

This training course provides service technician training for the GR-C1 series copiers.



This section provides an overview of the machine, and the options that can be installed.



- □ The GR-C1 fills this empty slot in the product lineup.
- □ It is a successor to the S-series and K-series black-and white copiers, to try to get customers to change over to color.
- □ PE-MF2 is user maintenance, but GR-C1 is maintained by techicians.



- □ SPF: Scanner, Printer, Fax
- □ SP: Scanner, Printer



- □ For Europe standard model, the ARDF or a platen cover are available as options.
- One-bin tray: This is the first time that a one-bin tray has been offered as an option for an A4 desktop MFP series.



□ Just a quick look – more detail later.



- □ SP5074 can be used to customize the application that appears when the Home button is pressed.
- □ Function keys:
  - > Nothing is assigned when the machine leaves the factory.
  - > If the browser unit is installed, a URL can be assigned to a function key.







		Also used with these new models:	Similar to:	Note
ARDF (D606): DF1030	New	S-C5		D118 Europe/China: Th
Platen cover (D607): Platen Cover PN1010	New	S-C5		customer must buy one of these.

□ These are only options for the RE and China versions of the D118. All other models have an ARDF as standard equipment.

### **Options: Paper Feed and Finishing**

		Also used with these new models:	Similar to:	Note
One-tray paper feed unit (D573): PB1050	New			Up to two of these can be installed below the main unit
One-bin tray (D574): BN1010	New			

		Also used with these new models:	Similar to:	Note
D649: Fax Option Type C305	New			Option for D118, standard for D117
D645: Handset Type C5502		AT-C3, AP-C3, S-C5		
D657: Fax Connection Unit Type D	New			For the Remote Fax feature (new function
				This unit will not be released at the same time as the GR-C1.
				time as the GR-C

		Also used with these new models:	Similar to:	Note
D656: HDD Option Type C305	New			
D566: Bluetooth Interface Unit Type D	New	OR-C1, AL-C2, AT-C3	N/A	New type, uses USB Not supported for China/Taiwan
B679: IEEE 1284 Interface Board Type A		OR-C1, AL-C2, AT-C3		Not supported for China/Taiwan
D377: IEEE 802.11a/g Interface Unit Type J		OR-C1, AL-C2, AT-C3		Not supported for China/Taiwan
D377: IEEE 802.11g Interface Unit Type K		OR-C1, AL-C2, AT-C3		
G874: Gigabit Ethernet Board Type A		OR-C1, AL-C2, AT-C3		
D656: VM Card Type T	New			
D656: Browser Unit Type H	New			
D377: File Format Converter Type E		OR-C1, AL-C2, AT-C3		
D658: Camera Direct Print Card Type K	New	AT-C3		
D656: SD card for NetWare printing Type J	New	AT-C3		

- □ PostScript3 is standard.
- □ There is no IPDS.

### **Options: Other**

	Also used with these new models:	Similar to:	Note
B870: Optional Counter Interface Unit Type A	OR-C1, AL-C2, AT-C3		
B829: Copy Data Security Unit Type F	OR-C1, AL-C2, AT-C3		HDD is not required
		•	



□ Also no fax memory upgrade option.





- □ The SD Card slots are discussed in more detail on the next few slides.
- □ The Bluetooth interface unit and the Wireless LAN interface unit cannot be used simultaneously.





□ There is no App2Me for this model.









□ SMC data export is a feature that was added for the GW+ controller.









This section provides an overview of the main specifications. For more details, see the service manual.







□ Envelope feed from bypass tray only.









□ Note that the resolution is only standard and detail.







- □ The PCDU contains developer.
- □ PCDUs are not installed by customers, but toner bottles can be.



- □ A color ratio of 20% is assumed.
- □ The average machine life is 120k.
- □ With a color ratio of 20%, the life of PCDU for CMY (24k) will run out after 24k/0.2, which is 120k. So the PCDU for CMY is a yield part, not a PM part.



This section briefly explains some of the most important features of this model that are fairly new to the product lineup.

#### **QSU (Quick Start Up) Fusing System** This system has been used in some of our recent products. □ There are fewer components Pressure Roller Fusing Belt than a traditional fusing unit, allowing costs to be reduced. □ The components have a low heat capacity, which means that the unit can warm up more quickly than a traditional fusing unit. Fusing Lamp For a full description, see the Fusing Pad **Detailed Section Descriptions later in this** course. Slide 36
### **GW+ Controller**

An enhanced GW controller is used in this series. This allows the new features explained in the next few slides.

