it to your PC and then rely upon 'Imaging for Windows' as the sole scanned document utility. Imaging for Windows gave us reasonable control over the document / scan. From SharpDesk we could simply drag and drop scanned images into OCR, send to email, print or send to other locations or programs. All Sharp scanner users get a choice of two 'Expert Vision™' OCR packages with the installation CD. The standard free OCR package is Expert Vision Lite which delivered pretty much everything that most users will need. Also included with the CD is Expert Vision Pro which requires registration and payment of a small fee but delivers a superior OCR package with more professional capabilities.

Within SharpDesk 2.0, Sharp include 'Composer' which allows you to merge documents that have been produced from different applications. You can renumber / rearrange pages to change and edit the document. At the end of the merge you have a new document which can be saved.

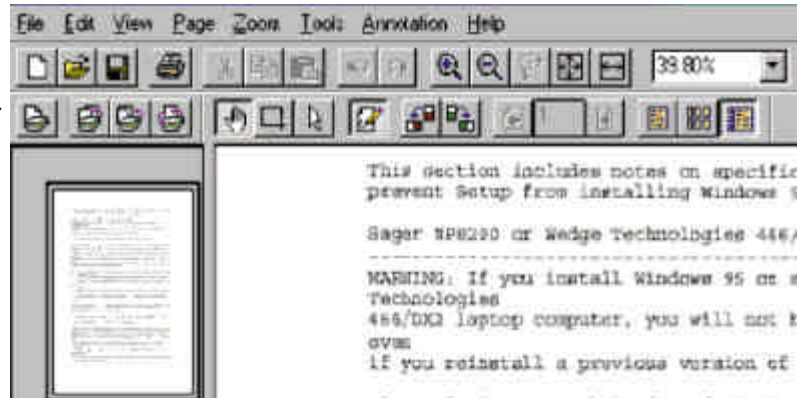
**Network Scanner Tool** is a macro / programming tool that allows you to configure automated routines for arriving documents. For example: When sending text based documents back to the PC you can have the document arrive, be auto sensed, sent to OCR and sitting waiting as a word processing document on your screen by the time you get back to the terminal. When configured with MicroSoft 'Front Page' and their scan to web program you can have a usable web page on your PC by the time you get back to your PC (example only - not included with Sharp AR-M450).

**Web Based Administration:** The Sharp AR-M450's Imager Home page allows you to choose pre-set destinations, email addresses and desktops. Authorised users and administrators can browse to the scanner configuration settings and enter, or alter, email addresses and other locations. In practice it was quite easy to set up.

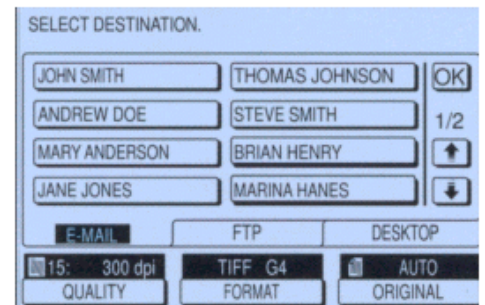
**From the copier control panel** you have a reasonable amount of control over the scanned documents and it was relatively simple to use. Simple menus let us choose the dpi of the scanned image or select from three large tabs marked: **e-Mail, FTP or Desktop**. Whichever we chose presented the destination in a simple format. On the screen we could see up to 8 large buttons which contained the name of the location, email or person that we could send to. All we did was press the appropriate button and our scan started and sent. For names that were off-screen we could scroll up and down the lists of names. This scrolling was not ideal but was functional.

**QWERTY Keypad for email addresses:** A significant improvement over the Sharp AR-M450's predecessor is the inclusion of a QWERTY keypad which allows you to enter any email address that you want 'on the fly'. This makes it far easier to send scanned documents to third parties in the same fashion that you send a fax.

A nice feature is that, via 'ImageSend' you can scan and send the same document to fax telephone numbers and email addresses in a single broadcast.



Windows Imaging Tool



Selecting preset scan destinations

Productivity Tests			
Output Origin	Job		
First Page Out	Single page via ADF	11.19	Secs
Copying A4/Letter	5 pages	17.39	CPM
Copying A4/Letter	5 sets of 5 pages	35.51	CPM
Copying 1:2	10 single to 5 double	23.13	CPM
Copying 2:1	5 double to 10 single	24.86	CPM
Copying 2:2	5 double to 5 double	23.52	CPM
Copying 2:2 Short documents	5 sets 5 double to 5 sets 5 double	37.97	CPM
Copying 2:2 Long Documents	20 double to 20 double	37.50	CPM

Printing Tests Using PCL Driver			
Printing Multiple Sets in Duplex	5 sets of 6 pages WP 9 Collated at Print Driver	32.14	PPM
Printing Various Networked Jobs	Mixed Network Workload	6.61	PPM
Printing Simplex:	35 Page Word 2000	36.84	PPM

Production Efficiency & Network Usability / Capability	
<b>Copier:</b> Scan Once Print Many	Yes
<b>Copier:</b> Max Jobs Auto Scanned into memory	Unlimited if hard disk installed
<b>Print:</b> 1 <sup>st</sup> page from a different tray than rest of page	Yes
<b>Print:</b> Insert dividers for chapters from the driver	No
<b>Print:</b> Insert front and back cover from the driver	No
<b>Print:</b> Offset separate finished documents	Yes
<b>Print:</b> Send to physical mailbox for later collection	Yes
<b>Print:</b> Send to virtual mailbox & print with a password	Yes

Remote Control from Client Terminals / Network	
View Toner Levels before printing	Via Sharp Monitor
Estimate max pages printed from toner	Yes
View paper levels in trays	Yes
Specify problem (paper jam, door open)	Yes
Obtain departmental management figures	Some info via accounting function
See \ View 3 <sup>rd</sup> party products	Any SNMP device
Estimate toner usage	No

Bandwidth \ File Sizes & Send Once Print Many		
Print Job	Network Printer	This Printer
Network Load Test	3.64 Mb	19.96 Mb
1 copy of 6 pages WP-9	367 Kb	371 Kb
5 copies of 6 pages WP-9 Collated at Application	367 Kb	371 Kb
35 Page Word 2000	811 Kb	425 Kb

Reproduction Quality		
	Printing	Copying
Banding \ Screen Clash	Slight	None visible
Small Text \ Lines	Good to 4 point text	Good to 4 point text
Color Definition (in grey)	Good	Slightly grainy with some banding
Photo Fine detail	Good	Reasonable
General impression	Good	Good