RICOH

D120/D121/D122/D139/D140/D141
Service Training

OR-C1

Slide 1

Version 1.0

This training course provides service technician training for the OR-C1 series. It only explains the differences from the R-C5.5, so knowledge of R-C5.5 is required.

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

What Models are there in the Series?

- **OR-C1a SP (D120/D139)**
  - 23 cpm
    - » There was no 23cpm model in the R-C5.5 series.
  - Contains scanner and printer as standard equipment
- **OR-C1b Basic (D121/D140)**
  - 28 cpm
  - Does not contain scanner and printer as standard equipment
- **OR-C1b SP (D121/D140)**
  - 28 cpm
  - Contains scanner and printer as standard equipment
- **OR-C1c Basic (D122/D141)**
  - 33 cpm
  - Does not contain scanner and printer as standard equipment
- **OR-C1c SP (D122/D141)**
  - 33 cpm
  - Contains scanner and printer as standard equipment

- **All models contain a duplex unit and a bypass tray as standard equipment.**
- **All models contain a color scanner.**
- **Basic models can be upgraded to SP models.**

Slide 3

No additional notes

Differences between Basic and SP Models

	Basic models	SP models
Function	Copy (Printer and Scanner are optional)	Copy, Printer (PCL), Scanner
Duplex	Standard	Standard
Memory	512MB standard	1GB standard
HDD	Optional	Standard
VM card	Optional	Standard
App2Me	Not included; download from web site	Standard
PDF direct print	Optional	Standard
Data overwrite security	Standard; included on the controller board	Standard; included on the controller board
HDD encryption	Standard; included on the controller board	Standard; included on the controller board

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Optional memory and hard disk

- For a customer who has a basic model, install the optional HDD if the customer wants to use the document box features.
- When a customer wishes to upgrade a basic model with a printer/scanner or printer enhance kit, the optional 512 MB must be installed.

Appearance (1)

- Optional ARDF
- 8.5-inch WVGA Color LCD
- Duplex and bypass are standard
- Two paper trays are standard
- Optional two-tray feed unit

- **Either of the following paper tray options can be installed**
  - Two-tray paper feed unit
  - One-tray paper feed unit
  - Large capacity tray
- **A platen cover can be installed instead of the ARDF.**

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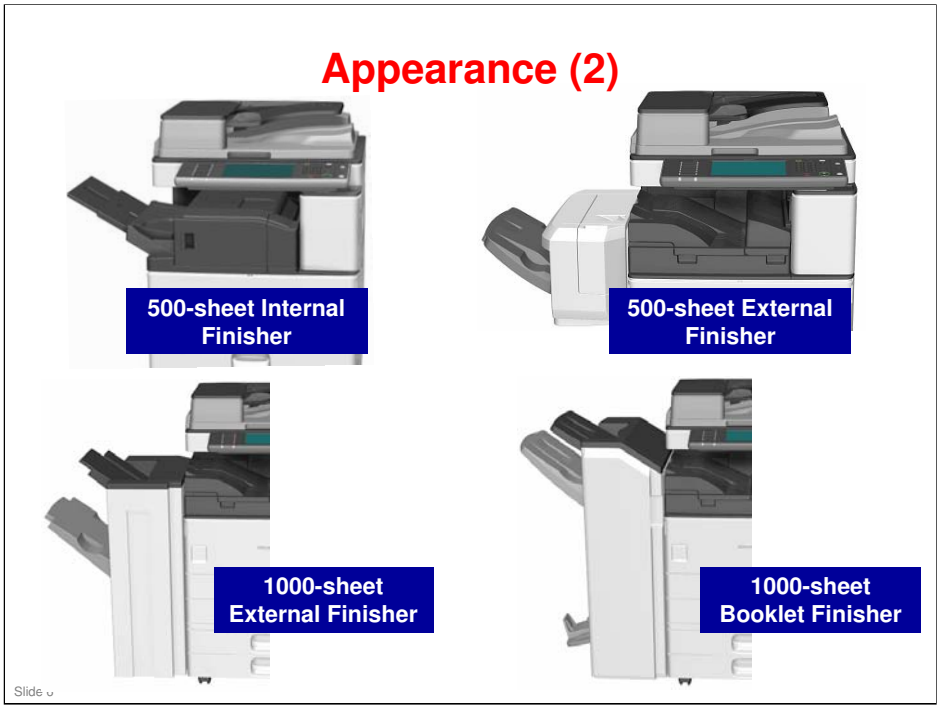
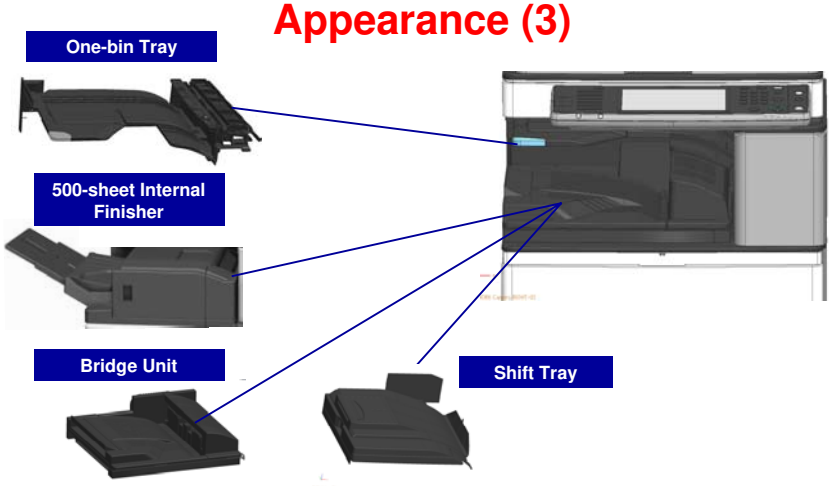
- This slide shows the document feed and paper feed options that are available.
- These are all based on previous products.
- Note that in the R-C5.5 series, the paper trays use the friction pad system, but in the OR-C1, FRR is used (for standard and optional trays).



- This slide shows the finishers that are available. Only one of these can be installed on the same machine.
- The 500-sheet internal finisher is a new finisher (similar to the Z-C1). The others are all based on previous products.
- If one of the 1000-sheet finishers is installed, the two-tray paper feed unit or the large capacity tray must also be installed (this is the same idea as previous models).

Appearance (3)



- **The gap between the operation panel and the paper trays can hold two options.**
  - Upper compartment: One-bin tray
  - Lower compartment: Bridge unit (required if an external finisher is installed), shift tray, or 500-sheet internal finisher.

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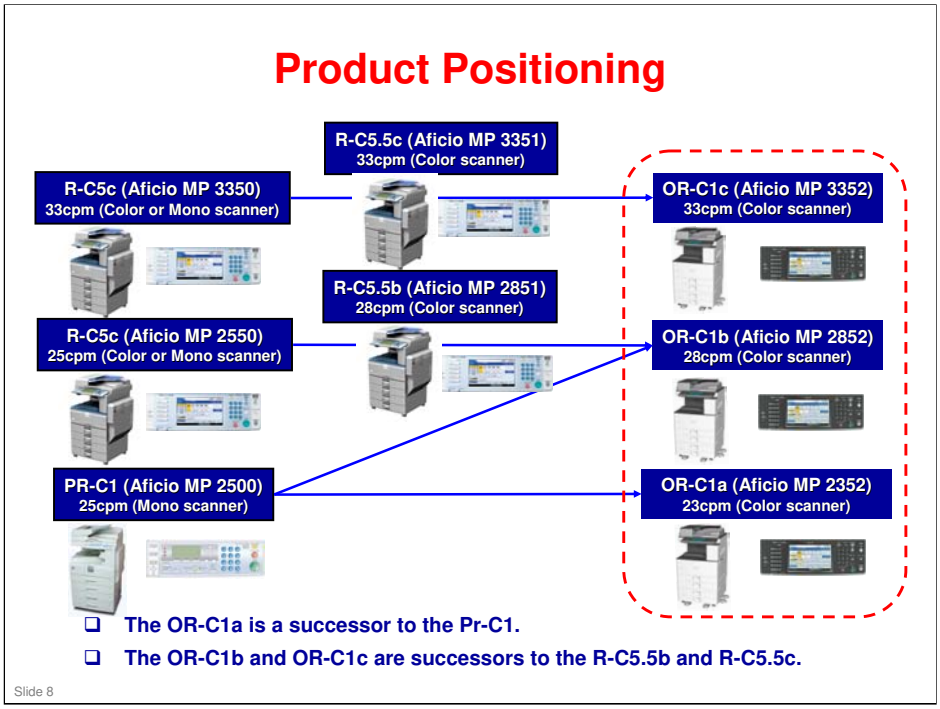
No additional notes



No additional notes

Basic Points about the Options

- **The following are based on previous products. The only difference is the color of the covers.**
  - ARDF (50 sheets): Similar to the AT-C2.5 and R-C5.5
  - One-tray paper feed unit (550 sheets): Similar to the AT-C2.5
  - Two-tray paper feed unit (550 x 2): Similar to the AT-C2.5
  - Large capacity tray (1000 x 2, tandem): Similar to the AT-C2.5
  - External finishers (all three types): Similar to the R-C5.5
    - » The 1000-sheet external finisher has a new cpu.
  - Shift tray, bridge unit: Similar to the AT-C2.5
    - » The gap between operation panel and paper trays is wider than previous models, so an additional base must be installed when installing the shift tray. The bridge unit has a thicker base.
- **The following are new.**
  - Caster table: Needed if the machine is installed on the floor in either of these two situations: a) without any optional paper feed units, or b) with the one-tray paper feed unit.
  - 500-sheet internal finisher (similar to the Z-C1)
  - One-bin tray
- **Note that in the R-C5.5 series, the paper trays use the friction pad system, but in the OR-C1, FRR is used (for standard and optional paper tray units).**

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- The key counter bracket and card reader bracket are also new options.
- Model codes for main options:
  - ARDF, D578, DF3060
  - Platen cover, D593, Platen Cover Type 3352
  - One-tray paper feed unit, D579, PB3120
  - Two-tray paper feed unit, D580, PB3130
  - LCT, D581, PB3140
  - One-bin tray, D582, BN3090
  - Shift Tray, D583, SH3050
  - Bridge Unit, D584, BU3050
  - 500-sheet Finisher, D585, SR3070
  - 500-sheet Internal Finisher, D586, Internal Finisher Type 3352
  - Punch Kit for Internal Finisher, D587, PU3020
  - 1000-sheet Finisher, D588, SR3090
  - Booklet Finisher, D589, SR3100
  - Punch Unit for Booklet Finisher, B807, PU3000 (same as for previous version of this booklet finisher)
  - Caster Table, D593, Caster Table Type D

Controller Options
Printer/Scanner

- **The SP model already contains printer and scanner features.**
  - No set-up is needed at installation.
- **The basic models can be upgraded as follows:**
  - To the basic model, add a printer unit and 512 MB memory, to make a copier/printer model.
  - Then, to the copier/printer model, you can add a scanner enhance option, to make an SP model.

