RICOH

MODEL MT-C4 TRAINING
Machine Codes: D062/D063/D065/D066
COPIER ENGINE

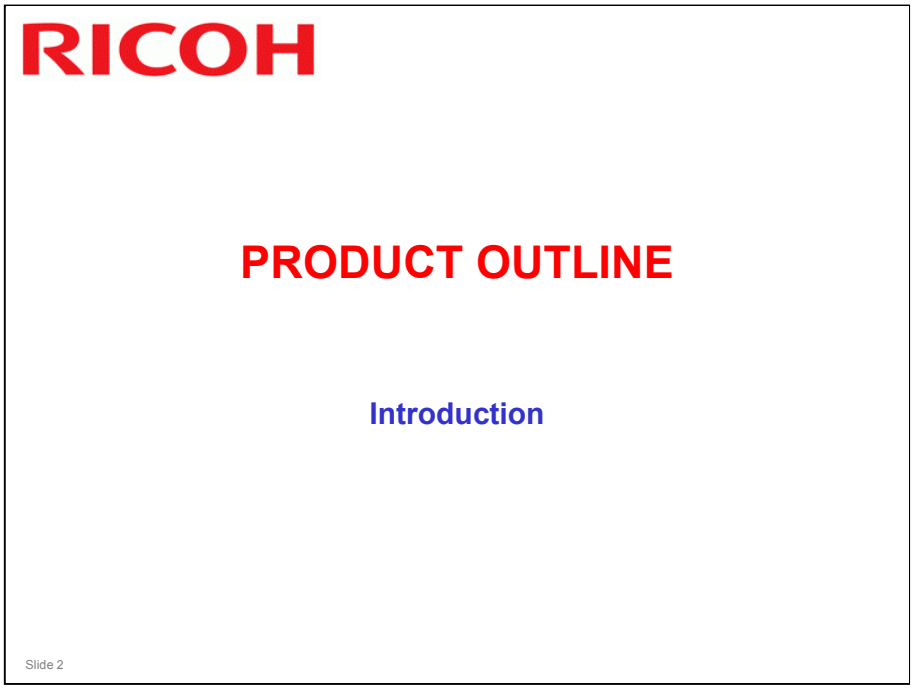
UPGRADE COURSE

BASED ON THE MT-C3

Slide 1

- This course explains the differences between this model and the B246 series copiers (MT-C3).
- Some of the options are new.

- This course assumes that you know the B246 series copiers. If you do not know this series, you should take a full course on it before you do this course.



No additional notes

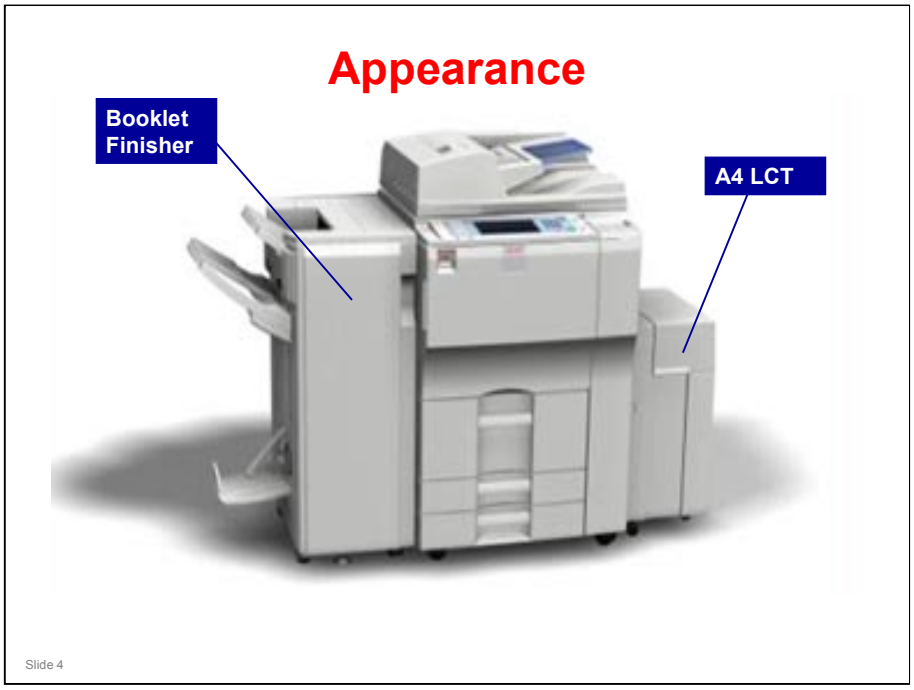
How many Models?

- **Four models**
  - MT-C4a (D062)
    - » 60 pages per minute (A4/LT LEF)
    - » Warm-up time: 30s
  - MT-C4b (D063)
    - » 70 pages per minute (A4/LT LEF)
    - » Warm-up time: 30s
  - MT-C4d (D065)
    - » 80 pages per minute (A4/LT LEF)
    - » Warm-up time: 60s
  - MT-C4e (D066)
    - » 90 pages per minute (A4/LT LEF)
    - » Warm-up time 300 s: Hot roller has a thicker surface layer than the other three models
- **Each model has two versions: One without printer/scanner kit, and one with printer/scanner kit**
  - So, there are a total of eight different machines.

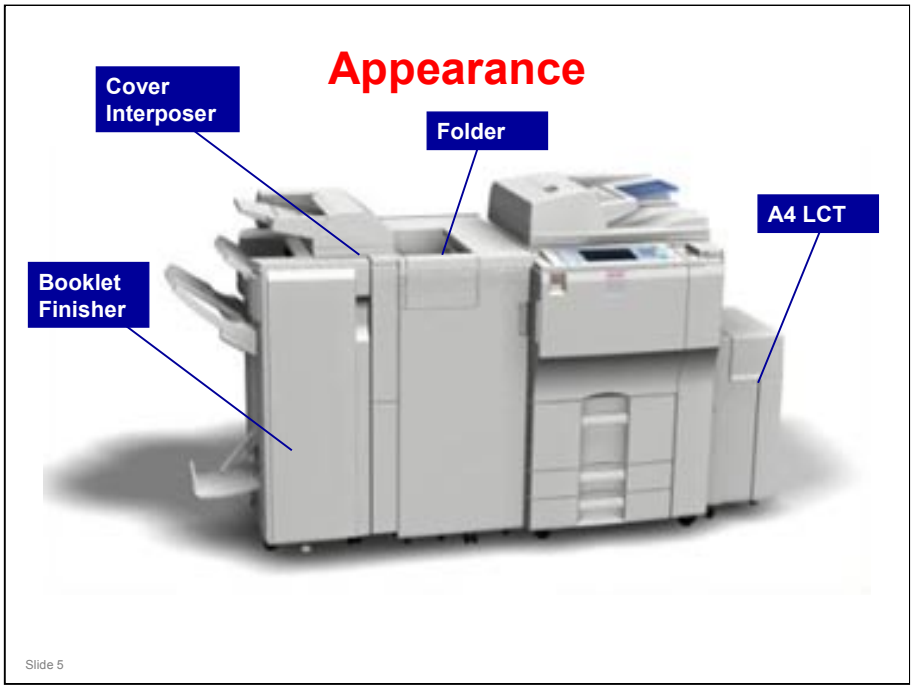
Slide 3

Other differences

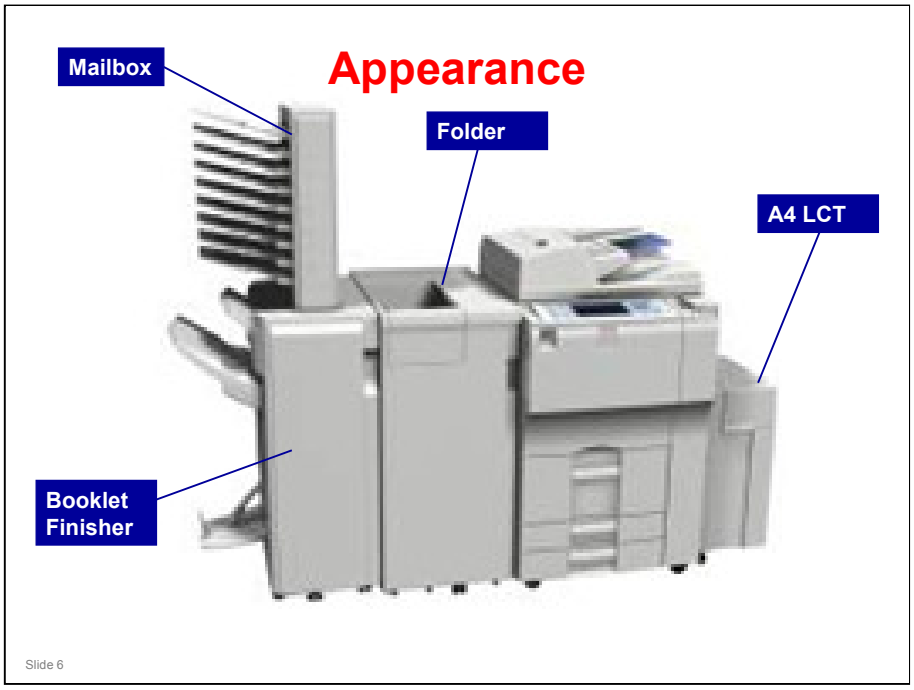
- D066 fusing unit has no pressure release mechanism
- D066 development unit has a pressure release tube
- D065 and D066 have stronger paper feed motors. D062/D063 use the same motors as the MT-C3 series.



❒ We will see another example configuration on the next slide.



No additional notes



No additional notes

Operation Panel

Slide 7

- This type of color display panel is new for the MT series.
- This shows the Europe/Asia version.

