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Highly Recommended
★★★★

PROS

- TopAccess delivers high functionality with easy to use network management.
- TopAcessComposer gives flexible web-based document management.
- Aggressive entry level pricing for digital copier.
- Well designed, icon based printer driver.
- Extensive finishing options plus auto booklet-maker.
- Post Process Interposer & ability to use 6 different paper sources per document.

CONS

- GL-1020 controller is more expensive than competing units.
- 1,000 sheet paper limit for online ledger/A3 paper supply (mainly affects users of the booklet maker).
- High bandwidth use on basic word processing documents.
- Could not recognize collation command in standard office printing applications.

Toshiba eSTUDIO 550
with GL-1020 Controller

Copy - Print - Scan - Fax

Product Overview

The Toshiba eSTUDIO 550 is a 55ppm digital copier which converts into a network printer with extended scan-to-email and other scanning capabilities.

Digital copying includes 5 next-job, copy reservation memories. Its paper supplies are spread across 3 main trays (plus a bypass) but, with the addition of a large capacity paper feeder and post process interposer, the total paper capacity reaches 7,600 sheets via 6 different sources.

The Toshiba eSTUDIO 550 is built for the mid-to-high speed and mid-to-high volume market. Typical users will include both heavy duty, networked, corporate offices and some mid-range pay-for-print environments. The device can be configured with either Toshiba's own GL-1020 controller (the subject of this report) or a 'built for Toshiba' EFI controller (separate report in LabCheck).

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Product Dynamics

This LabCheck report covers the Toshiba e-STUDIO 550 configured with the GL-1020 controller which was designed and built by Toshiba. BERTL has also published a LabCheck Report on the e-STUDIO 550 configured with the Fiery manufactured GA-1140 print controller. If you are considering purchasing the Toshiba e-Studio you should make sure you obtain the correct LabCheck Report because price, performance and functionality differs considerably from one controller to the other.

Toshiba's GL-1020 controller is the successor to Toshiba's earlier SC-2 external controller, which introduced users to Toshiba's icon based, user friendly network scanning solution. BERTL was pleased to find that the level of functionality, which had been limited at times on the previous SC-2 controller, has been improved significantly on the new GL-1020 controller.

The Toshiba e-STUDIO 550 itself is a 'ground up,' newly designed system. There have been numerous improvements over previous Toshiba 55ppm digital devices. These include:

- The addition of 5 next copy job reservation memories (earlier units had none)
- 115Lb/209gsm paper weight handling through all main paper trays (previous models could only handle 22Lb/80gsm stock through main trays)
- High 7,500 maximum paper capacity (previous units had 5,500 maximum capacity)
- Substantial upgrading of the printer driver's ability to control where individual pages of a document print from (for example, you can choose the paper source for each page of a document)
- Web-based document management and editing utility within TopAccess

- Higher powered print processors and higher standard RAM for improved print productivity
- 100-sheet automatic document feeder (previous models were restricted to 60 sheet capacity)
- Post Process Inserter (allowing preprinted stock to be added to documents after the fusing process).

Network Connectivity / Controller Strategy: Toshiba offers the e-STUDIO 550 with a choice of two network connections/ print controllers (1) Toshiba's GL-1020 or (2) Fiery's GA-1140. As stated earlier, there is significant difference between the two controllers. This LabCheck report covers the Toshiba e-STUDIO 550 configured with Toshiba's own GL-1020, the other LabCheck Report on the GA-1140 controller can be accessed at www.BERTL.com.

Testing the Toshiba e-STUDIO 550 & 810

The GL-1020 controller is designed by Toshiba. The GL-1020 takes much of its design backbone from the previous Toshiba print processor, the SC-2.

Toshiba has built on the platform of SC-2 and added a range of new features which now places this controller among the most versatile in its market :

1. Increased processor power and RAM
2. Scan to FTP capability
3. Scan to iFax capability
4. Ad hoc e-mail address entry capability from the copier control panel
5. TopAccessComposer (which provides document management and editing capability).

Product Dynamics

While the Toshiba e-STUDIO 550's GL-1020 controller is more expensive than the Fiery GA-1140 alternative it should be remembered that it ships with PCL, PostScript 3 a large 20GB hard drive and network scanning within the base price.

In contrast, by the time PostScript, the hard drive and network scanning have been added to the Fiery controller, the price of the GA-1140 exceeds that of Toshiba's GL-1020 controller.

Paper Supply: The Toshiba e-STUDIO 550 ships with 3,600 sheets of on-line paper capacity, which is adequate for most offices but not as high as some of its competitors. However, when fully configured, the paper capacity increases to a total of 7,600 sheets which is higher than some units currently on offer, although not the highest in its class.

There is an optional 4,000-sheet Large Capacity Feeder, which departs from the older Toshiba models in being side-mounted and front loading. As a further improvement, the new Toshiba e-STUDIO 550 supports 115lb/209gsm from all paper sources with tab printing/copying and sheet insertion; 'Post Process' insertion is also possible.

Post Process insertion allows the user to add extra pages to a document from a paper source position on the external/output side of the fuser unit. For example, a front cover which has been printed on a color laser printer can be added to the document via the Post Process Inserter, bypassing the hot fuser unit which could otherwise damage the color cover.

In addition to feeding paper for the documents produced on the Toshiba e-STUDIO 550, the post process inserter can be used as an off-line finisher (i.e. feed ledger/A3 printed work through the finisher as documents or saddle-stitched folded magazine-style booklets).

The combination of heavier paper types and post processor insertion makes the Toshiba e-STUDIO 550 one of the 'best in class' for paper weight/substrate capabilities.

The standard unit has a bypass tray, two 500-sheet universal paper drawers, and a 2,500 sheet, letter/A4 sheet tandem feed (1,250 sheets per side). The tandem tray is a single drawer with two internal sides that take paper.

When the right hand supply has been depleted, the left hand stack of paper is pushed over to the right and printing continues. This gives a large paper supply in one drawer, but is not as flexible as some other units. If the two paper holders were in separate drawers, like some alternative machines, you could have a different paper stock in both drawers and/or could refill paper supplies more simply while the device was running.

Full Paper Supply is 7,600 sheets (1,000 sheets ledger / A3)

Toshiba's tandem drawer

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Product Dynamics

Because Toshiba offers a fairly powerful booklet making finisher option, we would like to see more on-line ledger/A3 paper supplies than the two 500-sheet universal drawers and 100-sheet bypass provide. However, for most purposes the combined 1,100 sheets ledger/A3 will suffice. It may be a limitation in print shops, or offices that want to make a lot of booklets (the maximum online booklets produced without a paper refill could be limited to 73, which is lower than some competing units).