    - or –

  - To the basic model, add a printer/scanner unit and 512 MB memory to make an SP model.

    - also -

  - To add Document Box to the basic model without upgrading to an SP model, the optional hard disk must be installed.
- **The printer enhance option and the printer/scanner option both contain a hard disk.**
- **It is not possible to install a scanner option without the printer option.**
- **The options mentioned on this slide are all new.**

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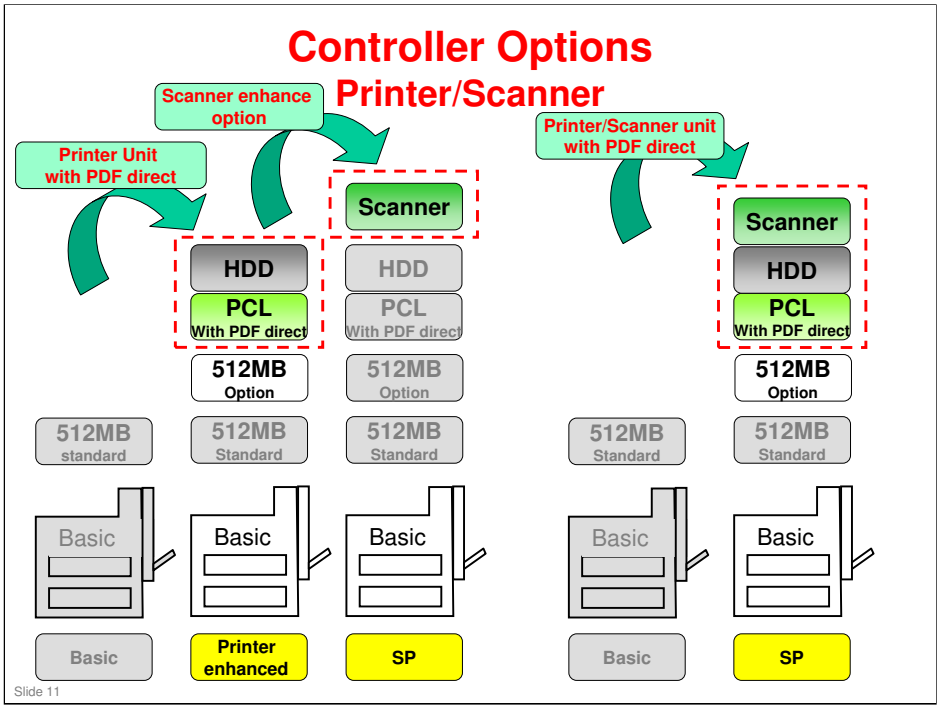
- The next slide shows the above in a graphic format.
- Printer drivers are PCL and PDF direct. Postscript 3 is an option. There is no RPCS.
- The procedures in the service manual for installing printer/scanner and printer enhance options apply only to the basic model, and not the SP model.



No additional notes

Controller Options
Memory Upgrade Options for the Basic Model

- **Optional memory and hard disk**
  - For a customer who has a basic model, install the optional hard disk if the customer wants to use the document box features.
  - When a customer wishes to upgrade a basic model with a printer/scanner or printer enhance kit, the optional 512 MB must be installed.
- **There are no memory upgrades for the SP model.**

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No additional notes

Controller Options
SD Cards

- **Data Overwrite Security, HDD Encryption: Standard (included in the controller ROM)**
- **VM card: New**
  - SP models: Included on the printer/scanner SD card, which is shipped with the machine in slot 1; contains App2Me
    - » App2Me must be enabled with user tools: Service Manual > Installation > Copier Installation > Installation Procedure > App 2 Me Setting (SP Models only)
  - Basic models: Option (SD card slot 2 only). App2Me is not shipped with the machine. To use App2Me, the VM card must be installed in slot 2 and App2Me must be downloaded from a website.
- **Printer/scanner unit: New**
  - SP models: Included with the machine (in SD card slot 1). Contains VM, PDF Direct, and App2Me. No installation or setup needed (except for App2Me; see above).
  - Basic models: Option (SD card slot 1 or 2). Contains PDF Direct
- **Printer unit: New**
  - For basic models only. Contains PDF Direct . Goes in SD card slot 1 or 2
- **Scanner enhance unit: New**
  - For basic models only. Goes in SD card slot 1 or 2.
- **Postscript 3: New**
  - Contains PDF Direct. Goes in SD card slot 1 or 2.
- **IPDS unit: New**
  - Goes in SD card slot 1 or 2.
- **Browser unit: Type E - same as At-C2.5/Ap-C2.5**
  - Goes in SD card slot 1 or 2.

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- Basic models: App2Me is not shipped with the machine. It must be downloaded from a website, and an SD card must be installed.

Controller Options
Others

- Copy data security unit: Same as R-C5.5
- File format converter: Same as R-C5.5
- IEEE802.11a/g, Gigabit Ethernet, IEEE1284: Same as R-C5.5
- Bluetooth (USB type): Same as AT-C2.5
- USB2.0/SD Slot: Similar to Di-C1.5
- Fax unit, optional extra G3 port: New
  - In this fax unit, the FCU and MBU boards have been combined. Because of this, the data backup procedure has been changed.
  - The handset for the USA is also a new model.
  - The memory module is the same as R-C5.5

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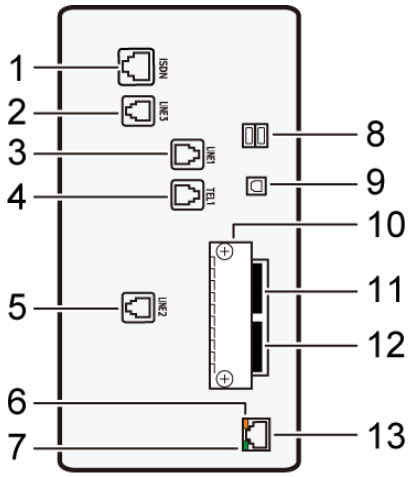
No additional notes

Slots



1. ISDN: Jack for ISDN connection (Japan Only)
2. Line 3: Jack for a 3rd optional Fax Interface Unit.
3. Line 1: Jack for the main telephone line from the outside for connection to the Fax Option (D596).
4. TEL1: Jack for telephone connection
5. Line 2: Jack for a 2nd optional Fax Interface Unit.
6. Orange LED: Lights when 100BASE-T is operating.
7. Green LED: Lights when 10BASE-TX is operating.
8. USB-A: Both USB slots can be used for the Bluetooth option or a card authentication device.
9. USB-B: Built-in for connection of USB devices (USB 2.0)
10. Board Slot: Optional interface boards are installed here.
    There is only one slot for interface board options.
11. SD Card Slot 1
12. SD Card Slot 2
13. Ethernet, standard LAN connection point for a 100BaseT LAN

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- The SD Card slots are discussed in more detail on the next few slides.

SD Card Slots (1)

- **Either Slot 1 (upper slot) or Slot 2 (lower slot)**
  - Use when installing the following options
    - » Basic model: Scanner/printer unit (with PDF Direct), printer unit (with PDF Direct), scanner enhancement unit
    - » PostScript
    - » IPDS
    - » Browser unit
  - The SP model has the printer/scanner SD card in slot 1 when shipped.
  - If the number of options that you wish to install is more than the number of available SD card slots, move them onto one SD card.
  - The manual for the printer/scanner unit shows the contents of all SD cards used with the machine, and which merging operations are allowed.

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Printer/Scanner Unit Service manual, SD Card Appli Move

- Note that PostScript 3 and PDF Direct can now be moved to another SD card. In previous models, this is not possible because of licensing restrictions.

SD Card Slots (2)

- **Slot 2 (lower slot)**
  - Empty when shipped
    - » Basic models: Install the optional VM card here
  - Use this slot for service procedures, such as firmware update and NVRAM backup.

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No additional notes

Data Overwrite Security, HDD Encryption

- **These features are built into the controller board for all models.**
  - There is no Security SD Card.
- **At installation, these features must be enabled with SP mode.**
  - Service Manual > Installation > Copier Installation > Installation Procedure > Data Overwrite Security
  - Service Manual > Installation > Copier Installation > Installation Procedure > HDD Encryption
- **Then the user must switch them on with a User Tool.**

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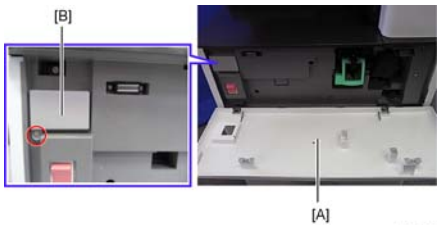
No additional notes

Storage Space for SD Cards



- Open the front cover [A] and remove the bracket [B].
- Store the SD cards in the indicated storage space.

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No additional notes

This section provides an overview of the main specifications and explains improvements over the models in the R-C5.5 and Pr-C1 series.

Comparing Specifications with Previous Models

	PR-C1	R-C5/5.5	OR-C1
Copy speed	25 cpm	R-C5.5b: 28 cpm R-C5.5c: 33 cpm	OR-C1a: 23 cpm OR-C1b: 28 cpm OR-C1c: 33 cpm
First copy time	6 s or less	4.5 s	OR-C1a: less than 5.4 s OR-C1b/c: less than 4.5 s
Warm-up time	12 s or less (basic model) 15s or less (GDI model)	22 s	OR-C1 with HDD: Less than 20.0 s OR-C1 without HDD: Less than 14.0 s
Paper feed capacity (standard)	1,100 sheets (500 sheets x 2 trays, 100-sheet bypass)		1,150 sheets (500 sheets in tray 1, 550 sheets in tray 2, 100-sheet bypass)
Paper feed capacity (maximum)	2,100 sheets (standard + two 500-sheet tray paper feed unit)	3,100 sheets (standard + 2000-sheet LCT)	3,150 sheets (standard + 2000-sheet LCT)

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No additional notes

Comparing Specifications with Previous Models

	PR-C1	R-C5/5.5	OR-C1
Paper output capacity	725 sheets (bridge unit + 1-bin tray + 500-sheet finisher)	1,625 sheets (bridge unit + 1-bin tray + 1,000-sheet finisher)	1,625 sheets (bridge unit + 1-bin tray + 1,000-sheet finisher)
Paper weight: Tray 1	60-105 gsm, 16-28 lb Bond	60-105 gsm, 16-28 lb Bond	52-157 gsm, 14-42 lb Bond; envelopes can also be fed from this tray
Paper weight: Tray 2	52-157 gsm, 14-42 lb Bond	52-157 gsm, 14-42 lb Bond; envelopes can also be fed from this tray	52-157 gsm, 14-42 lb Bond
Paper weight: Bypass	52-162 gsm, 14-43 lb Bond	52-157 gsm, 14-42 lb Bond; envelopes can also be fed from this tray	52-157 gsm, 14-42 lb Bond; envelopes can also be fed from this tray
Paper weight: Duplex	64-105 gsm, 20-28 lb Bond	60-105 gsm, 16-28 lb Bond	52-105 gsm, 14-28 lb Bond

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- gsm: grams per square meter
- OR-C1: Envelopes can only be fed from standard tray 1. The optional trays also do not support envelope feed.