No additional notes

Sales Points

- **High speed: 90 ppm (MT-C4e)**
- **Advanced ADF Functions:**
  - Color scan
  - Duplex scan with one pass
  - 250 sheets capacity (Less than 69 g/m^2, depending on the paper type and condition)
  - 150 sheets capacity(Less than 80 g/m^2)
- **Folding Unit, with various types of folding**
  - Same unit as in the B-C4 series
- **Color WVGA Operation Panel**
- **Scan to USB/SD**
- **Easy Pull-out Tray**
- **Distribution to multiple destinations (with E-mail address)**

Slide 9

No additional notes

Operation Panel

Slide 10

Normal Display

Simplified Display

❒ Some features are not available with the simplified display.

Easy Pull-out Tray Handles

Slide 11

No additional notes

Optional USB 2.0/SD card slot

- **This optional unit allows use of the new Scan to USB and Scan to SD features.**
- **This allows users to scan documents and save them in electronic format on an SD card and/or USB memory device.**
  - If the USB device or SD card is then connected to a computer, the scanned files can then be viewed, printed, or processed.
- **You cannot print or send files from this SD/USB slot with the operation panel. You must connect the USB device/SD card to a computer.**
- **This USB slot cannot be used as a printer interface, except for PictBridge.**

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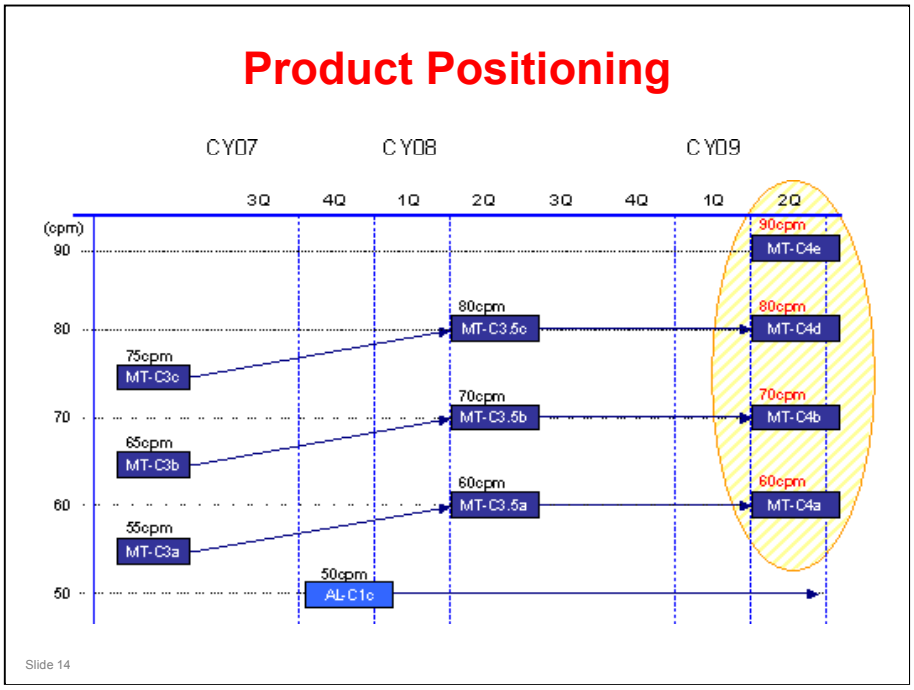
- Files saved on a removable memory device will not appear in the list of stored files.
- Files saved on a removable memory device cannot be printed or sent using the machine's operation panel. To perform operations on files saved on a removable memory device, you must use an application on a client computer.
- You cannot specify where the data is saved. Files are saved in the root directory of the removable memory device.
- Up to 2 GB of data can be saved. However, depending on the number of files already stored on the removable memory device, new files might not be saved, even if there appears to be sufficient free space.
- If the removable memory device is partitioned, files are saved on the first partition.

Optional USB 2.0/SD card slot

- **Up to 2 GB of data can be saved.**
  - However, depending on the number of files already stored on the removable memory device, new files might not be saved, even if there appears to be sufficient free space.
- **This machine supports FAT16 format USB memory devices and SD cards. Other forms of removable memory device are not compatible.**
- **Saving might fail if the USB memory device has password protection or other security features.**
- **To save files on a removable memory device, you must attach the optional USB 2.0/SD card slot to the machine.**
- **File formats that can be used:**
  - Single page TIFF/JPEG/PDF (including high compression PDF)
  - Multipage TIFF/PDF (including high compression PDF)

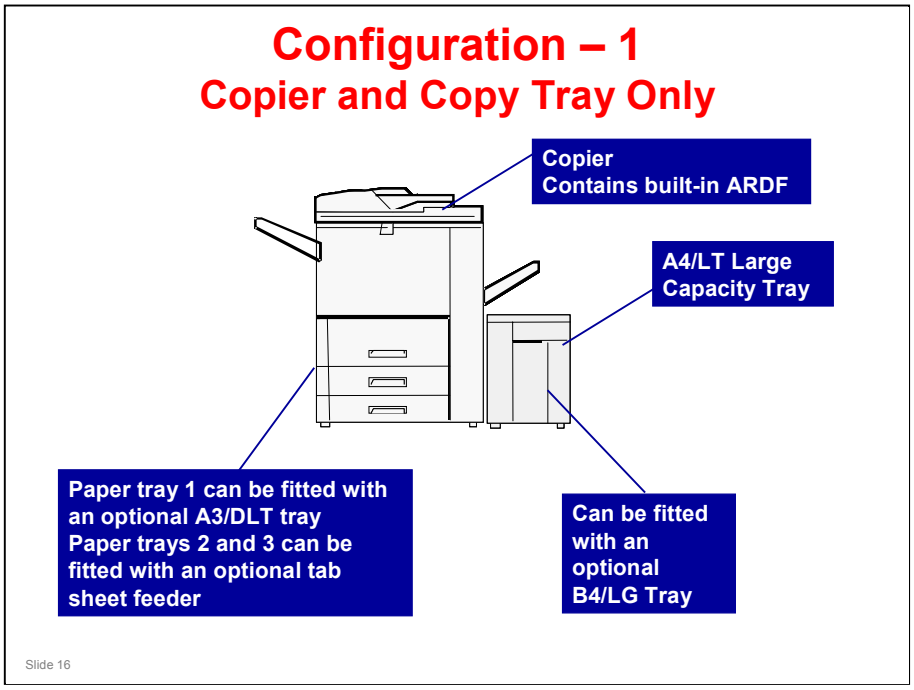
Slide 13

No additional notes

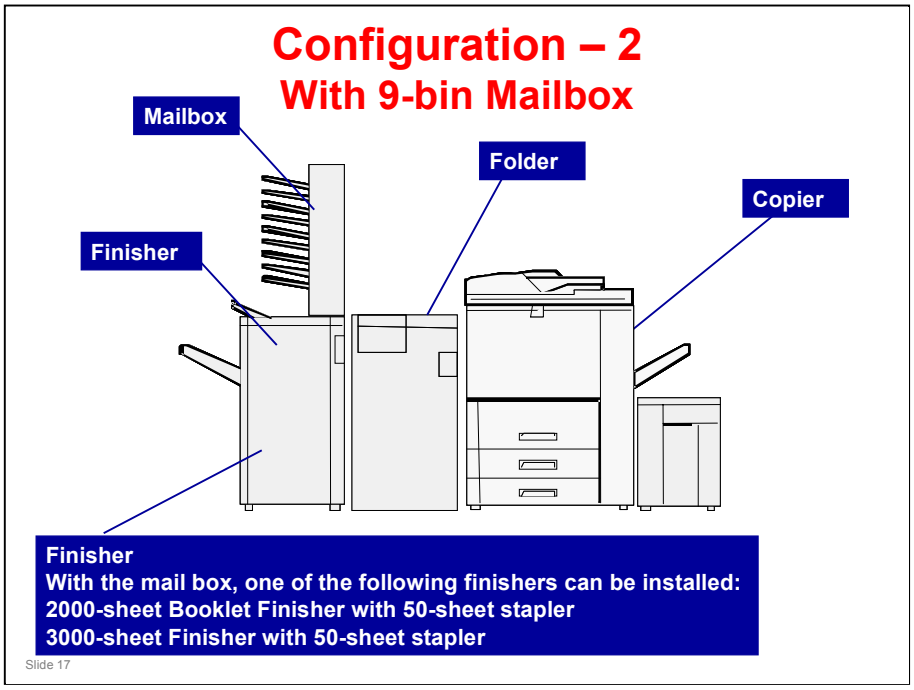


No additional notes

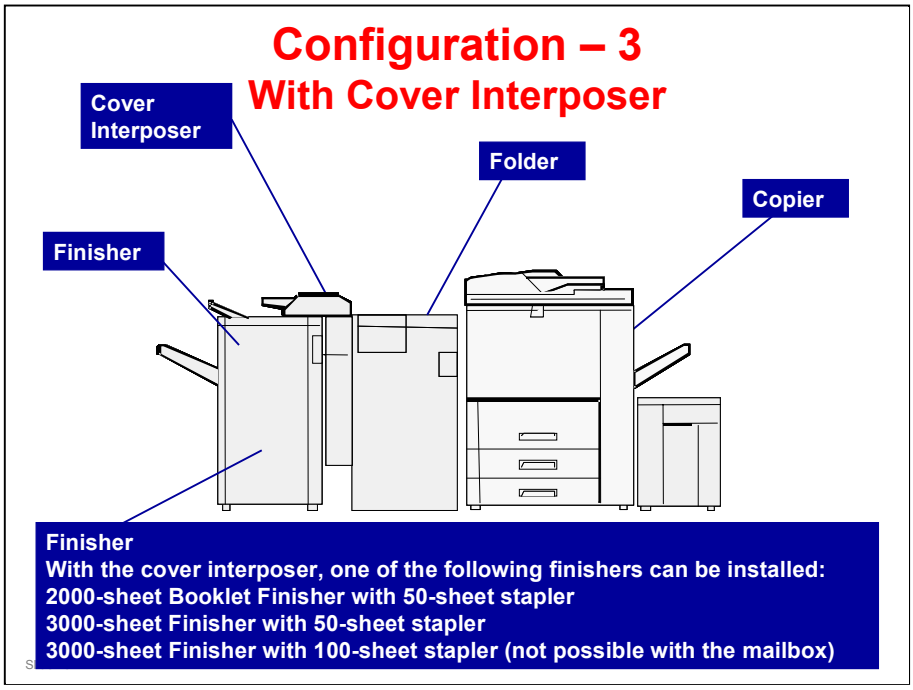
No additional notes



- The copy tray must be installed if no other finishing options are installed.
- Configurations with finishing options are shown on the next two slides.



