Color at Work™

# 100% Independent Analysis

## Ricoh Aficio 3228C

### 28 ppm Color, 32 ppm Monochrome
### Copier - Printer - Scanner- Fax

## Key Buyer Benefits

Feature rich color multifunctional product within a compact footprint

Excellent image quality across a wide range of business documents

Flexible desktop and network utilities via web-based Web Image Monitor and PC-based SmartDeviceMonitor plus DeskTopBinder utilities deliver device monitoring, cluster and recovery printing capabilities, and much more.

Wide range of productivity — enhancing features catering to both general office workflow and niche vertical sector requirements

Extensive fax functionality including several potentially time-and cost-saving features not typically found on a fax-centric product

Versatile document management capabilities both from a walk-up and desktop point of view

Color dropout technology providing advanced forms processing capabilities unmatched by rivals at time of writing

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## What's Inside?

*(Click on an entry below to go to the page listed.)*





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## What's Inside?





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## Product Dynamics

The Ricoh Aficio 3228C is the latest in a series of successful business color MFP solutions that have made Ricoh a leading player in the aggressively fought business color marketplace.

Replacing the Aficio 2228C, the new Aficio 3228C brings a wealth of new functionality, higher speed, greater processing power, and an equally aggressive price point.

The most obvious physical advantages that the Aficio 3228C offers over its predecessor include:

| | | |
|---|---|---|
| Max Color Speed | - 24 ppm | vs 20 ppm |
| Max Black speed | - 28 ppm | vs 28 ppm |
| Processor Power | - 600 MHz | vs 533 MHz |
| System Memory | - 1 GB | vs 76 8MB |
| First Page Out (Color/Mono) | - 6/8 | vs 8/10 |

However, go beneath the surface and there are many more new advancements in technology that distinguish the Aficio 3228C including:

**PxP Toner —** A major advance in image quality within the laser/LED printing industry has been the advent of chemically grown toners. In the past, toner was produced by literally smashing up and grinding down colored resins until the particles were deemed small enough to use. This approach resulted in uneven particle size which had an impact on image quality. With ever-increasing scrutiny being placed upon image quality, especially in an ever more colorful world the need to move to a more controlled method of producing toner is required. Ricoh's new PxP toner does just that. Instead of starting large and pulverizing down to small sizes, the PXP toner process starts small — chemically growing the toner particles from individual chemical building blocks. The result is a toner particle made up from polyester resin, coloring agents and wax with a very closely controlled particle size. As you will read later in the report, the results are impressive, with bright vibrant color, crisp fine lines, smooth grayscales and excellent halftone reproduction.

**Embedded Software Architecture (ESA) —** With digital MFPs being positioned by their makers as more than just an output device, the industry is opening up the doors to third party developers by moving away from the age-old, difficult to work with proprietary firmware and instead moving to industry recognized platforms with SDK (Software Developer Kit) support.

Ricoh's ESA is an open, scalable platform built on an object-oriented Java backbone that will allow for far greater and easier integration than the previous proprietary firmware. As this technology gets embraced by software resellers, VARs and other solution providers, expect to see more customized solutions and a whole new way in which the walk up experience to the office copier of old will be judged.

**BERTL analyst hands-on with the Ricoh Aficio 3228C**



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## Product Dynamics

**Market Positioning**

The Ricoh Aficio 3228C is capable of being both a color-capable and a color-centric MFP solution. While these two product descriptions may, to the end user, sound like marketing semantics there is a commonly accepted differentiator between the two.

**Color-capable** is commonly regarded as a device that is capable of continuing the day-to-day monochrome workload while also facilitating the occasional need for color. Most regard the volume split for a device of this type to be predominantly monochrome with color making up between 10 to 30 percent of the overall page count.

The majority of users of color capable devices are general office users producing jobs using Office applications with the same types of document production needs as monochrome users.

To help the migration from monochrome to color capable, the price differential between dedicated monochrome and color capable is kept as low as possible. The same is true of the running cost in monochrome mode. The reason being that manufacturers and dealers are happy to forfeit slightly higher capital cost sales profit in exchange for the much higher after-sales consumables business that the color output offers.

**Color-centric,** on the other hand is where the device is being purchased to handle a high color workload, with more than 30 percent color within the typical workflow.

While the majority of color-centric devices will also probably find their way into the general office, there will also be a much greater need to facilitate the needs of the color professional; marketing, design etc who may be using more sophisticated applications like Photoshop and Quark to produce high quality color output. These color professionals have needs for more color management and workflow capabilities than the general office worker who wants to hit print and forget about it. To accommodate these needs, some manufacturers offer a more powerful controller option (usually Fiery-driven) with sophisticated software utilities.

The price differential between monochrome and color-centric is considerably higher (30 to 40 percent) than that of the color-capable alternative. The same applies with monochrome running costs which tend to be higher than those found on monochrome and color-capable devices.

This is because the customer does not need coaxing to the world of color, having already been sold on the concept and are prepared to pay the premium.

A recent BERTL color survey would suggest that, while color-centric devices are seeing big sales increases that the typical workflow pattern in the office is still more in line with the color-capable philosophy, with the majority of documents still be produced in monochrome.

The Ricoh Aficio 3228C does not sacrifice any of the functionality available to monochrome Ricoh users, they simply pay a premium for high speed high quality office color capability. In fact, at the time of test, the Aficio 3228C offered more in terms of pure processing power and workflow capabilities than the monochrome equivalent in the Ricoh range.



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## Product Dynamics

**Imaging Unit Design**

The Ricoh Aficio 3228C uses laser technology.

There is still great controversy between whether laser or LED technology is the better way to go. LED uses fixed LED arrays to create the image on the moving drum while laser technology, as the name suggests, uses one or more laser beams that are directed to create the image on the moving drum via rotating mirrors.

LED proponents claim that laser imaging technology is more prone to environmental fluctuation while laser technology enthusiasts promote that laser imaging is more flexible allowing smaller and different sized dots to be created.

In reality, BERTL has seen good and bad output from both laser and LED printers over the years and advises users to look beyond the theory of the imaging process and see how the device is able to handle the specific workload critical to your business. Indeed, many manufacturers include both LED and laser imaging technologies in their range.

Just remember not to get sucked in by the hype and focus on what you need the technology to do, — create good quality output for your needs. A device that produces good PowerPoint presentation slides may create poor halftone photography, making it ideal for some and a waste of money for others.

The imaging drums are aligned in a tandem fashion, one drum for each color. The drums, as you can see from the top photo are positioned at a 45 degree angle with the paper passing along the transfer belt over each drum in turn, where the image is built up. This layout allows the Ricoh Aficio 3228C to maintain a more compact footprint compared to some rivals that have the imaging units in a line parallel to the floor.

**Imaging unit revealed while the waste toner bottle is replaced**

**Replacing toner is a simple process**

**End User Maintenance**

While virtually all devices will be sold with a maintenance contract, the trend is towards designing devices that allow end users to carry out routine maintenance tasks themselves in an emergency.

Toner supply changes are easy, with the side door opening to reveal the four toner bottles.

To gain access to the imaging drum themselves is not as easy, requiring the removal of several screw — a factor that might put some end users off.



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## Paper Handling

### Paper Capacity

The Ricoh Aficio 3228C has a standard paper capacity of 1,100 sheets, putting it on a par with the capacity of most rival units out of the box. The standard 1,100-sheet configuration breaks down to dual 500-sheet trays and one 100-sheet bypass tray. The first 500-sheet tray can only hold paper sizes up to letter/A4 while the second standard 500-sheet tray is truly universal, supporting paper sizes up to ledger/A3.

While the Ricoh Aficio 3228C may offer the same capacity as rival units it falls short in relation to its support of heavier paper stocks, with the100-shet bypass tray being the only source that can handle paper weights above 28 lb./105gsm. This puts the Ricoh at a disadvantage versus some competitors which offer several times greater heavy paper weight capacity support, a factor that could be important in environments where the device is to be used for the production of product brochures, business cards, covers or reports etc where longer runs on heavy media are commonplace.

The bypass tray maxes out at 90 lb. Index/ 163gsm which is also lower than the weight supported by some rivals. That having been said, for the majority of office environments the bypass tray will probably suffice the occasional heavy paper stock printing requirement.

In its favor, the Ricoh Aficio 3228C has the ability to create full bleed 11” x17” documents by using 12” x 18” papers. Again, like the larger stock, this is most likely a specific function and is one that relies upon the bypass tray.

Overall paper capacity can be extended to a maximum of 3,100 (letter) sheets through the addition of an optional tandem 2,000-sheet paper deck, which is installed beneath the main engine unit, thereby not increasing the overall footprint of the device. The high capacity unit is restricted to handling letter/A4 supplies. For those who wish to have greater paper size flexibility Ricoh also offers additional universal paper trays, each holding a maximum of 500 sheets of paper up to ledger/A3. This is an important consideration for environments such as a legal firms, real estate agents, design agencies, city planning departments, etc., where a diverse range of documents larger than letter/A4 are created on a regular basis.

**Reloading paper supplies in one of the 500-sheet universal paper drawers**

### Automatic Paper Selection

The Ricoh Aficio 3228C automatically detects paper for the user. This is a time-saving benefit compared to some competing units which force users to manually change dials or change paper settings at the touch screen when paper stocks are switched over.

This tray system on the Ricoh Aficio 3228C automatically detects the size of paper and passes the information to the device, saving valuable time, raising user productivity, reducing the potential for mistakes which can lead to paper jams, which in turn create bottlenecks.



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## Paper Handling

**Automatic Document Feeder**

The Ricoh 3228C comes with an 80-sheet duplexing automatic document feeder as standard. This is often an optional purchase for both monochrome and color devices in its sector. The capacity of the document feeder is also considerably higher than several of the Ricoh Aficio 3228C's competitors, but not the highest capacity in the market. We would like to see Ricoh add a single-pass duplex-scanning document feeder, a feature that it has already implemented on its departmental monochrome MFPs, and a factor that can help raise duplex productivity while reducing wear and tear on originals and reduce paper jam incidences due to the less rigorous paper path. Scanning on the 3228C is carried out at 600dpi in 8-bit color.

**Finishing and Output**

The Ricoh Aficio 3228C comes with two finishing options, the Booklet finisher and the Multi-tray finisher.

The **Booklet Finisher** can stack up to 1,000 sheets at a time in the main tray and staple up to 50 sheets. Users can choose 1 staple in 2 positions or 2 staples in 2 positions. The finisher also saddle-stitches up to 10 sheets, resulting in a 40-page booklet (some competition can handle up to 15 sheets, resulting in 60 page booklets). A hole punch unit can be added after installation, allowing users to do both 2-and 3-hole punch.

The **Multi-Tray Finisher** has 2 trays, the top tray accommodating up to 500 sheets while the lower tray holds up to 2,000 sheets. Users can staple up to 50 sheets at a time. Users can choose 1 staple in 3 positions or 2 staples in 1 position. The hole punch unit is the only option on this finisher which can be added after installation to allow users to do both 2- and 3-hole punch.