Comparing Specifications with Previous Models

	PR-C1	R-C5/5.5	OR-C1
RAM	Basic : 16MB SP : 400MB (16+384)	Basic : 256MB Std SP : 768MB Std	Basic : 512MB Std SP : 1GB Std
Memory for SDK		50.4MB	66MB
HDD	Not Available	Standard (SP only)	Standard (SP only)
VM Card & App2Me	VM Card : Optional App2Me : Not Available	VM Card : Standard (SP only) App2Me : Standard (SP only)	VM Card : Standard (SP only) App2Me: Standard (SP only)
Typical Energy Consumption (TEC), Wh	1,450	R-C5.5b: 2,804 (NA), 2,705 (EU) R-C5.5c: 3,022 (NA), 3,016 (EU)	OR-C1a: 2,070 (NA), 2,050 (EU) OR-C1b: 2,370 (NA), 2,390 (EU) OR-C1c: 2,680 (NA), 2,730 (EU)

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No additional notes

Targets

	PR-C1	R-C5/5.5	OR-C1
ACV, per month	6k	R-C5.5b: 7k R-C5.5c: 9k	OR-C1a: 4k OR-C1b: 5k OR-C1c: 7k
Max CV (5 years), per month	15k	R-C5.5b: 20k R-C5.5c: 30k	OR-C1a: 15k OR-C1b: 20k OR-C1c: 30k
Duty, per month		100k	100k
PM Cycle	60k	60k (individual parts of PCU), 120k (other PM parts)	60k (individual parts of PCU), 120k (other PM parts)
MCBC (Mean Copies Between Calls)	27.3k	37.5k	OR-C1a: 37.9k OR-C1b: 38.4k OR-C1c: 39k
Estimated Unit Life	5 years or 900k	R-C5.5b: 5 years or 1200k R-C5.5c: 5 years or 1800k	OR-C1a: 5 years or 900k OR-C1b: 5 years or 1200k OR-C1c: 5 years or 1800k

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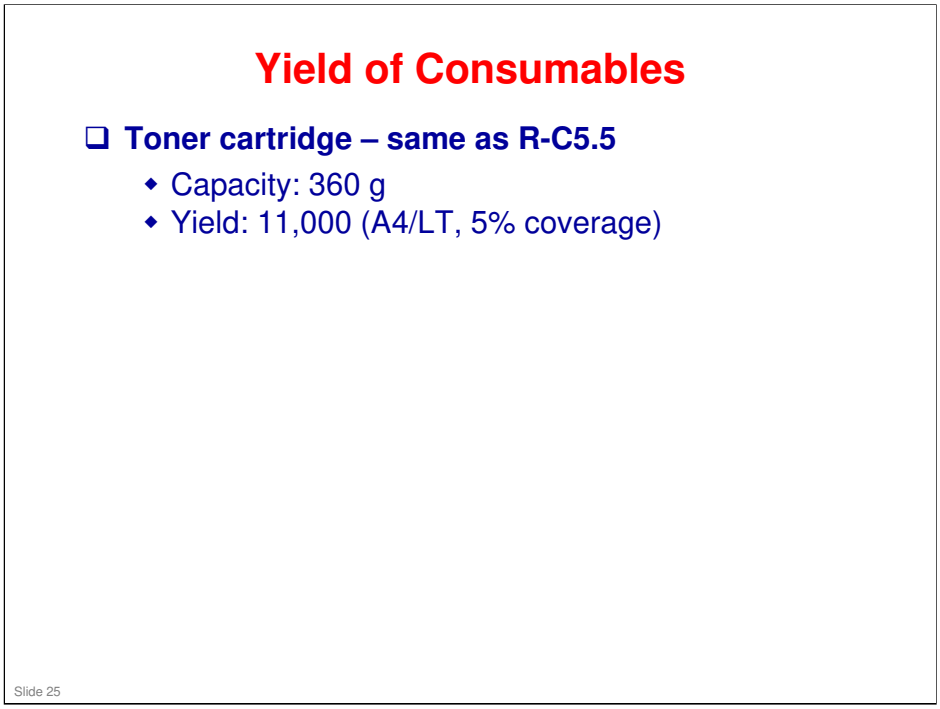
Other numbers

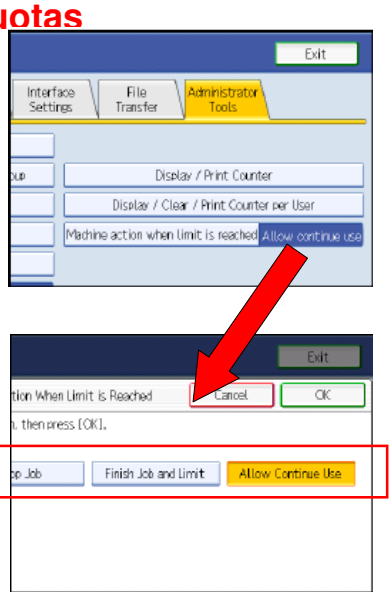
- Call ratio
  - OR-C1a: 0.039, OR-C1b: 0.047, OR-C1c: 0.063
- MCBF
  - OR-C1a: 102.6k, OR-C1b: 106.4k, OR-C1c: 111.1k



No additional notes

New Feature for this Series
Setting Quotas

- **This function allows the customer to set limits on the number of outputs for each individual user or group.**
- **The following applications can be managed with this function.**
  - Copy
  - Print (including "Print from USB/SD")
  - Document Server
  - SDK
  - Fax related jobs and "Mail to Print" jobs can't be limited.
- **User authentication must be enabled.**
- **Possible Settings**
  - Stop Job: When the maximum print volume is reached, both the current job and waiting jobs are canceled.
  - Finish Job and Limit: When the maximum print volume is reached, the current job is allowed to finish, but waiting jobs are canceled.
  - Allow Continue Use (Default setting): Print volume is not limited.
- **You can also set a 'count-per-page' setting for large paper sizes such as A3.**



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- This is the same as for AP/AT-C2.5.

New Feature for this Series
Print from USB/SD

- **In previous models, the optional USB/SD card slot can only be used for scanning data to an SD card or USB device.**
- **However, in this new series, it is also possible to print from data stored on an SD card or USB device.**
- **If the customer wants to print PDF files from the USB/SD card slot on a basic model, PDF Direct (built-into the printer/scanner unit or printer unit) or Postscript 3 must be installed.**
  - The SP model has PDF Direct built in.

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- This is the same as for AP/AT-C2.5.

New Feature for this Series
Scan to Web Mail (SSL over SMTP)

- **This function gives improved security for scan to e-mail.**
  - Gives better security when scanning to web mail.
- **Uses SSL encryption.**

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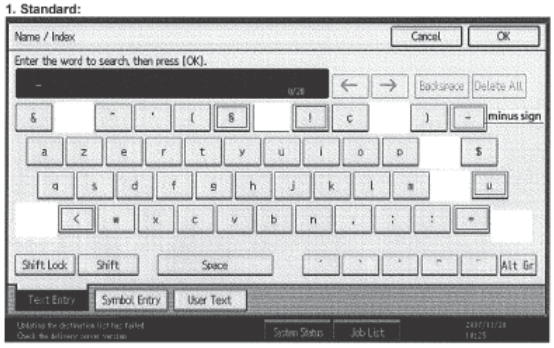
- This is the same as for AP/AT-C2.5.
- If this is enabled, internet fax to Ricoh GW models is not available because GW models do not comply with SSL reception at this time.

New Feature for this Series
AZERTY Keyboard

1. Standard:



- **If the language is changed to French, the keyboard changes as shown above.**

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- This is the same as for AP/AT-C2.5.
- It is possible to switch to a QWERTY keyboard.
- This feature is for Europe only. The North American model will use the QWERTY keyboard, which is widely used in Quebec.

New Feature for this Series
Safe Shutdown

- **In this machine, a board (the SDB) protects the HDD unit.**
- **After the main power switch of the machine has been turned off, the SDB keeps the power supply to the controller until the HDD unit has been shutdown safely.**
- **When shutting down from normal stand-by mode, if the safe shutdown takes more than 2 minutes, there is a problem with the controller board. It may be necessary to replace this board.**

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- This is the same as for AP/AT-C2.5.
- This table shows how long it takes to shut down from various machine conditions.
- SDB: Shutdown Board

Mode	Status	Details	Time to Shut Down
Stand-by	Stand-by	Stand-by Panel off Low power	Less than 10 s
		Operation SW off	0 s
Operation	Scanning Copying/Printing HDD deleting	-	Less than 20 s
	Firmware updating HDD encrypting	-	Less than 360 s
Error	SC issued	SC level A, D	Less than 360 s
		SC level B, C	Less than 10 s
	Application error	Application SD Removed	Less than 360 s
Starting up	Starting up	During 1 min. after application screen is displayed	Less than 80 s

- This section explains important changes to the installation procedure since R-C5.5.
- Installation for the copier is very similar to the R-C5.5. However, the procedures for the options have some changes. Make sure that you use the correct procedures for the machine you are working on.

Overview

- Installation for the main machine and peripherals is basically the same as for the R-C5.5.
- This section of the course shows the main changes.
- Some details are different, and some of the SP modes to use after installing peripherals such as paper trays have been changed.
- Always refer to the OR-C1 service manual when installing the machine and peripherals.