- □ The features are classified as follows:
  - Workflow improvement
  - TCO reduction
  - Environment
  - Security
  - Compliance

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#### List of features provided by this new controller.

- □ Workflow Improvement
  - > Customizable Home Screen: Optional HDD required
  - > MFP Full Browser: Optional HDD required
  - External USB Keyboard Support
  - > Auto Job Promotion: Optional HDD required
  - Enhanced Media Print
  - > Scheduled Print: Optional HDD required
  - Banner Page Print
  - JBIG2 Compression Support
  - Reduce/Enlarge Scan
  - > Enhanced Batch Scan: Optional HDD required
  - Split Scan from Book Type original
  - Import/Export of Preference Settings
  - Expanded the number of User Code
  - Scheduling of Quota Management
  - Homefolder over LDAP
  - > Newly Supported languages: Brazilian Portuguese/ Greek
- TCO Reduction
  - > Quota management: Optional HDD required
  - Remote Fax: Optional HDD required
  - Improved grey reproduction (PCL6)
- Environment
  - > Information Screen (Eco-Friendly Indicator): Optional HDD required
- Security
  - Unauthorized Copy Control (PCL6/PS)
  - > Enhanced Print Functions using HDD: Optional HDD required
  - Mandatory Security Information Print
  - > Output Mode Switch Timer for Received Fax: Optional HDD required
  - Enhanced Encryption Level (AES256bit, SHA-2)
- Compliance
  - Scan to PDF-A/digitally signed PDF





- □ Up to 72 icons can be registered on the home screen.
- □ If the optional browser unit is installed, a URL can be installed in a function key.
- □ This diagram shows the operation panel for another GW+ controller model, but the principle is the same.

### Workflow Improvement

**Customizable Home Screen - 2** 

- The displayed function icons and their order are customizable, and a bitmap such as a customer's corporate logo can be inserted at the upper right corner of the screen.
- Also a program short cut can be set on the home screen. Users can program a frequently used job operation on the home screen so that they can execute it with just one step.
- In combination with user authentication, each user can have their own personal home screen that only displays those icons that he/she uses.
  - Personal home screens require a hard disk.



□ Administrators can also hide certain icons.

### **GR-C1** Training







- □ The previous browser unit did not allow you to print web pages.
- □ Paper size for HTML direct printing is fixed to A4/Letter.
- □ The 10 key pad on the operation panel can't be used for entering numbers in the url. Use the displayed character entry screen or the USB keyboard.



- □ Bookmarks for each user is not supported.
- □ Simultaneous usage with an external billing system such as a coin lock is not supported.
- □ Preview screen before printing web pages is not available.
- Dependence of the page of the
- □ This new type of browser unit has scroll bars, Back and Forward buttons, a URL field, and others. The old types of browser unit did not have these features.

### **GR-C1** Training

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- □ Jobs that are skipped will be stored as 'Hold Print' jobs (max: 200 jobs).
- Skipped print jobs can be reprinted from the operation panel or Web Image Monitor after the cause of the error is resolved.
- □ If the number of pages for pre-detection of errors is increased, a longer time will be required until the first page of the job is printed.
- Print jobs that use IPDS can't be skipped.
- When a Fiery controller or optional Counter Interface Unit is installed, this function is not available.



□ A hard disk must be installed.





- □ Use this to print large jobs after office hours, so that others will not be prevented from using the machine.
- □ When the main power of the machine is turned off if the specified time has arrived, the Scheduled Print jobs are stored as Hold Print jobs.



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- PCL6 driver (Win) Postscript3 driver (Win/Mac)
- Users can register these settings as one-click icons on the printer driver, to make it easy to apply the most suitable color profile.