During our tests we did not encounter jams of any kind; however we did notice the removal of jams may be difficult in the duplex unit (the area in which paper jams are likely). The duplex unit is located on the left side of the machine, right where the optional finisher will go. If and when a jam occurs in the duplex unit, users must first separate the finisher from the main unit, and then open the duplex unit to find the jam. This may cause problems with non-technical users as well as those with physical disabilities. It will also demand that more space be allocated for the device due to the space having to be left to the left of the device to allow for the finisher to be rolled away from the main engine.

MFP devices are now an established part of the enterprise LAN infrastructure. And like other network devices, they are subject to the demands of IT managers for improved security. Manufacturers have been introducing sophisticated features that go beyond the security of the device itself (i.e., protecting the hard drive and console), addressing the key issues of network privacy. and authentication.

**Finisher being rolled away to gain access to the duplex unit**



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## Security

**Print Security**

Many users have expressed concern with document confidentiality while printing. They worry about printing private documents to the copier/printer and what happens in the time it takes them to walk from the desktop to the exit tray at the copier. Users fear these documents can be mixed in with other users jobs, looked at by other users, taken by mistake, or even forgotten about leaving those documents for all to see. This is an important consideration for any company subject to the HIPAA, Gramm-Leach-Bliley FSMA or other data privacy acts.

The new Ricoh Aficio 3228C prevents others from reading or removing private documents. This is done by suspending output until the user enters an authorization PIN at the system's control panel

The Locked Print Job function enables users to print with confidence, knowing they will be the only ones viewing and retrieving their personal papers.

Using the Locked Print Job function is simple. To do so users open the print driver dialog box and set "job type" to "locked print." After clicking "details," users enter a user ID and password — this ID and password will later be used at the control panel to release the print job. A confirmation message will appear asking users to confirm the password by re-entering it. Once this is done, users click "ok" as if it were a normal print job, sending the job to wait in the machine.

With the Locked Print Job now stored in memory, retrieving it from the machine is equally as straightforward as sending it.

After the user has logged in, the "Printer" key is pressed on the touch screen. This is followed by "Locked & Sample Print Job List," also on the touch screen. The logged-in user's print jobs will now appear. After selecting the desired job just input the password from earlier and press yes. Only now will that file print securely into the original user's hands.

**Fax Security**

The same lockdown capability can be used for fax, with the Ricoh supporting fax to user box through the use of sub-address fax numbering. To do this, each user requiring a secure fax delivery mechanism sets up a fax number complete with sub-address (like an extension). When faxes come in with the sub-address number they get routed directly into the fax box rather than get printed for all to see. This fax box can be password protected to guarantee security. Users can also set up the fax box to automatically reroute the faxes to an email address or simply view and delete the faxes directly from the desktop using the included DeskTopBinder v2 utility.

**Document Server Security**

Print on demand documents stored on the 3228C can also be made secure. Files stored on the device hard drive are specified as to who can view and print them and who cannot. The printing of stored files by unauthorized users is very much preventable.



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## Security

**Access Permission**

To ensure this, Ricoh has created four types of Access Permission.

The first is **Read-only**, you can print and send files as well as check the content of and information about stored files. This function is set for users with limited access who will just print and distribute the files.

The second is **Edit**, users have permission to view files and change the print settings for stored files. This is also a limited function for users, they may only change the way that file is set to print.

The third is **Edit/Delete**. Stored files can be deleted. Users with Edit/Delete permission may also view and edit files. This is for more advanced users, giving them access to control what is available to the users.

**Full Control** is the final type, giving users the most access possible. As well as being able to view, edit, edit/delete files, this user can allow other users access permission. This is more of an administrators function, allowing this user control of exactly who has what type of access.

**Hard Drive Data Security**

As jobs are printed, copied, faxed and scanned they are not deleted from the memory on the Hard Disk Drive, even after the job is finished. Instead, they remain in a passive area of the drive until finally overwritten. When you consider the size of these drives (80GB in this instance) it could be months or years before the segment of the drive the passive data is overwritten. This poses a big security risk as the data can be retrieved if the hard drive is stolen. This has raised many questions as users may print classified documents and not feel comfortable with them sitting on the Hard Disk Drive.
To put users at ease, Ricoh has created ways to ensure secure documents are deleted from the Hard Disk Drive on the Aficio 3228C with the introduction of its DOSS (Data Overwrite Security System).

With DOSS, the “Auto Erase Memory Setting,” overwriting starts automatically once the job is completed. Priority is given to the Copier, Fax, and Printer functions as the Auto Erase Memory function. When a copy, fax or print job is in progress, overwriting will only be done after the job is completed.

“Erase All Memory” will write over all data on the hard disk drive, (Ricoh notes this is important when machines are relocated or disposed of.) This is a one time event that is done by an administrator to ensure the machine is cleared of any and all documentation.

We would like to see Ricoh’s removable hard drive and VMSS (Volatile Memory Security System) hard drive security solutions offered for the Aficio 3228C in the future. These additions would allow for the same stringency of hard drive security but still allow the full functionality benefits of the hard drive to be utilized by users.

**Restrict Access To The Device Itself**

As soon as the MFP gets placed onto the network it becomes a potential gateway to other areas of the company infrastructure. To keep this gateway tight Ricoh includes a selection of security measures designed to keep non-authorized users away. User authentication is the most popular method of restraint, with users having to enter their username and password before entry is granted.



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## Security/Accessibility

This process involves the device checking the security information to the central company directory, be it Windows Active Directory or LDAP. This authentication also allows activity to be tracked and controlled through other tools such as the *scan to email forced sender function* or via the PCSM cost and job accounting system.

Access to the device across the network can be limited through the use of IP filtering and SNMP v3 support. IP filtering allows IT administrators to limit only those devices within the IP parameters set to access the device.

We would like to have seen MAC filtering, a more secure filtering approach that only grants access to network devices within the MAC series stipulated. As the MAC address can not be changed this is a much tighter lockdown compared to the IP filter, which, if the hacker discovers the IP range, can be mirrored.

SNMP is the protocol by which data is communicated between the device and other units across the network, including the directory system by which authentication is achieved. IT managers in security conscious environments are demanding SNMP v3 which offers data encryption and additional security measures thus preventing a hacker from monitoring the very security messages that are designed to keep them out. The Ricoh Aficio 3228C supports the most current version 3 of SNMP, which includes sophisticated security measures not found in versions 1 and 2.

**Accessibility**

Ricoh has incorporated new design features to make the Aficio 3228C more compliant with the Rehabilitation Act in the United States and easier for disabled users.

A major design shift on the Aficio 3228C is the option to detach the top of the unit and rest it on a desk if desired. This includes the control panel, doc feeder, and scanner all in one, able to separate from the unit itself, and on a desktop.

This “accessible scanner unit” is something new and innovative that we have not seen prior to this series from Ricoh. The separate unit can be placed as high or low as the user desires by simply finding a desk or counter top that meets your needs.

Competitors offer tilt screens allowing wheel chair users access to the control panel, but few allow users to have access to both the control panel and the doc feeder/scanner.

On the downside, the 3228C lacks paper drawer access from both the top and bottom. Ricoh users must open the paper drawers from the bottom reaching up — making it difficult for handicapped users while some competitors have the option to pull from the top or bottom.

At the present time there is no remote access capability offered for the Ricoh Aficio 3228C. By this we mean a method by which the traditional touchscreen operations could be handled via say a desktop PC.

This is a feature that some rival manufacturers have implemented, some going as far as including voice navigation to assist the blind and visually impaired.



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## Device Management

Remote access to imaging devices for monitoring, configuration, and administration purposes is now a core feature with the majority of MFPs on the market today. Ricoh and its Aficio 3228C is no different and boasts some very special features.

**Web Image Monitor**

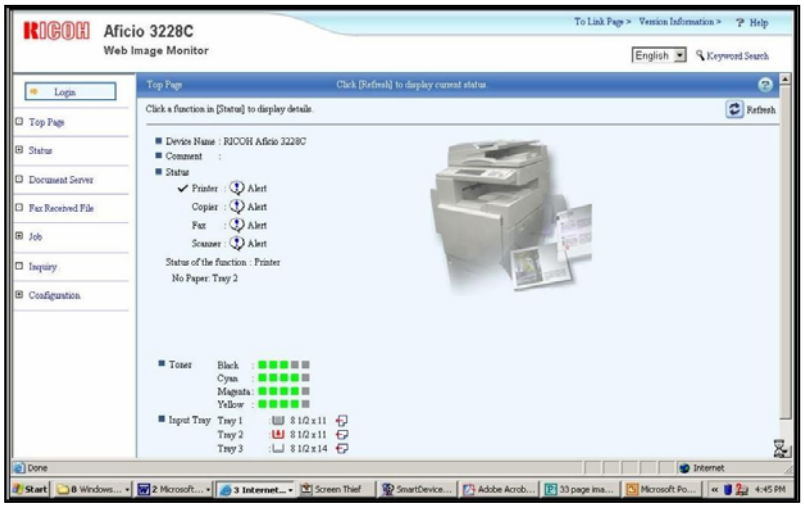
The Ricoh Aficio 3228C has an embedded web server called Web Image Monitor. This monitor is accessible by entering the IP address of the device into the URL address bar of the internet browser. When typed, the Aficio 3228C's current device status will be shown for both users and administrators alike.

From the perspective of most end users, the two monitoring capabilities of this device that will prove to be the most valuable are: 1) the ability to see if a device is capable of doing a job, i.e., whether it is online, has sufficient supplies and the finishing capabilities, and 2) an idea on how long it will take to get the job done, i.e. what is ahead of it in the queue.

From the home page of the Web Image Monitor users can see the status of the device, enabling users from the desktop to see if the device is online and has enough supplies to handle the job they need without the need for user intervention.

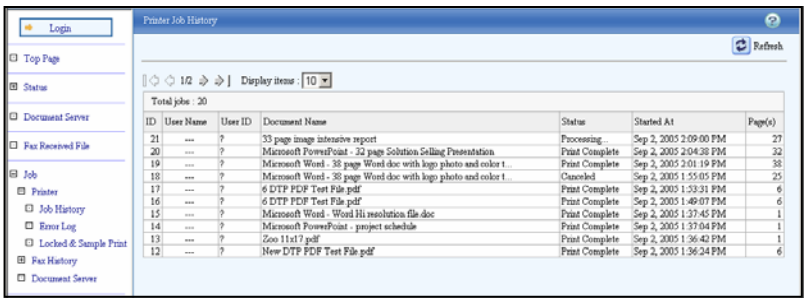
Why is this important? Let's say the third paper drawer is empty and it is the only tray capable of handling the 11 x 17 user request. Normally the user would send the job, make his/her way over to the device and find the error.

This may produce a bottleneck of print jobs backed up behind it, creating down time. The user will then have to refill the paper drawer — in some cases even be forced to reprint the job as it may have stopped in mid job. Web Image Monitor will tells uses the status of that drawer prior to printing, eliminating all these problems.




