

# KONICA MINOLTA BIZHUB 130F – THE HEART OF YOUR OFFICE (Part 1)

By **VLADIMIR KAMENOV**

*In this issue of RechargeEast Magazine we are offering an article in two parts about Konica Minolta Bizhub 130f. Part 1 will dwell on the functioning of the device and disassembly methods. Part 2 will be about the adjustment procedures after the device is cleaned and assembled. Part 1 is published in the July issue and Part 2 will appear in the August issue.*



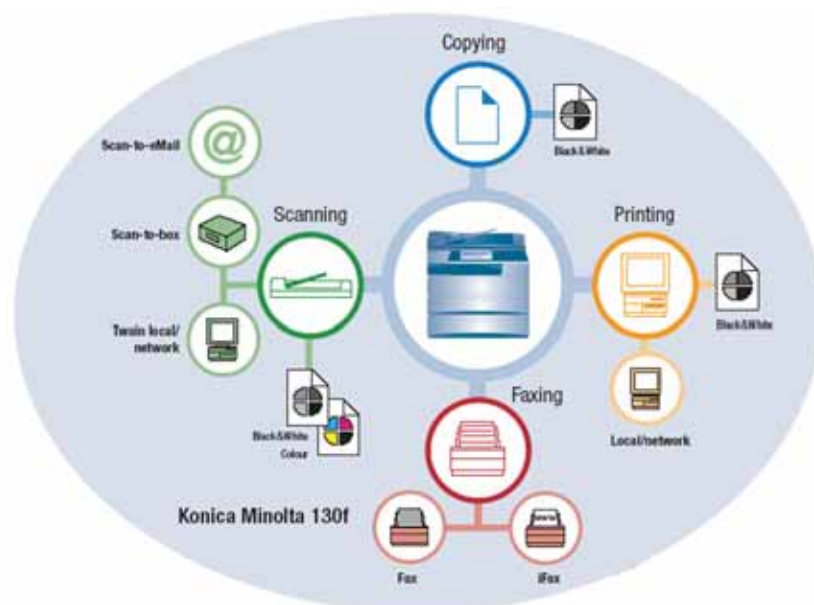
Eng. Vladimir Kamenov, PhD

**A**s the brochure suggests this small model from Konica Minolta is really intended to become the heart of your office. Since I have no doubts about the multifunctional capabilities of the machine, in this article I will try to analyze its construction from a technician's point of view. But, first, let's get familiar with the functions of the model:

**Vladimir Kamenov, PhD,** is a specialist in maintenance of various models of Toshiba copiers. He holds a master's degree in Precision Mechanics and a PhD degree in Applied Mechanics. His work experience includes part-time and full-time jobs as service engineer. He also lectures at the Sofia Technical University, Precision Mechanics Department, Office Equipment Specialty.