Document Feeder: There is a 600x600 dpi,100-sheet reversing automatic document feeder (RADF) which passes the original over a fixed scanner (similar to the e-STUDIO 35 and 45). Toshiba has stuck to a traditional 'one side at a time' scanning system, rather than adopting a single-pass scanner with two scan heads that pass over the top and bottom of originals at the same time.

Toshiba's document feeder does not allow as wide a choice of original types as a single-pass scanner, but the duplex copy speeds were faster than other copiers, which may put it on equal footing with a single-pass, dual head copy scanner. Toshiba says it has re-engineered the document feeder to dramatically improve the accuracy of its deviation tolerances.

Scanning systems on modern copiers are increasingly used in document management systems, where OCR-based applications regularly scan and read forms and other standard documents that require respondents to fill in boxes. If the registration of the scanner is slightly out, the OCR may not correctly read and place the data into the appropriate slots on the computer system. Even if the scanner is only used for text OCR conversion, any minor skew in the original during document feeding/scanning can result in a document that is harder (or impossible) for the OCR software to convert. A nice touch, is that the Toshiba e-STUDIO 550's document feeder outputs ledger/A3 and letter/A4 originals to separate trays.

Finishing Options: Chargeable extras include a multi-position stapler finisher and folding, saddle stitch capability (automatic booklet maker) plus a hole punch (capable of 2-and-3-hole or 2- and 4-hole punching, depending on which country you are in). There is also the new optional post process inserter, which fits before the hole punch to act as an additional paper source for insert or cover sheets. Stapling of up to 50 sheets is currently possible; this is on par with many competing devices, but 100-sheet stapling is now available on some competing units. Toshiba tells us that a 100 sheet staple finisher with booklet maker will be available in the first quarter of 2003.

Design: The Toshiba e-STUDIO 550 uses bulk toner (which is loaded by the operator) while the system remains service engineer-dependant for other maintenance. Toshiba supports print or copy volumes of up to 400,000 impressions a month, which is possible via a photoconductor/imaging system that Toshiba estimates lasts 400,000 pages between replacement/preventative maintenance; which is one of the higher lives for a 55ppm device.

TECHNICAL IMPROVEMENTS

Toshiba uses what it calls 'IH fusing' technology to provide a fast warm up time, especially when recovering from energy save mode. Toshiba claims that it is 'typically 160 seconds to first copy / print from cold.'

The IH system is similar to that used in the e-Studio 35 and the e-Studio 45 and is said to be more energy efficient than other types of heat based fusing systems. For example, Toshiba quote that energy conversion in the Toshiba e-STUDIO 550's IH system is typically around 90% of a Halogen system (which, at best, can manage 65-70%).

An improvement to earlier Toshiba copier designs is the introduction of a 3 part coil. This is meant to deliver better temperature control, in particular at the ends of roller, which have a tendency to retain heat outside the range of the paper passing through.

The cleaning system of the fuser is further enhanced by using a web cleaner rather than traditional silicon and felt cleaner rollers.

The result is a fusing system that is claimed to have improved reliability and energy efficiency, resulting in the extended PM cycles, up to 500K.

Toshiba also incorporated a series of quality control sensors, in the print system, that continually measure the surface potential of the drum in terms of photoconductive ability, drum temperature and humidity.

The toner delivery systems and charging systems adjust during operation to maintain optimum conditions.

Product Dynamics

Page Coverage/Pixel Counter: Newly featured in Toshiba's 55-81ppm devices is a pixel counter which Toshiba claims enables the machine to calculate and store the average toner page coverage for both print and copy documents. This figure is based on the average page size and figures related to the laser diode write times. Our advice is to treat the pixel counter as a general guide only. While it can provide users with a rough feel of the types of documents that are being printed, it was not accurate enough to be used in true cost calculation or for contracting purposes.

The reason for this is that like most pixel counters, the image data that is being calculated is based upon the **ELECTRONIC IMAGE** (ie: the data that is being sent to the print engine) and **NOT THE FINAL PRINTED PAGE**. Scientific tests have established that an electronic document (i.e pixel counted) that measures, let's say, 5.34% page coverage (by pixel counting), when it actually becomes a "printed" document, could have a true final "toner on paper" coverage of 7.5% to 18%.

So, what changes 5.34% "electronically calculated pixel coverage" to 18% true "toner on printed page coverage"?

For a start there is the toner: Different toner has varying electronic charge properties and particle sizes. Tests have found that using third party toner can result in higher page coverage on standard identical test patterns, which in turn can lead to lower life per toner cartridge.

Then there is the photoconductor itself: As the photoconductor ages, its electrical charge properties change, and this affects toner usage.

Next you have atmospheric conditions: Some offices will have lower page coverage and higher toner yields simply because of their relative humidity and temperature. In contrast some offices may have lower coverage on the same device, even if using the identical consumables and parts, because of atmospheric conditions.

Putting Toshiba's pixel counting to the test, BERTL took a certified 11.3% coverage test original (containing mixed text and various graphic elements). The test original was copied multiple times on the Toshiba e-STUDIO 550 and the average page coverage measured on the device was obtained from its control panel.

According to the Toshiba e-STUDIO 550 the page coverage was 9%. In reality, BERTL's original had 25% heavier page coverage than the estimate from the Toshiba e-STUDIO 550. This means that there could be a fairly wide margin of error between 'electronic pixel counted page coverage" and the actual amount of "toner page coverage" on the "printed" page.

The accuracy may be even less reliable if third party (not Toshiba manufactured) toner is used. This will only really affect people who are contracting to purchase (or supply), either the equipment or a service contract, in reliance upon the estimated toner coverage from Toshiba's pixel counter / page coverage calculator. Ultimately, several other manufacturers use similar pixel based toner coverage / usage estimating systems and they all have similar limitations.

Disabled Persons Usage / Section 508 Compliance (USA): To assist users with disabilities, Toshiba has angled the control panel and placed large keys in logical groups all with a concave surface, some also have a back light. There is also a Quick Tab with the most used features shown in reverse plus large font sizes to aid the visually impaired.

Scan

The largest differentiator between the two Toshiba controllers is in the area of network scanning. The alternative controller (Fiery GA-1140) comes with no network scanning in its base price; you must purchase a costly hard drive and scanner accelerator card upgrade. Ultimately, the Fiery GA-1140's scanning worked reasonably well but is not as sophisticated as Toshiba's own controller (GL-1020).

Scanning is included in the base price of the Toshiba GL-1020 controller. Much of the look and feel of the network scanning is identical to that offered on the original SC-2 controller, which was one of the most user friendly scanning solution available. Many IT managers have told BERTL that they want to increase network scanning in the office as a means to share information better, cut down on hard copy storage requirements, and make the office more productive by providing access to documents quickly and easily.