- A banner page is used in network printing in order to separate documents (or "print jobs") from each other and to identify the originator of the print by user name.
  - In some cases, print jobs are sent to a central processing area where messengers take the printouts back to the owner, but the usual practice in modern office environments is for the user to retrieve his or her own documents. The banner page makes it clear who printed each job.
- □ Printed banner pages are counted as B&W jobs.
- The banner page is not available for "Sample print", "Locked print", "Stored print", "Hold print" and "Send to Document Server". Although exclusive control on printer driver UI is available on Windows OS, it doesn't work on Mac OS. This means that if both banner page and "Locked print" are selected at the same time on Mac OS, but the banner page setting is ignored.
- □ Landscape can't be selected as the orientation of banner pages.
- The NetBIOS name will be used as the Host name on banner pages. If users set a computer name which is longer than 15 bytes on a Windows OS, only the first 15 bytes of the computer name will be printed as Host name because of Windows OS specifications.
- □ If languages which are not supported by MFPs are included in the account name, computer host name or job name, the characters will be garbled.
- When users print multiple copies, just one sheet of banner page will be printed before the first copy. But please note that there are some applications which handle multiple copies as multiple jobs. In this case, banner pages will be printed before each copy.

### **GR-C1** Training







- □ This is a familiar copier function, and it is now available for scanner mode.
- □ This function is not available for TWAIN scanning or WSD scanning.
- When using this function, "High Compression PDF" can't be selected as the file type.
- □ It is not possible to specify different reduction/enlargement ratios for height and width.







□ This is a familiar copier function, and it is now available for scanner mode.



No additional notes

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- Before using this function, please change the "LDAP Auth: Folder Path Overwrite Setting" to "Overwrite" in "General Settings" of "Scanner Features".
- □ If the user has logged in using LDAP authentication, select whether or not to overwrite the user's address book on this machine with the folder information of the logged-in user.
- □ After log-in to the machine, users can use HomeDirectory information registered to address book automatically as a destination for "Scan to Folder".
- If HomeDirectory information is registered on the LDAP server, users can use the registered folder information as a destination for "Scan to Folder" with one touch operation after log-in even though folder information is not registered on the mahcine.
- Also, HomeDirectory information stored in the LDAP server can be used on machines in same network. This means that administrators don't have to register shared folder information in each machine.
- If HomeDirectory information is not registered on the LDAP server, no folder information be copied to the address data generated automatically in the machine.









□ The user interface has familiar features, such as right click menus, shortcut keys, drag & drop.



□ Ibis is provides as a separate package, and is also bundled with Birdie-S.





No additional notes





- □ The machines do not have to be the same model, but they must be GW+ controller models with the Fax Connection Unit SD card option installed.
- □ Sub machines can select and register multiple center machines beforehand, but can only transmit to one center machine at a time.
- □ Sub machines must have their own address books. Sub machines cannot use the center machine's address book.
- □ The customer must buy a Fax Connection Unit SD card option for the center machine and each of the subordinate mahcines.



- □ The setting of "K(Black) per Page" is available only when printing from the PCL6 driver.
- □ The image quality of gray images printed with black toner only is slightly different from when printed with CMYK toner.
- Definition of "Gray": Objects that have the same values for R, G and B components. If the color is similar to grey but the values of R, G and B are not the same, the image is printed with CMYK toner even if "K(Black) per Page" is selected.
- □ When "K(Black) per Page" is selected, the productivity may decrease because it is needed to judge which color components (RGB) are used on the page before printing.







- Displayed data depends on whether user authentication is disabled or enabled.
  - > If user authentication is enabled => Eco counter for each user is displayed.
  - If user authentication is disabled => Eco counter for system (all users of the machine) is displayed.
- □ The Eco-Friendly Indicator is shown at these times
  - > After log-in
  - After recovering from energy save mode (when user authentication is disabled)
  - > After system auto reset (when user authentication is disabled)



- Duplex will be default for drivers on the CD-ROM, but not for drivers downloaded from the web site.
- □ For some features, duplex must be off. Users must be aware of this.



- □ When printing on small sized paper such as A6 or envelopes, a part of the security information may not be printed.
- □ If print fonts which are not supported by the device such as Chinese, Arabic, Korean or Thai are included, the security information can't be printed correctly.
- □ The directions of image and security information may not match when printing from a PS driver or IPDS.





Print settings cannot be changed when print jobs are sent via Centronics interface, USB or Bluetooth.