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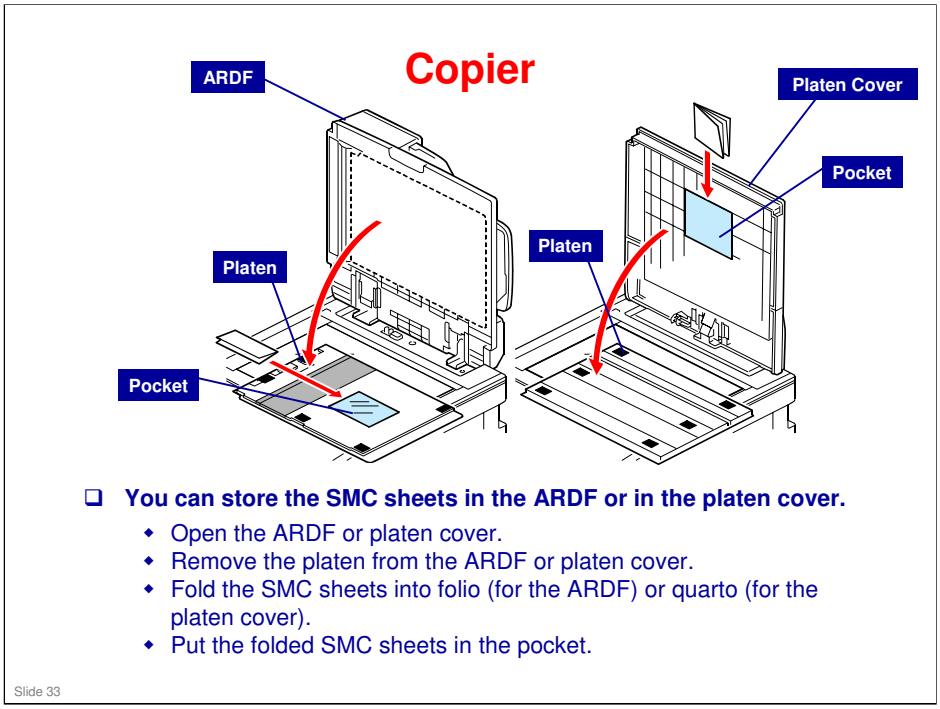
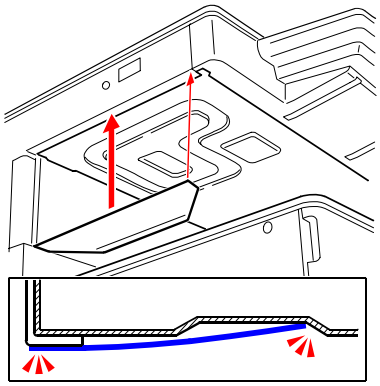
No additional notes



No additional notes

One-bin Tray



- **A mylar must be attached.**
- **Make sure that you attach it correctly, as shown above.**
  - Note how the shorter edge of the mylar is attached just at the start of the sloping part of the plate.

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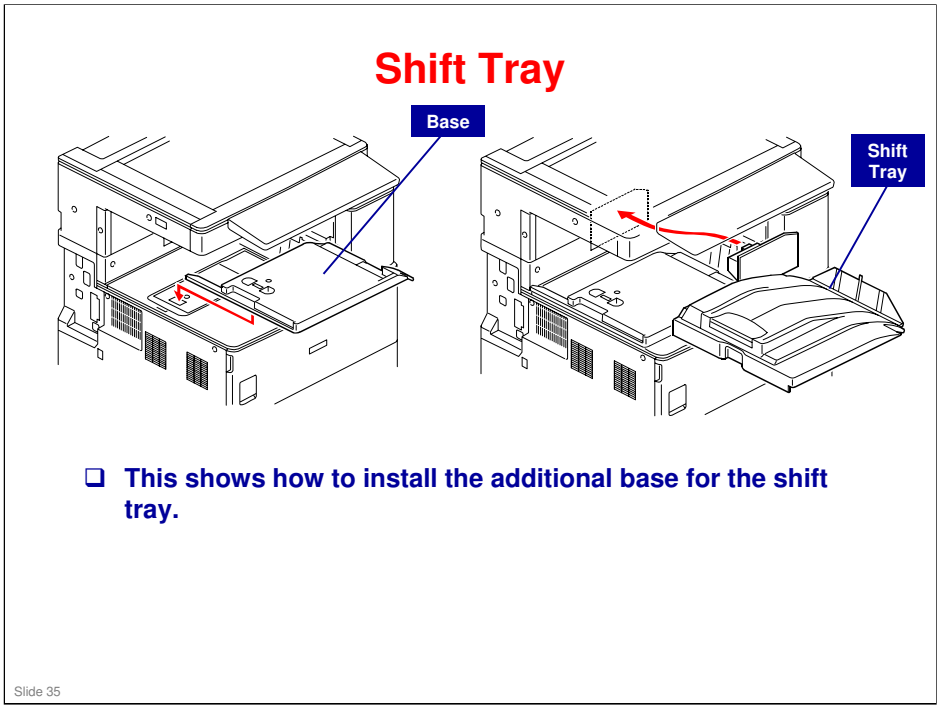
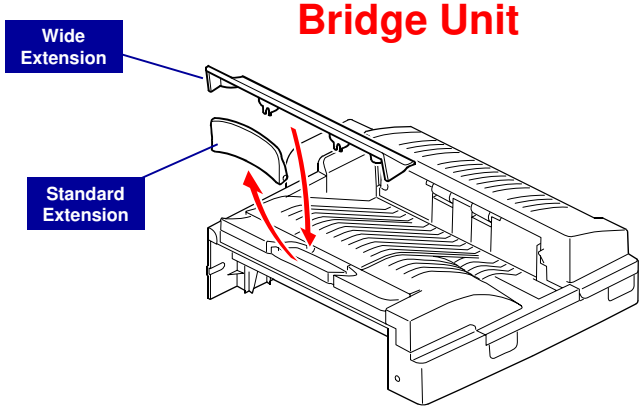
No additional notes



No additional notes

Bridge Unit



- **If the booklet finisher will be installed, you must change the extension tray.**
  - Remove the standard extension tray and install the wide extension tray from the accessories.

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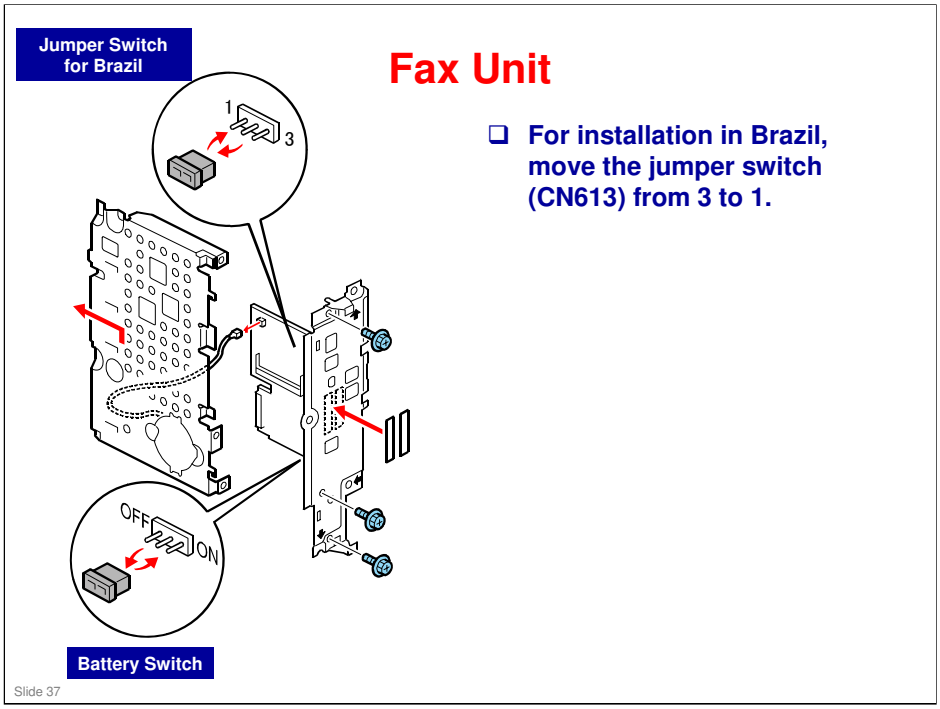
No additional notes



No additional notes

USB/SD Card Slot

- If the optional booklet finisher has already been installed, the installation procedure for the USB/SD Card Slot is different.

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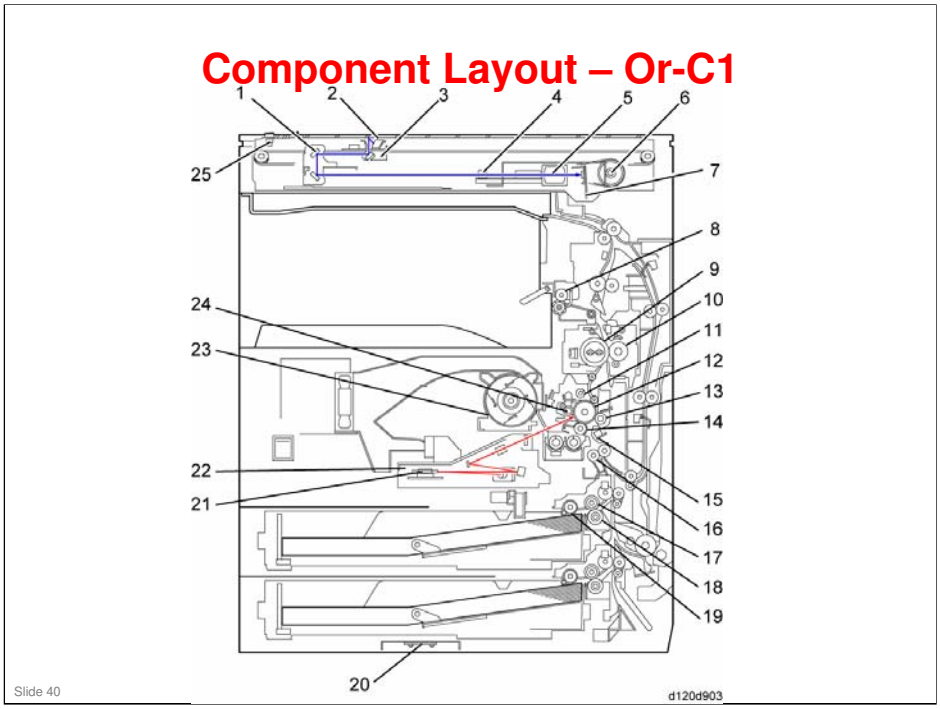
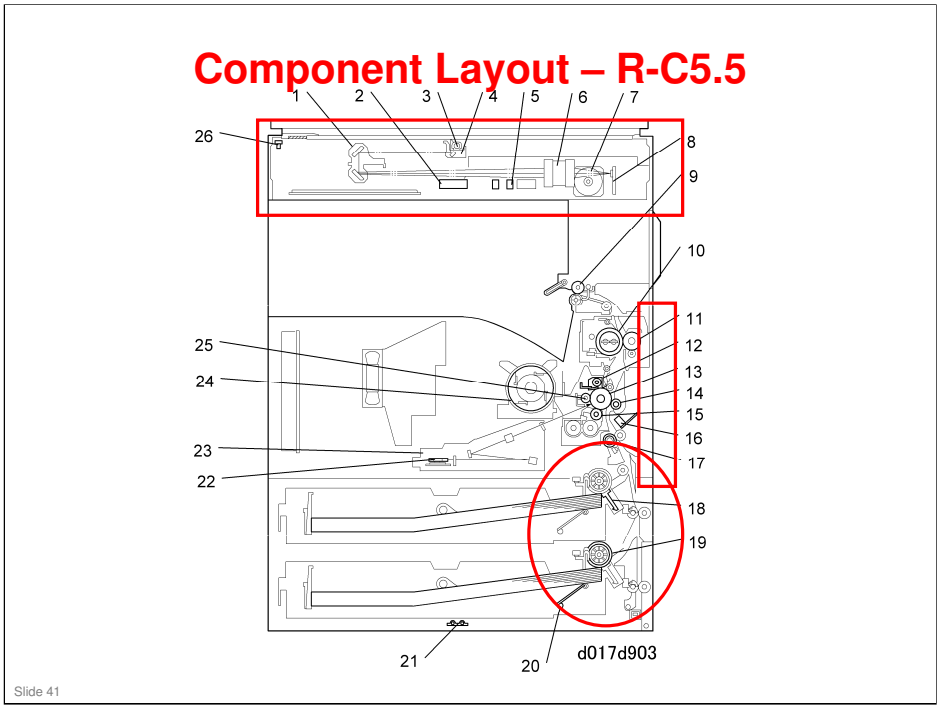
No additional notes