One of the most important aspects to the successful implementation of a network scanning policy within a company is the acceptance of the solution by the general staff. A highly sophisticated scanning solution may offer massive functionality, but if staff find it too complicated to use, it is wasted money. Toshiba's GL-1020 controller network scanning solution is certainly not the most sophisticated in the market, but, it has been designed to make the process as simple as possible, even for the less IT-literate office user. A good use of icons and graphics makes the scanning interface at the copier easy to navigate, while the template system allows users to create their own filing system easily.

The GL-1020 controller is capable of sending documents directly to network file locations, e-mail addresses, I-Fax Devices, FTP locations, Twain compliant software packages and TopAccessComposer

(Toshiba's web-based document management program).

Like most other scanning solutions now on the market, the Toshiba scanning solution works on a template system which is set up from the desktop. Users select the template they wish to use (for example, scan to an e-mail address or scan to a particular network folder) then put the documents in the document feeder and press scan. The selected template tells the copier the scanning and paper settings for the document(s). Once the job has been scanned, the template then tells the GL-1020 controller what to do with it.

Toshiba has incorporated two template types within the GL-1020 unit.

Public Templates: These are set up by the administrator, have optional password protection and can be used by anyone in the office. These might be used for general filing of office post, sending standard e-mails, or for scanning images to software packages. A maximum of 60 public folder templates can be set up by the administrator. The administrator also has the capability to set up a standard public template and send it across the network to multiple GL-1020 servers, saving time.

Private Templates: These are set up by end users and can be PIN-protected to prevent other users from accessing them. There are a total of 200 groups per GL-1020 controller, and each group can hold a maximum of 60 templates. This allows every individual in a company to have his or her own group and series of templates for private use. To access private templates, users type in their individual group number, and their pin code, and then scroll throughout their template list until they find the one they wish to use. So for example, users could set up their own template for their mail, order forms, commission claim forms, etc.

Imaging at Work™

Scan

Setting Up a Template: Department, public and private templates are created using Toshiba's browser based 'Top Access.'

Department and public templates can only be created by a user with the administrator password at the TopAccess Login. Private templates can be created by any user around the network.

To create a private template we:

1. Chose the group we wished to set up the template in;
2. Selected a spare template location between 1-60;
3. Clicked the icon which represented the type of template we wanted to create;
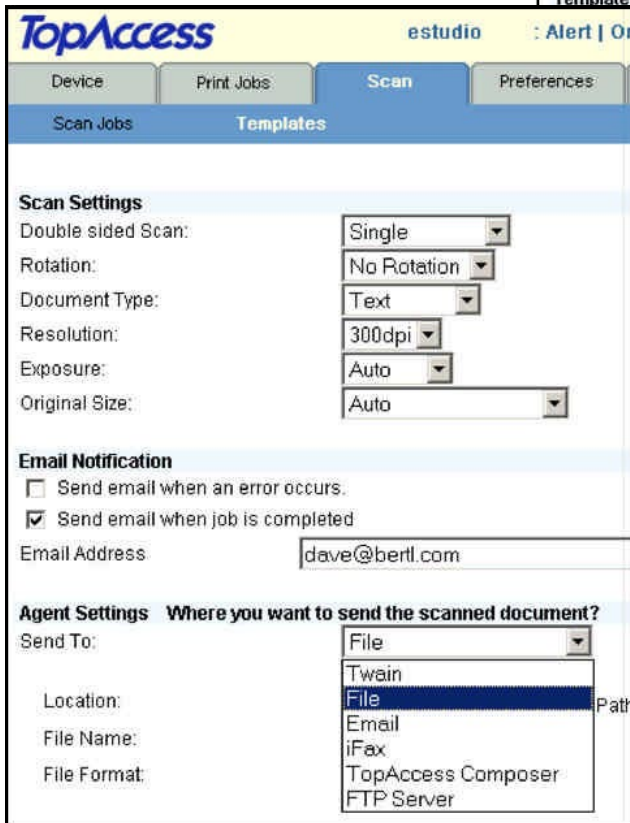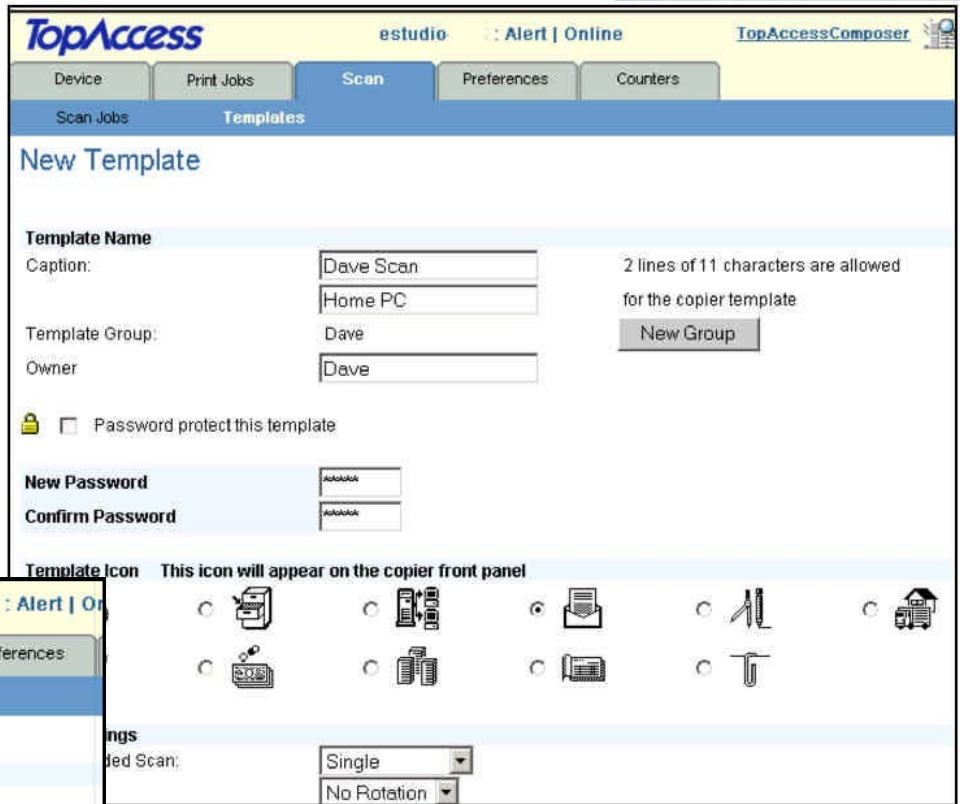
4. Added the two caption names which would show up next to the picture at the copier control panel.

We could also add further details which could be used as a reference when looking through templates in the future.

Having set up the name of the template we then set up the settings for the scanner -- including duplex or simplex scans, rotation of the pages, type of document text, text/photo or photo, resolution level, paper size and exposure details. These details are used by the copier scanner to create an image.

