Microsoft At Work Copier Product Plan

Contents

1. INTRODUCTION:.....

2. KEY CAPABILITIES:.....

3. PRODUCT DEFINITION:.....

3.1. Departmental Fax/Copier.....
3.2. Mid Speed Departmental Monochrome Copier.....
3.3. Departmental Color Copier.....

4. MICROSOFT AT WORK COPIER FEATURE DESCRIPTION:.....

4.1. Imaging:.....
4.1.1. Image Reduction and Enlargement:.....
4.1.2. Image Editing Module:.....
4.1.3. Automatic Image Filtering and Correction.....
4.1.4. Halftone Scanning, Printing and Transmission.....
4.1.5. Duplexing.....
4.1.6. Color Copying and Printing.....
4.1.7. Manual and Automatic Contrast Control.....
4.2. Peripheral Support:.....
4.2.1. Output Handler.....
4.2.2. Document Server Support.....
4.3. Document Rendering:.....
4.3.1. PC Printer Support.....
4.3.2. Windows Software Compatibility.....
4.3.3. Multi-Document Print.....
4.3.4. PDL Support.....
4.3.5. Document Merge.....
4.3.6. Automatic Copy Numbering.....
4.3.7. Document Preview.....
4.4. Trouble Reporting/Diagnosis.....
4.4.1. Remote Trouble Reporting.....
4.4.2. Remote Administration.....
4.4.3. Inference-based Diagnostic Engine (MEDIC).....
4.5. Document Transmission.....
4.5.1. Microsoft At Work Fax Functionality.....
4.5.2. Color Document Transmission.....
4.6. Other Features:.....
4.6.1. Activity Reporting.....
4.6.2. Job Interrupt Mode.....
4.6.3. Email Integration.....
4.6.4. Recipient Addressing.....
4.6.5. Power Management.....

5. CONCLUSIONS:.....

1. Introduction:

The Microsoft At Work Copier operating system software is an advanced software platform for a new generation of digital monochrome and color copiers being introduced by Microsoft and hardware manufacturers in the second half of 1994. The software has been designed to provide walk-up and desktop PC users with rich document rendering, image editing, document distribution, and on-demand reproduction capabilities. These devices will propel copiers from their currently limited role of providing simple reproduction of static documents to one where they are the centerpiece in the document publishing and distribution process.

This white paper describes the key capabilities to be provided by the Microsoft at Work based copier software and the particular product segmentations that Microsoft envisions for these products.

2. Key Capabilities:

Ease of Use:
As with other Microsoft At Work systems, copiers will use a touch sensitive graphical user interface to give users access to advanced document imaging and output management functions. On-line, interactive context sensitive help eliminates annoyingly common experiences such as determining the correct bin for a legal document, or locating a paper jam. The graphical user interface can alert users if they are incorrectly performing a function, and walk them through resolution. Users can preview document appearance on the screen before printing, avoiding errors like putting the letter head in upside down and selecting the wrong output paper size.

Desktop Connectivity:
Microsoft Windows is a popular operating system for the desktop, with a new copy sold every 2.5 seconds. Microsoft is building software into Windows that will integrate the capabilities of Microsoft At Work based copier and other intelligent devices with the operating system, so that all the power of the Microsoft At Work based copier is available to desktop PC users. For example,

- Printing**:** The Microsoft At Work based copier becomes the user's standard printer. The Microsoft At Work based copier takes advantage of Microsoft's newly developed Microsoft At Work Rendering technology, which outperforms both Postscript® and PCL® for many documents, yet requires only a fraction of the memory and CPU power of these languages (The Microsoft at Work Rendering technology was introduced to the public first in the form of the Windows™ Printing System, which will is an add-in card for the HP® LaserJet® II and LaserJet III).

  In addition to providing this superior printing performance, the Microsoft At Work based copier gives the user full control over their print request. It provides full feedback on the status of the print job, telling you whether the requested paper sources are available, what the precise status of your print request is, and whether any problems have occurred. The PC user also has access to all finishing options, such as sorting, stitching and binding.

- Communications: Access to the Microsoft At Work based copier's document communications capabilities described below are also built into Windows. Users can distribute documents to all recipients either directly from the mail

client in Windows for Workgroups 3.11 or directly from their mail-enabled application.

- On Demand Reproduction**:** Users can save a copy of the document on the copier's mass storage or a LAN connected server can be accessed and documents can be reproduced directly from any Windows PC.