No additional notes

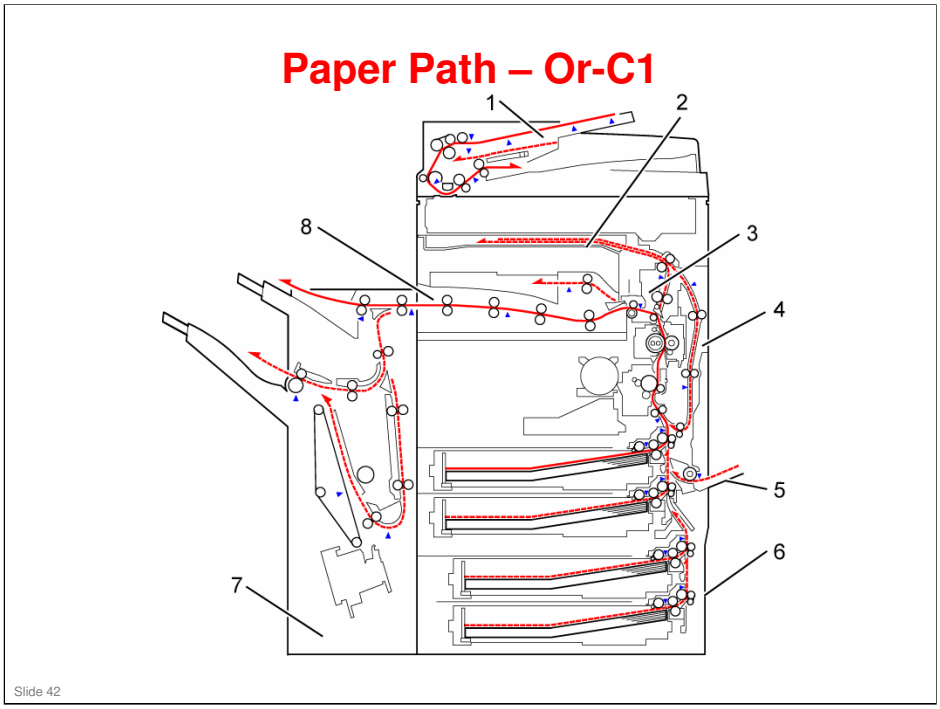


- 1. 2nd scanner
- 2. Exposure lamp
- 3. 1st scanner
- 4. Original length sensor
- 5. Lens
- 6. Scanner motor
- 7. SBU board
- 8. Exit roller
- 9. Fusing hot roller
- 10. Fusing pressure roller
- 11. Cleaning unit
- 12. OPC drum
- 13. Transfer roller
- 14. Development roller
- 15. ID sensor
- 16. Registration roller
- 17. Feed roller
- 18. Separation roller
- 19. Pick-up roller
- 20. Optional tray heater
- 21. Polygon mirror motor
- 22. Laser unit
- 23. Toner supply bottle holder
- 24. Drum charge roller
- 25. Scanner home position sensor

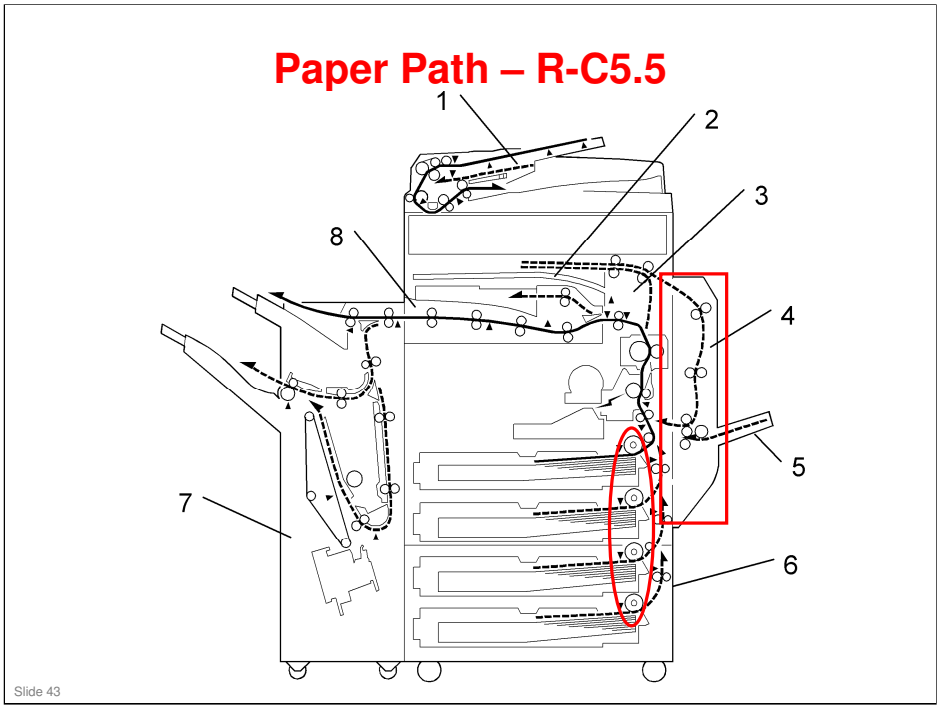


The red circles/rectangles show the main differences.

- Scanner – In the Or-C1, a different type of lamp is used, and there are fewer APS sensors
- Duplex – In the Or-C1, duplex is built in and the feed path is more compact.
- Paper Feed – The Or-C1 uses the FRR method



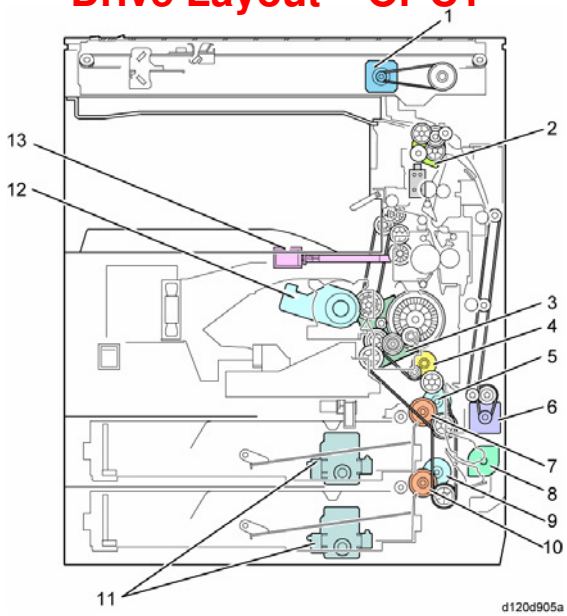
- 1. Optional ADF
- 2. Optional 1-bin Tray
- 3. Interchange Unit
- 4. Duplex Unit
- 5. By-pass Feed Tray
- 6. Optional Paper Tray Unit
- 7. Optional Finisher
- 8. Optional Bridge Unit



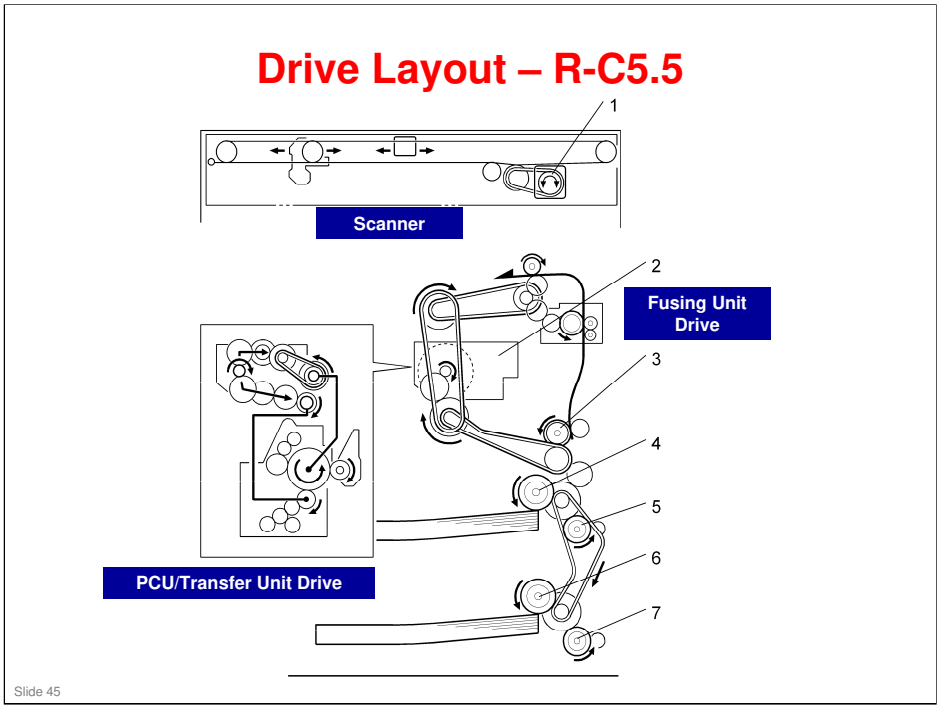
The red circles/rectangles show the main differences.

- Duplex – In the Or-C1, duplex is built in and the feed path is more compact.
- Paper Feed – The Or-C1 uses the FRR method

Drive Layout – Or-C1



- 1. Scanner Motor
- 2. Duplex Motor
- 3. Main Motor
- 4. Registration Clutch
- 5. Upper Transport Clutch
- 6. By-pass Motor
- 7. Upper Paper Feed Clutch
- 8. By-pass Feed Motor
- 9. Lower Transport Clutch
- 10. Lower Paper Feed Clutch
- 11. Paper Tray Lift Motor
- 12. Toner Supply Motor
- 12. Fusing Drive Release Solenoid



- As can be seen, the drive layouts of the two models are very similar.