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Scan

The next step was to tell the GL-1020 controller what to do with the images when they arrived. To do this we chose one of six options which Toshiba calls 'Agents'.

Scan to Twain routes scanned images to a folder accessible to any software application using twain image protocol.

Scan to File routes scanned images to a particular network location including the (default) GL1020 20GB hard drive. We had to choose two settings:

- File format: TIFF, MultiPage TIFF or PDF.
- Destination: Either a file within GL-1020 itself or a specific network folder. The administrator can restrict the number of people able to send scanned images to network folders reducing network space if this is a concern.

Scan to E-Mail routes scanned images to an e-mail address. We had to set seven settings:

From: Our e-mail address

Return e-mail address: The e-mail address to which replies would be sent

To: The e-mail address of the receiver

Subject: A general note informing the user the content of the e-mail

Body Text: More information on the document and action instructions

File Format: TIFF, MultiPage TIFF or PDF

Message Fragmentation: Provides the option to divide a large document into manageable pieces so they can go through e-mail systems with bandwidth limitations

In addition to providing predesignated scan to e-mail templates we could also add an ad hoc e-mail address using the keypad on the touch screen. A major advantage Toshiba's adhoc scan to e-mail has over many of its competitors is the LDAP integration of the ad hoc function. This means that the user is able to retrieve addresses directly from a centrally managed corporate contact database. While there is no capability to add cc and bcc addresses to the e-mail, the user can add a subject line, message and name the file. This is important in the modern age where virus attacks through e-mail is commonplace. Unknown e-mail addresses with no message will be discarded.

Scan to FTP routes files directly to FTP folders. The screen shot opposite illustrates the setting required to set up this template type. Scan to FTP was not available on the original SC-2 scanning option. We see this as a major benefit over the previous system for users wishing to store documents in web based systems.

Scan to I-Fax routes messages directly to internet fax-enabled device. We had to set 7 settings: the same as listed above under scan to e-mail. Scan to I-Fax was not available on the original SC-2 scanning option.

Scan to TopAccessComposer routes files to folders within Toshiba's web based document management utility, TopAccessComposer. More on this later in this report.

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Scan

Choosing the scanning option from the copier control panel was a simple, user-friendly process. At the copier control panel, the user simply presses the printer/ network button, selects 'scan' and a window appears on the control panel with the option of using a public or private template. Public templates could be viewed six at a time and we could scroll down the list to view other templates. Each template is shown with the picture and two caption names on the screen. User simply choose the template they wish to use, place the documents in the document feeder or on the platen, and press the Scan button again to scan the documents.

To access private templates, the user selects his or her own group number, and adds the private four digit PIN number to gain access to the template list. The templates are again shown in groups of six, in picture and caption format. From the copier control panel the user can change the scanning setting defaults to set the templates that are being created, like duplex or simplex, rotation, type of document, exposure, resolution and paper size. 'Agent' settings can not be changed at the copier control panel because these are controls utilized by the GL-1020 controller. To change the file format, destination, etc, the user must go to TopAccess and then edit the template from the desktop.
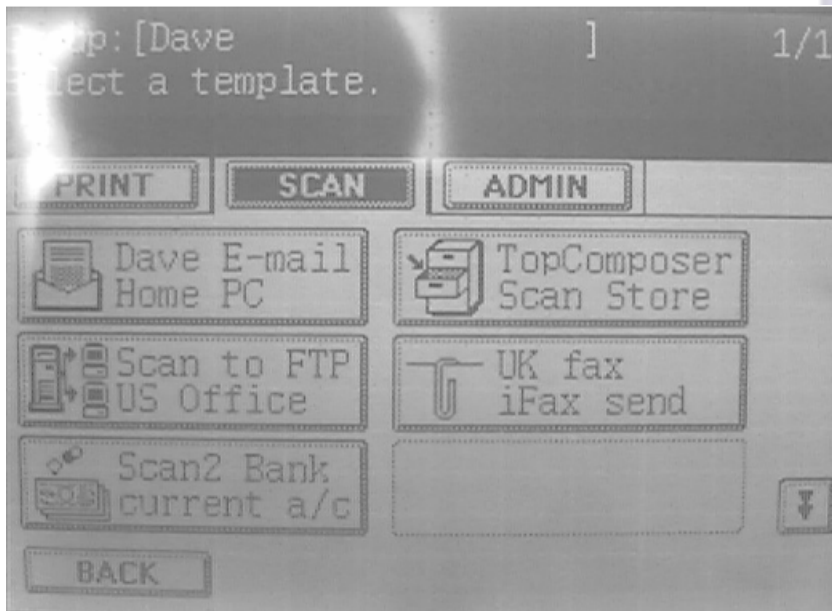
Selecting a template from the copier control panel.

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TopAccessComposer

Besides additional scanning destination options, Toshiba has also included a web-based document management utility called TopAccessComposer. TopAccessComposer effectively ties together the scanning and printing functions of the GL-1020, allowing users to manage a mix of hard copy and electronic documents. TopAccessComposer operates using a folder system which is stored at the large 20GB hard drive on the GL-1020 controller.

There are three types of folder:

Department: Only administrators can store and amend documents, but anyone in the office can use them to print and combine with other documents

**Public:** All users have read and write functionality

Private: Can be restricted to registered users only, and protected by PIN codes for secure access.

Documents can be stored to a folder in one of two ways:

- Electronic files can be transferred by using the TopAccessComposer delivery option in the print driver
- Hard copy files can be transferred by using a 'Scan to TopAccessComposer' template

Having stored the file(s) within a folder, users can view each document as a series of thumbnail images, or zoom out to full page size if further examination of the page is required.