**Above: Users can see key status levels on the device**

**Below: Users can se e the job queue at a glance, even the number of pages in the job.**



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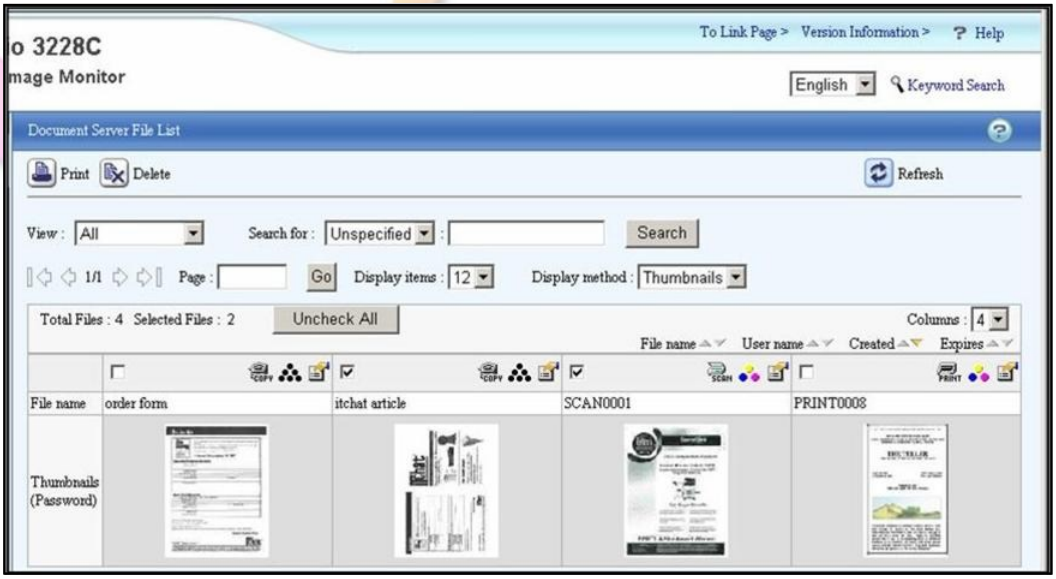
## Device Management




**Users can view and reprint copy, print, fax, and scan files stored on the device hard drive.**

The Job Tab takes care of the second important issue, how long will it take? By providing users with a view of the current job queue at the device, this allows users to see how much work is stacked up ahead of any job they decide to send.

The further away the user is from the Ricoh Aficio 3228C, the more important this feature becomes. With jobs lining up in queue who knows how long it may take before your job is ready.

With the Job Tab, users are not constantly walking back and forth from desk to copier to retrieve the document. Simply put, Job Tab puts the user a click away instead of a walk away from knowing if his/her job is ready.

Web Image Monitor also allows users to view and administer documents they have stored at the device.

These files could be documents scanned or printed to the device and used as a print on demand repository, or a method of viewing fax documents stored securely within a sub address fax folder.

Users are able to view thumbnail or full size images of the first page of each document stored, edit documents, even pull back the files to the desktop. We would have liked the ability to view all the pages of the document.

Unlike some rival devices, users are able, using the Ricoh Aficio 3228C to view all four function formats within the single application. In the illustration above, a BERTL analyst is reviewing pages stored on the device using the copy, print and scan functions.



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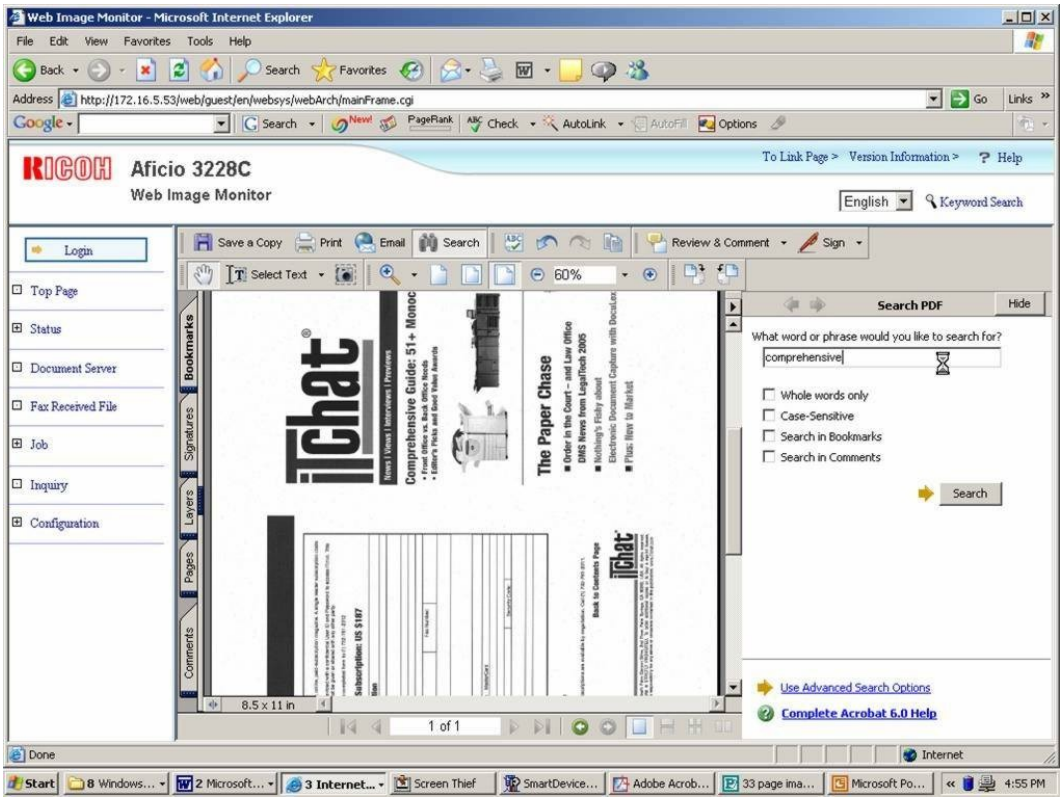
## Device Management

Another invaluable feature that impressed BERTL analysts was the seamless editing capability that is made available. Users are given the choice of downloading the file of their choice to the desktop in either PDF or JPEG format. In the example below, we chose to download the file as a PDF. The file is pulled to the desktop, opening the Adobe Acrobat application but remaining within the window of the Web Image Monitor. We could edit the file and resubmit the file to print in one seamless process.

This has numerous real-world applications including the personalization of documents/forms/letters on a user by user basis without each user having to store each file on their PC and keep it updated. Instead, the office manger can just ensure that the document archive on the Aficio 3228C is kept up to date. This can also save valuable storage space as the file is only being stored permanently on the single hard drive.



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## Device Management

**Email Alert System**

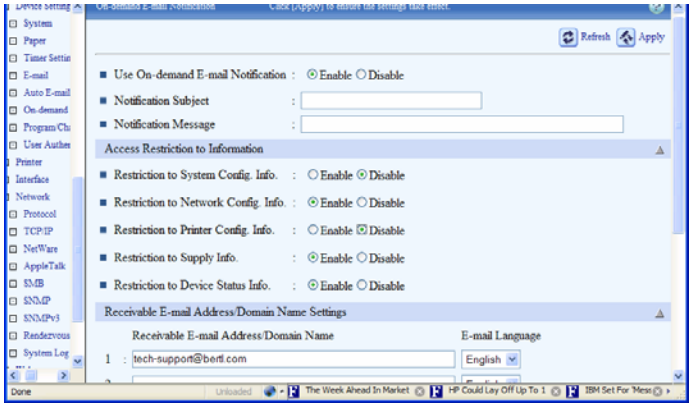
For small businesses especially, usually there is limited and, in many cases, no staff dedicated to monitoring imaging devices.

Even in small workgroup environments, it makes sense to designate a “key op” for the printer rather than relying on a distant corporate support desk.

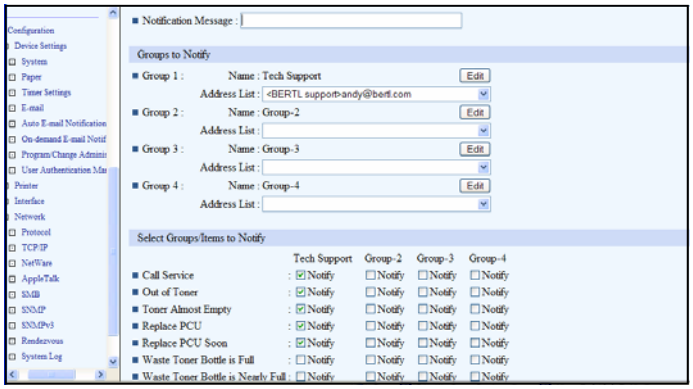
For these situations, the Ricoh Aficio 3228C supports email alerts, which can be configured through the Web Image Monitor interface. Emails can be sent to office managers or other general staff when either resource limits or error conditions occur. The list of alerts include: toner low, waste bottle full, paper out, cover open, and paper tray error.

The Ricoh Aficio 3228C also supports “on-demand” email replies. This allows dealers or other remote IT staff to query the device’s SNMP data base by sending an email request, which then triggers an informational reply. This approach gets around corporate firewalls that would otherwise block Web access.

To configure the on-demand configuration page, administrators enter authorized email requestors and the types of information that the remote user can view (e.g., printer info, device status info, and supply info.)




**With on-demand email, remote support staff and dealers can receive device status emails.**




**Email alerts can be configured for multiple recipients.**



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# Device Management

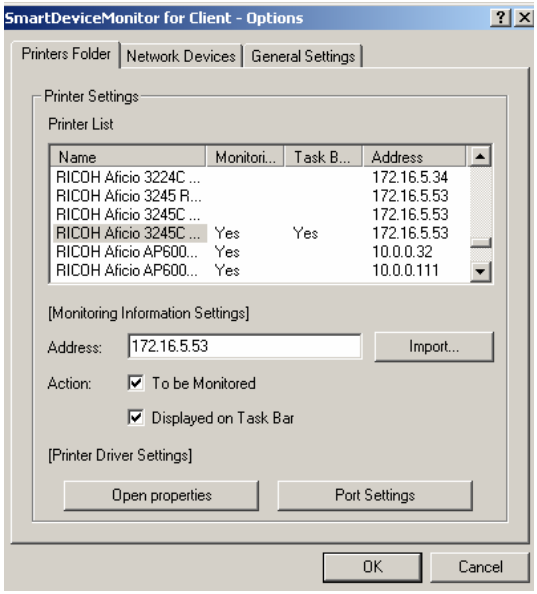
**SmartDeviceMonitor**

For those who do not want to be opening internet browser windows every time they want to check on the status of a device, there is another way to view job and status called the SmartDeviceMonitor. This is a Windows-based application, which can be accessed through the application's icon in the Windows notification area.

One advantage of the SmartDeviceMonitor over the Web interface is that it lets users monitor multiple Ricoh devices. A click on the notification icon and users can view device configuration, device status and job history information for any discovered Ricoh device.