**Contact:**

Email:  
vladokamenov@tu-sofia.bg  
Tel.: +359887730384



**HERE ARE THE TECHNICAL SPECIFICATIONS OF THE MACHINE:**

| <b>Copier specification</b>                  |  |
|--|--|
| Copy speed A4                                | Up to 13 copies/ min.  |
| Copy resolution                              | Max. 600 x 600 dpi   |
| 1st copy                                     | 12 sec. ( A4 crosswise)  |
| Gradations                                   | 256 gradations   |
| Magnification                                | 50% - 200% in 1% steps via original glass  |
| Multiple Copy                                | 1-99, countdown  |
| Copy memory                                  | Standard: 8 MB (650 pages)<br>Max.: 40 MB (3.370 pages)  |
| Copy features                                | APS, AMS, auto cassette switching, job memory, electronic sorting, combine 2in1, department controller |
| <b>Printer Specifications (GDI standard)</b> |  |
| Print speed A4                               | Up to 13 prints/ min.  |
| Print resolution                             | Max. 600 x 1200 dpi  |
| Page description language                    | GDI  |
| Interface                                    | USB 2.0/ Parallel (IEEE1284)-optional/ Ethernet (10/100Base-TX)-optional                               |
| Print Memory                                 | standard: 8 MB<br>max.: 40 MB  |
| Operating system                             | Windows 95/98/SE/Me/2000/XP/NT4.0  |
| <b>Printer specification (PCL optional)</b>  |  |
| Print Speed A4                               | up to 13 prints/min.   |
| Print resolution                             | max. 600 x 600 dpi   |
| Page description language                    | PCL 5e/ PCL 6  |
| Interface                                    | USB 2.0/ Parallel (IEEE1284)-optional/ Ethernet (10/100Base-TX)-optional                               |
| Print Memory                                 | standard: 8 MB<br>max.: 40 MB  |
| Operating system                             | Windows 95/98/SE/Me/2000/XP/NT4.0  |
| Print features                               | Transmit once, print many/ RIP once, print many/ Watermark/ Layout (2-up, 4-up, 8-up)                  |
| <b>Fax specification</b>                     |  |
| Fax transmission time                        | less then 2 seconds (ITU no. 1)  |
| Fax modem speed                              | max. 33.6kbps  |
| Coding                                       | MH/ MR/ MMR/ JBIG  |
| Fax features                                 | iFax/ delayed transmission/ broadcasting/ polling/ memory receiving                                    |
| <b>Scanner Specifications</b>                |  |
| Scan speed                                   | Up to 15 scans/ min.   |
| Scan resolution                              | Max. 600 x 600 dpi   |
| Scan modes                                   | TWAIN scan/ Scan-to-box/ Scan-to-eMail/ Scan-to-iFax   |
| Scan features                                | colour scanning  |
| <b>System specification</b>                  |  |
| Automatic document feeder                    | Max. 80 sheets (75 g/m2)   |
| Output paper size                            | A6 to A4   |
| Paper weight                                 | 60 -120 g/m <sup>2</sup>   |
| Paper input capacity                         | Standard: 550 sheets<br>Max.: 1.050 sheets   |
| Sheet bypass                                 | Multi-bypass tray (max. 50 sheets)   |
| Output capacity                              | Max.250 sheets   |
| Finishing modes                              | Electronic sorting   |
| Warm-up time                                 | Less than 23 sec.  |
| System Dimension                             | 520x450x446 (WxDxH, mm)  |
| System Weight                                | approx. 20.8 kg  |

From the technical point of view this is a crossover machine between a modern digital copier mechanics and a laser printer. It seems as though the engineers from Konica Minolta just wondered how much strength to build in it, or, probably, their sales managers made up its design. As you may know, there are some differences between copiers and printers in general. The first are intended to last longer and to be serviceable to a greater extent

than laser printers. This concept is visible in the elements used such as chargers, fusers, photoconductor modules etc.

Strictly speaking, the bizhub 130f model sits somewhere in the middle. As we go on with this article you will see more details about its construction. I just want to mention some of the components:

- Lets start with the most unusual component choice – the laser scanner. It is not a laser at all!!! The machine uses a LED array for making hidden electrostatic images on the drum. Not until recently only brands like Kyocera and OKI used the LED technology. The fact is that this is a far more advanced and cheap way of producing images with resolution of 600x600 and even 1200x1200dpi. The reason that not so many manufacturers used LED, I suppose, is the patents on it. But nowadays we witness more models using this technology. I have observed several Minolta full color digital copiers models that use it. To find such a module in this humble model was a really good surprise to me. As you may know there are a lot of advantages – easy cleaning and access as well as better reliability and simplicity. I speak from experience – many times I would lose nearly an hour dismantling a copier just to reach to the laser scanner assembly, and then, of course, there is the cleaning and the reassembly, so judge for yourself.

- The second component - the transfer roller - is taken directly from laser printers. Gone are the days when the technician lost nearly half an hour in cleaning the lower corotron assembly, which was always dirty as a coal mine, because it stood directly under the photoconductor unit. Transfer rollers are a well proven technology. They are reliable, easy to clean and they do not get too dirty.