In its most basic format, TopAccessComposer provides a flexible print on demand function for network users, allowing them to store commonly used
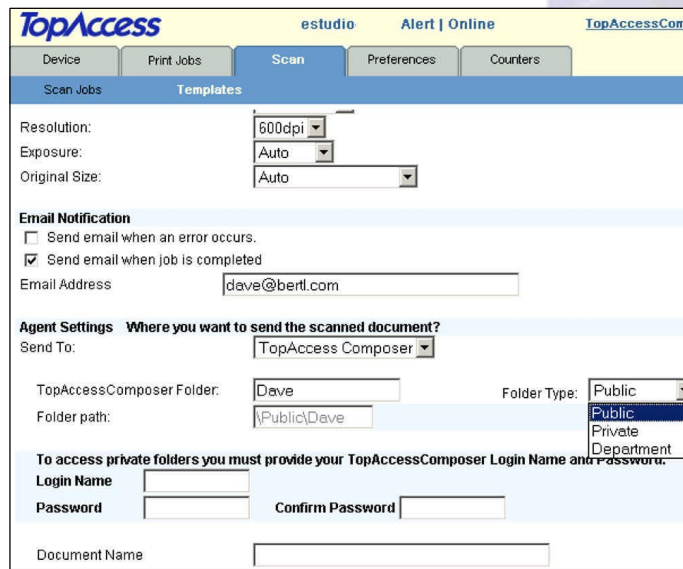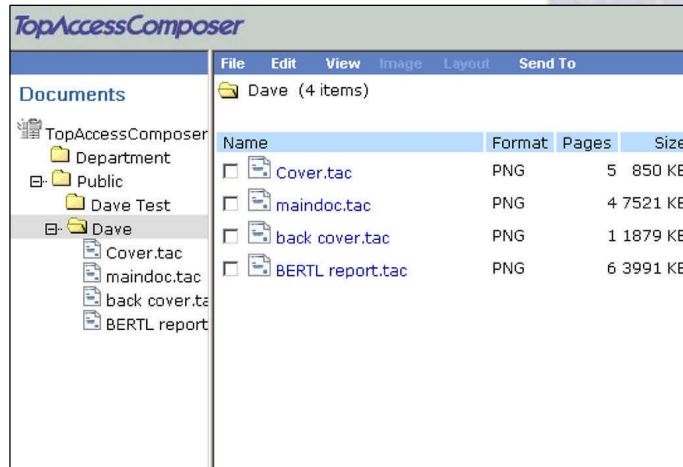
documents at the device, ready for reprinting whenever needed without the bandwidth incurred when print jobs are sent over the network.

Although some manufacturers now offer some form of print on demand accessible from the desktop, TopAccessComposer goes several steps further in terms of the functionality available to the user.
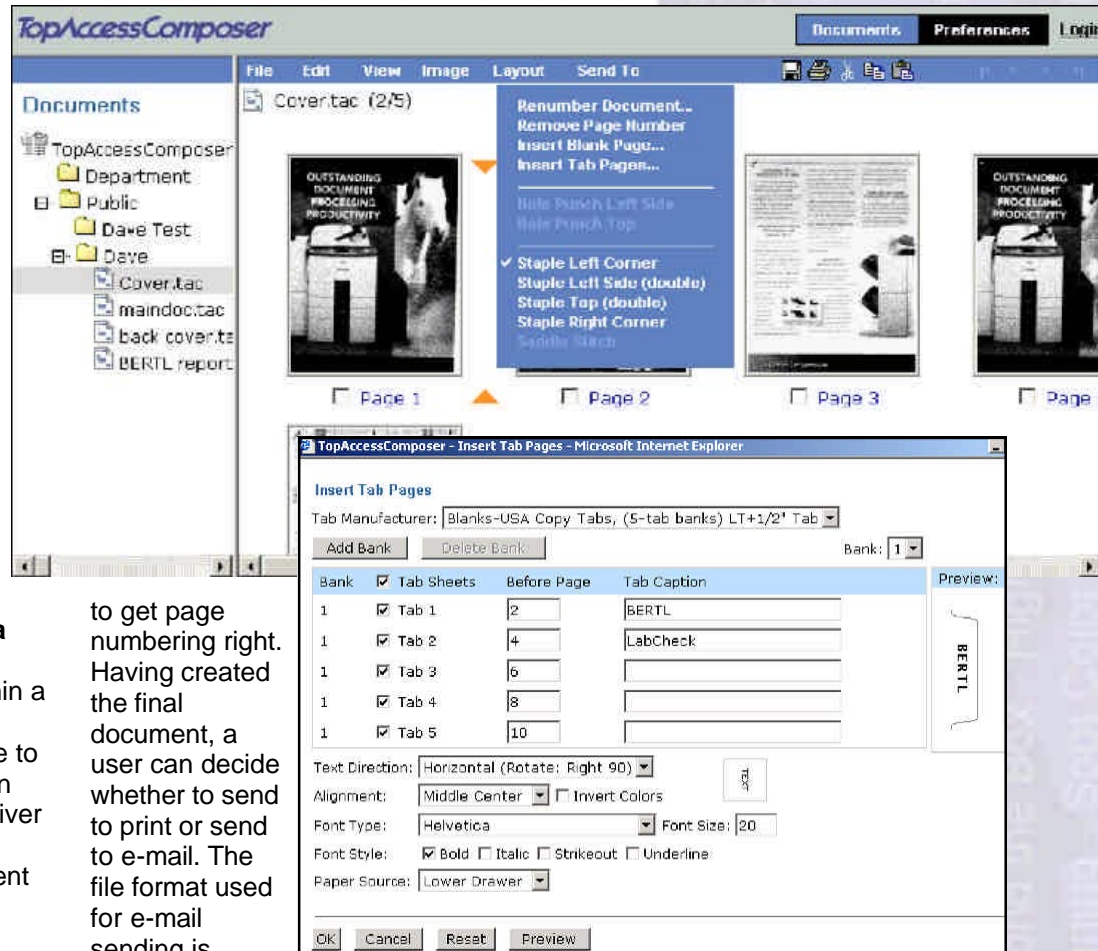
Imaging at Work™

TopAccessComposer

Editing of pages within documents: TopAccessComposer allow users to delete and replace pages within documents. This is a useful function in an environment where documents become out of date quickly. For example, a personnel department could keep company training manuals in a public folder at the device, ready to reprint whenever required without having to send the entire document back over the network. When a contact page changes, rather than having to resend the entire document back to the folder and delete the old document, the user can just send the new page to the folder, delete the out of date page from the manual, and insert the new page in its place.

Combining multiple documents into a single finished print job: Users can combine multiple documents stored within a folder into a single document ready for printing. This means that the user is able to combine electronic documents created in multiple applications using the printer driver delivery mode, plus insert hard copy scanned pages directly from the document scanner at the copier.

Tab Insertion: We liked the innovative tab insertion feature that Toshiba included within TopAccessComposer. Tabs can be created on the fly and inserted within the document. Tab creation is a process that is commonly fraught with problems, and costly when the process goes wrong. It is easy to get a page position wrong when trying to build in tab positions from the printer driver or copy control panel. They also commonly have to be preprinted, which involves more time and effort.

Using TopAccessComposer tab insertion, the user can see a thumbnail of each page on the same screen, making it much easier to get page numbering right. Having created the final document, a user can decide whether to send to print or send to e-mail. The file format used for e-mail sending is restricted to TIFF. BERTL would have liked to have seen PDF format as well. When questioned about the lack of PDF format, Toshiba advised that the decision had been made to select TIFF due to its universal viewing capability, and due to the added ability to send the file to iFAX devices, which would only be able to handle TIFF format documents.

TopAccessComposer does allow users to save documents as PDF files which can then be sent via standard e-mail systems.