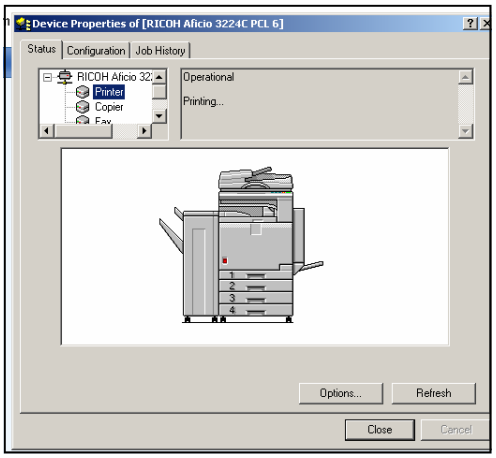
Another key feature of the SmartDeviceMonitor is the ability to group multiple devices for improved productivity and reliability.

With its "Extended Features" users can distribute a multi-copy job across a printer group for greater throughput. They can also create recovery groups so that when a Ricoh device experiences a device error, the job will be automatically re-routed to another printer.

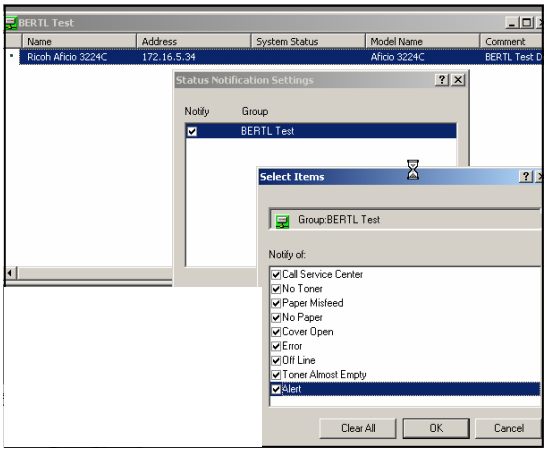



Finally, SmartDeviceMonitor Extended Features also can be configured to pop-up a print completion message.

**The status of the device can be seen instantly.**




**Pop-up notification can be set up to alert the office manager/administrator etc when a device requires attention.**



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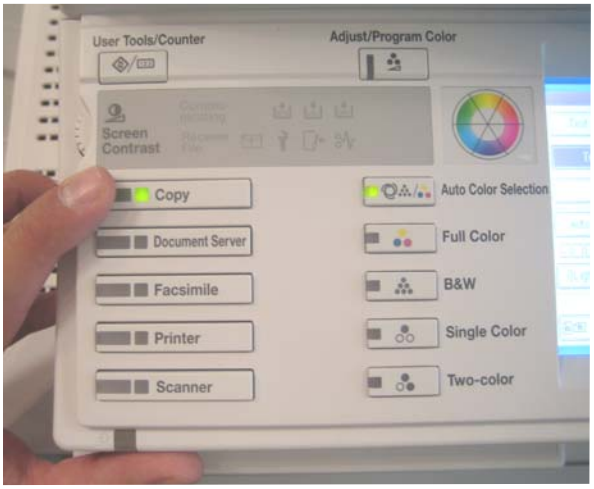
## Copy

Users familiar with recent Ricoh models will feel very much at home with the new Aficio 3228C.

The Aficio 3228C control panel consists of a series of hard buttons as well as a large touch screen to guide users to the task they desire. When first glancing at the control panel, the user will immediately notice the current function and status of the machine. The majority of the time the machine will be in its factory default, copy mode. On the left of the panel, 5 hard buttons exist with a small green light on them to change the function; Copy, Document Server, Facsimile, Printer, and Scanner.




**Above: Left-side hard button key panel**

**Below: Right-side hard button key panel**


Above the Function Keys are indicators that display the status of the machine, indicating errors. Small visuals identify these errors; Add Staple, Add Toner, Load Paper, Service Call, Open Cover, and Misfeed.

Just right of hard function keys are five similar looking buttons that also light up known as color selection keys. These five keys read as follows from top to bottom: Auto Color Selection, Full Color, Black & White, Single Color, and Two-color. Auto Color judges the color of the original automatically, and copies either in full color or black/white. Ricoh's Auto-color mode operates on a page-by-page basis meaning that a user producing a document with some monochrome and some color pages is only paying the four click rate for the pages actually in color. This is a valuable cost saving feature.

Full Color Copy makes copies by overlaying yellow, magenta, cyan, and black. Black/White Copy makes copies in black regardless of the color of the original. Single Color Copy copies in one designated color (chosen by the user). Two Color Copy copies black to black, but all other colors different shades of a single color (chosen by the user).

The right side of the control panel is very straight forward. Users will find a "start key." This is pressed to start the scanning process or to print documents stored using the Document Server Function. A Clear/Stop key is pressed to delete a number entered prior to scanning or to stop a job once it is in progress.



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## Copy

The Number keys are pressed to enter the number of copies and data for a selected function. Check Mode key can be pressed to check the entered copy job settings. A program key is pressed to register frequently used settings, or to recall registered settings. The Clear Mode key will clear out the previous copy job setting when pressed. An Energy Saver key will switch the 3228C into and out of Energy Saving Mode.

If users wishes to interrupt a long job to make copies during copying or scanning, they just have to press the Interrupt Key.

The opening screen is standard to all Ricoh MFP products, with the user working from left to right building the copy job requirements as they go. Many users will never need to mine away from the main screen, a valuable time-saving feature.

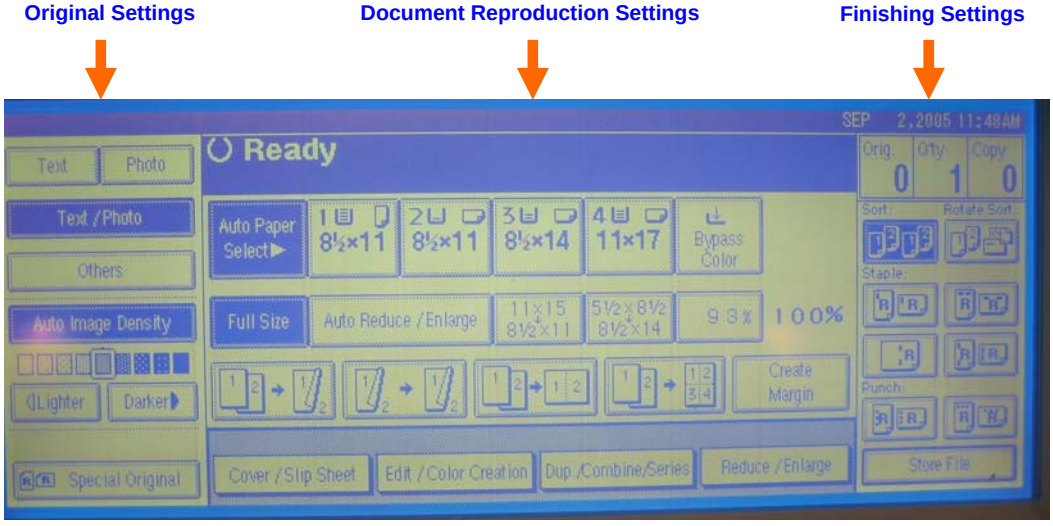
**Job Build**

The Ricoh Aficio 3228C comes with a standard 80-sheet duplexing automatic document feeder. For users who need to produce jobs larger than the 80-sheet capacity, Ricoh has included a job build capability. This not only allows multiple scans to be linked to create large documents, but also allows the combination of cut sheet pages, fed through the document feeder, with pages copied from books and other sources that must be scanned using the flat-top glass platen scanner unit.

This is an important feature within the legal profession where case documents being reproduced for a court hearing may include standard cut sheet pages plus photographs and other documents that could not be placed through the document feeder. In this instance, the job build feature would allow the paralegal to build the entire job in memory before creating the multiple sets required.

Job build gives the device a major advantage versus one of its main office competitors which only has a 30-sheet document feeder.

Image quality options let you specify the type of original. Users can choose between Text, Text/Photo (default mode), Photo, Map, and second generation modes (for copying copies).



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## Copy

Within photo and text/photo modes you can enhance output by selecting; photographic print, press print and second generation copy options.

The Ricoh Aficio 3228C comes with the same copier functionality users would expect to find on a monochrome device, including: page numbering and stapling, cover mode, shift/erase and book copying, N-up copying, job interrupt, 25 to 400 percent zoom, mixed original mode and more.

**Copy Concurrency**

To accommodate environments where copy is an important workflow the Ricoh Aficio 3228C includes a copy concurrency capability. By this we mean that if a copy job is already in progress, that a user can scan a second copy job into the queue. While restricting advance copy queue capability to two jobs is more limited than some rival devices, it should satisfy the needs of most office environments.

**User Productivity**

While manufacturers may promote the headline speed of a device, the most important aspects of the device to many copy users will not be the engine speed, but is more likely to be areas such as:

- First copy out time
- Scanning speed
- Maximum document feeder capacity
- Simplicity of interface layout

These factors are all going to play a larger part in the overall time a walk-up user needs to spend at the device before they can return to work with their single page copy job or leave the device to run when larger copy jobs are required. In all these key areas of user productivity, the Ricoh Aficio 3228C stands out as being a device to beat.

**Image Quality**

The image quality from the Ricoh Aficio 3228C was among the best we have seen from a front office color MFP.

The overall appearance of the output was a soft sheen due to the wax-impregnated toner. This had a pleasing look without suffering from the glare that a high gloss finish can produce when being read in offices with overhead lighting.

Fine lines and fonts were well reproduced with no areas of concern. Grayscales were reproduced well with none of the stepping that we have seen on some devices.

Skin tones had a natural look and feel while at the same time solid areas of color had the vibrancy that office users producing presentations need.

The biggest area of improvement that the new PxP toner imaging system highlighted versus previous Ricoh color MFPs was in the reproduction of halftone images such as photographs. While in the past some output had a slightly grainy appearance the output from the Ricoh Aficio 3228C looked much more professional.

The only area of image quality concern was in the reproduction of grayscales when produced using CMYK. The problem is not one unique to Ricoh. When producing grayscale shades on a page containing color data the Auto Color Mode has to reproduce the grayscales using a mix of CMYK toner. This can result, as in the case of the Ricoh Aficio 3228C and virtually all other devices, in a slight hint of one color within the grey. In the case of the Ricoh Aficio 3228C it was a slight hint of cyan giving the 25 percent grayscale shade a slightly bluish tint.



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## Print on Demand

The 80GB hard drive on the Ricoh Aficio 3228C serves two main purposes:

1. Provides extra page spool memory for copy, print, scan and fax functions.
2. Document storage (called Document Server by Ricoh) which allows copy, print, fax and scan users to store and retrieve commonly-used documents quickly, without having to re-scan, reprocess or generate network bandwidth.

Each stored job can be categorized by user name, document name and date stored. The image below illustrates a series of jobs that have been stored. Once stored, jobs can be retrieved and reprinted from either the copy control panel or via a choice of two desktop utilities (DeskTopBinder or Web Image Monitor).