- Either a mail box or a cover interposer can be installed.
  - See the next slide for the configuration with the cover interposer.
- The mail box cannot be installed with the 90cpm model (MT-C4e)
- The mail box cannot be installed with the finisher with 100-sheet stapler.



- Options must be installed in this order
  - For example, do not install the folder after the cover interposer.
- Either a mail box or a cover interposer can be installed.
- The mail box cannot be installed with the finisher with 100-sheet stapler.

Engine Options – Paper Feed

- **A3/DLT Kit for Tray 1: New item**
  - This is new because tray 1 in the copier main body has been modified.
- **Tab Sheet Kit: Same as the B246 series**
  - This can be installed at any time in paper tray 2 or 3 to let it feed tab sheets.
- **A4/LT Large Capacity Tray (LCT): Same as the B246 series**
- **LG/B4 Kit for the LCT: Same as the B246 series**

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No additional notes

Engine Options - Finishing

- **Copy Tray: Same as the B246 series**
- **Cover Interposer: Same as the B246 series**
  - Cannot be installed if the mailbox is installed
- **Mailbox: Same as the B246 series**
  - Cannot be installed with the cover interposer or D460 finisher
- **Folder: Same as the D059 series (B-C4)**

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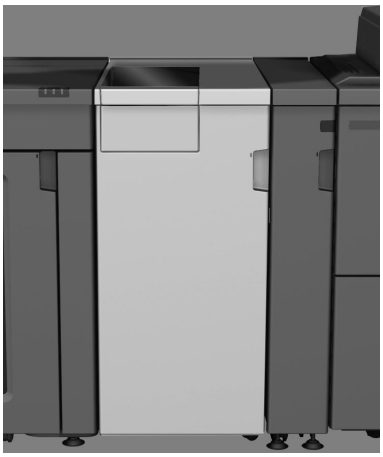
No additional notes

Multi-folding Unit (1)



- This replaces the z-folding unit from previous models.

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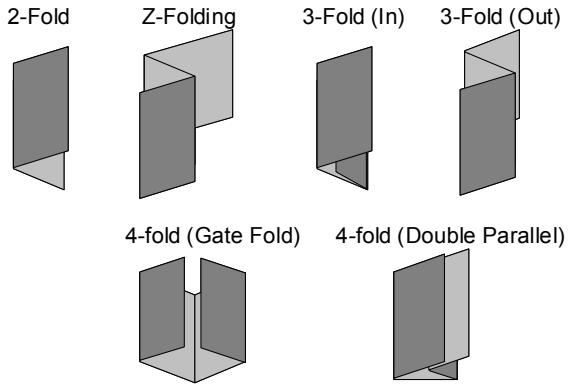
No additional notes

Multi-folding Unit (2)



- **The unit can make a wide range of folds in the output.**

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No additional notes

Engine Options - Finishers

- **D373: 2000-sheet Booklet Finisher with 50-sheet stapler (same as Venus-C1)**
  - This finisher has three trays: a proof tray on top of the finisher, an upper (shift) tray, and a lower tray for booklets.
- **D374: 3000-sheet Finisher with 50-sheet stapler (same as Venus-C1)**
  - This finisher has two trays: a proof tray on top of the finisher and the upper (shift) tray.
  - This finisher does corner stapling only. It does not have a lower tray for stapled and folded booklets.
- **D460: 3,000-sheet finisher with 100-sheet stapler (based on the model that is used with the B246 series)**

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- There are three types of finisher for this model.
- A range of hole punch units is available for each finisher.
- Each finisher also has an optional jogger unit which tidies up the copy stack as it leaves the finisher exit.

Engine Options - Finishing

- **Finisher Options**
  - Punch units
    - » There are optional punch units for each finisher. The punch units for the D373/D374 are different from the ones for the D460.
    - » Each punch unit has three types, for different parts of the world.
    - » The punch units are the same as for the B246 series copiers.
  - Jogger units
    - » There are optional jogger units for each finisher. The jogger units for the D373/D374 are different from the ones for the D460.
    - » The punch units are the same as for the B246 series copiers.

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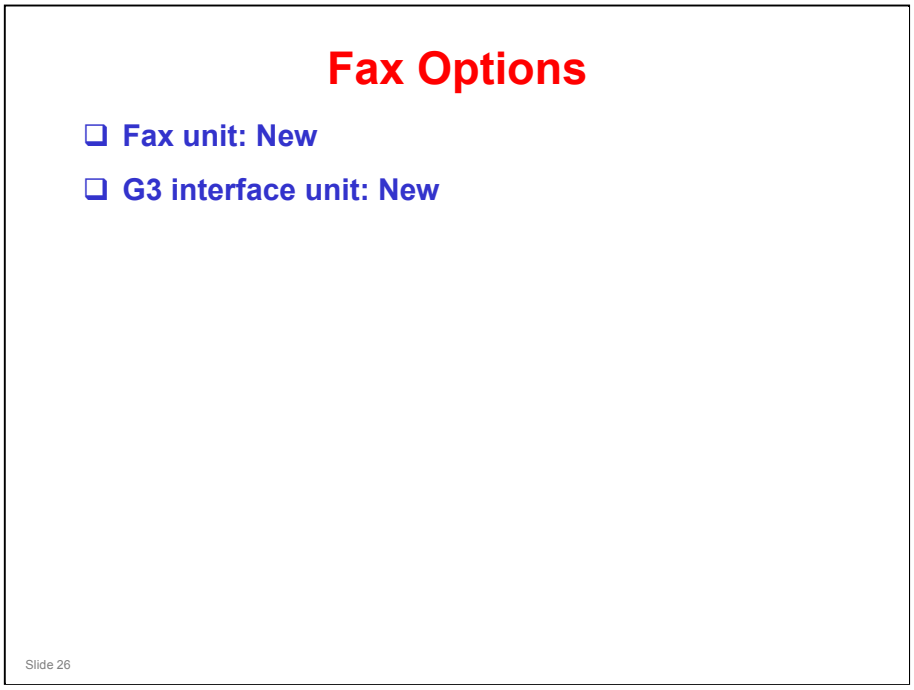
- Punching and folding cannot both be done in the same job.

- If you install a printer/scanner kit in an MT-C4 basic model, additional memory must also be installed. This memory is included in the printer/scanner kit.



No additional notes

Interface Options

- **Interfaces: Only one of these can be installed at the same time:**
  - IEEE1284 interface: Same as other previous models
  - IEEE802.11b interface: Same as V-C2
  - Bluetooth interface: Same as other previous models
- **Gigabit Ethernet interface: Same as V-C2**
- **USB/SD Card slot: New**

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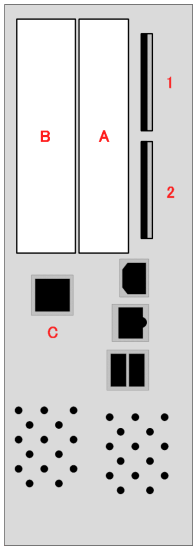
- There is no IEEE1394 interface

Interface Options



USB 2.0

Ethernet

USB Host

- **Slot A: One of the following**
  - IEEE1284
  - IEEE802.11
  - Bluetooth
  - File format converter
- **Slot B: Copier connection kit**
- **Slot C: Gigabit Ethernet**
- **SD Card Slot 1: Slot for SD card options**
- **SD Card Slot 2: Slot for service operations**

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❒ The MT-C4 series has only 2 SD card slots. The MT-C3 series has 3 slots.

Security Options

- Data Overwrite Security Unit: Type H - same as AP-C2
- Copy Data Security Unit: Same as AP-C2
- HDD Encryption Unit: Same as AP-C2

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No additional notes

Other Options

- Copier connection kit: Same as B-C4
- VM card type J: Same as B-C4
- File format converter: Same as MT-C3.5
  - Goes in the same slot as the IEEE1284, IEEE802.11, or Bluetooth option
- Browser unit: Same as MT-C3.5
- Counter interface: Same as other previous models
- Key counter bracket: Same as MT-C3.5
- Key card bracket: Same as MT-C3.5

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No additional notes

This section explains the important changes to the specifications.

Changes to Specifications

- **Warm-up Time**
  - MT-C4a/b: Less than 30 seconds
  - MT-C4d: Less than 60 seconds
  - MT-C4e: Less than 300 seconds
- **Changes to ADF specifications**
  - Original Size
    - » One-sided: A3/11" x 17“ to B6/5.5" x 8.5"
    - » Duplex: A3/11" x 17" to B5/5.5" x 8.5
- **Memory**
  - Basic model without Printer/Scanner unit: 512 MB
  - Model with Printer/Scanner unit: 1.5 GB
  - MT-C3.5: Standard 256 MB, Max: 512 MB
- **Hard disk: 160GB**
  - MT-C3.5: 80 GB

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Why is the warm-up time so long for MT-C4e (D066)?

- The outer layer of the hot roller is much thicker, to enable higher productivity. Because of this, the fusing unit takes longer to warm up.

Memory

- There is no optional memory (except for the usual fax memory option). However, the printer/scanner kit contains the required memory for using this option.