Tab insertion

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Imaging at Work™

Print

The Toshiba e-STUDIO 550 can be upgraded to a network printer with the optional embedded GL-1020 print controller.

Base print controller specifications:

- 566Mhz Processor
- 256MB RAM (no further expansion)
- 20GB hard drive
- PCL5e, PCL6 and PostScript 3 printing
- Network scanning
- 10/100BaseT Ethernet connectivity

Connection to the Toshiba e-STUDIO 550 is via a direct 100BaseT TCP/IP connection in Windows XP.

Some of the installation could be improved. For example, when you place the Toshiba CD into your computer it automatically runs an installation which, unless you choose to install only required components, installs Agfa fonts onto your computer. At the end of the installation it forced the client computer to close and reboot; this was both time consuming and unwanted.

simplex to duplex output. During the network load test, a series of simplex and duplex print files (combining color and mono files from multiple applications) are sent to print. The Network Load Test examines how well the processor is able to cope with transitioning between different print job types. Most printers slow considerably when asked to perform this test.

Printer Productivity

Print Job / Test	Duplex or Simplex	Time taken to complete job (s) in seconds	Speed as PPM	Bandwidth Used
35 page Word document	Simplex	45.78 seconds	45.87 ppm	0.99 MB
35 page Word document	Duplex	49.06 seconds	42.8 ppm	0.99 MB
5 sets of 6 page Word Perfect document	Duplex	47.37 seconds	37.99 ppm	347 MB
10 page Acrobat graphics document	Simplex	23.90 seconds	25.1 ppm	3.26 MB
15 page PowerPoint presentation	Simplex	49.37 seconds	18.22 ppm	2.01 MB
10 page Access database	Simplex	19.53 seconds	30.72 ppm	377 KB
Netload Load Test (9 print jobs sent in rapid sequence to simulate network traffic. Jobs mixed 1-5 pages in Word, Word Perfect and Acrobat)	Mixed simplex and duplex	101.29 seconds	17.77 ppm	4.81 MB

The Toshiba performed well across a wide range of print tests, outperforming many competitors in the 55ppm sector.

Duplex productivity was at a high level, with productivity only dropping by 7% when the 35 page Word job was switched from

The Toshiba e-STUDIO 550 was much faster on this work pattern than most 55ppm benchmark devices. For information on the performance of the Fiery GA-1140 controller, which has also been tested by BERTL, see its own LabCheck report at www.BERTL.com

Toshiba e-STUDIO 550 with GL-1020 Controller

Print

The next test measured the performance of the Toshiba e-STUDIO 550 when processing larger streams of network traffic and more complex and varied work loads.

Our results show that the print performance of the Toshiba e-STUDIO 550 was high.
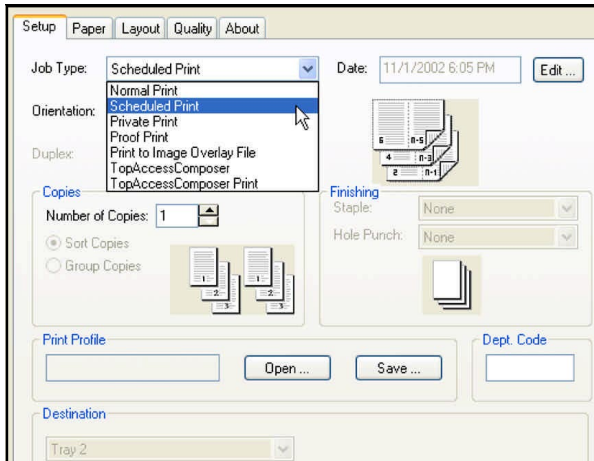
When processing the entire set of jobs as a rapid sequence of jobs arriving from the network, the Toshiba e-STUDIO 550 delivered a high level of productivity. This is due to the processor's ability to process additional jobs while a job is being output.

As the table (below right) illustrates, the overall output time across the 12 jobs dropped by 88.48 seconds -- or to put it another way, the Toshiba e-STUDIO 550's ability to process additional jobs while outputting another document increased its overall productivity by 30%.

Mixed Work - Sent as Separate Print Jobs

Job Type	Sets	Type	Print Time in seconds	Print Speed in PPM
6 Pages WP9	5	Duplex	47.37 seconds	37.99
3 Pages Word	1	Simplex	11.34 seconds	15.87
10 Pages Acrobat	1	Simplex	23.90 seconds	25.1
6 Pages WP9	1	Simplex	19.09 seconds	18.85
1 Page Acrobat	1	Simplex	9.28 seconds	6.46
Acrobat 5 Pages	1	Simplex	16.32 seconds	18.38
Word 35 Pages	1	Simplex	45.78 seconds	45.87
Word 22 Pages	1	Simplex	32.15 seconds	41.06
Acrobat 1 Page	1	Simplex	11.37 seconds	10.55
Acrobat 2 Pages	1	Simplex	10.16 seconds	11.81
PowerPoint 15 Pages	1	Simplex	49.37 seconds	18.22
Access 10 Pages	1	Simplex	19.53 seconds	30.72
Total Time taken and average across 12 jobs			295.66 seconds	28.61 PPM

Mixed Work - Sent as one continuous Print Job

All above jobs sent as one network load	Time taken to complete all 12 jobs	Average Speed in PPM
	207.18 sec	40.83 PPM

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Print

The printer driver is well laid out, graphically oriented, and relatively simple to use.

The PCL6 driver provided seven different job type options. In addition to the private and proof print and image overlay options (which are now on most print drivers at this level of the market) Toshiba includes three additional job delivery options.

Schedule Print: allows users to set the time when a job should be released to print. This can be useful when large print jobs are created that don't have to be printed immediately. This feature allows a user to set up the larger, non time critical jobs to print after office hours to avoid tying up the device during peak hours.

TopAccessComposer: allows the user to send the document directly to a TopAccess Composer folder. Once stored, users can further manipulate the document with the ability to edit, delete pages and combine the document with other jobs in the folder.

Finishing/document production options are another strong feature on the GL-1020 controller. As the screenshots illustrate, users enjoy a high degree of functionality built into the driver. In the example, our analysts set up a manual into which we wished to add preprinted color fed from the post process inserter; stiff card back cover fed from the bypass tray; colored card stock for the first page of each chapter; and tab dividers before every chapter for easy navigation.

The screen shots illustrate how the Toshiba e-STUDIO 550's driver implemented this complicated production requirement.