- Administration**:** From their favorite PC application, users can print 10 copies, double sided, stapled and sorted. All imaging and output handling options are directly and easily accessible from a bi-directional graphical user interface. Microsoft At Work based copiers can be administered remotely from any PC, allowing users to change options, add new software, and diagnose problems.

Document Distribution:

The Microsoft At Work based copier has rich document communications functions built in. Users can publish documents to all recipients directly from their PC application. For example, a user will be able to create a cc: list in their word processing document. The user can then send the job to the copier, and designate which copies are for local recipients, by adding a header that identifies that recipient. Copies for other remote recipients will use the messaging functionality shared with the Microsoft At Work Fax to transmit the document to fax machines and other copiers for final printing and distribution. The document will be transferred to the Microsoft At Work based copier, where recipients are reached in one of several manners:

- Locally: Copies for local recipients will be printed on the Microsoft At Work based copier with a cover sheet identifying the recipient.

- Remote: Additional copies of the document can be send to other Microsoft At Work based copier located anywhere in the world, where copies can be printed or routed directly to their PC. The only connection method required is a standard telephone line.

- Via Fax: The Microsoft At Work based copier can also transmit the document to any recipient that has a fax machine. Recipients that have a Microsoft At Work based fax machine will receive a copy with quality equal to that of the original. Users of standard G3 fax machines will receive a document at the highest resolution supported by that machine (Note: Users can also select "economy mode" to reduce transmission costs when sending to standard G3 machines).

True WYSIWYG Color and Monochrome Reproduction:
Today's printing devices often produce output that look significantly different from what the user saw on the page or on her screen. There are at least two problems with this process. First, the output may be transformed into a page description language, and some information may have been lost in the process. Second, there may be no calibration between the different output devices. This second problem is particularly prevalent in color devices, where the capabilities of different input and output devices vary greatly. Microsoft At Work system software solves these problems. First it uses an imaging model that is compatible with the Windows imaging model. Second, it will use a color model that is compatible with the color model being included in the next version of Windows (code-named Chicago). By implementing imaging models and color models that are compatible with Windows, the copier guarantees that colors you see on your screen or in the original document will be exactly matched on the printed page.

Image Editing:
Digital imaging, coupled with a well structured software environment greatly increases the kinds of special document processing features that are possible on these devices. For example,

- Scalable: The Microsoft At Work based copier can automatically scale images to fit available paper sizes. Alternatively, the Microsoft At Work based copier can select the paper size that best fits the document being copied.

- Antialiasing: An image filter can eliminate any unwanted spots on the document.

- Overlays: Overlays can be added to automatically number copies, such as stamp documents as "Confidential," or add a company logo that is stored digitally on the copier. They can also have the Microsoft At Work based copier to autonumber copies using this same capability.

- Color Highlighting: Color accenting or other methods can be used to emphasize a selected portion of the document.

- Edge Detection: Edge detection algorithms can be used to blow up a portion of a document. For instance, the user could select an article in the newspaper by circling it. The copier would identify the area to be enlarged and would reprint the circled area as a full page image, or could merge with other documents.

- OCR: OCR filters (typically from third parties) can convert analog text information into digital information.

- Cut/Paste: Areas from one document can be cut and pasted into another. Other areas can be deleted.

- Document Merge: Two documents can be merged into one, at high speed. For example, in a mail merge, where the address is placed at the appropriate point in a form letter.

On-demand Reproduction:

Users can store copies of documents in the copier's mass storage media or on other LAN-connected servers. When a quick copy is needed, the user can walk up, access the document, and print the number of copies required. This capability can be used by companies to maintain copies of frequently used documents. For example, product catalogs and employee procedures can be kept on-line for easy access by walk up users. By supporting PC file systems and file formats on the copier, walk up users can also insert a floppy disk into the copier and make copies.

- Users can input stored documents in a number of different ways:
  - By inserting a floppy disk into the Microsoft at Work based copier’s floppy disk drive
  - Remotely from their PC
  - Remotely over the Microsoft at Work based copier’s communications channels. (This feature allows companies to remotely maintain document databases. For example, a company could maintain a marketing information database in the Microsoft at Work based copier of each of its branch offices. When a new product is introduced, new documentation could be sent to the offices automatically.)
  - Remotely from other Microsoft intelligent devices, such as a Microsoft at Work based phone or facsimile machine.