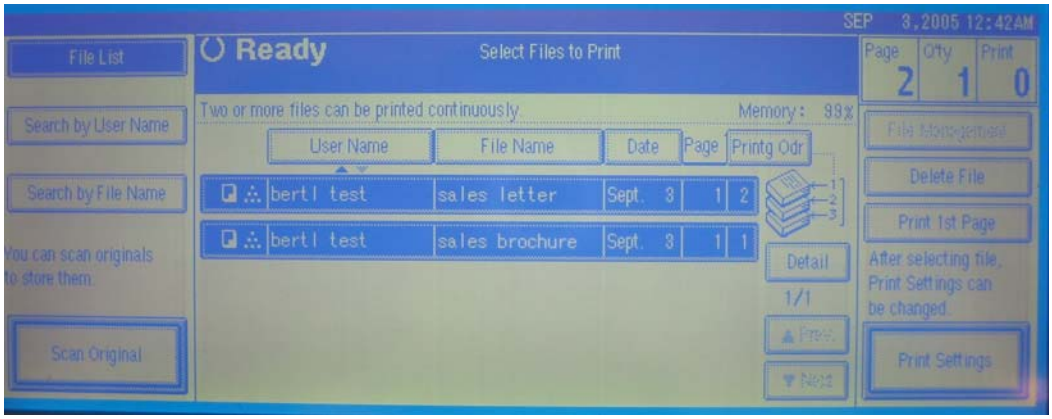
In addition to providing a reprint on demand function, the Document Server also allows users to send emails and faxes using attached documents stored on the hard drive, rather than have to scan them in during the transmission.

For example, say a user has to send a handwritten order to a customer via email. The customer also wants product brochure information. The product brochures are already stored in memory for daily use. This means the user has to attach the stored file when the email is set up. This saves the user from having to scan the entire brochure.

Note: Only files stored within the 'Store File' facility within the scan function can be attached to emails. The same is true with only documents stored within the fax function being attachable to fax transmissions.

The reason for this is the format in which the files are saved. Copy jobs stored using the Document Server function on the copy control panel are stored in proprietary format, print files are stored post-RIP, and scan and fax files are stored in industry standard TIFF or PDF format.

**Two jobs stored on the Document Server being combined into a single job and reprinted**



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## Print

Network printing is standard on the Ricoh Aficio 3228C. This is a trend that is commonplace in the office color MFP market.

The controller is powered by an 600 MHz processor, with an impressive 1 GB RAM and an 80 GB hard drive.

Standard connectivity includes 10/100BaseT Ethernet and USB 2.0. Parallel, Wireless 802.11b, BlueTooth and FireWire (IEEE1394) connectivity are available as optional upgrades.

We would have preferred to have seen the faster IEEE 802.11g wireless option, but were still impressed by the range of connectivity options available.

PCL5c, PCL6 and Ricoh's own RPCS printer drivers are all included as standard.

Genuine Adobe PostScript 3 and Direct PDF printing are available for an additional charge. True 1,200 x 1,200 dpi print output is supported in all PDLs except PCL5c, which is restricted to 600 dpi.

While readers will be accustomed to seeing PCL and Post-Script PDLs, RPCS may be less familiar to those considering Ricoh for the first time.

RPCS (Refined Printer Command Stream) is the company's own proprietary driver software utilizing the power of the desktop CPU while taking much of its printing technology from PCL. This best of both worlds offers, according to Ricoh, a speedier driver.

In certain circumstances, we agree. For example, it shaved 25 percent off of a 4 MB high-resolution image contained in a Word file. However, this kind of improvement is dependent on the speed of the desktop CPU and the current application load.

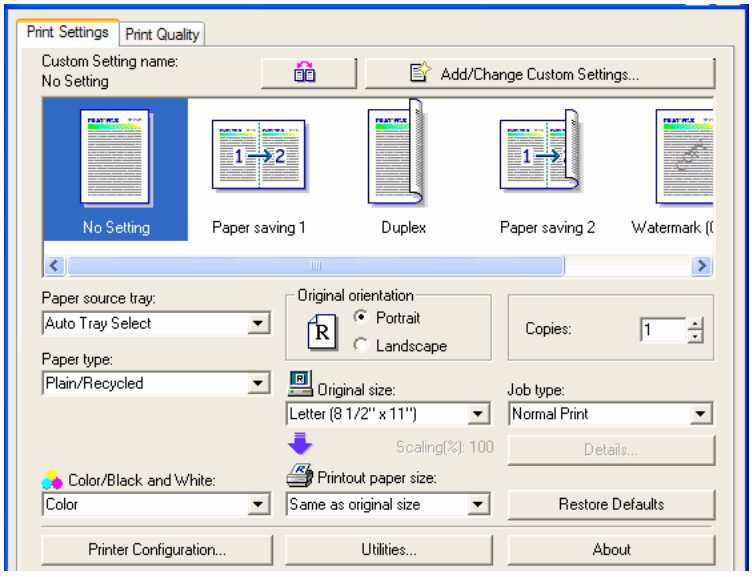
Productivity when measured in terms of print submission to print output was very good across all three drivers, with all three drivers outperforming most competitors on most standard office workloads. As expected, PostScript lagged behind PCL on most Microsoft applications, with RPCS taking first place. PostScript however proved to be more efficient at handling PDF workflow.

### RPCS Driver Design

The RPCS driver has a very different look and feel compared to the PCL and PostScript drivers.

This in itself has its pros and cons. RPCS fans will say that the icon-based driver offers greater ease of use and a higher

**Ricoh's RPCS icon-driven RPCS driver**



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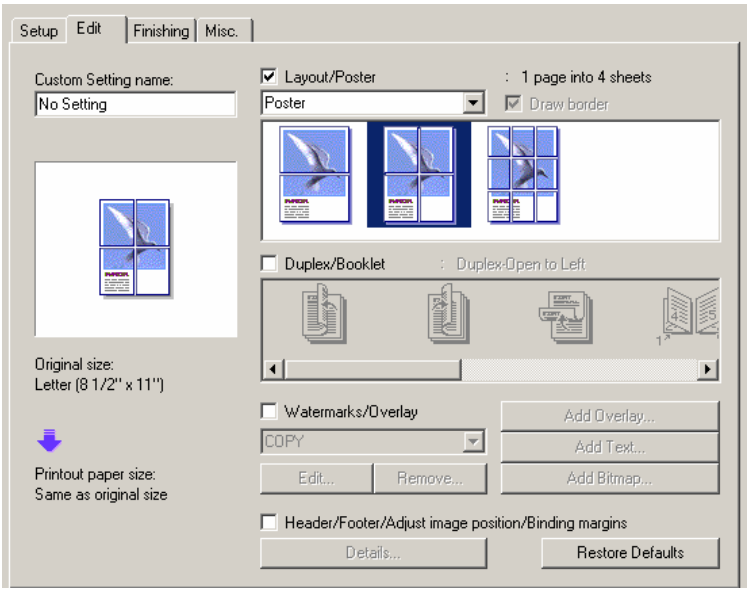
## Print

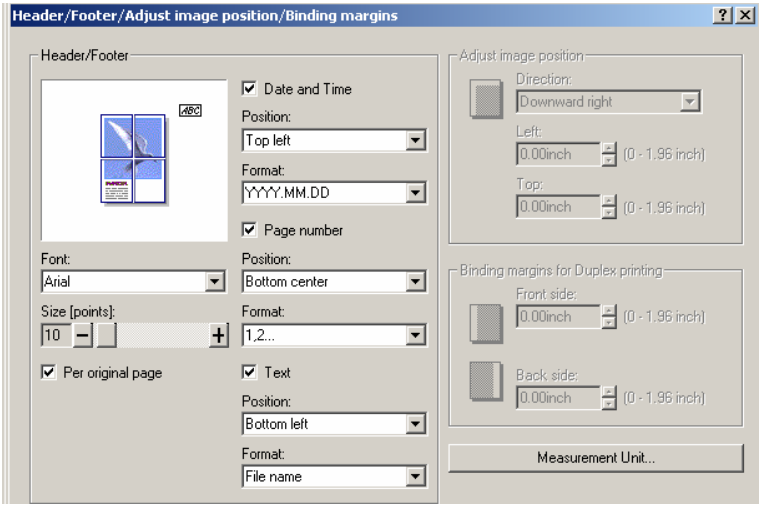
level of functionality. The downside is that the driver takes some getting used to, and for those who switch between drivers depending upon the workload, it requires more thought than the more conventional PCL to PS switching.

BERTL analysts liked the custom setting facility on the RPCS driver. This allows users to save common device settings under a one-touch template. The setting is stored prominently on the opening tab of the driver, with users able to view a description of the template settings by moving their mouse cursor over the icon. While this is not a unique function to the RPCS driver, it feels more like a backbone feature of the driver rather than an aside that must be sought.

To add or change a custom setting, users go into a secondary level of the driver. Here, users are presented with four tabs. Within the setup tab, users can chose paper input and output features including cover stock options.




**Poster setting could be useful in education sector placements where large display materials are produced on a regular basis**




**Page numbering, watermarks, date and time stamps can all be added**



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Within the edit tab users have the ability to chose duplex functionality, including a booklet imposition layout mode.

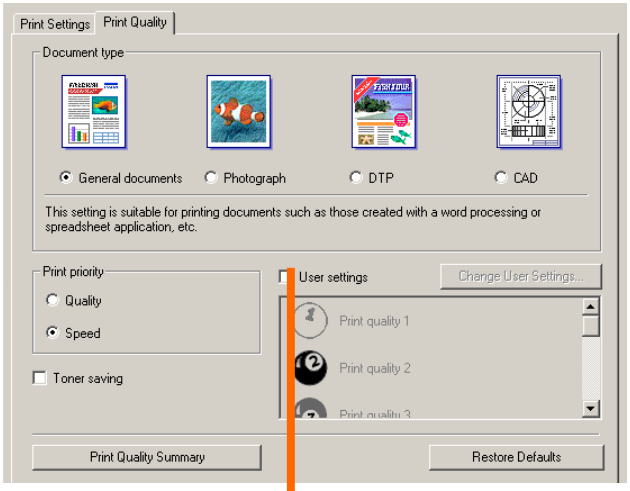
They also have the ability to split an image onto multiple page printouts using the Poster mode. This is a useful function for those environments such as schools, charities, retail establishments that need large format printing but cannot afford the high cost of the equipment or the outsourcing fees.

The edit tab also includes an image overlay function. This allows users to store commonly used background elements as a ripped image which is incorporated into the print file at the device. This saves processing time and reduces bandwidth, two important considerations when dealing with large color files.

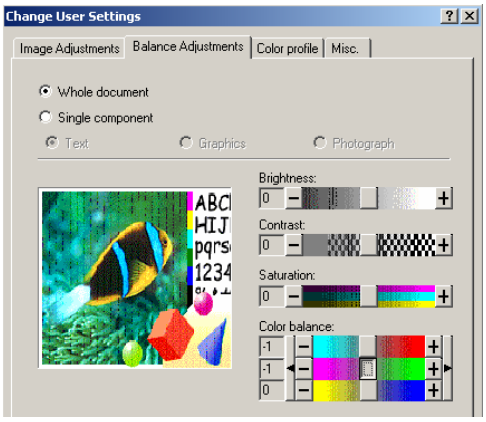
We were also impressed by the range of header and footer information features available on the driver. The options included the addition of date and time stamps, page numbering and free-text.