Tab Sheet control

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Imaging at Work ™
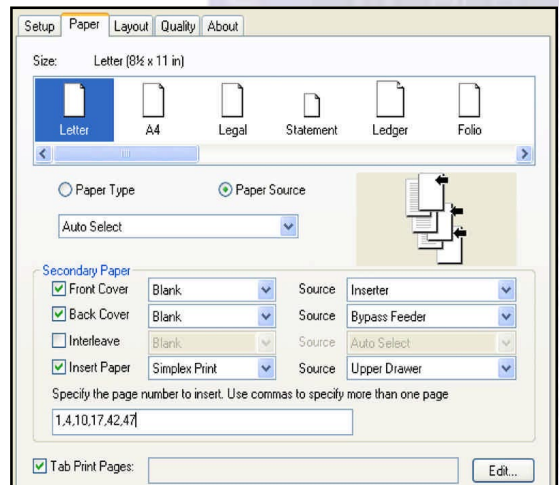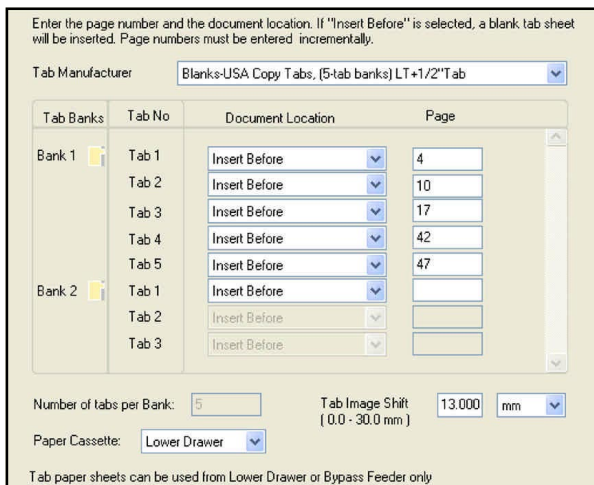
Print

While the Toshiba GL-1020 offers a high level of document production, there are drivers on the market (including the GA-1140 controller for the Toshiba e-STUDIO 550) that offer even more. These drivers allow users to stipulate every individual page within the document to a specific paper tray.

In the case of the Toshiba GA-1140 driver, users can create documents requiring the use of up to 6 paper sources. **The GL-1020 controller allows the user to add a maximum of 5 paper sources within a document: front cover, back cover, inserts, tabs, and main paper stock.**

It's also noteworthy that, unlike some competing units, the post process inserter is available for not just adding covers, but can also be used as the paper source for the sheet insertion section of the driver. This allows users to add colored photographs, etc. within a document, further increasing the professional image of the document.

Booklet Making: The Toshiba e-STUDIO 550 can be configured with an automatic saddle stitch booklet making finisher.

The printer driver's menu for creating saddle stitched booklets is simple to follow as illustrated above.

A minor design limitation is that only two of the paper drawers (plus the bypass) on the Toshiba e-STUDIO 550 can handle ledger/A3 paper, which means that up to 1,000 sheets (via auto drawer switching on empty) are available on line for continuous booklet production. While this is similar to most 50-60ppm devices, at least one competitor can print up to 6,600 sheets of ledger paper. When calculating the number of booklets that can be produced via the two paper drawers, bear in mind that it takes 15 sheets of paper to produce a 60-page booklet.

20 Page Magazine Style Booklet Creation	
THIS TABLE IS INSERTED FOR REFERENCE PURPOSES ONLY Tests Conducted on Toshiba e-STUDIO 650	
Engine Speed	65
Status When Ejected	Fully folded, center stapled and stacked for packing
Seconds per booklet (after first out)	20 secs
No. of Booklets / Hour	180

To test the booklet making speeds and functionality, a 20 page letter/A4 document is sent to print 'magazine style' with centre folding, saddle stitch finishing onto ledger / A3 paper.This test was conducted on the 65ppm version of this device (the Toshiba eSTUDIO 650) with booklet maker. Speeds are provided for reference purposes only.

Bandwidth: The Toshiba e-STUDIO 550's GL-1020 produced low file sizes for Acrobat and graphical documents, but delivered larger than average print file sizes/network traffic on standard office documents. For example, a 35 page Microsoft Word document was 0.99MB, nearly 3 times larger than some network printers. In its favor, however, was the fact that the driver correctly interacted with office applications when asked to create multi-set jobs.

On 5 sets of the 6-page Word Perfect document, the GL-1020 driver created a a 6-page document with a code telling the printer to print it five times. Many printer drivers can't do this – instead of creating a six page set with command to print 5 copies, they print a 30-page document which generates high network bandwidth and can cause finishing problems when stapling and/or when printing in duplex.

Booklet Creation

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Imaging at Work™
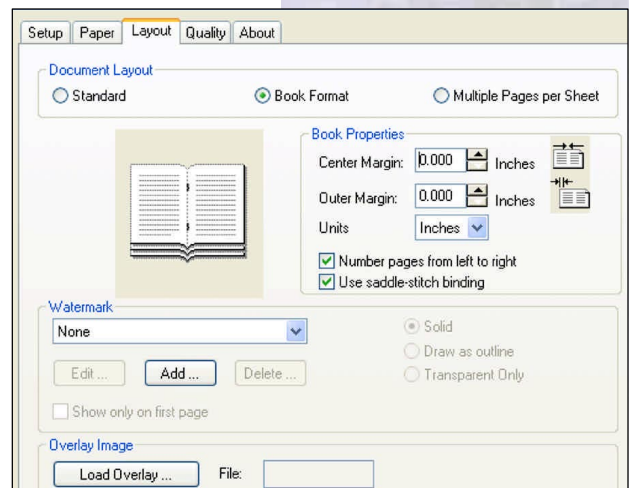
Print

Job Queue Management Within the control panel, you can view the queue of pending print & copy jobs. We could move jobs up & down the queue or delete jobs.

Print image quality was acceptable for most offices purposes: Some images, including photographs, were reproduced a bit darker than we'd have liked, but not to a high degree. We saw no jagged edges (a common problem on some other units.) Solid black and grayscale blocks were reproduced with some visible banding and graininess. Because some images were a bit dark, the ability to clearly print colored text (screen colors reproduced in gray shades) on solid colors was impaired and sometimes hard to read.

Network Management System: Administration is via Toshiba's "TopAccess" web browser-based utility. To use TopAccess you open the internet browser and enter the IP address of the device. The resident web server on the Toshiba e-STUDIO 550 provides TopAccess network management tools. From TopAccess, we could see the device status, page volumes split into copy, print and scan plus search for other devices over the network.

PDF/Direct Printing: The GL-1020 controller doesn't offer direct PDF printing as an option. If buyers require PDF printing, Toshiba offers the function on the Fiery GA-1140 controller.

Internet Printing/IPP: The Toshiba e-STUDIO 550 supports IPP printing which means that the device can be set up to receive jobs from remote locations across the internet. IPP printing has to be enabled at the printer engine and an address set up for the device. Once this has been done, users can set up an IPP printer driver by typing in the URL of the device in the port location on the printer driver.