Scanner

- An LED lamp is used. SP modes must be adjusted if the lamp is replaced.
  - R-C5.5: Xenon lamp
- There is no APS width sensor. The machine detects the document width with the CCD before scanning starts.
- The CCD is color scanning only.

Slide 46

No additional notes

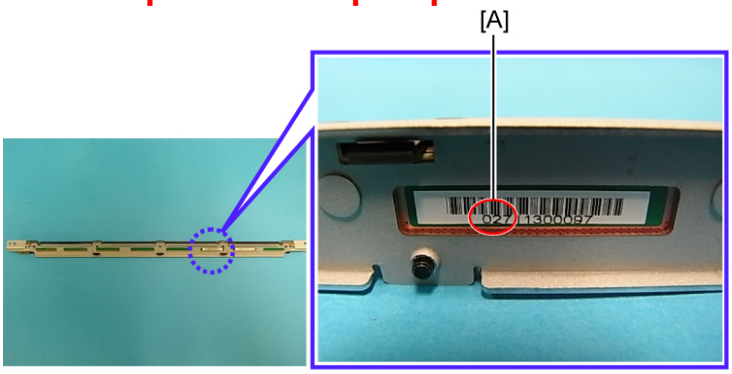
Original Width Detection Failure

- **There is no original width sensor.**
- **The CCD detects the width of the paper before scanning (this is known as 'pre-scanning').**
- **If the original has punch holes, or is thin or transparent, the CCD may detect the incorrect width.**
- **The following problem may occur for thin originals:**
  - If the user opens the cover during pre-scanning, they may get a strong light from the scanner lamp in their eyes.
  - To prevent this, the lamp power is less during pre-scanning (default: 60%).
  - However, with the reduced setting, sometimes the machine cannot detect the original size.
  - If this happens, increase the setting using SP4-309-004.

Slide 47

No additional notes

Scanner
Exposure Lamp Replacement



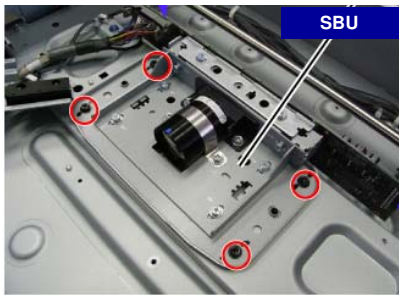
- **Before installing the new exposure lamp, check the first three digits [A] in the bar-code on the new lamp.**
- **After installing the new lamp, go to SP4-954-005 and adjust the setting, referring to the table in the service manual.**

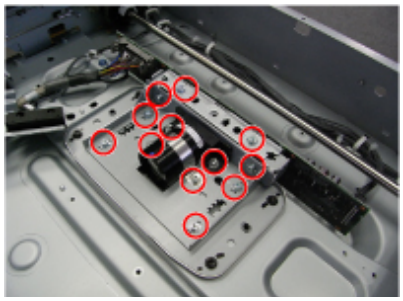
Slide 48

Service Manual, Replacement and Adjustment, Scanner Unit, Exposure Lamp

- This setting is called the ‘chromaticity rank’, and needs to be adjusted for each lamp.

Scanner
SBU Replacement





Remove these screws only

Do not remove any of these screws

- Make sure that you remove the correct screws.

Slide 49

No additional notes

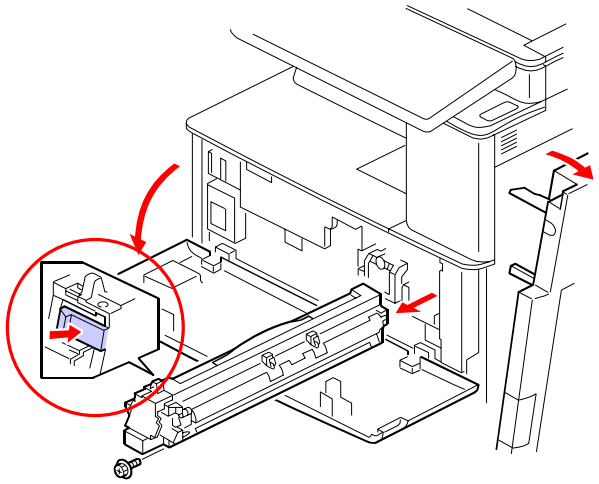
PCU

- **One screw holds the PCU in place, at the right of the PCU.**
  - R-C5.5: No screw
- **The PCU is not interchangeable with other models.**

Slide 50

- See the next slide for a diagram.

Removing the PCU

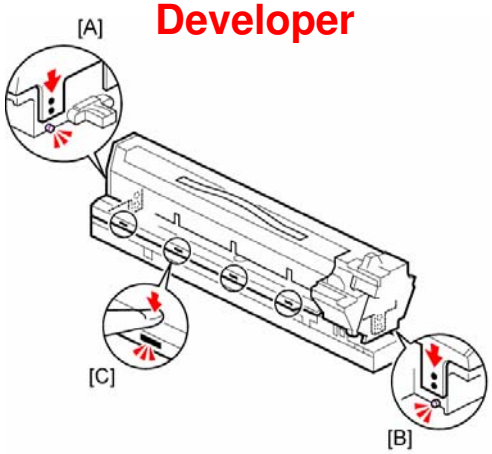


- Push the latch to remove the PCU.

Slide 51

No additional notes

Reassembling the PCU after Replacing Developer



- **There are only three tabs.**
  - R-C5/R-C5.5 has four tabs.

Slide 52

No additional notes

Laser Unit

- The LD Board is smaller. Apart from that, there are no changes from the R-C5.5

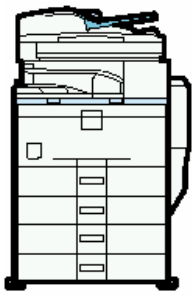
Slide 53

No additional notes

Bypass, Duplex

- **The bypass tray and duplex unit, when closed, are flush with the side of the machine.**
  - The components are similar to the Di-C1.

OR-C1



R-C5.5

Slide 54

- The new arrangement means that the replacement procedures are different from the R-C5.5.

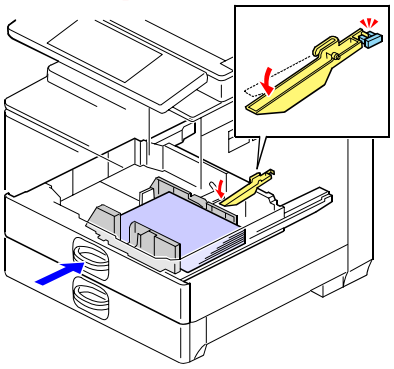
Paper Feed - 1

- **All trays use an FRR (feed and reverse roller) mechanism.**
  - R-C5.5: Feed roller and friction pad
- **Tray 1 can feed envelopes and cards, but tray 2 cannot.**
  - Trays 1 and 2 are not interchangeable. A peg at the rear of tray 1 prevents you from sliding it into the 2nd feed station.
- **When paper is used up, the bottom plate lifts, so the top sheet is always at the same height.**
  - A motor is used to lift the bottom plate. There is no complicated shaft and spring mechanism like R-C5.5 has.

Slide 55

No additional notes

Paper Feed - 2



- **Tray 1 has a sensor for small-width paper. It detects if paper less wide than B5 SEF is in the tray.**
  - A feeler near the rear of the machine tests for the presence of paper in the gap between the side of the tray and the B5 SEF width position.

Slide 56

No additional notes

Dust Collection Box

- Open the front cover and remove one screw. Then you can pull out this unit.

Slide 57

No additional notes

Fusing

- **The components of the fusing unit are very similar to the R-C5.5.**
- **CPM is reduced for small paper sizes and thick paper, if the temperature at the ends of the hot roller becomes too high.**
  - This is known as 'CPM down mode'.
    - » R-C5.5: If the temperature becomes too high, copy speed is not reduced. Instead, SC545 or 553 occur.

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- CPM down mode is explained in more detail on the next few slides.

Fusing

CPM Down Mode – Overview

- **When the temperature at the ends of the hot roller becomes too high, the machine enters CPM down mode.**
- **There are three levels of CPM down mode. If the temperature continues to increase, the machine goes from level 1, to level 2, and level 3.**
  - When going to a higher level, the CPM decreases.
- **The threshold temperatures for each of these levels depends on the paper size.**
- **Paper sizes affected by CPM down:**
  - Thick paper (157 g/m^2): B5, A5, B6, A6 (all SEF)
  - Normal paper: A5, B6 (all SEF)

Slide 59

- The threshold temperatures for each level and each paper size can be adjusted with SP modes 1-124-009 to 1-124-023.

Fusing

CPM Down Mode – Reductions in Copy Speed

- **Reductions in copy speed for each level**
  - OR-C1a (23cpm model)
    - » Level 1: 80% (18.4 cpm)
    - » Level 2: 70% (16.1 cpm)
    - » Level 3: 45% (10.35 cpm)
  - OR-C1b (28cpm model)
    - » Level 1: 70% (19.6 cpm)
    - » Level 2: 60% (16.8 cpm)
    - » Level 3: 35% (9.8 cpm)
  - OR-C1c (33cpm model)
    - » Level 1: 60% (19.8 cpm)
    - » Level 2: 50% (16.5 cpm)
    - » Level 3: 25% (8.25 cpm)

Slide 60

- These speed reductions can be adjusted with SP Mode.
  - Level 1: SP 1-124-006
  - Level 2: SP 1-124-007
  - Level 3: SP 1-124-008

Fusing

CPM Down Mode – Average CPM for Typical Cases

		Normal Paper			Thick Paper		
		OR-C1a (23 cpm)	OR-C1b (28 cpm)	OR-C1c (33 cpm)	OR-C1a (23 cpm)	OR-C1b (28 cpm)	OR-C1c (33 cpm)
A4	Average CPM after start of CPM down mode:	No CPM Down					
B5	Average CPM after start of CPM down mode:	No CPM Down				20cpm	20cpm
A5	Average CPM after start of CPM down mode:	No CPM Down	24cpm	27cpm	18cpm	17cpm	17cpm
B6	Average CPM after start of CPM down mode:		24cpm	27cpm	18cpm	17cpm	17cpm
A6	Average CPM after start of CPM down mode:	No CPM Down			21cpm	18cpm	18cpm

Slide 61

- No CPM Down: CPM down mode is not done for this paper type/size on this model.