- Storage options supported by the Microsoft At Work based copier:
  - Internal storage (hard disks, optical disks)
  - Installable external storage devices
  - Access to LAN-connected servers

Remote Administration and Diagnostics:

In order to truly integrate Microsoft At Work Copiers with the existing PC and office equipment network, Microsoft At Work Copiers can be managed remotely using simple PC administration tools or integrated in standard network management systems. For example, alarm systems can notify on-line administrators when problems occur, and technicians can call up the copier and run diagnostics remotely. The copier also has a built-in diagnostic engine that uses a powerful inference model to determine the most likely cause of malfunctions

and shows the user how to resolve the problem so that service calls are minimized. Service companies can utilize specific on-line service logs to train new technicians on model specific diagnostics.

Scalable, Upgradable, Software and Hardware Platform:
The Microsoft At Work based copier software is designed with well defined hardware interfaces, so that hardware manufacturers can create a family of different machines targeted at different users. For example, they can use a low end digital scanner in one product and a higher speed scanner in another. The hardware manufacturer simply develops different drivers for these two scanner engines, and the rest of the software is unaffected. This also allows the manufacturer to introduce new hardware technology rapidly. To change printer engines or controllers, the manufacturer only need develop a new Microsoft At Work based copier software driver. This reduces time to market for new product releases, increasing competitiveness and market responsiveness.

The Microsoft At Work based copier software architecture is also designed to support easy upgradability by end users. They can add optional finishing modules, duplexing units, memory, storage devices, and optional software modules. In many cases, the software can automatically takes advantage of these additional resources. In all other cases, the user only needs to add an additional software driver. This driver can even be downloaded remotely by service technicians. This upgradable solution allows hardware manufacturers to provide a single product that is configurable to target different user needs and price sensitivities.

Windows Compatible Development Environment and API:
There are over 300,000 developers of Windows based applications in the world today, and the number is growing rapidly. There are several thousand development tools designed for the Windows environment. The Microsoft At Work based copier environment is compatible with the Windows development environment, so that Windows developers will already understand how to develop for Microsoft At Work based copier, and they will have many development tools available to help them. In fact, they can in many cases begin their development using a standard PC and transfer the code to the Microsoft At Work based copier when they need to test the code on the Microsoft At Work based copier's hardware.

3. Product Definition:

The Microsoft At Work Copier Product Family is planned to consist of the following product categories. The actual products deployed by hardware manufacturers may differ, as they add proprietary, value-added functionality, and make decisions on the hardware to be used.

3.1. Departmental Fax/Copier

Description:

Fax/Copiers will be developed utilizing software for Microsoft At Work Fax machines combined with the imaging and color capabilities of the Microsoft At Work Copier software. Products will include a very high speed peripheral bus that connects printers and scanners and are isolated from the processor complex.

Incremental Feature Set:

We see the following important incremental features for this product as modules over the core Microsoft At Work Operating System and Microsoft At Work Fax features:

- Image Reduction and Enlargement
- Halftone scanning, printing, and transmission
- Output handler support
- At Work Fax functionality
- Power Management
- Manual and Automatic Contrast Control

3.2. Mid Speed Departmental Monochrome Copier

Description:

Mid-Speed Departmental monochrome digital copiers require deployment of higher speed hardware, including an isolated peripheral bus at around SCSI II rate (10 MB/sec), and addition of hardware imaging support module (e.g., Weitek chip set), to move beyond the departmental fax/copier: These systems will be Class 3-4 type copiers, supporting 300-600 dpi, and 20-40 cpm. For document archival, they will optionally incorporate a minimum high capacity on board storage or LAN access software to attach to LAN-connected servers. To differentiate these systems and take advantage of the Microsoft At Work PC connectivity, hardware manufacturers will want to deploy additional software functionality as listed below.

Incremental Feature Set:

Important incremental features for this product as modules over the Microsoft At Work Operating System, Microsoft At Work Fax, and Departmental Fax/Copier features are the following:

- Duplexing
- Image Editing Module
- Automatic Image Filtering
- Document Server Support.
- Integration with Windows
- Inference Based Diagnostic Engine
- Job Interrupt Mode
- Email Integration
- PC Printer Support
- Print from Server
- Automatic Copy Numbering
- Document Preview
- PDL Support
- Remote Administration
- Remote Trouble Shooting
- Activity Reporting
- Multi Document Print
- Document Merge

3.3. Departmental Color Copier

Description:

Color digital copiers can easily be supported and provide all work group users the ability to print color documents from their desktop, and to transmit these images to any of Microsoft At Work Desktop Windows software user. The chief addition to the Microsoft At Work Operating System software to support the Departmental Color Copier is the addition of the Windows Color Model, which will be introduced in the Chicago release of Windows. This color model will support gamut matching and color space calibration so that the copier's scanner input space can be matched to the printer's output space, and so that the colors displayed on the user's PC screen match those outputted on the printer. Color image editing where users can perform on-line color customization and color contrasting is also supported. This system would support performance characteristics of Class 3-4. Assumes optional Microsoft At Work Fax capabilities integration.