Mailbins/Mailboxes: There is no physical mailbin option, so sharing the Toshiba e-STUDIO 550 across a larger department may be awkward. On the other hand, Toshiba e-STUDIO 550's driver includes virtual mailboxes called 'Private Job' (located under the Private Job tab in the driver). While we do not consider virtual mailboxes to be as convenient as physical mailbins, they do allow users to send jobs to the printing device and hold the jobs in memory, until the user arrives and enters a password. This keeps the work separate from other work arriving at the printer and is an approach adopted by various manufacturers. The obvious limitation to all virtual mailbox systems is that when you get to the printer you have to wait in line for your print job to be processed once you have entered your passcode and submitted the job to the print engine (the Toshiba is at par with other systems in this respect). While the user has to wait at the printer for their job to get into the queue and print, the stored job is pre-RIPed and therefore processes reasonably fast.

E-Mail Notifications: TopAccess provides the capability to set up e-mail notifications to the administrator when problems occur with the device. There was no capability to designate different types of alert to different addresses. This would have been of benefit. For example, we would have preferred to have been able to send paper low alerts to a local administrator, device errors to the IT department and toner low alerts to the dealer so they know to plan a visit. Toshiba's DocMon feature allows each user to specify whether they want a pop up alert informing them that their job has either 1) been printed successfully, or 2) printing was unsuccessful due to a problem.
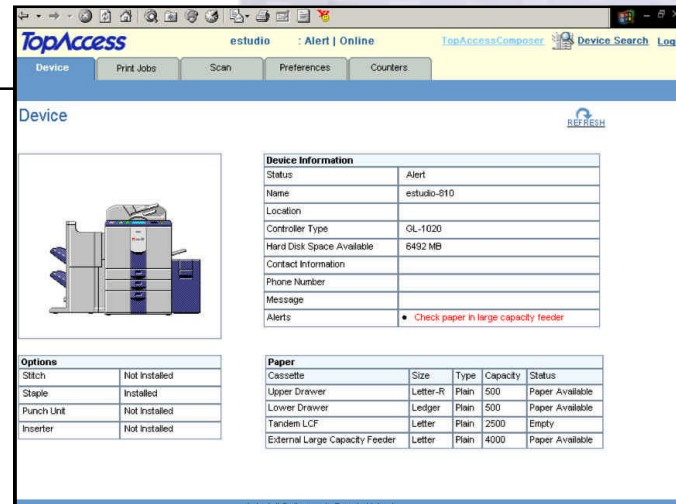
Web based management

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Copy

A major advantage of the Toshiba e-STUDIO 550 was its speed of delivery. This is partially aided by its ability to output completed sets of documents face down (most copiers deliver face up output). Overall, the Toshiba e-STUDIO 550 outpaced other tested 55ppm copier MFPs.

Copier Productivity: A series of office-style copy jobs were run through the device. The test procedures are based upon "most likely usage" of the copier functionality. By this we mean that we do not de-feature automatic functions, nor do we pre-set paper sources in order to show the fastest speed achievable.

Our productivity tests were run using the high capacity paper tray, which is the most likely paper source used for plain paper in most offices. Our test was conducted with the standard finisher, which delivered slightly faster finished sets than the saddle stitch finisher.

The Toshiba e-STUDIO 550 performed well and delivered the fastest overall average copy speed of all current 55ppm units we've tested to date.

Copy Concurrency : The Toshiba e-STUDIO 550 includes five copy memories. When a job is stored in the first memory slot, the remaining four memories can be used to store copy jobs. Unlike at least one competing 55cpm device, the Toshiba e-STUDIO 550's five copy job memories are not also used for print jobs.

When we tested a competing product, each print job took up one of the five memories. *On the competing device, we sent five print jobs and found they could no longer scan in a copy job until the first print job had finished processing. Meanwhile, further print jobs were queuing up at the server / desktop of network users. These print jobs continued to fill the five memories and block copying until the backlog was cleared.*

Because the Toshiba e-STUDIO 550 has a separate copy processor and print controller, it delivered good concurrency and did not back up if we tried to scan in additional jobs while older jobs were processed.

Copy Speeds - shown as copies per minute (cpm)	
Advertised Engine Speed	55 cpm
1 set of 5 single sided to single sided	28.49 cpm
5 sets of 5 single sided to single sided	35.00 cpm
1 set of 10 single sided to 5 double sided	31.26 cpm
1 set of 5 double sided to 10 single sided	35.54 cpm
1 set of 5 double sided to 5 double sided	25.87 cpm
5 sets of 5 double sided to 5 double sided	44.96 cpm
1 set of 20 double sided to 20 double sided	39.96 cpm
Average Copy Speed	**34.44** cpm

Copy

Control Panel: The Toshiba e-STUDIO 550 has a touch screen control panel which was reasonably well laid out, with simple to follow menus. Toshiba has arranged the copier control panel buttons/ screens into different groups which they say assists with disabled access. Not so easy to find was scanning, which does not have its own button but comes up as an option when you press "Printer/Network."

Large, well laid out control panel

Job Build: The Toshiba e-STUDIO 550 allows documents larger than the capacity of the document feeder to be created using its job build feature. Jobs can be built from both the ADF and the platen, allowing users to incorporate pages from books and/or originals that can't that can't be placed through the document feeder.

Print on Demand: The Toshiba e-STUDIO 550 ships with a standard document storage facility enabling print on demand of up to 24 documents of 400 pages. When equipped with the GL-1020 controller, users also have access to TopAccessComposer which provides extensive print on demand functionality for network print users, as described earlier in the report.

Tandem Copying: There is currently no tandem copy option (link two copiers to act as one) but Toshiba indicated that it may be introduced. If available, we have been told that users won't have to buy the print controller to link devices as a combined tandem copying system. If this feature is important to you, check the status with Toshiba.

Finishing Productivity: The Toshiba e-STUDIO 550 finisher proved efficient, with no reduction of speed when we added single corner or two side staples (this differs from the saddle stitch finisher, which had a reduction in speed).

Copy Speeds - Finishing Productivity

5 sets of 5 simplex pages with 2 side staples

Timed with standard finisher (not booklet-making finisher)	Finishing Time (in seconds)	Time added per set (in seconds)
Toshiba e-STUDIO 550 standard finisher	1.47	0.29
Toshiba e-STUDIO 550 booklet maker finisher	13.2	2.64
Alternative 55ppm device booklet maker	1.94	0.38

Copy Image Quality: Copy image quality was acceptable but not outstanding. Some work was lighter than desired. Toshiba says that service technicians can set image quality to suit user requirements at the time of setup, so the image quality may be improved upon at client locations.