Comparison with B-C4

		MT-C4e	B-C4a
Spec	Output speed	90cpm	90cpm
	Warm Up Time	300sec	360sec
	Paper Capacity (Max)	8300	8050
	Paper weight (via Tray)	52 - 128gsm 14-34lb bond	52 - 216gsm 14lb Bond - 80lb Cover
	Paper weight (Max)	216gsm 80lb Cover	300gsm 110lb Cover
	Paper Size	A3/DLT	13 x 19.2
	Max Monthly Volume	300K	1000K
	ADF capacity	250	100
	Color Scanning	Yes	Yes
	Dimensions	Approx. 690 x 790 x 1165 mm	870 X 860 X1476
	Fax	Yes	No
Options	EFI controller	No	Yes
	Stacker	No	Yes
	2 tray Interposer	No	Yes
	Professional Saddle Stitch	No	Yes
	Large LCT	No	Yes
	Ring Binder	No	Yes
	Perfect Binder	No	Yes
	Trimmer	No	Yes
	Multi Folding	Yes	Yes

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- This table compares the high-end model of the MT-C4 series with the low-end model of the B-C4 series.

No additional notes

Reliability Targets

	MT-C4a	MT-C4b	MT-C4d	MT-C4e
ACV	25K	30K	50K	70K
MAX CV	150K			
Duty	300K			
PM Interval	300K			
EM Interval	200K			
MCBC	120K			
Life	9,000K or 5 years			

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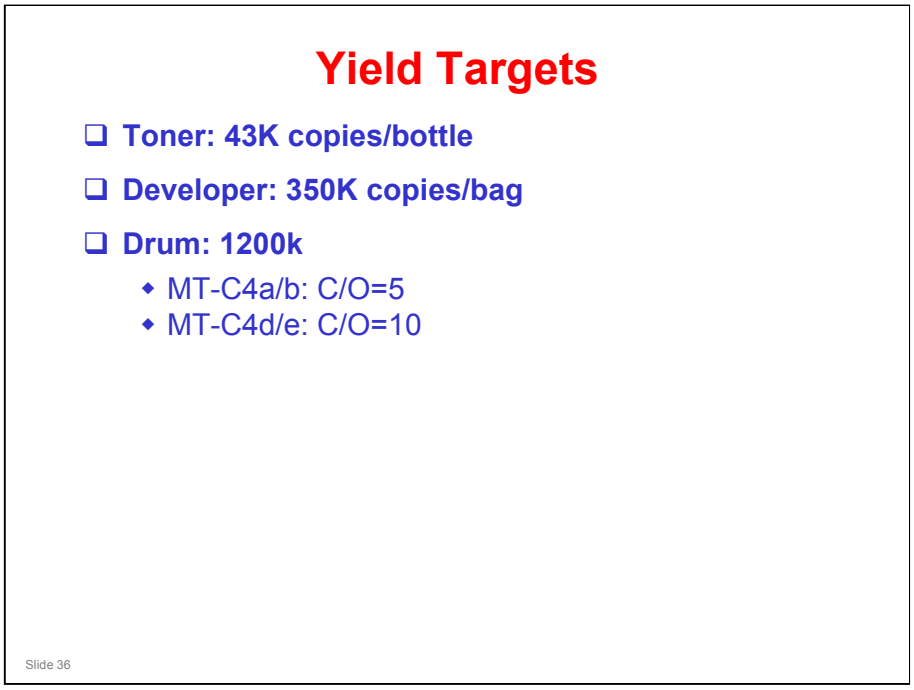
- Same as the B-C3.5, except that the target ACV is higher. The drum has a more durable coating than the B-C3.5.



- The toner, developer and drum are compatible with the MTC3.5 and MT-C3 series.

This section describes changes to installation since the MT-C3.5.

Changes

- **Main machine**
  - The following procedures are modified slightly
  - Developer initialization
    - » See the next slide
  - Leveling the machine
    - » See the service manual for the new procedure
  - Procedures were added for connecting the following
    - » Drum heater
    - » Tray heater
    - » Scanner heater
- **Options**
  - A3/DLT Feeder Kit (D482) installation is changed, because there are some modifications to the tandem tray.
  - Copy connector kit installation procedure: Based on V-C2
  - New procedures for the new options (folder, USB/SD slot)
    - » Folder installation: There are two paper guides in the accessories. Use the short paper guide; the long one is for use with the B-C4
  - Changed procedures for the controller options
    - » Check the service manual for the new procedures

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No additional notes

Developer Initialization

- **Enter SP2963-002, then enter the lot number of the developer.**
  - The lot number should be seven numbers.
  - If seven numbers are not entered before you do SP2963-001, the LCD shows an error message.
- **Do SP2963-001.**
- **It may take approximately four minutes to initialize toner supply and the auto process control settings.**

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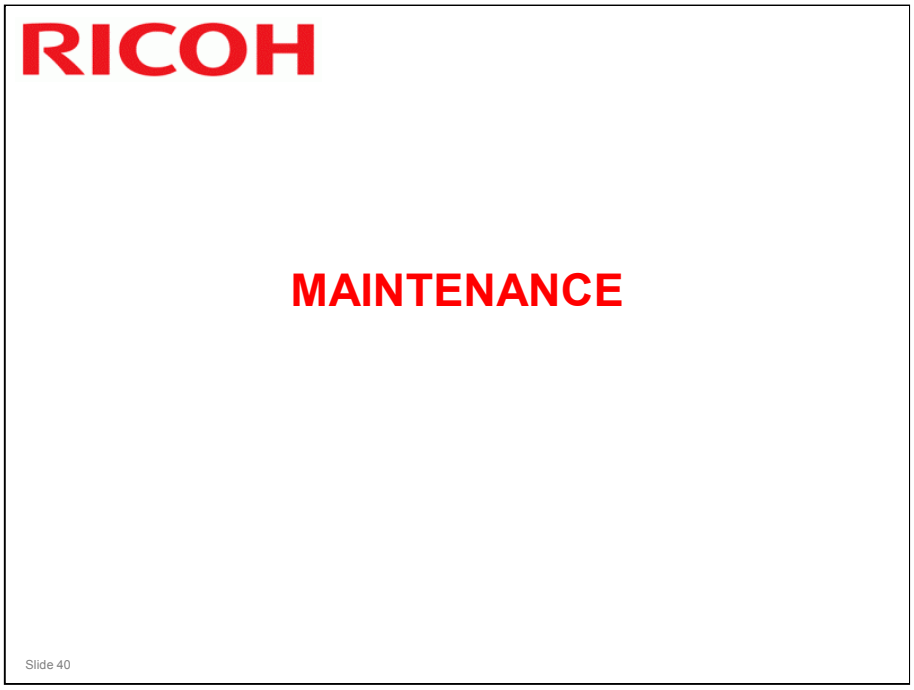
❒ This should also be done when replacing the developer.



This section describes changes to PM since the MT-C3.5.

New PM Parts

- ARDF transport belt: Replace every 600 k
- PTL (pre-transfer lamp): Clean every 300k (dry cloth)
- Toner pan: Clean every 300k (dry cloth)
- Bypass paper end sensor: Clean every 300k (blower brush)
- Transfer Belt Unit Casing and Slide Rail Bracket: Clean every 300k (dry cloth)
- Optional Folder: Inspect and clean each PM visit
- Toner collection bottle: Inspect each visit (expected life 1500k)

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No additional notes

Other Changes to the PM Table

- **Exposure glass: Clean with damp cloth (no alcohol)**
- **Charge corona wire: Clean with a cloth moistened with alcohol (no water)**
- **Charge corona grid: Replace at 300k, not 450k**
- **Fusing unit components: Replace at 450k, not 300k**
  - Cleaning Web Pressure Roller Bearings: Replace at 900k

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No additional notes

This section describes changes to the replacement procedures since the MT-C3.5.

New Procedures

- **ARDF Transport Belt Assembly**
- **SIOB**
  - This is a new circuit board in the scanner/AD section
- **Toner Separation Unit**
- **Paper Feed Motors**
  - This machine has three paper feed motors.
  - D062/D063 have a motor in each feed unit. However, D065/D066 have all the feed motors at the rear of the machine.
  - The paper feed motors of the D065/D066 are different from the motors for the D062/D063. The D065/D066 motors have a higher torque.

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No additional notes

Modified Procedures - 1

- **Minor changes have been made to these replacement procedures.**
  - Covers
    - » Operation panel
  - ADF/Scanner
    - » ADF
    - » Scanner motor
    - » Scanner HP sensor
    - » Scanner wires
    - » Scanner heater
    - » ADF registration sensor, feed motor, CIS unit
    - » Exposure lamp: Take care not to crease the flat cable
  - Laser Unit
    - » LD Unit
    - » Polygon Motor and Polygon Motor Drive Board
  - Development
    - » Development unit removal
    - » Entrance seal and side seals
  - Drum
    - » Drum motor: Gears are not the same for all models

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No additional notes

Modified Procedures - 2

- **Minor changes have been made to these replacement procedures.**
  - Paper feed
    - » Tandem tray side-to-side registration adjustment: Layout of the machine is different.
    - » Paper feed unit: D065 and D066 have 2 harnesses.
    - » Paper tray removal for trays 2 and 3 has changed
    - » New note added for paper feed roller replacement
      - – The feed rollers of the main machine and the LCT are not interchangeable because they turn in different directions.
      - – After replacing a feed roller in the main machine, always make sure that it turns counterclockwise in the direction of paper feed.
      - – Do not touch the surface of the rollers with your bare hands.
      - – Reset the PM count to zero for the new rollers
  - Fusing
    - » Fusing Lamps, Hot Roller, and Pressure Roller
    - » Fusing/Exit Motor
  - Others
    - » Ozone filters
    - » Circuit boards: All procedures changed

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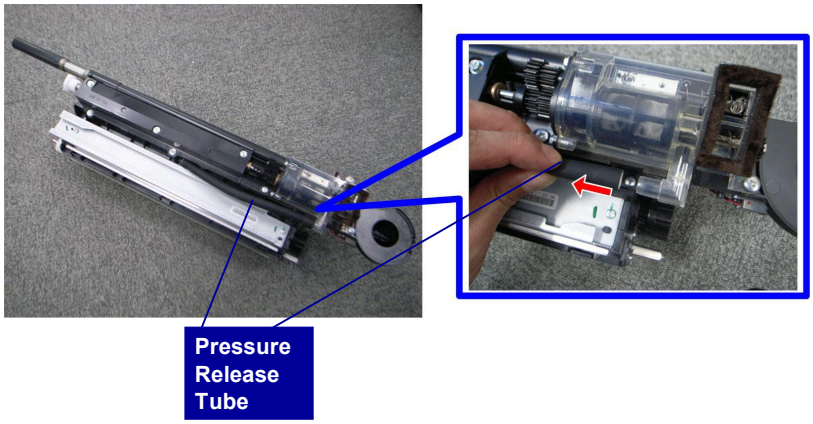
No additional notes

Development Unit - 1



- **For D066, the pressure release tube should be removed before removing the development unit.**
  - This also must be done during installation, before developer is added.