Incremental Feature Set:

- Color Copying and Printing
- Color Document Transmission
- Color Image Editing

4. Microsoft At Work Copier Feature Description:

The following list details features planned for implementation in the Microsoft At Work based Copier software.

4.1. Imaging:

4.1.1. Image Reduction and Enlargement:

- Variable reduction and enlargement
- Presets corresponding to typical page size changes (65%, 74%, 93%, 129%, 155%)
- Automatic reduction/enlargement to fit available paper sizes

4.1.2. Image Editing Module:

- Pattern overlay (e.g., gray pattern or watermarks). Pattern overlay will be able to support autonumber feature defined below or distribution header information
- Delete, cut, and paste, including from one document to another
- Color reversal
- Color highlighting/changing
- Edge detection to support pen or mouse tagging images for highlighting, cutting, or copying

4.1.3. Automatic Image Filtering and Correction

- Antialiasing to remove stray pixels or skewness
- Antiskewing for crooked or jagged scanning or Group 3 fax reception

4.1.4. Halftone Scanning, Printing and Transmission

- The system will support the ability to scan and print in true gray scale
- Systems with a fax attachment will be able to transmit gray scale files

4.1.5. Duplexing

- 2 sided-> 1 sided
- 1 sided -> 2 sided
- 2 sided-> 2 sided
- Book-> 1 sided
- Book -> 2 sided

4.1.6. Color Copying and Printing

- The system will include a color model compatible with the Windows Color Model to ensure input/output color matching and matching with PC display devices.
- System will support the ability to scan, print, color customization, contrast editing, and storage of color documents.

4.1.7. Manual and Automatic Contrast Control

- GUI controlled manual contrast control including color
- Preset contrast settings for automatic adjustments

4.2. Peripheral Support:

4.2.1. Output Handler

- Support for stacking, stapling, sorting, stitching, binding, shrink wrapping,
- Slip sheet support (interleaving of blank page from separate bin)
- Transparency support (interleaving of blank page from separate bin)

4.2.2. Document Server Support

- Support the ability to archive and store frequently printed documents on a server that is either directly attached or LAN attached
- Supports file compression
- Supports ODBC (WOSA API) access
- Distributed file system access (WOSA API)
- Attached external drive access (SCSI)
- Attached dedicated server

4.3. Document Rendering:

4.3.1. PC Printer Support

- Microsoft At Work Rendering printer driver with support for all available output handling devices (staplers, duplexing, transparencies, reductions, etc.)

4.3.2. Windows Software Compatibility

- Users will be able to access Windows based applications such as Microsoft Excel or Word from the network, download and print from the copier.
- Users will be able to access a file stored on the Microsoft At Work Copier or attached server and request a print without opening the file, transferring to PC and issuing a print request on the PC.
- High-quality documents can be rendered from a mass storage medium such as floppy drive, PCMCIA, or CD-ROM. This will include color documents and will be small enough to fit on a floppy, "standard" PCMCIA card, or CD-ROM (i.e., will utilize reasonable compression algorithm).

4.3.3. Multi-Document Print

- The system will have the ability to take jobs from different applications and sequence them together as a single print job. This means that a Word document could be attached with a Microsoft Excel document to create a single print job.
- This activity will happen concurrently with other system functions without performance degradation

4.3.4. PDL Support

- Installable PDLs, including Postscript level I plus color and PCL level 4
- These PDLs may make use of hardware assist

4.3.5. Document Merge

- Users store a template on the Microsoft At Work Copier. The user then sends data that is merged with this template to create the final product. Mail merge is an example of this, but it can be used for any sort of forms fill applications. The value of this feature is that in high volume situations, it is inefficient to have

the user's PC do the merge operation and rasterize each unique job. The host (Microsoft At Work Copier) is the ideal point to do this.

- The system will keep track of pages that do not contain unique information as a result of the merge and will rasterize them only once. It will also do intelligent rasterization for the unique pages where possible.