Boards

- **The SIO board circuit has been included in the IPU board.**
- **NVRAM:**
  - Controller board: There is only one NVRAM.
    - » R-C5.5 has two.
  - BCU board: There is an NVRAM on this board.
  - If you change the BCU or controller, follow the instructions in the service manual carefully concerning the NVRAMs.
- **SDB (Shutdown Board): Controls the safe shutdown process**

Slide 62

No additional notes

Internal Finisher

- **This new finisher is similar to the one used with the Z-C1.**

Slide 63

- There is a separate presentation on this finisher accompanying this course.

Shift Tray, Bridge Unit

- **The gap between operation panel and paper trays is wider than previous models, so an additional base must be installed when installing the shift tray or bridge unit.**

Slide 64

- We saw this additional base in the Installation section.

One-bin Tray

- In the R-C5.5, the LED is at the right side of the tray.
- In the OR-C1, the LED is at the left side of the tray.

Slide 65

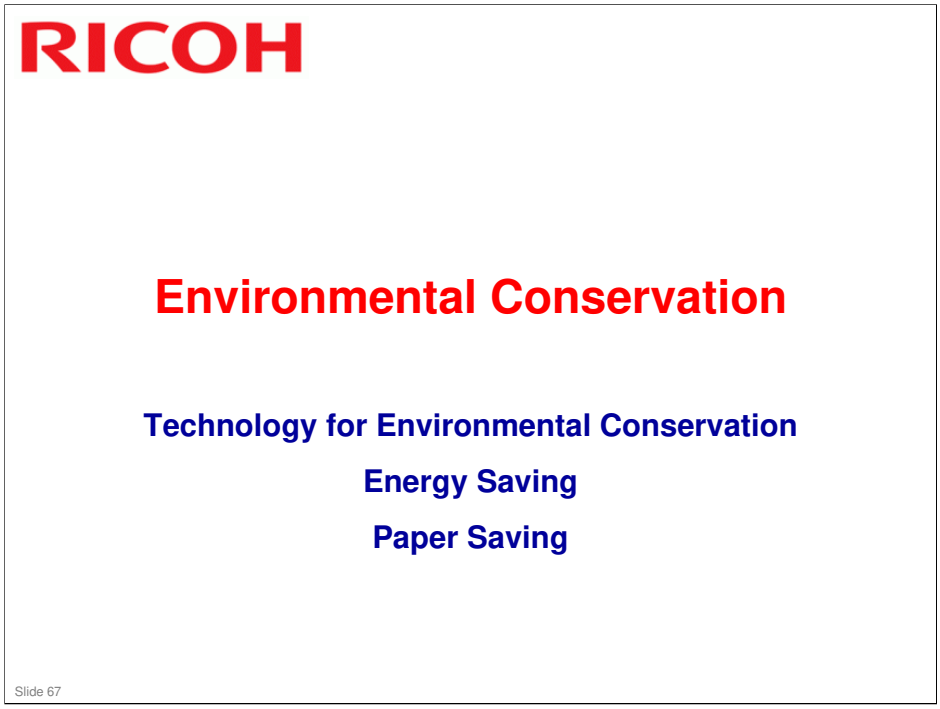
No additional notes

Fax Unit

- **The MBU and FCU are combined into one board.**
- **After you replace the FCU, you must transfer the SRAM data from the old FCU to the new one.**
- **This is done by connecting the old FCU to the new one with a flat cable.**
  - A flat cable is provided with the new FCU service part.
- **The following data will be transferred: TTI, RTI, CSI, bit switch settings, RAM address settings, NCU parameter settings**

Slide 66

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



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

Technology for Environmental Conservation

**: New or modified function
*: Has this function
Blank: Does not have this function

Environmental Technology/Feature	Description	New model OR-C1	Old model R-C5.5
1. QSU	- Reduction of warm-up time (Energy saving) - Reduction of CO_2 emissions	*	*
2. Hybrid QSU			
3. IH QSU			
4. Paper-saving features	- 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		*	*
12. Recycle-friendly design		*	*

Slide 68

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

Brief Descriptions of the Technologies

- **1. QSU (Quick Start-up)**
  - This technology reduces both the amount of energy consumed while in Standby mode (the Ready condition) is reduced, as well as the time it takes for the machine to warm up to the Ready condition.
  - This is made possible through the utilization of dual fusing lamp heating, low fusing point toner, a pressure roller with a "sponge" surface layer, and a thin surface layer hot roller.
- **2. Hybrid QSU**
  - This technology adds an additional circuit to conventional QSU Technology, which allows the benefits of reduced energy consumption and reduced warm-up time described above to be extended to high-speed machines.

Slide 69

No additional notes

Brief Descriptions of the Technologies

- **3. IH QSU**
  - This technology incorporates IH (Inductance Heating) technology into conventional QSU technology, which allows the benefits of reduced energy consumption and reduced warm-up time to be extended to color machines.
- **4. Paper-saving features**
  - 1) The duplex (double-sided) and Combine features reduce paper consumption.
    2) The Document Server and other electronic document management features reduce paper consumption by offering an electronic method for storing and managing important documents.

Slide 70

No additional notes

Brief Descriptions of the Technologies

- **5. High-speed duplex output**
  - 1) Enables high-speed duplex printing through the utilization of the Duplex Interleaf and high-speed Inverter Transport features.
  - 2) Enables quick printing of duplex jobs through the use of Duplex Scanning.
- **6. Ozone reduction design**
  - Greatly reduces the machine's ozone emissions to near-zero levels by utilizing:
    1) A charge roller/belt instead of a corona wire
    2) An image transfer roller/belt instead of a corona wire-based transfer system

Slide 71

No additional notes

Brief Descriptions of the Technologies

- **7. PxP (polymerized) toner**
  - "PxP toner" is a fine-particle, polyester resin based toner, manufactured using a Ricoh-original polymerization method instead of the conventional pulverization method.
  - This allows the toner to fuse at a lower temperature, which reduces the impact on the environment and contributes to achieving even higher image quality than before.
  - PxP toner also has other benefits, including a reduction in the amount of toner needed to develop the image, as well as an approximate 35% reduction in CO_2 emissions during the toner manufacturing process.

Slide 72

No additional notes

Brief Descriptions of the Technologies

- **8. Noise reduction design**
  - 1) The machine and its components are designed to minimize the overall noise generated by the machine. As a result, all noise levels conform to the local laws and regulations as well as user requirements in each market in which the products are sold.
  - 2) Reduces the noise generated by the polygon mirror motor.
- **9. Minimization of harmful substances**
  - 1) Products sold in the EU conform to the RoHS Directive.
  - 2) Products sold in China conform to China's version of the RoHS Directive.
  - 3) In addition, Ricoh imposes strict internal standards for limiting the presence of harmful substances.

Slide 73

No additional notes

Brief Descriptions of the Technologies

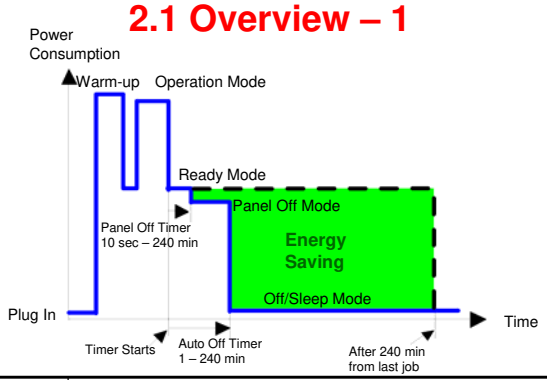
- **10. Environmentally-friendly toner bottle**
  - A changeover from PS/PP/HDP to PET plastics allows approximately 40 percent by weight of the toner bottle to be recycled, and also reduces CO_2 emissions that occur during the toner bottle manufacturing process.
- **11. Toner recycling**
  - Enables effective use of resources by recycling (reusing) the toner left over on the drum surface after image transfer.
- **12. Recycle-friendly design**
  - To maximize the recycling ratio of machine and component materials, as well as the ease of performing the recycling in the field, machine sections and components are designed so that the recyclable parts can be separated out easily.
  - In addition, components are designed so that they can be reused for as long as possible after the machine has reached its operational lifetime.

Slide 74

No additional notes

2. Energy Saving

2.1 Overview – 1

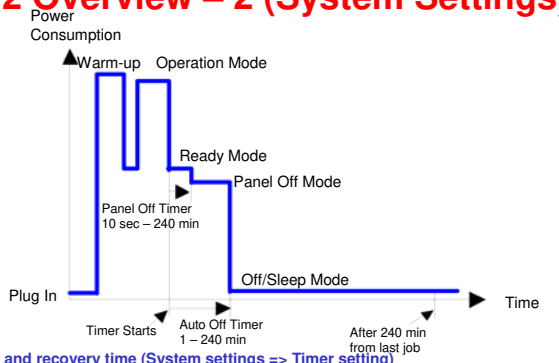


Energy Saver Modes	Description
Energy Saver Mode (Panel Off)	The machine is still in the Copy Ready condition. Level 1: Panel off only Level 2: Panel off and lower the fusing temperature.
Auto Off Mode	If no printer/scanner or fax unit is installed: No power is supplied to the printing engine and the controller.
Sleep Mode	When a printer/scanner or fax unit is installed: No power is supplied to the printing engine, and almost none to the controller.

Slide 75

- 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.

2. Energy Saving
2.2 Overview – 2 (System Settings)



Timer settings and recovery time (System settings => Timer setting)

Mode	Timer	Default	Setting range	Recovery time
Panel off Mode	Panel Off Timer	1 min.	10 sec to 240 min.	3 sec.
Off/Sleep Mode	Auto Off Timer	1 min.	1 to 240 min.	10 sec. (with HDD) 11 sec. (w/o HDD)

Specified values for timers	Panel Off Mode	Auto Off Mode
If Panel Off > Auto Off	This mode can start	This mode can start
If Panel Off = Auto Off	This mode cannot start	This mode can start
If Panel Off < Auto Off	This mode cannot start	This mode can start

Slide 76

- 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.

2. Energy Saving
2.2 Energy Saver Mode: Condition of LEDs

❑ **Condition of LEDs on the operation panel**

Mode	Operation Switch LED	Energy Saver LED	Main Power LED
Panel off Mode	On	On	On
Off/Sleep Mode	Off	Off	On

Slide 77

No additional notes

2. Energy Saving
2.2 Energy Saver Mode: Panel Off Mode – 1

- **The machine enters panel off mode when one of the following is done.**
  - The panel off timer runs out after the last job.
    - » The panel off timer is controlled by User Tools: Timer settings.
  - The Energy Saver key is held down for a second.
- **The machine is still in the stand-by (ready) condition, but turns off the LCD of the operation panel.**
- **The machine recovers to the ready condition if one of the following occurs:**
  - The Energy Saver key is pressed
  - An original is placed in the ADF
  - The ADF is lifted
  - The user touches the operation panel
  - The front door is opened or closed

Slide 78

- In some MFP models, when it takes 1 minute to return from Off/Sleep mode, there may be no Panel Off Mode
- Also, there is no Panel Off Mode in printers.