- Another good decision is to keep the main charger in the form of a corotron assembly. No matter how good new things sometimes are, there is nothing better and reliable than a good old corotron wire assembly. Main chargers do not get as dirty as lower ones, so they are easily cleaned, as opposed to modern PCRs and comb electrode chargers, which are good when new, but defect more quickly.

- Further let's take a look at the image scanner. The use of a proven CCD scanner technology makes a very good impression. Most modern multifunction printers and even some digital copiers use the new CIS – contact

image sensors. It is true that in this technology there are no mirrors to clean but the quality.... In contrast the CCD assemblies have proven to be more reliable and have better image quality conversion. The downside is that you have to clean a mirror or two sometimes, but hey, in older copiers there were six!

- The fuser is again a good choice of components. Nowadays even high volume digital copiers sometimes use fixing films, not to mention 90% of laser printers. Engineers at Konica Minolta opted for the proven heating Teflon roller and fluorine rubber pressure roller. The module has a sturdy construction but I mentioned the lack of a cleaning roller or felt. I explain this with the lower fusing temperature of modern toners and printer mechanics.

- Following the modern tendencies in digital copiers design, most of the machine's components are crumbled in the right side, but this doesn't make it difficult to disassemble, as every module is well thought of and easy to remove. You just need to remove a screw or two.

In conclusion, I can say I am pleasantly surprised by this small multifunction copier. Combined with the low printing speed I expect the mechanical parts of the printer to last forever, as you know durability of mechanical components is in relation with the operating speeds and loads.

Now let's take a deeper look into the operation, method of disassembly and cleaning of the machine:

## AUTOMATIC DOCUMENT FEEDER - DOCUMENT SCANNING SEQUENCE

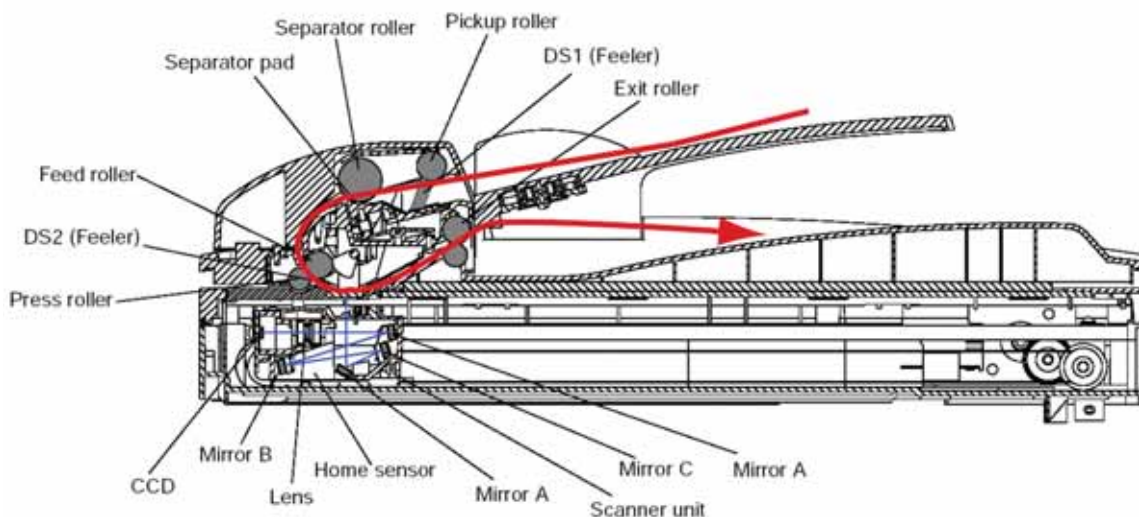
### ADF Detection

When a document is placed into the document feeder, Document Sensor 1 (DS1) is activated and you will hear the short beep. The document will be transferred when the start key is pressed.