4.3.6. Automatic Copy Numbering

- The system will support the ability to autonumber documents so that users can keep track of a limited number of distributed copies.

4.3.7. Document Preview

- The user will have the ability to view rasterized jobs before printing.

4.4. Trouble Reporting/Diagnosis

4.4.1. Remote Trouble Reporting

- Including ability to automatically notify administrator when malfunction has occurred

4.4.2. Remote Administration

- Remote queue management
- Remote diagnostics
- User administration
- Configuration management
- Remote software download
- Service maintenance notification.

4.4.3. Inference-based Diagnostic Engine (MEDIC)

- Inference diagnostic engine will work through probabilistic choices for malfunctions, and assist user in correct resolution path. Should paper jam between two sensor locations, interactive help will tell user location of jam.

4.5. Document Transmission

4.5.1. Microsoft At Work Fax Functionality

- All features available on the Microsoft At Work fax machine, including published quality and editable document transmission would be available on the Microsoft At Work Copier.
- Integrating fax functionality will allow users to publish a document to all recipients using only the copier. Local recipients would have a hard copy printed out with a personalized cover sheet, while remote users would have the document transmitted to them.

4.5.2. Color Document Transmission

- Microsoft At Work Rendering will be extended to include color formats. It will be integrated into fax and copier products to allow them to economically transmit color documents and images.

4.6. Other Features:

4.6.1. Activity Reporting

- Will be able to store activity reports. Will delineate on a per-account basis and send these reports to designated, LAN-connected or PSTN connected servers for roll up into backend databases. Examples are accounting systems and automated billing for leased copiers.

4.6.2. Job Interrupt Mode

- Allows suspension of long jobs so others can use the machine.

4.6.3. Email Integration

- User will be able to scan in a document and email to co-workers via their LAN-based email system. This would extend to networks outside of user's corporate environment.
- Gateways will be accessed using the Microsoft At Work Fax transport for wide area routing and messaging. This would allow users who find an interesting article to distribute it easily to people’s PC in-boxes, where the Microsoft At Work Fax Viewer would display it for them and allow it to be printed out.

4.6.4. Recipient Addressing

- Copies can be printed with personalized cover sheets indicating the recipient. This allows the user to publish a document automatically to all recipients; via email, printed out for internal hard-copy distribution or for remote users reachable only by fax. Data to complete this cover sheet may be derived from the MAPI address book or from the application issuing the print request.

4.6.5. Power Management

- Utilize Windows Power Management technology to minimize cold-start boot time and provide "instant-on" capabilities.

5. Conclusions:

We expect that the Microsoft At Work based copier will provide a new standard of digital document reproduction, document distribution, and desktop connectivity. We are working with key members in the copier industry to bring these products to market over the next year.

Microsoft brings to this market an unparalleled reputation for developing superior operating systems and applications software and strong skills in marketing those products. Our participating copier manufacturers will provide strong skills in developing and marketing office products. Together we will be building a family of copier products that will utilize the advances of digital technology, while meeting real user needs.

Overview of the Microsoft At Work™ Software Architecture

On June 9th, 1993, Microsoft Corporation announced the Microsoft At Work™ software architecture, a set of modular software technologies designed to bring ease of use, compatibility, and an enabling platform to devices in the workplace such as copiers, telephones, fax machines, printers, and handheld systems. These software components will be embedded inside these devices and in Microsoft® Windows™ based PCs to address many key problems that exist in the workplace today - devices are difficult to use, they don't connect with Windows based PCs directly, and they cannot be easily programmed or customized to meet the needs of individuals and businesses.

Users will realize these benefits by using graphical user interfaces on devices such as copiers and telephones that make all features easy to access and use, and by having control of and connections to devices from Microsoft Windows based PCs. The Microsoft At Work software architecture offers full compatibility with the Microsoft Windows operating system, ensuring that data can move freely between Microsoft At Work based devices and the PC. This compatibility also allows the over 300,000 developers in the world today to use their existing development tools and knowledge to write applications that run on the Microsoft At Work platform.

Since the June 9 announcement, Microsoft has delivered the first Microsoft At Work software in Microsoft Windows™ for Workgroups v3.11, and multiple office equipment manufacturers are expected to ship devices based on Microsoft At Work software in 1994. Over 60 companies from the telecommunications, office automation, and personal computer industries are working with Microsoft to develop compatible hardware and software products.