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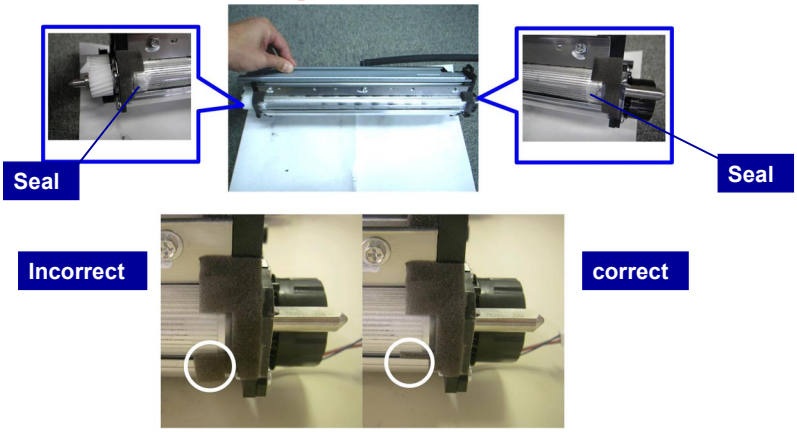
No additional notes

Development Unit - 2



- **Entrance Seal and Side Seals: New notes for reinstalling the seals**
  - Attach the seals as shown in the above diagrams.

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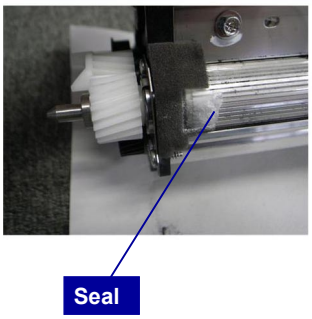
No additional notes

Development Unit - 3



- This is a closer look at the seal.

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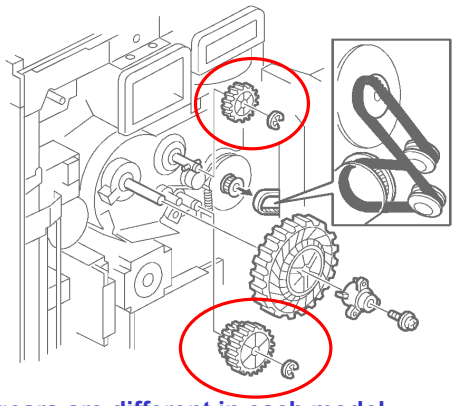
No additional notes

Drum Motor



- **These gears are different in each model.**
  - D062 and D063 have black gears, but D065 and D066 have white ones.

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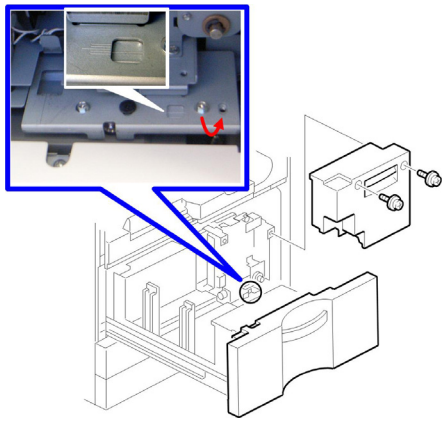
No additional notes

Tandem Tray Side-to-side Registration



- The adjustment is basically the same, but the machine layout is slightly different.

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No additional notes

Circuit Boards

- **The procedures have all changed.**
  - Also note the following points
- **NVRAM**
  - The BCU and controller boards both have NVRAMs.
  - See the service manual for correct removal and replacement procedures.
- **CNT Board**
  - Each model in this series has a different CNT board.
  - If you install the wrong CNT board, the operation panel displays SC955-03.
  - In this case, replace the CNT with the correct board.
  - Remove the NVRAM from the old CNT board, and install it on the new CNT board.

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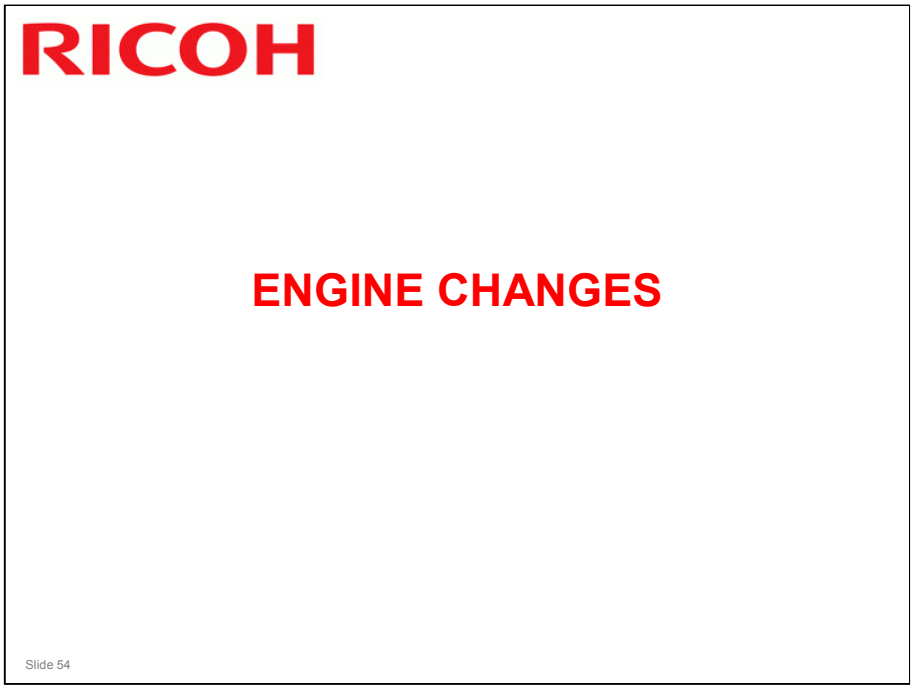
No additional notes

PSU Board

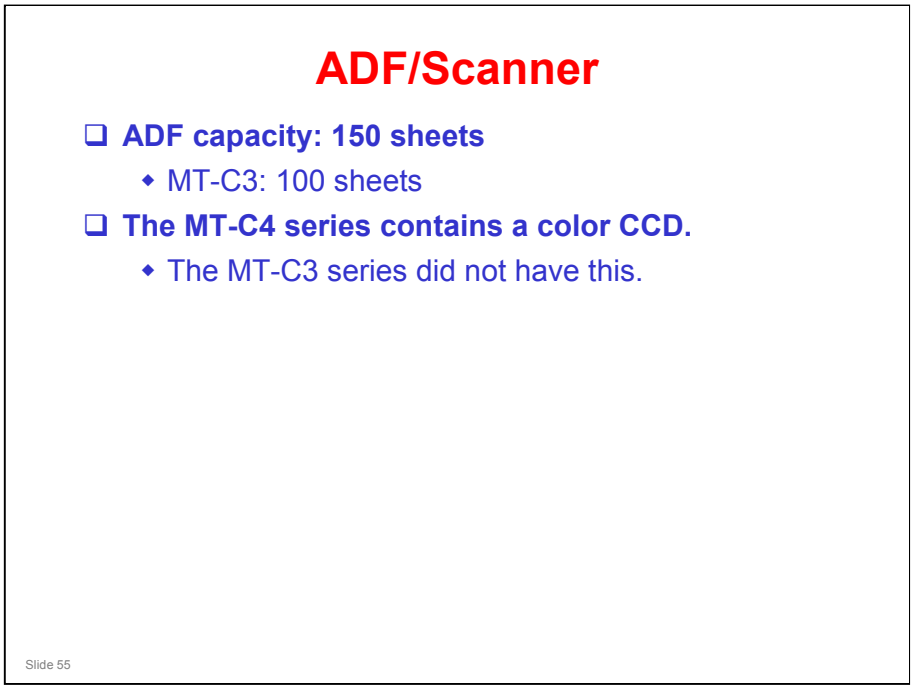
- Make sure that you connect the white cable and the black cable in the correct locations.

Slide 53

No additional notes

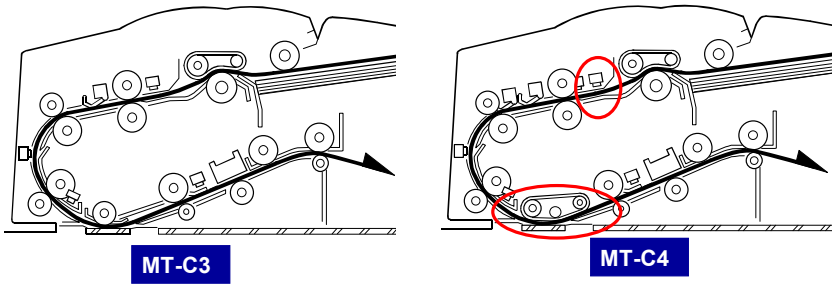


This section describes important changes to the engine since the MT-C3.5.



No additional notes

ADF Transport Belt



- The ADF transport belt was added.
- Also, the 'skew correction sensor' is now called the 'separation sensor'.