9 Features				Users can specify whether		
os Output Mode Switch Timer: Detailed Settings sing can be set Select item. Off Griff Specific Period Settings				taxes received in a		
			specific period are to be			
				printed, to stand by to print, to be forwarded to a registered receiver, or to		
On	Co Print ID Setting			be saved on the HDD.		
put Mide Switch				Also, prohibiting		
bottur cot to				automatic printing of		
? Features				received faxes can be set manually on the operation		
as Output Mode Switch Timer						
sing can be set	Select item.			panel when this timer		
Off	General Setting	Off		function is disabled.		
Off	G3-1	Same as General Setti				
OII	63-2	Same as General Settir				
On	63-3	Same as General Setti				
put Made Switch	Internet Fax	Same as General Settin				

- □ By utilizing this function, received faxes are not printed when users are not in their office, so they can reduce the risk of information leak from uncontrolled outputs.
- And also, it will be possible to forward faxes received when the office is closed to another working office.
- Printing from the LAN-FAX driver is always possible regardless of output mode switch timer setting.
- □ The machine must have a HDD.
- To use this function, specify the period of time to switch the output mode in "Timer: Detailed Settings", and then specify the output mode in "Output Mode" when the Output Mode Switch Timer function is enabled.
- Jobs affected by this timer
  - Received fax/ Internet fax/ IP fax documents
  - Mail to Print
  - > Auto Report related fax application
- Available Timer settings
  - > Weekly settings (set output mode switch timer for each day of the week)
  - > Specific Period Settings (This timer is used when the office is closed for a long time.)
- Available Output Mode
  - Not Set (Default)
  - Print
  - > Standby to Print (Printing received fax documents will be suspended.)
  - > ID Required Print (an ID will be required to print suspended fax jobs.)
  - > Forwarding (Received fax documents will be forwarded to a specified email address.)
  - > Store (Received fax documents will be stored in Document Server.)
- □ These timer settings and output modes can be assigned for each fax line and type.








#### AES256bit

- The Advanced Encryption Standard (AES) is a symmetric-key encryption standard adopted by the U.S. government. AES is also adopted by NESSIE in EU and CRYPTREC in Japan.
- □ There are 3 types of AES, and each of these ciphers has a 128-bit block size, with key sizes of 128, 192 and 256 bits, respectively. DES, the previous encryption standard, has a 56-bit key size, so AES with a 256-bit key size is much safer than DES.

#### SHA-2

- Secure Hash Algorithm-2 (SHA-2) is a set of cryptographic hash functions designed by the National Security Agency (NSA).
- SHA-2 has 224, 256, 384, and 512 bit hashes. Since SHA-2's hashes are longer than SHA-1 (160 bits), SHA-2 is safer than SHA-1. Ricoh basically adopts the 256-bit hash.



- PDF/A is a file format and an ISO Standard for the long-term archiving of electronic documents. Users can utilize this function when scanning paper documents related to quality management, or when submitting electronic documents with PDF/A format is required by governments.
- Also, users can avoid manipulation by utilizing the digitally signed PDF function when scanning receipts or contracts for which keeping the original content is needed.
- Some PDF viewer applications cannot open PDF/A files. (example: Acrobat 4.0 or earlier)
- Locked PDF/A function is not available on some SDK applications.

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- Before you start to work on the machine, take note of the cautions listed in the manual in these sections:
  - Important Safety Notices
  - Replacement and Adjustment > Beforehand
- □ This section of the TTP contains new cautions introduced recently.



# Before Removing Components Before you start to remove components from the machine, turn off the main power switch, check that the shutdown process has finished, then unplug the machine. After the main power switch has been turned off, power supply to the controller is maintained until

the HDD unit has been shut down safely.

No additional notes

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This section explains the main points about the installation procedure. Only the important points are explained here – this is not a full procedure.

□ Most of the installation is straightforward, but a few points have to be explained.

For full details, see the procedure in the service manual.









- □ What happens if the power is turned off during the initialization process?
  - It depends on when the power turns off during the process. In the worst case, it may be necessary to replace all PCDUs and the ITB.













## **External USB Keyboard**

□ Customers can use an external USB keyboard when the software keyboard is shown on the operation panel, if an external USB keyboard is connected to the USB port at the side of the operation panel or the controller box USB port.

- **Do the following steps to enable this feature.** 
  - 1. Connect the external keyboard to the USB port at the right side of the operation panel or the controller box USB port.
  - 2. Enter the SP mode and set SP5-075-001 to 1 (ON)
  - 3. Exit SP mode and turn the main power on and off.
  - Select a language type for the external USB keyboard with [User Tools] > [System Settings] > [General Features] > [External Keyboard].
  - 5. Turn the main power on and off.

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□ See the fax unit's service manual for the procedure.