These features become valuable when documents are produced in applications without advanced document production capabilities.

Image quality adjustments were equally as user-friendly as other features within RPCS, with a selection of well-defined preset image settings, plus the added ability to define user-specific settings. To make maters easier for novice users, we were pleased to see an elementary visual guide which showed the user how adjusting a color setting would change the overall appearance of the output. This can take the mystery out of some color adjustment options and allows users to get the best quality output without the time and cost consuming process of trial and error.




**Visual aids help users understand the impact of changing settings**



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## Print

The PCL and PostScript drivers had a more familiar look and feel, a factor that would be appreciated by users unaccustomed to RPCS. All three drivers shared much of the same functionality with a few features specific to one driver or another. This could be confusing with users having to switch between drivers to get the full functionality out of the device. For example:

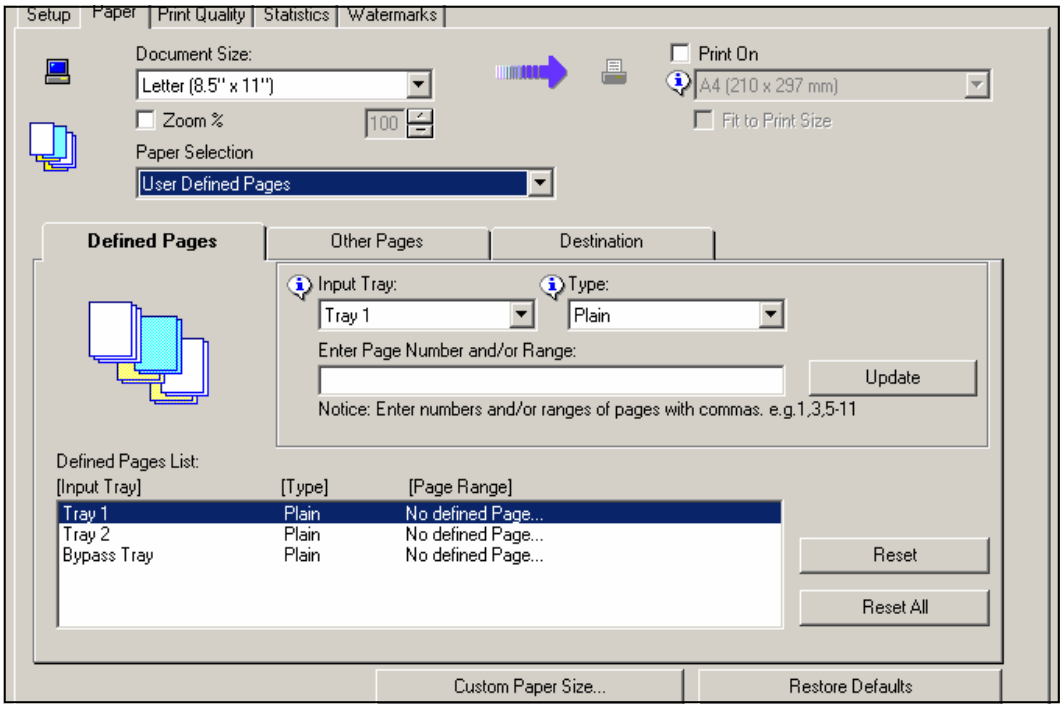
- While all three drivers included a watermark facility, only the RPCS driver includes an overlay function.
- While all three drivers include N-up capability, only the RPCS driver includes Poster mode.
- While all three drivers allow users to choose a separate paper source for the front cover, only the PCL driver goes to the next level and permits paper selection on a page by page basis throughout the document.

The Ricoh Aficio 3228C's optional PostScript driver looks and feels similar to other PostScript drivers. Operation is very straightforward, with the ability to manage color (via Image Color Management), choose paper size and print quality, resolution (up to 1200x1200 dpi), and select Toner Saver Mode — all handled in the Advanced functions area.

### Direct PDF Print

The addition of PostScript also brings with it Direct PDF capability. This time-saving feature allows users to direct PDF jobs straight to the device without having to open Acrobat and submit them to print. In the case of large PDF documents such as manuals or graphically intensive files the opening process before the user can even submit the job to print can be irritating.

**User defined page by page paper source selection using the PCL driver**



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## Desktop Utilities

**DeskTopBinder Lite**

Bundled in with the Ricoh Aficio 3228C, the DesktopBinder Lite is a capable document management system, going well beyond the typical bundled software fare.

Users are able to view, manage and download files stored within folders on the MFP hard drive in the same way as described earlier with Web Image Monitor.

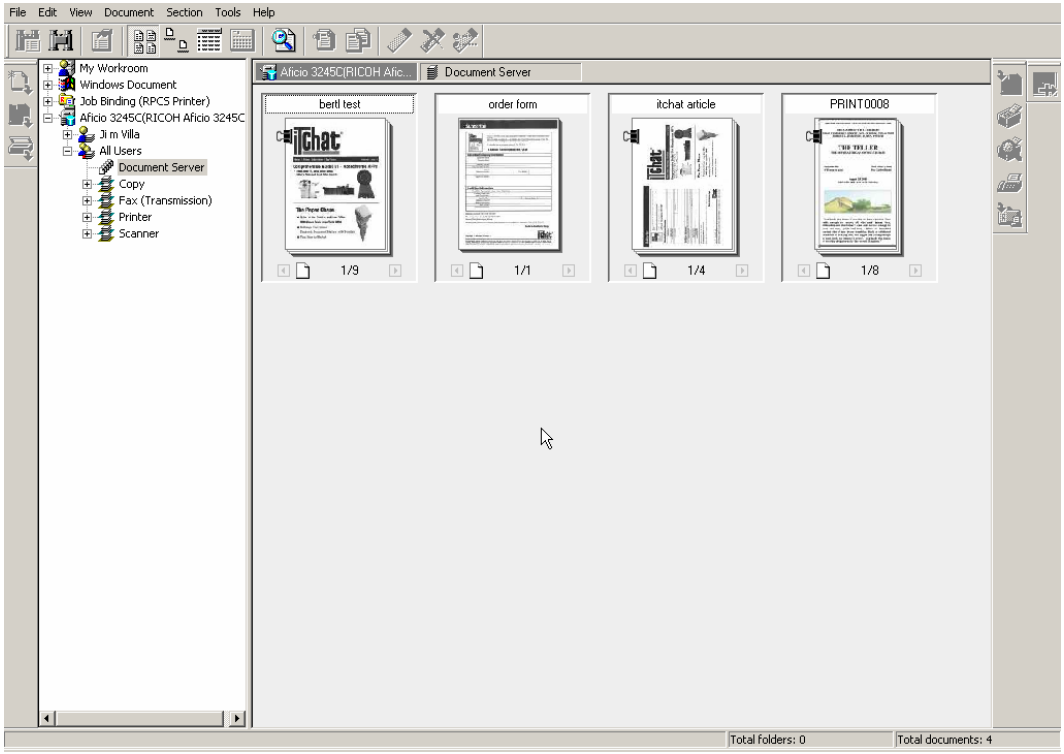
However, once the document has been added to the DeskTopBinder library — either by a drag-and-drop from Windows, direct scanning, or pulling back from the Document Server hard drive on a Ricoh MFP, there is far more functionality available to the desktop user than that found on the Web Image Monitor.

Like Web Image Monitor, documents can be searched, annotated with notes, combined to create larger jobs, converted to image formats, and of course printed. While there are a fairly extensive set of features, it does come with some limitations. For example, searching is limited to document name, date information, and a single “document properties” field, rather than on a full-text basis.

What it offers in terms of job composition facilities should be more than sufficient for many small office, especially in legal and financial services. For example, the Viewer supports the ability of users to merge document and to re-arrange, delete, or insert individual pre-ripped images.

There are many areas that BERTL likes about the DeskTopBinder.

**Viewing files stored at the Ricoh Aficio 3228C Document Server using DeskTopBinder**



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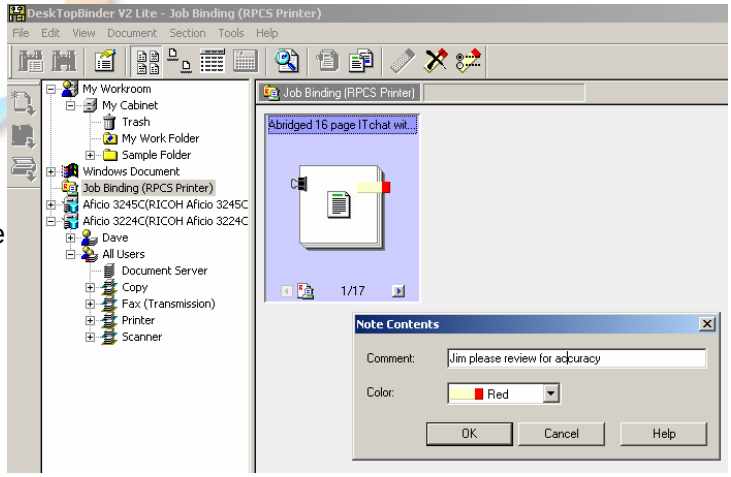
## Desktop Utilities

The ability to include color-coded notes to documents is a useful feature that can provide entry-level project task management.

The ability to merge multiple documents together, add extensive finishing and pre-flight features such as page numbering, watermarking, date stamp, etc. can be invaluable to administrators compiling documents with multiple authors/ contributors.

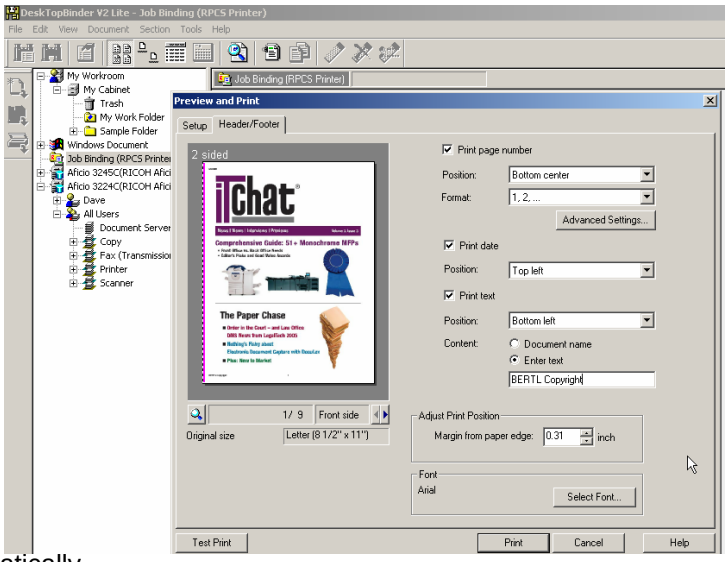
DeskTopBinder Lite also supports a “function palette” icon, which lets users directly print PDF files or “easy print” — using the RPCS driver — other documents. The palette menu floats on the desktop, giving users convenient access to these print functions as well as the ability to add documents to the library through a speedy drag-and-drop.