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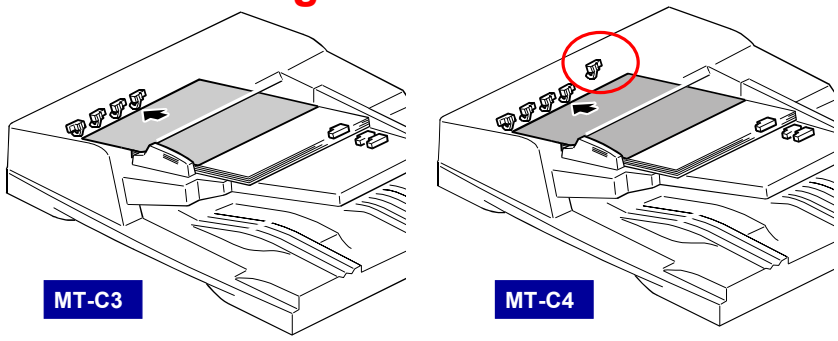
No additional notes

ADF Original Size Detection



- The MT-C4 uses an additional sensor.
- This is similar to the V-C1.
- SP6016 is also similar to V-C1, not MT-C3

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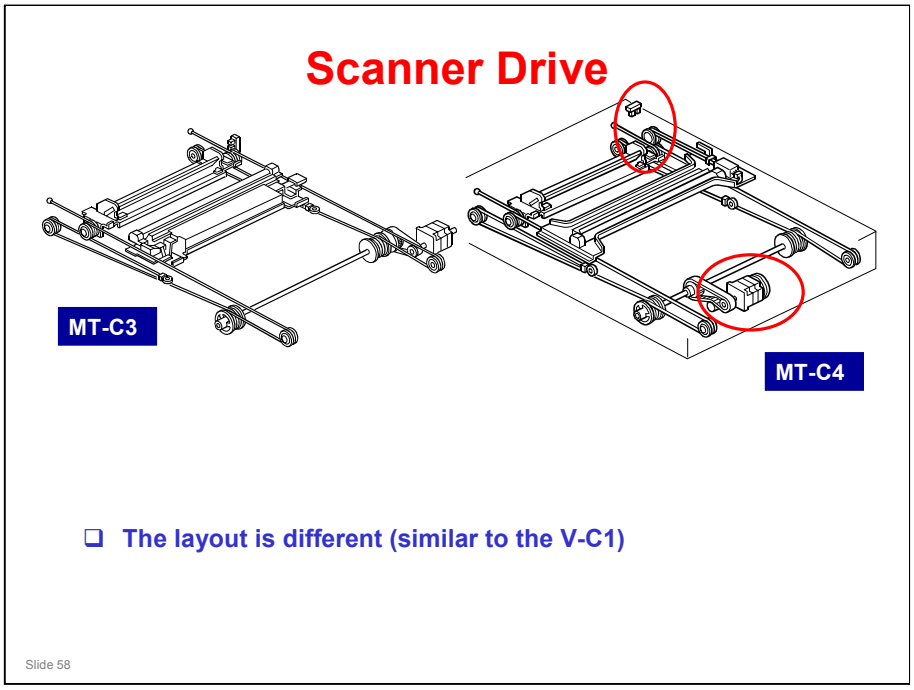
- In the scanner below the exposure glass, there are also some sensors, as in previous models.
- There are some differences between the Europe and North America versions
  - EU: Length sensor x 1
  - NA: Length sensor x 2



The red circles show the important differences.

New Circuit Board

- **SIOB**
  - Located under the exposure glass
  - Drives the scanner and ADF motors and exposure lamp
  - Monitors the scanner HP sensor and the ADF components
  - Interfaces the BCU and IPU with the operation panel and SBU.

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No additional notes

Laser

- Up to 32 density levels per pixel
- Two LDs, each emitting two beams
- Laser beam pulses are controlled by the IPU.
  - In the MT-C3, it was controlled by the BICU.

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No additional notes

Drum

- **Rotation Speeds**
  - D062/D063: 270mm/s
  - D065: 362mm/s
  - D066: 420mm/s
- **Reverse rotation at end of job: 5 mm (not 10 mm)**

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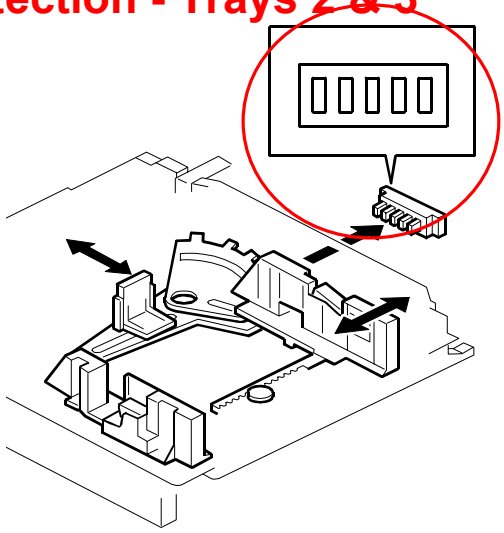
No additional notes

Paper Size Detection - Trays 2 & 3

- **Tray 1 does not have a size sensor.**
  - Input the paper size with SP5019 002.
- **Trays 2 and 3: If the user wants to use a paper size that cannot be detected by the sensors, they can select the paper size with the Tray Paper Settings button on the operation panel.**
  - The 'custom size' button only appears if SP 5112 is enabled



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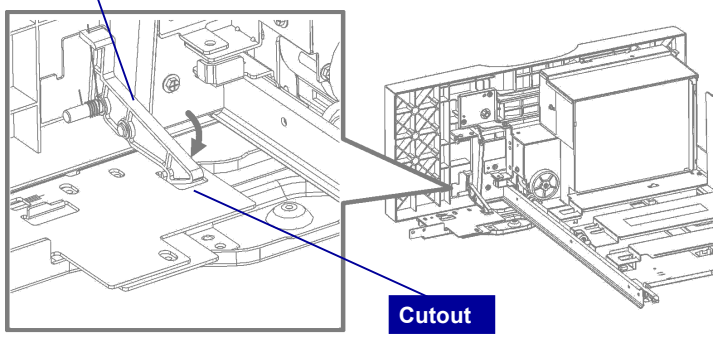
- Paper Size Detection is changed to a system that is similar to Bellini-C3.
- Tray 1 does not have a size sensor or a dial.
  - The paper size for tray 1 has to be stored with SP5019 002.
  - Adjustable side fences also need to be moved. This can only be done by a technician. tray does not have paper size switches. Every time the paper size is changed by moving the front and back fences, you must enter the selected paper size with SP5019-002.
  - If the A3/DLT kit is installed in Tray 1, and SP5019 002 is set to 'Custom size', then a custom size for tray 1 can be input with SP 5040 (vertical dimension) and 5041 (horizontal dimension). A custom size cannot be set if Tray 1 is a tandem tray.
- For trays 2 and 3, the actuator at the rear of the tray turns on the paper size switches. The machine detects the size by the combination of switches that are turned on. The output from the switch depends on the position of the dial.
- The machine can only detect a certain number of set paper sizes. Other sizes cannot be detected. The user must use the Tray Paper Settings button on the operation panel.
  - There is no * setting, because there is no dial.
  - The default setting is 'Auto Paper Detect', which means that the machine takes the paper size from the sensor. To use a paper size that is not in the table, use the Tray Paper Settings button.
  - If the fence position is incorrect (in the case of Auto Paper Detect) or if the size is not the same as set with the operation panel, jams will occur.
  - Note SP 5112 however: The machine default is 'disabled' which means the user cannot use non-standard paper sizes.
  - There is no SP for the F sizes (8 x 13, 8.5 x 13, 8.25 x 13), because the cassette can detect these three sizes automatically.
  - Also note that the tray can detect 12 x 18" automatically.

Tray Lock – Tray 1



- When tray 1 is placed in the paper feed unit, the lock lever drops into the cutout because of spring tension, and this locks the tray.
- The lock lever is connected to the tray handle. As a result, pulling the tray handle lifts the lock lever, and this releases the tray.

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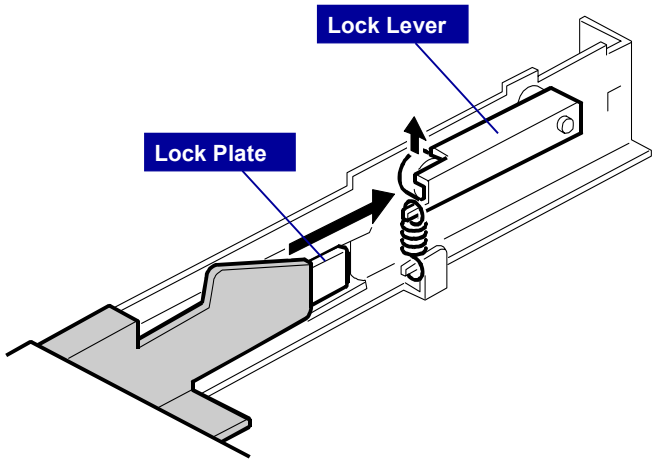
No additional notes

Tray Lock – Tray 1



- The lock lever on the left rail of the mainframe also drops behind the lock plate on the support bracket to lock the tray in the proper position at the same time.