User Tools / Cou	nter / Enquir:	y	-	[cit	Batting.					E	f.et.
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Note: This must be done during basic installation for the SPF model, not only for the fax option.

> Fax Service Manual > Installation > Fax Unit (D649) > Fax Icon Addition

□ You can also do this after installing the browser unit, or the Remote Fax option.

Main Service Manual > Controller Options > Browser Unit

Fax Service Manual > Installation > Remote Fax Installation











The mag	e following should be done before transporting the chine.
1.	Move the ITB lock lever down to the shipping position. This moves the ITB away from the K PCDU.
2.	Do SP 4806-001 to move the scanner carriage from the home position. This prevents dust from falling into the machine during transportation.
3.	Remove the toner bottles. This prevents toner flow into the toner supply tube, which is caused by vibration during transport. This can also cause the tube to be clogged with toner.
4.	Make sure there is no paper left in the paper trays. Then fix down the bottom plates with a sheet of paper and tape.
5.	Attach securing tape to stop the waste toner bottle from coming out.
6.	Do one of the following: Attach shipping tape to the covers and doors. Shrink-wrap the machine tightly.
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Service Manual > Appendix > Maintenance tables

## **Yield Parts**

These are parts that are expected to function correctly for longer than the machine life, and should not need to be replaced, except for EM.

**These are shown in the PM table as (R).** 

- □ Replacement at 24k color prints
  - PCDU (CMY)
    - » The machine is not expected to make 24k color prints within its life time, so the color PCDUs are considered as yield parts.

#### Replacement at 120k

- ITB cleaning unit, PTR unit
- Fusing belt, fusing pressure roller, fusing entrance guide
- plate, fusing exit guide roller
- Bypass feed roller
- Optional paper tray: Separation pad, pick-up roller

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Service Manual > Appendix > Maintenance tables



Service manual > Preventive Maintenance > PM Parts Settings



Service manual > Preventive Maintenance > PM Parts Settings



□ For the procedure, see SMC List Card Save Function in the service manual (System Maintenance section).









□ The paper transport motor drives all the paper feed, duplex, and paper exit rollers.



□ Couldn't get all the labels in, so here is a close up of the area around the paper transport motor.


□ The LD unit thermistor is under the LD unit (yellow and magenta).





□ There is only one motor ([N]).



#### **GR-C1** Training

### **RICOH**







No additional notes





No additional notes







□ The green line shows how the light reflected from the original goes to the CCD.













□ The two laser diode units are physically the same. However, don't switch them because the color skew adjustments for each color could be different.





□ We will see how to use these adjusters later.



#### **GR-C1** Training



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Service manual > Replacement and Adjustment > Image Adjustment > Color Skew Adjustment

Service manual > Replacement and Adjustment > Laser Optics > Laser Units









Service manual > Replacement and Adjustment > Image Adjustment > Color Skew Adjustment Service manual > Replacement and Adjustment > Laser Optics > Laser Units











- □ The lubricant bar is shorter in the color PCDUs than in the K PCDU.
- □ The toner density sensor is a HST sensor.
- Depressurization outlet: Basically, the PCDU is a closed unit. However, some external air does get in and this can raise the internal pressure. This depressurization outlet relieves this pressure, and the filter prevents toner from coming out.





- □ The drum cleaning blade is a counter blade.
- □ There is no quenching lamp. The OPC discharges itself after cleaning.





□ The toner supply hopper mechanism is explained later.

#### **GR-C1** Training

### **RICOH**



Gears C, E, and G are the drum phase gears. Do not remove in the field. They are adjusted in the factory to the optimum posiiton to reduce banding on outputs.

#### **Replacement Procedures**

- □ Do not disassemble the PCDUs.
  - There are no service parts for the individual components of the PCDUs.
- If you are working around the drive area (see the previous slide), mark the posiitons of the drum phase gears.
  - If these gears come off, it is very difficult to get them back in the correct place, and the machine may have to be replaced.
  - The drive unit is available as a spare part, but it is very difficult to replace.

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□ There is no toner end sensor for K.

### **Toner Supply Path**







□ This part of the machine is also called the sub hopper or toner hopper.

Service Manual, Replacement and Adjustment, Image Creation



 $\hfill\square$  This section covers the standard tray and the bypass tray.