Finally, DeskTopBinder Lite includes AutoLink. This software assumes Ricoh’s ScanRouter network scanning software has been already installed. AutoLink monitors the in-trays, automatically importing the scanned document into the DeskTopBinder Lite’s libraries, allowing users to creating a basic workflow solution.




**Above: A document stored in a shared DeskTopBinder folder containing tasks for each member of the project team**

**Below: Once the multiple documents have been compiled, final print settings such as page numbering etc can be added before committing to print .**



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## Scan

The Ricoh Aficio 3228C ships with a wide range of network scanning utilities as standard. These include *Scan to email*, *Scan to folder*, *Scan to FTP* and *Scan to Internet fax*.

Lightweight Directory Access Protocol (LDAP) integration is included along with *serverless scan to folder* and SMTP plus POP standard features.

### LDAP Integration

LDAP allows the Ricoh Aficio 3228C's scan to email utility to integrate with central corporate contact databases. This is a far more preferable solution than when MFPs were restricted to storing email addresses as a pre-defined template on a device by device basis, or manually typing the entire email address using the touch screen QWERTY keypad.

With LDAP, users can enter the first few letters of an address, and the search engine will show all matching names on the central contact list. Users can still enter names which are not stored on the central database using the QWERTY touch screen interface.

### Network Authentication

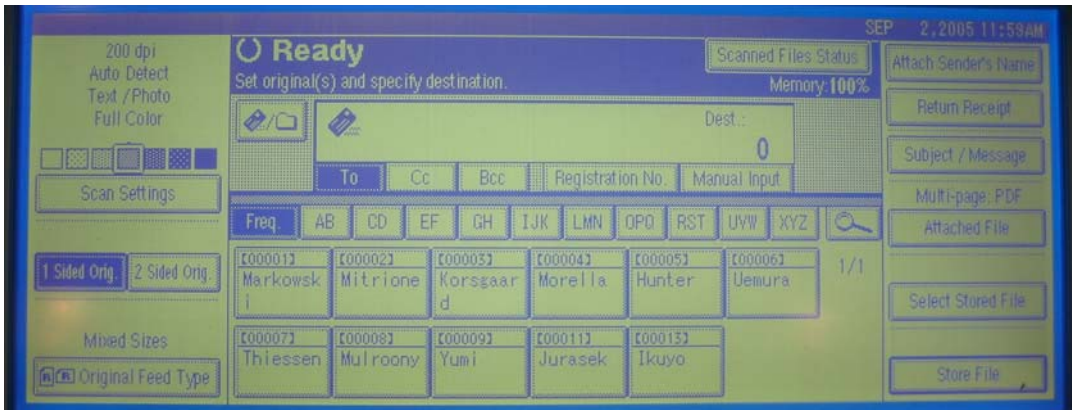
IT managers are always concerned with the possible threat of viruses. Most damaging viruses are often spread through email. Viruses often search for unprotected email servers, from where they can distribute themselves using the organization's entire contact database in a matter of seconds.

To protect the company and its clients from this type of attack, many IT managers are now protecting any gateway to the central email server via authentication. The basic level of protection is SMTP authentication, which sets up a single password for the email server. The second, and more secure level of security is POP before SMTP authentication, where every device around the network requires its own POP authentication code before it is allowed to communicate with the email server. By having both forms of authentication available, the Ricoh Aficio 3228C will be more acceptable to security-conscious IT managers.

### Scan to Email

The scan to email feature on the Ricoh Aficio 3228C has a good level of functionality. Users can add cc and bcc addresses, plus include the sender's email address) if stored on the system).

**Users choose destinations from the stored address book, via manual entry using the QWERTY keypad or via a search through the LDAP central contact database**



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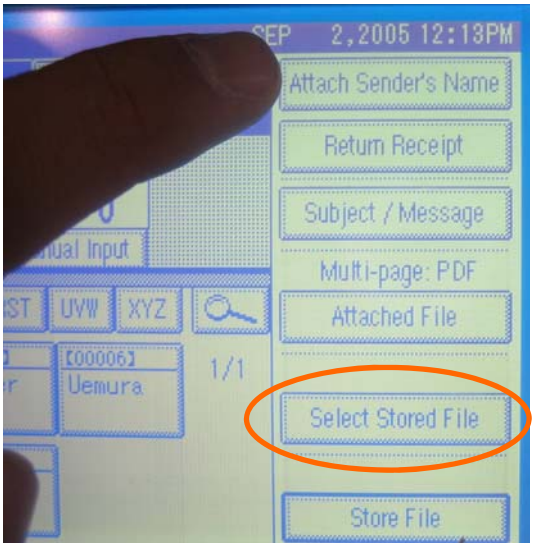
## Scan

Choosing the sender's own email address means the email arrives at the recipient under the sender's address rather than as a generic email from a Ricoh Aficio 3228C. This allows the recipient to auto-reply directly to the original sender's email address. With LDAP authentication, the population of the sender detail fields can be forced, thus providing an audit trail for information being sent out of the device, an important consideration for those needing to comply with Sarbanes-Oxley Legislation, or simply those concerned with internal security. BERTL also likes the added ability to include a receipt request with the email and a message asking them to confirm that they have received the message. This confirmation gets delivered to the sender. Users can also include a subject line (up to 64 characters) or choose between 12 pre-set messages such as urgent, confidential, ext, and a message (up to 80 characters x 5 lines) to identify the email information.

The Ricoh Aficio 3228C also includes the ability to rename file attachments. The file name can be up to 64 characters long. Users are also able to attach files previously stored on the hard drive (Document Server).

Scan settings include the option to choose between color or monochrome, PDF, JPEG, TIFF, and Multi-page TIFF. Users can choose to scan the documents from 600 dpi down to 100 dpi. The 100 dpi option is lower than most competition unites (which commonly offer resolutions down to 200 dpi). This lower scanning resolution gives the Ricoh Aficio 3228C an advantage for document archiving due to the lower file sizes created.




**Extensive capabilities are provided including the ability to attach a previously stored file, saving valuable user time**

**Emails can be entered ad hoc using the QWERTY keypad utility within the touchscreen**

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## Scan

### Scan to Folder

The Ricoh Aficio 3228C offers serverless scan to folder capability, a feature missing from some of the not so recent Aficio models. Previous Ricoh MFPs have required a separate server-based application to run in conjunction with the Ricoh MFPs scan to folder function. The 3228C does not need this because it operates directly across SMTP networks using SMB. We were impressed to find that users can browse to a network folder on the fly rather than having to set up templates before hand.

### Scan to FTP

While scan to folder provides a method of sending documents to other Windows PCs it does not allows for sharing across Unix or Macintosh platforms. For this Ricoh includes scan to FTP, which sends files using FTP protocol, which can be accessed by a much wider range of operating platforms. FTP templates can be set up in advance using the management utilities or directly from the copier using the QWERTY keypad.

### Scan to Internet Fax

More and more offices fax devices are now being sold with Internet Fax. An Internet fax enabled device (when set up to the network with its own email address) can send and receive hard copy documents using the Internet as the delivery medium rather than the expensive telephone lines. Files are sent as TIFF-F files and offer significant cost saving opportunities for companies that send long distance/ international faxes. The fax option is required before users can send documents via internet fax.

### GlobalScan

The top of the range scanning solution for larger corporations, GlobalScan provides extensive integration with third party software solutions (including leading document management packages like Hummingbird, Documentum, iManage, RightFax network fax server, plus others).

GlobalScan also allows users to send scanned files to multiple different destination types in a single process. For example, a document can be sent to numerous email addresses, archived on the corporate FTP site and stored on a local desktop folder.

### External Data Source Scan Destinations

With more and more people on the move, the need to be able to transfer files and documents quickly is becoming more and more important. We are not seeing devices enter the market with USB flash drive port support and SD digital card data port capability. We would like to see Ricoh add one or both of these options with the ability to scan directly to the data source. This would be a valuable feature for devices placed within a business center or airport lounge, allowing business professionals to scan hard copy documents directly onto a medium that can later be transferred back to their laptop. At the present time there is already one manufacturer offering scan to SD card capability.



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# Scan

### Color Dropout Scanning Functionality

In addition to the now customary resolution, file type, and other scanning options, the Ricoh Aficio 3228C also comes with an additional scanning feature called color dropout that sets it apart from rival color MFPs.

### What Is Color Dropout?

Color dropout is a scanning feature that, as the name suggests, removes a specific color from a scanned image. Color dropout can be carried out either at the hardware before data transmission or on the desktop using software after data transmission. The benefit of performing color dropout at the device stage is that the bandwidth associated with the file now decreases dramatically due to the removal of much of the image data. This bandwidth reduction puts less strain on the network and can have a marked effect on the data transmission speed and time to file availability.

### Who Uses Color Dropout?

In short, anyone who processes forms will probably benefit from color dropout technology: financial institutions processing loan applications, insurance companies processing insurance claims, government departments processing tax rebates, immigration requests, grant submissions, schools processing bubble-sheet test sheets, and others.

Forms often incorporate a background color within their design to allow for easier navigation and improved completion accuracy. While the use of color makes forms easier to read and complete, it adds an additional burden when scanning the results into the business process automation system used to analyze the completed forms. The data found within the forms only needs to be collected in black and white through processing by OCR (optical character recognition) or ICR (intelligent character recognition) software. From that point on, the form is converted into binary data and routed to a database or document management system where it becomes part of the electronic workflow.



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## Scan

Rival MFPs can offer 2-bit or 8-bit monochrome scanning which reduces the bandwidth associated with color scanning, but the color data is still present in the document just in monochrome format. This means that, at the least, the file size is going to be greater, increasing transmission time and storage space. It can also mean that documents are more difficult to process, especially if the colored area is actually written over.

In the illustrations below, a sample health insurance application form was scanned using color dropout and in monochrome modes. The second block of information, which asks the user to write over a red background, is virtually illegible in the monochrome scan, which means that the ICR process cannot be carried out automatically. The scan using Ricoh's color dropout technology is easily read and can be fed directly into an ICR engine for further processing.

**Does Color Dropout Affect Productivity?**

In theory, color dropout could have an impact in two areas of scanning: the scanning speed and the overall time to get the color removed before data transmission can begin.

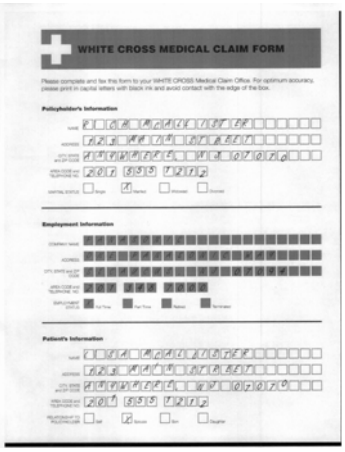
BERTL looked into this. We scanned 50 pages of a completed, standard government tax form, running the same job in both monochrome text mode and color dropout mode. In both instances two times were measured: the time to scan the originals into the hardware (the point at which the operator can return to their desk), and the time before the file is now accessible at the desktop. We carried out the test on a clean 100BaseT network using SMB protocol.

We were pleasantly surprised to find that there was no slow down in the scanning speed when color dropout was applied. This means that the process will not be adding to the cost burden of the company in terms of human intervention time.