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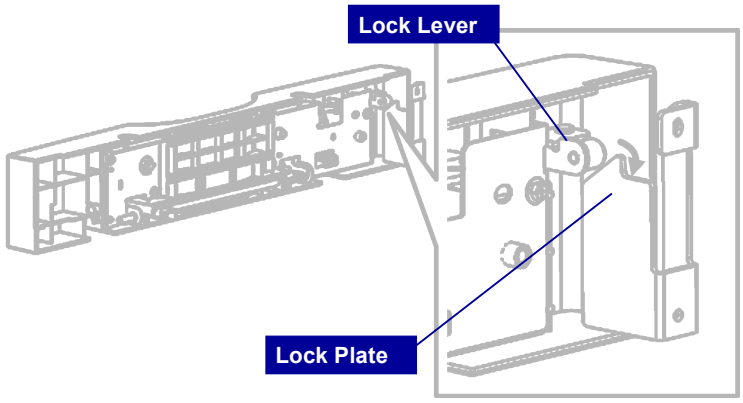
No additional notes

Tray Lock – Trays 2 & 3

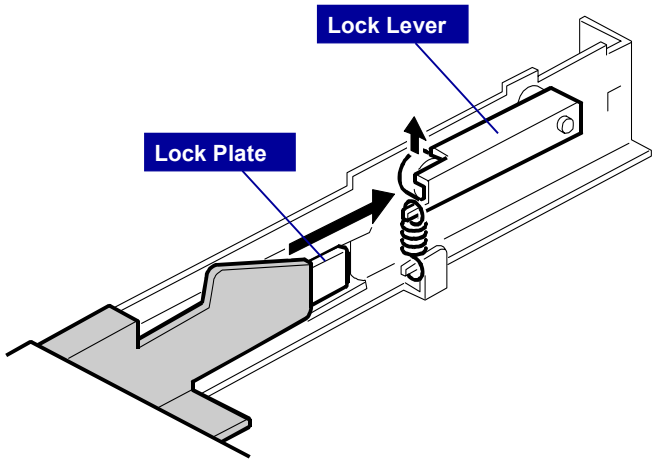


- When tray 2 or 3 is placed in the paper feed unit, the lock lever drops behind the lock plate in the mainframe because of spring tension, and this locks the tray.
- The lock lever is connected to the tray handle. As a result, pulling the tray handle lifts the lock lever, and this releases the tray.

Slide 65

No additional notes

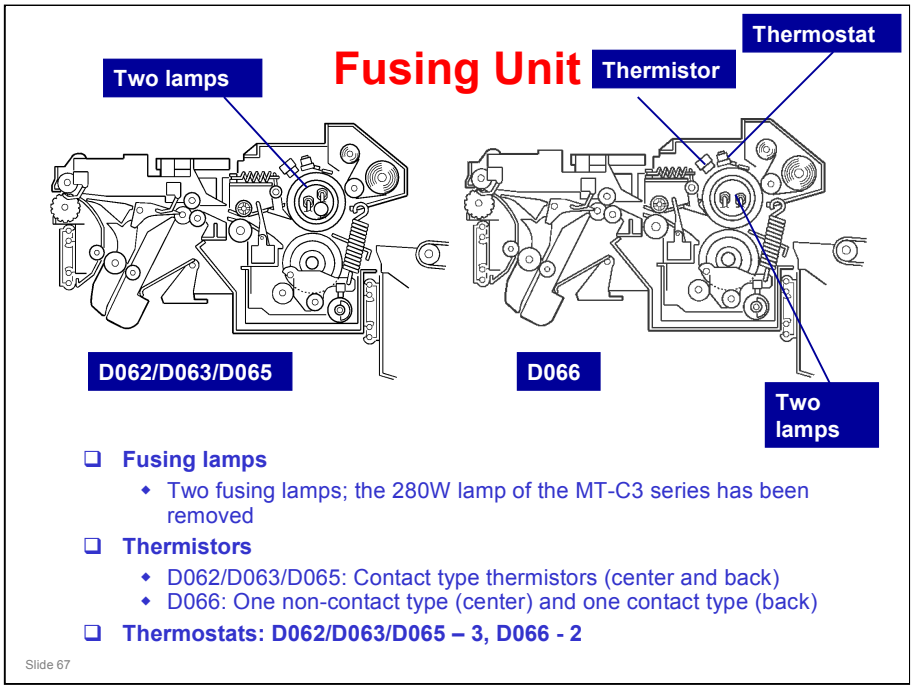
Tray Lock – Trays 2 & 3



- The lock lever on the left rail of the mainframe also drops behind the lock plate on the support bracket to lock the tray in the proper position at the same time.

Slide 66

No additional notes



- The MT-C3.5 series also has only two lamps. This fact may have been missing from some documentation.
  - D062/D063/D065: The fusing unit has spaces for three lamps, but one of them is empty.
- Part numbers of thermistors
  - D062/D063/D065: AW100108 (center), AW100109 (back)
  - D066: AW100084 (center), AW100076 (back)

Fusing Unit

- **Hot roller and pressure roller**
  - D062/D063/D065: Diameter 40 mm (same as MT-C3.5)
  - D066: Diameter 50 mm (the hot roller has a thicker wall)
- **Pressure release mechanism**
  - There is no pressure release mechanism in the D066.
  - The nip between the hot roller and pressure roller is made only by spring tension. The diameter of the hot roller and pressure roller is bigger than in the other models.

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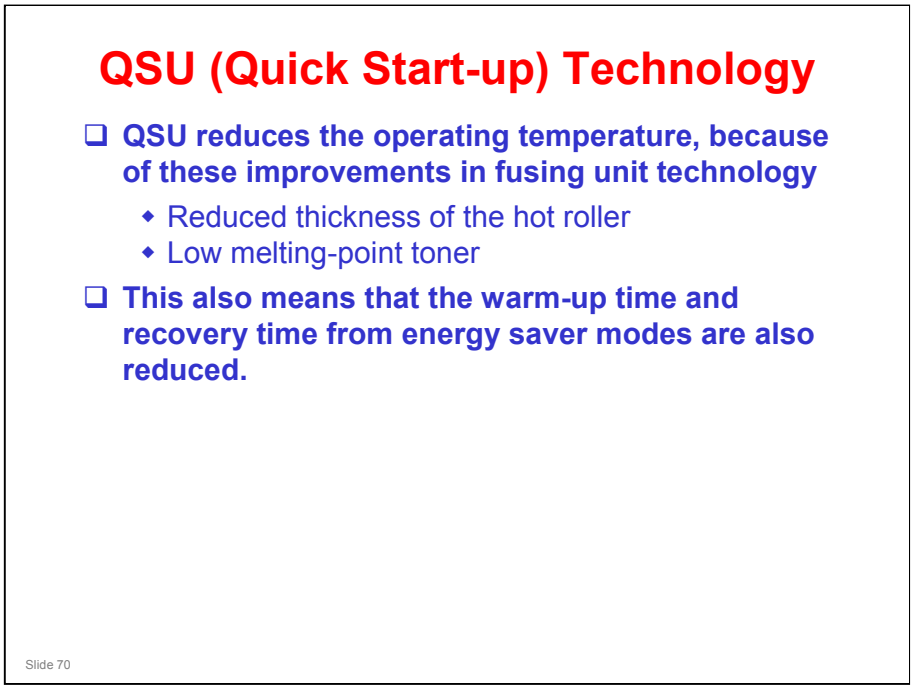
No additional notes

This section describes the latest situation concerning energy saver modes. It applies to other recent models, and not only MT-C4.



- 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.

Instruct the users to use Energy Saving Features

- **Energy Saver mode**
  - Customers should use energy saver modes properly, to save energy and improve the environment.
- **Duplexing**
  - Duplexing reduces the amount of paper used.
  - This means that less energy overall is used for paper production, which improves the environment.

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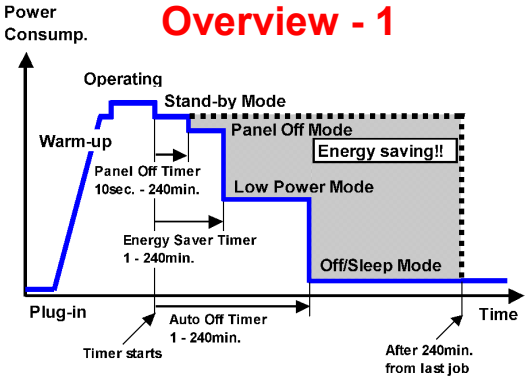
No additional notes

Energy Saver Modes

Overview - 1



- **This machine has three types of energy saver modes:**
  - Panel off mode
  - Low power mode
  - Off/Sleep mode
    - » Off mode: It is used only if no printer/scanner and/or fax unit is installed.
    - » Sleep mode: It is used instead of off mode when a printer/scanner or fax unit is installed.

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- 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 grey 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 grey area will disappear, and no energy is saved before 240 minutes expires.

Energy Saver Modes

Overview - 2

- **The user can set these timers with User Tools (System settings > Timer setting)**
  - Panel off timer (10 sec – 240 min): Panel Off Mode
    - » Default setting: 10 seconds
  - Energy saver timer (1 – 240 min): Low Power Mode
    - » Default setting: 1 minute
  - Auto off timer (1 – 240 min): Off/Sleep Mode
    - » Default settings:
      - – MT-C4a/b: 1 minute
      - – MT-C4d: 16 minutes
      - – MT-C4e: 15 minutes
- **Auto off may not work when an error message appears.**
- **These timers start at the same time:**
  - When the machine ends all waiting jobs
  - When the user ends all manual operations

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- 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.

Energy Saver Modes

Overview - 3

- **How is energy saved?**
  - Panel off mode
    - » Operation switch: On
    - » Energy saver LED: On
    - » Main power LED: On
    - » Fusing lamps: At target operating temperature (level 1) or slightly reduced (level 2)
  - Low power mode
    - » Operation switch: On
    - » Energy saver LED: On
    - » Main power LED: On
    - » Fusing lamps: Temperature is reduced
  - Off/sleep mode
    - » Operation switch: Off
    - » Energy saver LED: Off
    - » Main power LED: On
    - » Fusing lamps: Off

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MT-C4 does not have the level 2 setting for Panel Off Mode.

Energy Saver Modes

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

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No additional notes

Energy Saver Modes

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 10 seconds
- **The user can set the level with a User Tool.**
  - System settings > Administrator Tools > Energy saver level

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MT-C4 does not have the level 2 setting.