No additional notes







- □ ITB: Image Transfer Belt
- D PTR: Paper Transfer Roller











There is no contact and release procedure for jobs that have a mixture of color and black-and-white pages. The belt always stays in contact with all 4 PCDUs during printing.





□ The ITB cleaning blade is a counter blade.



### After Replacing the ITB Unit

#### **D** Do the following after replacing the ITB unit.

- 1. Enter the SP mode.
- 2. Set SP3-701-018 to "1" (This is the manual setting for the new unit detection).
- 3. Set SP5-804-022 to "1", and rotate the ITB for about 100 seconds.
- 4. Set SP5-804-022 to "0" to stop rotation of the ITB after 100 seconds.
- 5. Set SP1-001-031 to "1".
- 6. Execute "MUSIC" manually (to do this, execute "SP2-111-001")
- 7. SP values from SP1-001-033 to 040 are updated by the above steps.
- 8. Reset SP1-001-031 to "0".

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After Replacing the Paper Transfer Roller

- 1. Set SP3-701-018 to "1".
- 2. Exit from the SP mode.
- 3. Turn the main power off and on.

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 $\hfill\square$  [B] are the actual ID sensors.





No additional notes



- The waste toner from the drums for yellow and magenta and the ITB cleaning unit are gathered at the center of the bottle by the waste toner bottle transport coil. The others are dropped into the bottle directly from the PCDUs.
- □ The agitator for the ITB moves the piled up waste toner towards the rear of the bottle. This agitator is driven by the waste toner bottle transport coil.



□ These caps are included with every waste toner bottle.



### **Principle**

- □ This machine uses a Quick Start Up Direct Heating (QSU-DH) fusing system which saves energy and improves print quality.
- □ The new fusing unit does not have a fusing roller. Instead, there is a thin fusing belt which turns freely around the lamp.
- □ The fusing belt is much thinner than a hot roller, so less electricity is used to heat the belt.

By using a flat fusing pad, fusing is done on a flat surface without uneven pressure from the pressure roller. This means that there is less damage/wrinkling to the paper. This is especially helpful for envelope printing.

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□ There is no lamp in the pressure roller.

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- Di-C1.5 series: There is a steel pipe inside the belt.
- Gr-C1: No steel pipe. More energy is conserved.





#### Why are there two pressure roller thermistors?

One of them is just outside the paper width of A4/LT, and the other is just inside. They monitor the roller temperature within the paper feed area, and outside this area (where the temperature will be higher).













Replacement and Adjustment, Fusing, When SC554 Occurs

- No fuse is present in the machine's original fusing unit, so you have to install one.
  - ➢ Fuse for new unit detection, part number: M026 4371
  - ≻ \*1:
  - a) Do not use SP 3-701-014 to reset the fusing unit counter manually when doing the above reset procedure for SC554-00.
  - b) Do not open the door when doing the procedure in this flow chart ("SC reset failure" will be shown.). The SC reset will be successful if the fuse for new fusing unit detection is blown if the machine door is open during the SC reset, and it will not be successful if it is not blown. The SC reset should be performed again if it fails.
  - "SC reset failure" will be shown when this SP (SP5-810-002) is executed if an SC other than SC554-00 occurred.
#### SP 5-810

- □ From the flow chart on the previous slide, you can see that a new SP (SP5-810-002) has been added.
- □ If you do this SP, the machine checks for the fuse for new unit detection, and blows the fuse if it is found.
  - If the fuse is not found and blown, the SP fails.
- □ SP 5-810-002 is normally only done as part of the countermeasure for SC 554.

□ SP5-810-1 does not look for or try to blow the fuse.

Slide 181











No additional notes

























#### **GR-C1** Training







- □ The operation timing of each clutch is as follows.
  - 1. The paper feed clutch is turned on until the paper transport roller begins to operate.
  - 2. The paper transport clutch is turned on until the paper reaches the mainframe.





□ Just after the power is turned on, the tray goes down to home posiiton. Then, the motor lifts it to the correct position.











□ This section explains the technology used in this machine for environmental conservation, and the default settings of related functions.