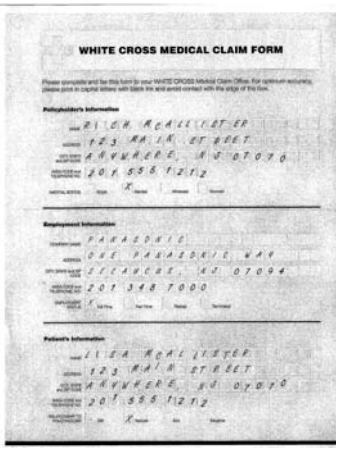
We were even more pleasantly surprised to see that the data transmission time

**Original form**


**Form scanned in monochrome text mode**




**Form scanned using color dropout mode**



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## Scan

dropped 36 percent when we applied color dropout and resulted in a bandwidth reduction of 40 percent. While these figures will obviously change from form to form, depending upon the level of color dropout out, these figures are a guide to the potential time and bandwidth savings that a company can realize.

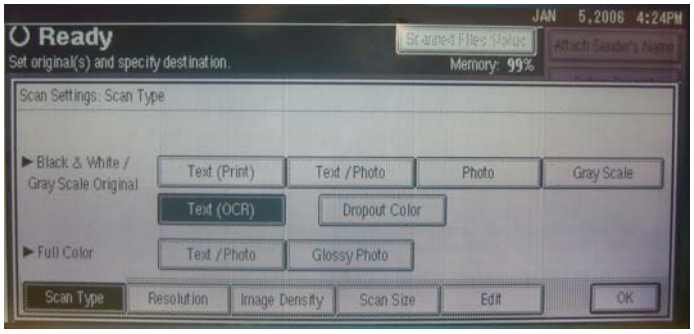
**How is Color Dropout Used?**

This feature can be found by selecting Dropout Color as part of the text, text/ photo, or photo modes within the scanning settings menu. When users choose Dropout Color, they are provided with an additional function offering a specific color dropout choice.

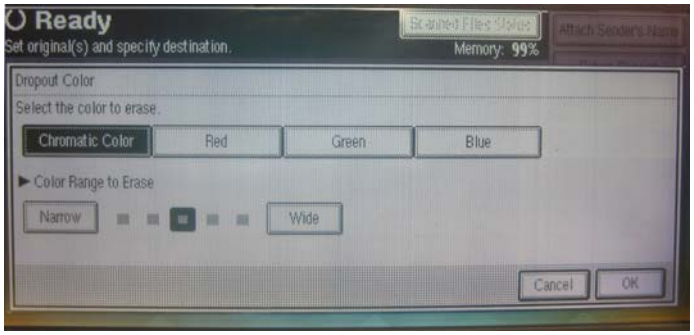
Having selected the color dropout feature, a user can now choose to remove red, blue, or green from the scanned image. This puts the device on a par with most production scanners that generally only offer color dropout using those three colors. In addition, a user can also specify the width of the gamut that would fall within the color dropout. This allows for greater flexibility when handling forms with, for example, bold red text would translate to black readable text, but light red shades, such as background navigation enhancements, would be removed.

As an extension to this, we would like to see Ricoh take full advantage of its color touch screen and offer users the ability to view the color dropout files prior to data transmission. This would allow users to see whether the gamut range selected was wide enough to remove all the unnecessary color at a glance. We would also like to see Ricoh add an ISIS driver to their device, which would allow the device to be compared in the same leagues as document production scanners within enterprise scanning workflow environments.

Ricoh has yet again raised the bar in the area of MFP scanning, moving beyond the simplistic world of scan to email and scan to desktop, and now entering the realm of being a genuine scanning workflow solution provider.




**After selecting Dropout Color (above), another window opens, allowing users to choose which color should be removed from the final output (below).**



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## Fax

The Ricoh Aficio 3228C has an optional fax option that must be installed prior to shipment. The fax function has a dedicated 4MB of memory for page memory, advertised as holding up to 320 pages.

Most fax transmissions will take place at the default, 200 x 100/200 dpi. If higher quality is needed, the 3228C can use 400 x 400 dpi (optional). We would have preferred to have the higher 400 dpi transmission as a standard feature, as this is fairly common on devices of this type. Instead, users have to pay an upgrade fee to get higher quality output.

While the device may be considered more for its copy, print and scan capabilities it also holds an impressive arsenal of fax functionality, with several features that you would not find on a dedicated fax product.

**Automatic Fax Forwarding to Email**

The Ricoh Aficio 3228C is able to automatically route/forward faxes to an email address, using the device's scan to email function. This is a valuable feature and allows mobile or home office users to receive faxes whether they are in or away from the office. It can also be used to maintain higher security by preventing confidential fax documents from being viewed by unauthorized persons.

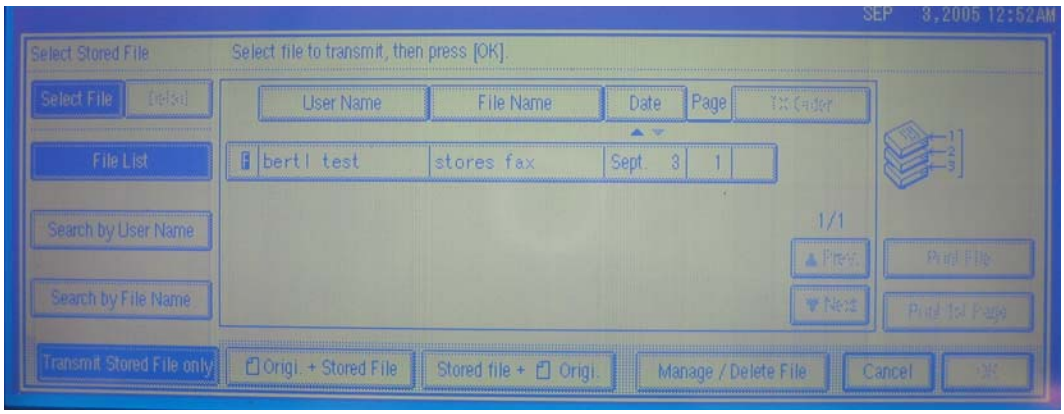
**Attach Stored Fax Files**

Just like we discussed earlier within scan to email, users can also attach stored files with a fax original. This could be a valuable time-saving feature. For example, a sales processing clerk has to send a signed confirmation of an order to head office with a copy of the contract.

The contract is already stored on the document server when the contract was initially send to the customer for approval. Using the fax file attachment feature the sales order clerk now only has to send the cover sheet and signed order page plus attach the contract file stored on the Document Server.

This saves the order processing clerk from having to wait until the entire document has been scanned into memory.

**Stored fax file being attached to a paper-based original**



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## Fax

### Delayed Transmission

Rather than send long distance/ international faxes during peak daytime rates, the Ricoh Aficio 3228C includes a delayed transmission capability. This allows the user to choose the time at which the fax is sent. This can offer cost-saving opportunities. The feature can also be used to set up large fax transmissions to go outside normal business hours to prevent the creation of fax bottlenecks.

Some of the standard fax features include; 2,000 quick dials, broadcast capability, MH, MR, MMR, and JBIG compression, and 2 seconds per page transmission (with JBIG).

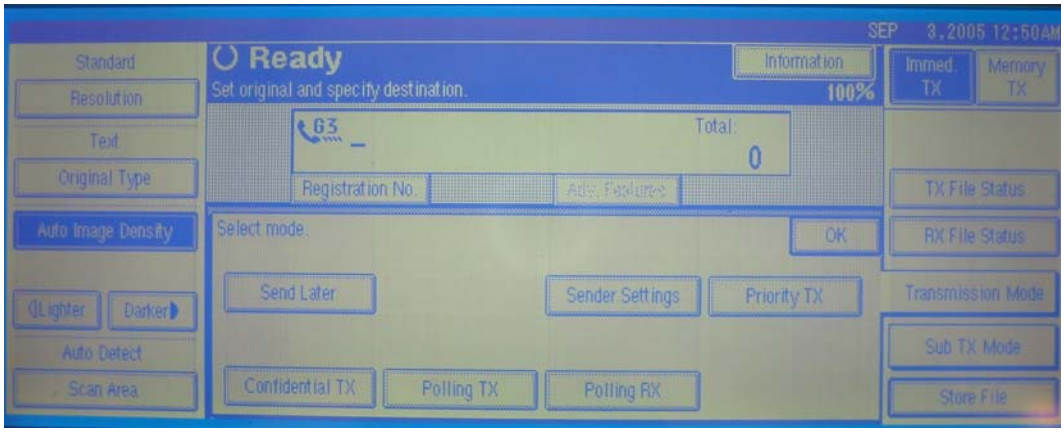
### LAN Fax

The fax function on the Ricoh Aficio 3228C can also be utilized by desktop users via its standard LAN Fax function.

The LAN Fax driver was basic, lacking features such as cover page, address book, editor etc.

The Ricoh Aficio 3228C also includes internet fax, which converts hard copy documents into TIFF-F attachments which can be sent over the Internet to email addresses or received in hard copy to other Internet fax capable devices.

**Users can choose to send faxes at a time that suits them, be it for cost of time efficiency**



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## Summing Up

There is a lot to like about the Ricoh Aficio 3228C. Within a compact footprint lies a device packed with features that leave many competing units well behind.

While the seemingly endless list of features may not have an underlying benefit to everyone, the versatility offered by the device makes it a strong contender in most vertical and horizontal environments.

The pedigree of Ricoh's Document Server document storing technology is in evidence within every aspect of the device, providing time saving opportunities for both walk-up and desktop users. That is not to say that it is perfect. We would like to see the ability to view the entire document from within Web Image Viewer and would also like to Ricoh take the next step and build in the capability to convert files into a searchable format so that users can search files by content without having to pull them back to the desktop.

Image quality, which in the past has been an area that some competitors have focused upon when attacking Ricoh color products, is now an area most would be best steering conversations away from when trying to outgun the Ricoh Aficio 3228C. With the exception of grayscale reproduction in full color mode the image quality was impressive in both copy and print modes.

Print and copy productivity are up to the usual high speed we have come to expect from Ricoh. There are a few potential productivity bottleneck areas surrounding the low supplies of legal and ledger/A3 paper and the copy concurrency limit of only 2 jobs. These two factors might cause certain environments to experience higher than desired user intervention rates compared to some rival units.

Scan and fax functionality are both at the top of the pile. The ability to attach pre-scanned files with hard copy originals may, in the right workflow environment, offer significant time efficiency advantages versus competitors.

With its color dropout scanning functionality, Ricoh has yet again laid down the gauntlet to other MFR manufacturers and raised the bar in the area of MFP scanning, moving beyond the simplistic world of scan to email and scan to desktop and now entering the realm of being a genuine scanning workflow solution provider.

**What We'd Like to See**

We would like to have seen the ability to combine multiple destination types within a single scan operation. This is a feature that could again reduce user intervention time and is a feature available on some rival units without the need to purchase top end scanning capabilities such as GlobalScan.

In closing, the Ricoh Aficio 3228C will be a tough device to beat and will be a valuable addition to most offices.



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