Document separation is the process that allows a multi-page document to go through the scanner one page at a time. The bottom document is separated from the remaining documents by the friction of the separator pad. Following document separation, the feed roller causes the document to advance. As it advances, the leading edge of the document activates the Document Sensor 2 (DS2) sensor. Once DS2 is activated, the feed roller continues to rotate until the document reaches the scan position. The machine uses the distance from DS2 to the scan position and the diameter of the feed roller to determine the number of rotations necessary to feed the document to the scan position.

When the document reaches the scan position, the light from the scanner lamp strikes the face of the document and is reflected into the lens through mirrors A, B, and C. In case the light intensity along the length of the scanner lamp is not uniform, shading compensation is provided to ensure even illumination. As the reflected image passes through the lens, it is focused onto the charged coupled device (CCD). The CCD then converts the dark and light areas of the image into electrical impulses, or image data.

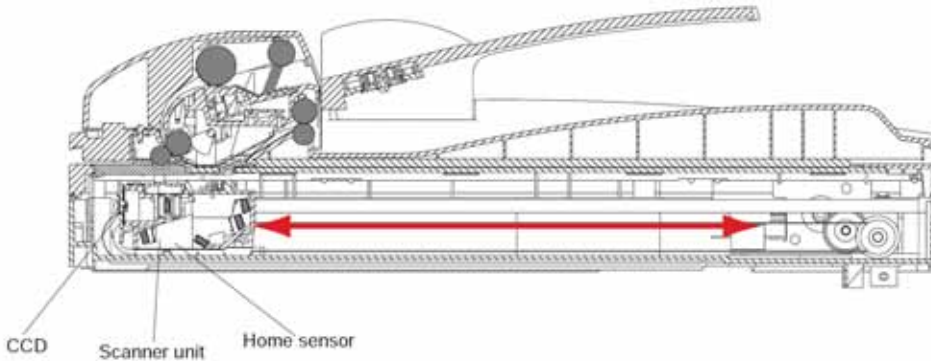
When DS2 detects the trailing edge of the document, the image signal output is turned off. The scanner continues to remain active for a few more seconds in case there is another document to follow. The scanned document is discharged through the document exit by the exit roller:



**Original Detection** - The sizes of the documents are detected by the following two sensors:

| Detection                           | Action  | Sensor |
|-------------------------------------|---|--------|
| Document presence                   | Detects whether there is a document on the tray or not        | DS1    |
| Leading and trailing edge detection | Detects the leading and trailing edge of the feeding document | DS2    |

**FBS section** - Light reflected from the original passes through three mirrors and a lens to form a reduced image on the CCD Sensor as the Scanner Motor moves the Scanner. The CCD sensor converts the light pattern (image data) into an electrical image signal. The electrical image signal is then output to the Main Board:



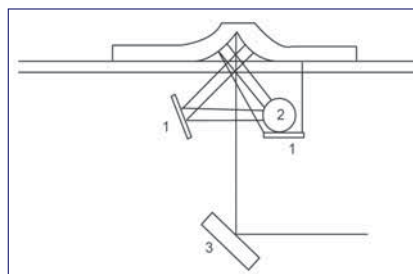
Now that the theory is clear, let's start disassembling the ADF and optics modules.

First, remove the screw, holding the black ground wire and a screw to release the metal cover of the ADF's communication cable. Unplug the cable, lift the ADF and pull it upwards to detach it from the copier. As was shown in the theory section, the construction of the module is very simple. All you need to do here is to clean the rubber feed rollers and separation pad with cleaning fluid:



**Exposure Section: Construction and Function**

1. Reflector Tape - The Reflector Tape reflects the light from the Exposure Lamp and supplements its illumination.
2. Exposure Lamp - A Cold Cathode Fluorescent Lamp (CCFL) is used to illuminate the original.
3. Mirror - Directs the reflected light from the original to the lens:



Hand solution

...serving the color

S.E.A. S.r.l.  
Via S. Antonio, 51 loc. Giardoni - 82030 Limatola (BN) - ITALY pbx. +39 (0) 823484101 - fax +39 (0) 823487244  
e-mail: info@free-tech.com Web: www.free-tech.com

Cod. F1160CRPC

TURQUOISE  
CLEANING  
CREAM  
FOR  
DRUM  
(ml 100)

€ 9,5 each

Cod. F1160CRPCR

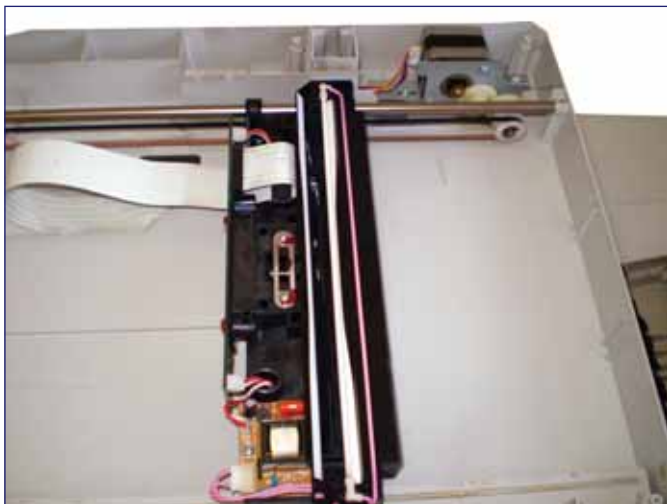
PINK  
CLEANING  
CREAM  
FOR  
PCR  
(ml 100)

€ 9,5 each

Now the way is cleared to disassemble and clean the optics module. Remove the five screws and lift the entire plastic cover with the ADF's slit glass and the platen glass. Be careful not to remove the two screws holding the slit glass, because it could fall off and break on the ground. Clean the glass with window cleaner:



The construction of the scanning module is very simple. On the figure you can see the drive section, the guide and the scanner assembly. All you need to do here is to clean the two mirrors under the expo lamp with dry cotton swab. Be careful as the lamp itself is very fragile. A little lubricant can be applied to the assembly guide:



Open the front and side covers. Open the paper cassette. You will notice the simplicity of the feed roller. All you need is to clean it. Slide the lever numbered with 1 to release the developing unit from the drum unit. At this point you can clean the registration roller with rubber cleaning fluid. Also clean the transfer roller with dampened with water cloth:

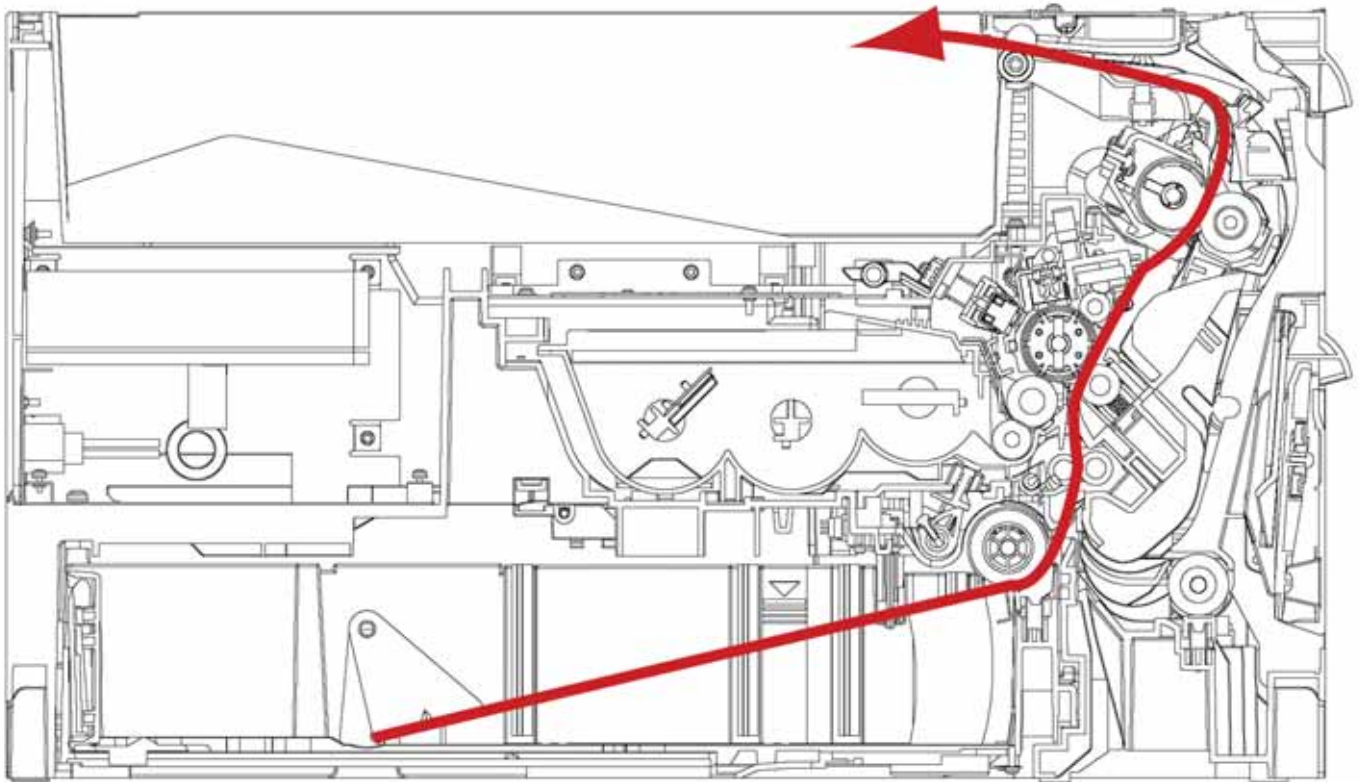


Pull out the developing box and then the drum unit. Store the second in a dry dark place. You can notice the absence of developer in the developing box. The machine uses only toner. What's more – there is no waste toner space behind the drum. That is so because there is no waste toner at all!!! All the toner is recycled. This is another resemblance with modern eco friendly printers. At this stage you can clean the main charger with a cotton swab, moistened with window cleaner:



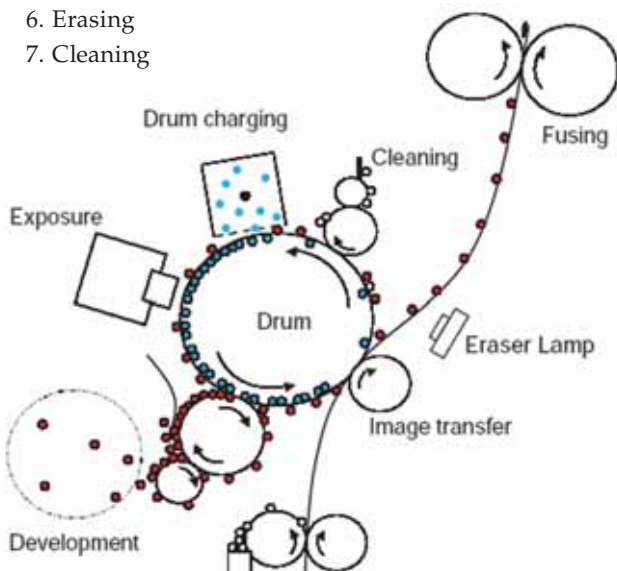
## RECORDING SECTION

**Recording Paper Feed Path** - A sheet of the recording paper is separated from the remaining paper by the friction of the pickup roller. The paper is moved along the paper guide until it reaches the register roller. It is then fed by the rotation of the register roller:

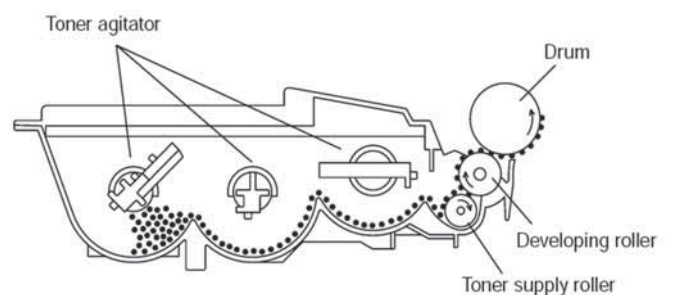


**Image Processing** - The image processing is roughly divide into the following steps:

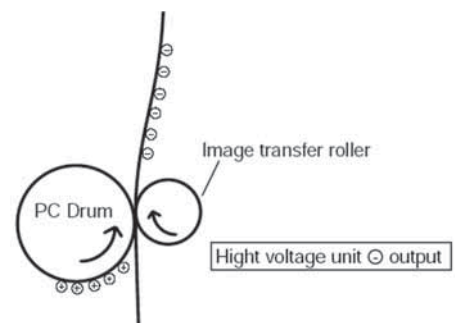
1. Drum Charging
2. Drum Exposure
3. Development
4. Image transfer
5. Fusing
6. Erasing
7. Cleaning



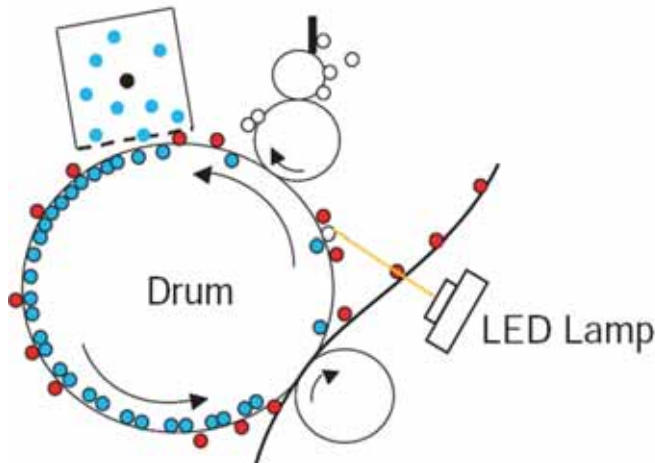
**Development** - Toner is applied to the invisible static image on the Drum and a toner image is created on the surface:



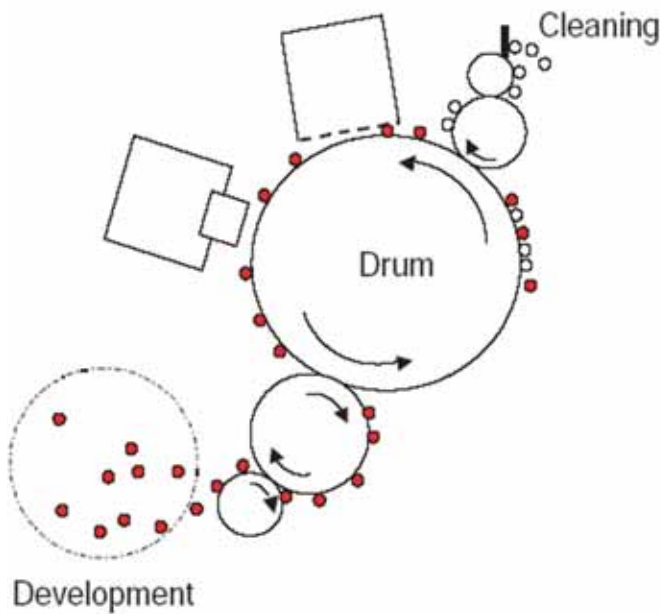
**Image Transfer** - Image transfer is the process of transferring the toner image created on the Drum in the developing process to paper. There is no blur of toner because the paper is always pressed by the Drum and the Image Transfer Roller:



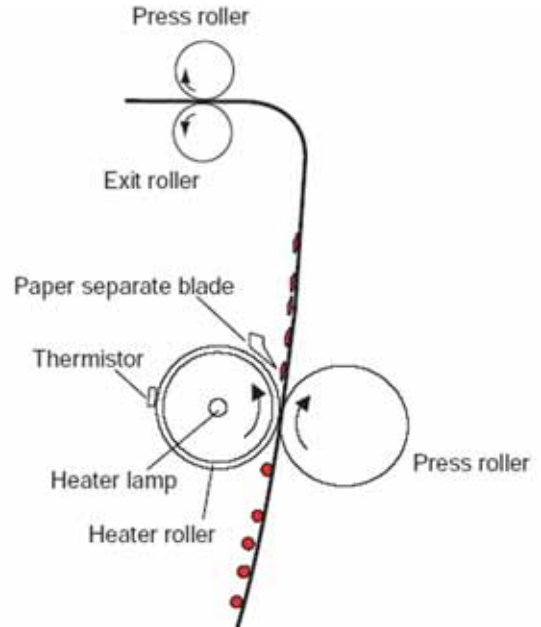
**Erasing** - An LED lamp exposes the Drum surface. When it is exposed the drum charge erases. This helps the drum to be recharged evenly at the next step of charging:



**Cleaning** - The residual toner or paper dust must be removed from the drum. Paper dust is removed from the drum surface by a rubber roller. And then by a metallic roller, and finally scraped off. The residual toner is removed by the developing roller and toner supply roller, and is recycled:



**Fusing** - The toner image transferred on to the paper is securely fixed. A heat roller system is used as the fusing system. The toner image is fused by Heater Roller heated by the Heater Lamp, and securely fixed by the pressure between the Heater roller and Press rollers. A Thermistor detects and controls the Heater Roller temperature. The Thermostat functions when the Heater Lamp is not turned OFF even if the Thermistor detects a high temperature malfunction:



As we speak about fusing, here is the fuser unit. To remove it, you must remove four screws (2 on each side) and one holding the ground wire. When you remove the screws, pull out the unit carefully as you don't forget to disconnect the two connectors at the back:



Now you can disassemble the fuser unit. It is really simple – just remove two screws on the top of the fuser and one holding a metal plate on the right side. You can clean the separation fingers with acetone as well as the thermistor:





Now the entire inside of the printer mechanism is exposed. You can clean it with a vacuum cleaner. It is important to clean the LED assembly, shown on the figure with alcohol and a cloth. This greatly improves the image quality. On the left side of the figure you may notice a strange pulley and wire mechanism. This is used to move the LED assembly close or away from the drum unit when the side cover is opened in order to keep the drum unit from scratching.



The final stage is to remove the rear covers and clean the mechanical and electrical components from dust:



Now the machine is thoroughly disassembled and cleaned you can assemble it in the reverse order. After that it is possible that it needs some adjustments. For this purpose there are several service modes.

To be continued...**RCE**



**Recharger Magazine's  
Readers' Choice Awards  
Special Recognition**

## **Best New Technology & New Startup**

**Lid Factory™**

Put a "Lid" on it  
*Universal inkjet cartridge seal*

- Universal for black and color
- Air tight seal prevents ink drying
- Apply to wet or dry nozzle plate
- Seals and protects orifice plate
- Transparent see through seal
- Light weight: 16/ounce
- No equipment needed
- Fast/easy application
- OEM appearance



## **Free Samples**

**Lid Factory™**  
1000 Park Avenue  
Cayucos CA 93430 USA

Web: [lidfactory.com](http://lidfactory.com)  
E-mail: [info@lidfactory.com](mailto:info@lidfactory.com)  
Voice/Fax: 805 995-2628