Environmental	Description	New model	
1. QSU 2. Hybrid QSU	- Reduction of warm-up time (Energy saving)	**	
3. IH QSU 4. Paper-saving features	Reduction of CO <sub>2</sub> emissions     Allows documentation to be managed digitally, cutting down on paper consumption.     Improves machine productivity when printing out duplex (double-sided) images.	*	
5. High-speed duplex output	- Improves machine productivity when printing out duplex (double-sided) images	*	
6. Ozone reduction design	- Low ozone emissions	*	
7. PxP (polymerized) toner	-Energy saving - Conservation of materials/resources (reduced toner consumption)	*	
8. Noise reduction design	- Low noise	*	
9. Minimization of harmful substances	- Minimization of harmful substances	*	
10. Environmentally-friendly toner bottle	- Conservation of materials/resources	*	
11. Toner recycling			

□ This slide explains what technologies are used for conserving the environment in this product.















- Through major reductions in warm-up time and recovery time from energy saver modes (Low power, Off/Sleep), QSU (Quick Start Up) Technology has eliminated the traditional trade-off between energy saving and convenience of speed.
- □ The IH (induction heating) method used in the Apollon series is also a part of this technology.



- When the machine is not being used, the machine enters energy saver mode to reduce the power consumption by turning off the LCD of the operation panel and lowering the fusing temperature.
- □ The area shaded green in this diagram represents the amount of energy that is saved when the timers are at the default settings. If the timers are changed, then the energy saved will be different. For example, if the timers are all set to 240 minutes, the green area will disappear, and no energy is saved before 240 minutes expires.
- Power consumption during warm-up may be much higher than shown in this diagram.



- The user can set these timers with User Tools MFP/ Priport: User Tools > System settings > Timer Setting Printer : User Tools > System settings > Energy Saver Timer
- □ Normally, Panel Off timer < Energy Saver timer < Auto Off timer.
- But, for example, if Auto Off timer < or = Panel Off timer and Energy Saver timer, the machine goes immediately to Off mode when the Auto Off timer expires. It skips the Panel Off and Energy Saver modes.
- Example
  - > Panel off: 1 minute Low power: 15 minutes, Auto Off: 1 minute
  - The machine goes to Off mode after 1 minute. Panel Off and Low Power modes are not used.
- □ We recommend that the default settings should be kept.
  - If the customer requests that these settings should be changed, please explain that their energy costs could increase, and that they should consider the effects on the environment of extra energy use.
  - If it is necessary to change the settings, please try to make sure that the Auto Off timer is not too long. Try with a shorter setting first, such as 30 minutes, then go to a longer one (such as 60 minutes) if the customer is not satisfied.
  - If the timers are all set to the maximum value, the machine will not begin saving energy until 240 minutes has expired after the last job. This means that after the customer has finished using the machine for the day, energy will be consumed that could otherwise be saved.
  - If you change the settings, the energy consumed can be measured using SP8941, as explained later in this presentation.
- Power consumption during warm-up may be much higher than shown in this diagram.






- □ This timing chart shows what happens if the operation switch is pressed while the machine in off mode.
- □ Power consumption during warm-up may be much higher than shown in this diagram.





- □ This timing chart shows what happens if data is received while the machine is in sleep mode.
- □ Power consumption during warm-up may be much higher than shown in this diagram.



- □ This timing chart shows what happens if the operation switch is pressed while the machine in sleep mode.
- Power consumption during warm-up may be much higher than shown in this diagram.









<ul> <li>(5) Multiply this by the power consumption spec for each mode and convert the result to kWh (kilowatt hours)</li> <li>(6) This is a simulated value for power consumed.</li> </ul>						
Exemple	laulatio		n e del\.			
Example	e calculation	ns (SPF I	model):			
Mode/condition	SP8941: Machine Status	Time at Start (min.)	Time at End (min)	Running time (hour)	Power Consumption	Power consumption
		(1)	(2)	(2) - (1)/60 = (3)	(4)	(XWH) (3) x (4)/1000 = (5)
	001: Operating	21089	21386	5.0	600	
Operating	Time					
Operating Stand by (Ready)	Time 002: Standby Time	306163	308046	31.4	60	1.8
Operating Stand by (Ready) Off/Sleep	Time 002: Standby Time 005: Off mode Time	306163 508776	308046 520377	31.4 193.4	60 1.7	0.3







### In the above formula:

- Sheet: A sheet of paper
- Page: A side of a sheet of paper. In duplex mode, one sheet is two pages
  - > Output page: One side of a sheet of output paper
- Original Image: An image of one original page (or, an image of one side of a twosided original)
  - For one sheet of output paper in two-in-one copying, four original pages are copied onto two output pages.



The end