Energy Saver Modes

Low Power Mode

- **The machine enters low power mode when the energy saver timer runs out after the last job.**
- **The energy saver timer is controlled by User Tools: Timer settings.**
- **When the machine enters low power mode, the fusing temperature is lowered to the prescribed temperature (below the machine ready temperature).**
- **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
- **The recovery time depends on the model and the region.**
  - MT-C4-a/b/d: 10 seconds
  - MT-C4e: 30 seconds

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No additional notes

Energy Saver Modes

Off Mode

- **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 auto off timer is controlled by User Tools: Timer settings.
  - 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.**
- **The machine recovers to the ready condition if the operation switch is pressed.**
- **Recovery time**
  - MT-C4a/b: Max 30 seconds
  - MT-C4d: Max 60 seconds
  - MT-C4e: Max 300 seconds

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No additional notes

Energy Saver Modes

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 auto off timer is controlled by User Tools: Timer settings.
  - 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.**

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No additional notes

Energy Saver Modes

Sleep Mode - 2

- **The machine recovers to the ready condition:**
  - If data is received
    - » Then, after the job is completed, the machine returns to sleep mode immediately. Panel Off and Low Power modes are skipped.
  - If the operation switch is pressed
    - » 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.
    - » This is the same as Off mode.
- **Recovery time**
  - MT-C4a/b: Max 30 seconds
  - MT-C4d: Max 60 seconds
  - MT-C4e: Max 300 seconds

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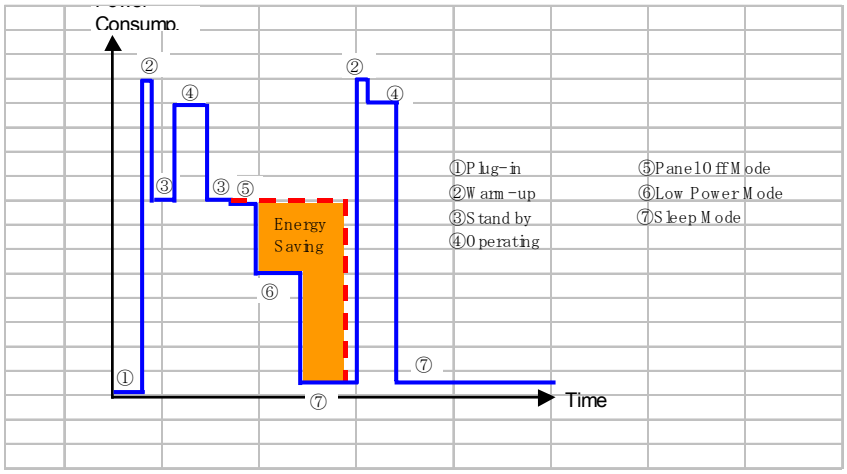
No additional notes

Energy Saver Modes

Energy Savings during Off/Sleep Mode - 1

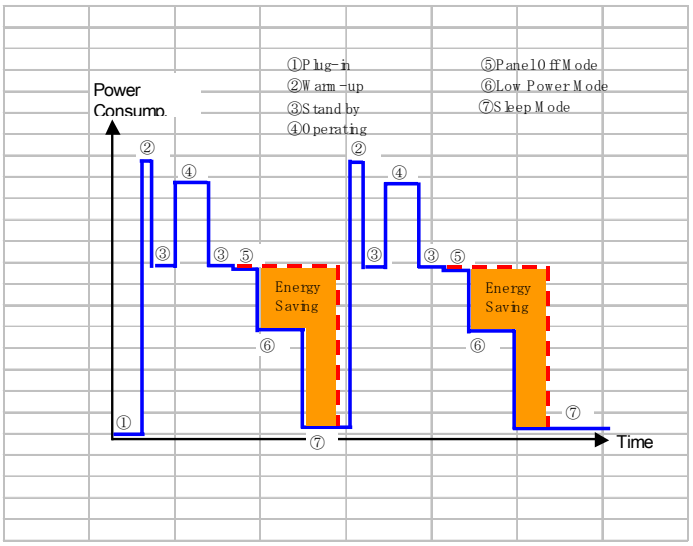


Slide 81

- This timing chart shows what happens if data is received while the machine in sleep mode.

Energy Saver Modes

Energy Savings during Off/Sleep Mode - 2



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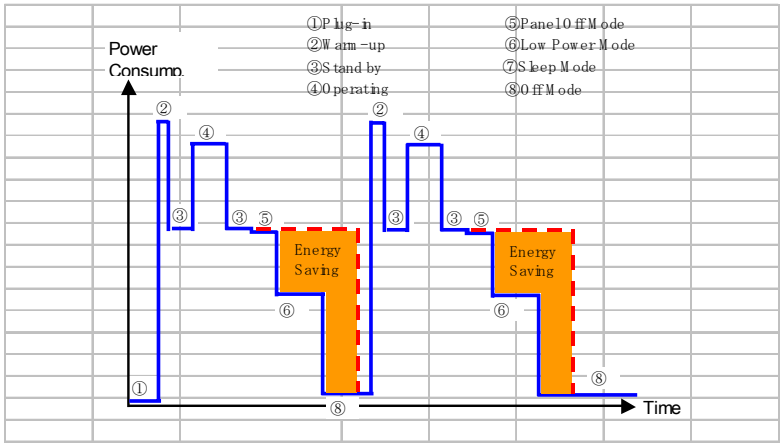
❒ This timing chart shows what happens if the operation switch is pressed while the machine in sleep mode.

Energy Saver Modes

Energy Savings during Off/Sleep Mode - 3



Slide 83

- This timing chart shows what happens if the operation switch is pressed while the machine in off mode.

Energy Saver Modes

Measuring the Energy Consumed - 1

- **SP 8941 (Machine Status) keeps a record of the amount of time that the machine spends in each mode.**
  - 8941 001: Operating
  - 8941 002: Standby
  - 8941 003: Panel off mode
  - 8941 004: Low power mode
  - 8941 005: Off/sleep mode
- **With this data, and the power consumption values from the specifications, we can estimate the amount of energy that is used by the machine.**
  - 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

Energy Saver Modes

Measuring the Energy Consumed - 2

- **To use SP8941 to calculate the energy consumed:**
  - At the start of the measurement period, read the values of SP8941 001 to 005.
  - At the end of the measurement period, read the values of SP8941 001 to 005 again.
  - Find the amount of time spent in each mode (subtract the earlier measurement from the later measurement).
  - Multiply this by the power consumption spec for each mode.
  - Convert the result to kWh (kilowatt hours)

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Here is an example calculation.

	Power Consumption Spec (W): **Data: a**	SP8941: Machine Status	Value at Start (min) **Data: b**	Value at End (min.) **Data: c**	Amount of Time (Data:b - Data: c) (min.) **Data: d**	Power Consumption (Data:a x Data:d) (Wmin.) **Data: e**
①Operating mode	1081.8	001: Operating Time	21089.0	21386.0	297.0	321294.6
②Ready mode (stand by)	214.0	002: Standby Time	306163.0	308046.0	1883.0	402962.0
③Energy mode (Panel off)	214.0	003 Energy Save Time	71386.0	75111.0	3725.0	797150.0
④Low power mode	153.0	004: Low power Time	154084.0	156340.0	2256.0	345168.0
⑤Off /Sleep mode	7.0	005: Off mode Time	508776.0	520377.0	11601.0	81207.0
Total Time of Data: d (min.)					19762.0	
Total Time of Data: d/60min. (Hour)					329.37	
Total Power Consumption of Data: e (Wmin.)						1947781.60
Total Power Consumption of Data: e / 60min / 1000W (KWH)						32.46

Paper Saving

Measuring the Paper Consumed - 1

1. Duplex: Reduce paper volume in half!

2. Combine mode: Reduce paper volume in half!

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

Slide 86

No additional notes

Paper Saving
Measuring the Paper Consumed - 2

- **To check the paper consumption, look at the total counter and the duplex counter.**
- **The total counter counts all pages printed.**
  - For one duplex page, the total counter goes up by 2.
  - For a duplex job of a three-page original, the total counter goes up by 3.
- **The duplex counter counts pages that have images on both sides.**
  - For one duplex page, the duplex counter goes up by 1.
  - For a duplex job of a three-page original, the duplex counter will only increase by 1, even though two sheets are used.
- **MT-C4:**
  - Total counter: SP 8581 001
  - Duplex counter: SP 8411 001
  - Single-sided with combine mode: SP 8421 004
  - Duplex with combine mode: SP 8421 005

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❒ The following table shows paper savings and how the counters increase for some simple examples of single-sided and duplex jobs.

Originals	Simplex Sheet used	Duplex Sheets used	**Paper Saved**	Total counter SP8501-001	Duplex counter SP8411-001
1	1	1	**0**	1	0
2	2	1	**1**	2	1
3	3	2	**1**	3	1
4	4	2	**2**	4	2
5	5	3	**2**	5	2
10	10	5	**5**	10	5
20	20	10	**10**	20	10

Paper Saving
Measuring the Paper Consumed - 3

- **If combine mode is used, the total and duplex counters work in the same way as explained previously.**

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- The following table shows paper savings and how the counters increase for some simple examples of duplex/combine jobs.

2 in 1					
Originals	Simplex Sheet used	Combine Sheets used	**Paper Saved**	Total counter SP8501-001	Simplex Combine counter SP8421-004
1	1	1	**0**	1	1
2	2	1	**1**	1	1
3	3	2	**1**	2	2
4	4	2	**2**	2	2
5	5	3	**2**	3	2
10	10	5	**5**	5	5
20	20	10	**10**	10	10

Duplex + 2 in 1					
Originals	Simplex Sheet used	Combine Sheets used	**Paper Saved**	Total counter SP8501-001	Dupplex Combine counter SP8421-005
1	1	1	**0**	1	1
2	2	1	**1**	1	1
3	3	1	**2**	2	2
4	4	1	**3**	2	2
5	5	2	**3**	3	3
6	6	2	**4**	3	3
7	7	2	**5**	4	4
8	8	2	**6**	4	4
9	9	3	**6**	5	5
10	10	3	**7**	5	5
11	11	3	**8**	6	6
12	12	3	**9**	6	6