2. Energy Saving
2.2 Energy Saver Mode: Panel Off Mode – 2

- **Important**

  There are two levels of Panel Off Mode:

  - **Level 1:**
    Panel off only (No recovery time)
  - **Level 2:**
    Panel off and lower the fusing temperature.
    Recovery time should be within 3 seconds

Slide 79

No additional notes

2. Energy Saving

2.2 Energy Saver Mode: Off Mode – 1

- **Off mode is used only if no printer/scanner or fax unit is installed.**
- **The machine enters off mode when one of the following is done.**
  - The auto off timer runs out after the last job.
  - The operation switch is pressed to turn the power off.
- **When the machine enters auto off mode, no power is supplied to the printing engine, and almost none to the controller.**
- **Recovery time**
  - Less than 10 seconds (with HDD)
  - Less than 11 seconds (without HDD)

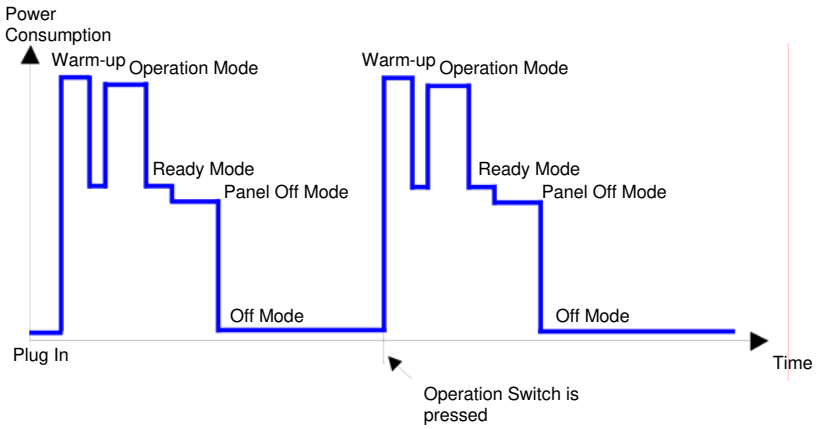
Slide 80

No additional notes

2. Energy Saving

2.2 Energy Saver Mode: Off Mode – 2

- **The machine recovers to the ready condition if the operation switch is pressed.**



Slide 81

- 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.

2. Energy Saving

2.2 Energy Saver Mode: Sleep Mode – 1

- **Sleep mode is used instead of auto off mode when a printer/scanner or fax unit is installed.**
- **The machine enters sleep mode when one of the following is done.**
  - The auto off timer runs out after the last job.
  - The operation switch is pressed to turn the power off.
- **When the machine enters sleep mode, no power is supplied to the printing engine, and almost none to the controller.**
- **Recovery time**
  - Less than 10 seconds (with HDD)
  - Less than 11 seconds (without HDD)

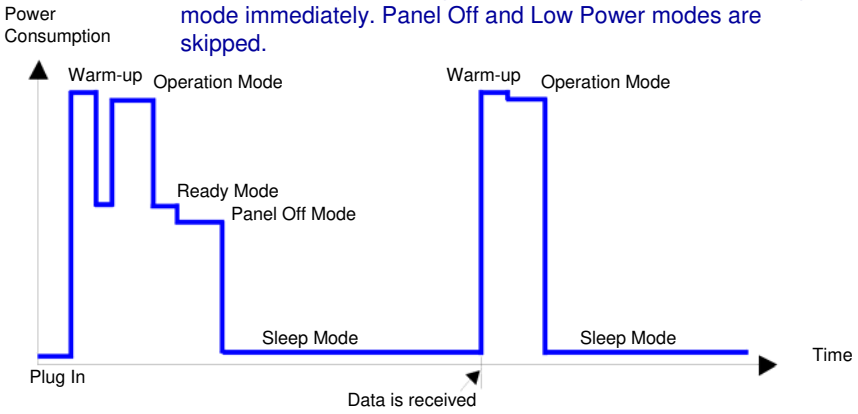
Slide 82

No additional notes

2. Energy Saving

2.2 Energy Saver Mode: Sleep Mode – 2

- **The machine recovers to the ready condition:**
  - **If data is received**
    - » After warm-up, the job starts, but the operation panel stays dark.
    - » Then, after the job is completed, the machine returns to sleep mode immediately. Panel Off and Low Power modes are skipped.



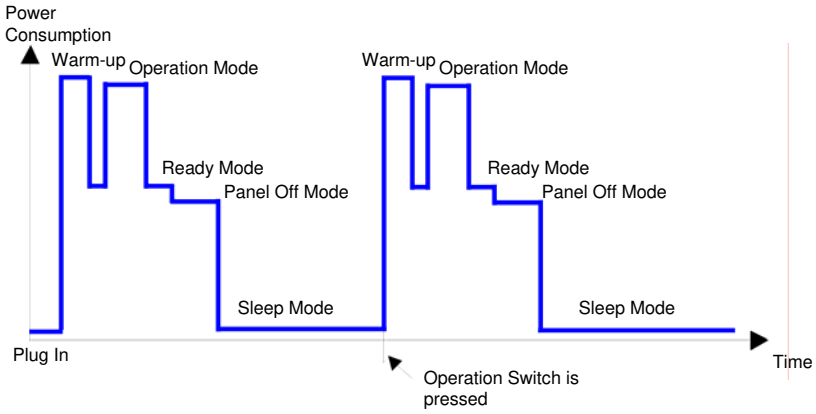
Slide 83

- 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.

2. Energy Saving

2.2 Energy Saver Mode: Sleep Mode – 3

- **The machine recovers to the ready condition:**
  - **If the operation switch is pressed**
    - » The operation panel lights. When warm-up is finished, the machine goes to the ready condition.
    - » Then, after the job is completed, the machine returns to sleep mode when the auto off timer runs out or the operation switch is pressed.



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- 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.

2. Energy Saving

2.3 Energy Save Effectiveness – 1

- **With the data from SP 8941:Machine Status, and the power consumption values from the specifications, we can estimate the amount of energy that is used by the machine.**
  - 8941-001: Operating mode time
  - 8941-002: Standby mode time
  - 8941-003: Energy saver mode time
  - 8941-005: Off/sleep mode time
- **This should only be used as a reference value, because the power consumption specifications are measured in a controlled environment with a constant power supply.**
- **To get an exact measurement at the customers site, a watt meter must be used to measure the actual energy consumed.**

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No additional notes

2. Energy Saving
2.3 Energy Save Effectiveness – 2

(1) At the start of the measurement period, read the values of SP 8941:001-005 (Machine Status), measured in minutes.

(2) At the end of the measurement period,read the values of SP 8941:001-005 (Machine Status), measured in minutes.

(3) Find the amount of time spent in each mode.
(Subtract the earlier measurement from the later measurement and convert the result to hours.)

(4) Power consumption figures for each model are acquired from "Publication System of MSDS_&_PEI (PRODUCT ENVIRONMENT INFORMATION)" database.
Example:

Mode/condition	Power consumption:
Operating mode	800W
Ready mode / Energy Save	240W
Off/Sleep mode	1.7 W (Basic model) 4.2 W (SP model; 230V) 4.0 W (SP model; 110V)

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No additional notes

2. Energy Saving

2.3 Energy Save Effectiveness – 3

(5) Multiply this by the power consumption spec for each mode and convert the result to kWh (kilowatt hours)

(6) This is a simulated value for power consumed.

Example calculations:

Mode/Condition	SP8941: Machine Status	Time at Start (min.) (1)	Time at End (min) (2)	Running time (hour) (2) – (1)/60 = (3)	Power Consumption Spec. (W) (4)	Power consumption (KWH) (3) x (4)/1000 = (5)
Operating	001: Operating Time	21089	21386	5.0	800	4.00
Stand by (Ready)	002: Standby Time	306163	308046	31.4	240	7.54
Energy save	003: Energy Save Time	71386	75111	62.1	240	14.90
Off/Sleep	005: Off mode Time	508776	520377	193.4	1.7 (Basic) 4.2 (SP; 230V) 4.0 (SP; 110V)	0.33 (Basic) 0.81 (SP; 230V) 0.77 (SP; 110V)
Total (6)						26.77 (Basic) 27.25 (SP; 230V) 27.21 (SP; 110V)

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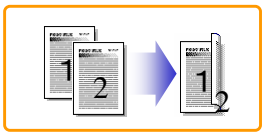
No additional notes

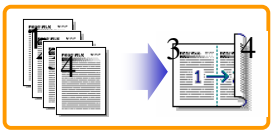
3. Paper Saving
3.1 Measuring the Paper Consumed – 1

1. Duplex: Reduce paper volume in half!



2. Combine: Reduce paper volume in half!

3. Duplex + Combine: Using both features together can further reduce paper volume by 3/4!



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No additional notes

3. Paper Saving
3.1 Measuring the Paper Consumed – 2

- **To check the paper consumption, look at the total counter and the duplex counter.**
  - Total counter : SP 8581 001
  - Single-sided with duplex mode : SP 8421 001
  - Double-sided with duplex mode : SP 8421 002
  - Book with with duplex mode : SP 8421 003
  - Single-sided with combine mode : SP 8421 004
  - Duplex with combine mode : SP 8421 005
- **The total counter counts all pages printed.**
- **The duplex and combine counter counts all pages printed with duplex and combine mode.**

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No additional notes

3. Paper Saving
3.1 Measuring the Paper Consumed – 3

- **How to calculate the paper reduction ratio, when compared with Single-sided copying, with no 2-in-1 combine mode**
- **Paper reduction ratio (%) = Number of sheets reduced: A/Number of printed original images: B x 100**
  - Number of sheets reduced: A
    = Output pages in duplex mode/2＋ Number of pages in Single-sided with combine mode + Number of pages in Duplex with combine mode x 3/2
    A = (②+③+④)/2 + ⑤+⑥ x 3/2
  - Number of printed original images: B
    = Total counter＋ Number of pages in Single-sided with combine mode ＋ Number of pages in Duplex with combine mode
    B = ①+⑤+⑥

① **Total counter**	**: SP 8581 001 (pages)**
② **Single-sided with duplex mode**	**: SP 8421 001 (pages)**
③ **Double-sided with duplex mode**	**: SP 8421 002 (pages)**
④ **Book with with duplex mode**	**: SP 8421 003 (pages)**
⑤ **Single-sided with combine mode**	**: SP 8421 004 (pages)**
⑥ **Duplex with combine mode**	**: SP 8421 005 (pages)**

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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 two-sided original)
  - For one sheet of output paper in two-in-one copying, four original pages are copied onto two output pages.

No additional notes