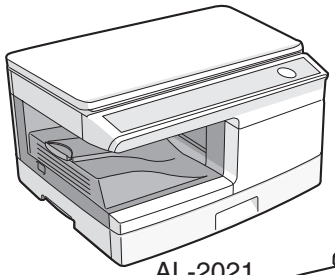
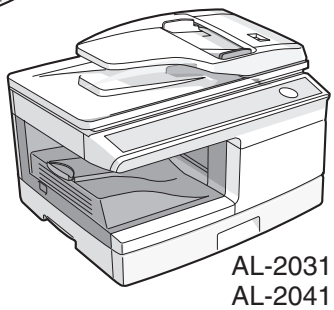
SHARP SERVICE MANUAL

CODE: 00ZAL2041/S2E



AL-2021



AL-2031
AL-2041

DIGITAL MULTIFUNCTIONAL SYSTEM

MODEL AL-2021 AL-2031 AL-2041

CONTENTS

Parts marked with "⚠" are important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

SHARP CORPORATION

This document has been published to be used for after sales service only.
The contents are subject to change without notice.

CAUTION

This product is a class 1 laser product that complies with 21CFR 1040 of the CDRH standard and IEC825. This means that this machine does not produce hazardous laser radiation. The use of controls, adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

This laser radiation is not a danger to the skin, but when an exact focusing of the laser beam is achieved on the eye's retina, there is the danger of spot damage to the retina.

The following cautions must be observed to avoid exposure of the laser beam to your eyes at the time of servicing.

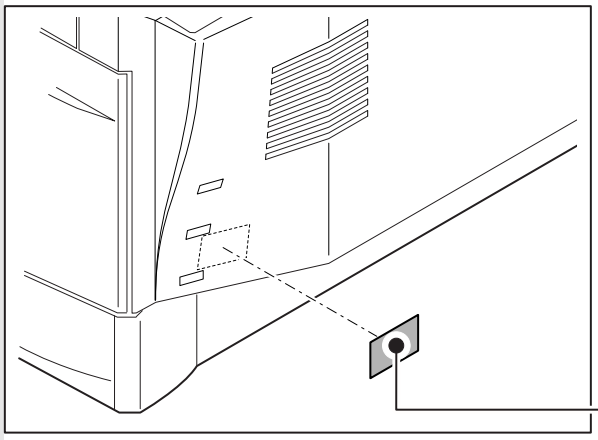
1) When a problem in the laser optical unit has occurred, the whole optical unit must be exchanged as a unit, not as individual parts.
2) Do not look into the machine with the main switch turned on after removing the developer unit, toner cartridge, and drum cartridge.
3) Do not look into the laser beam exposure slit of the laser optical unit with the connector connected when removing and installing the optical system.
4) The middle frame contains the safety interlock switch.

   Do not defeat the safety interlock by inserting wedges or other items into the switch slot.

⚠

At the production line, the output power of the scanner unit is adjusted to 0.57 MILLI-WATT PLUS 20 PCTS and is maintained constant by the operation of the Automatic Power Control (APC). Even if the APC circuit fails in operation for some reason, the maximum output power will only be 15 MILLI-WATT 0.1 MICRO-SEC. Giving and accessible emission level of 42 MICRO-WATT which is still-less than the limit of CLASS-1 laser product.

Caution
This product contains a low power laser device. To ensure continued safety do not remove any cover or attempt to gain access to the inside of the product. Refer all servicing to qualified personnel.



The foregoing is applicable only to the 220V model, 230V model and 240V model.

VAROITUS! LAITTEEN KÄYTTÄMINEN MUULLA KUIN TÄSSÄ KÄYTTÖOHJEESSA MAINITULLA TAVALLA SAATTAA ALTISTAA KÄYTTÄJÄN TURVALLISUUSLUOKAN 1 YLITTÄVÄLLE NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE.

VARNING - OM APPARATEN ANVÄNDS PÅ ANNAT SÄTT ÄN I DENNA BRUKSANVISNING SPECIFICERATS, KAN ANVÄNDAREN UTSÄTTAS FÖR OSYNLIG LASERSTRÅLNING, SOM ÖVERSKRIDER GRÄNSEN FÖR LASERKLASS 1.

CLASS 1
LASER PRODUCT
LASER KLASSE 1

LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT

CONTENTS

[1] GENERAL

1. Major functions

Configurations

Item / Model	CPM (A4)	PPM (A4)	SB/ MB	2 Tray	SPF	R-SPF	Color Scanner (push)	GDI printer	SPLC printer	E-SORT	Duplex	Shifter	FAX	Sharp desk	IEEE 1284	USB	RJ 45	External NIC
AL-2021	20CPM	20PPM	MB	×	×	×	○	×	○	○	×	×	×	○	×	○ (2.0 Hi-speed)	×	×
AL-2031	20CPM	20PPM	MB	×	○	×	○	×	○	○	×	×	×	○	×	○ (2.0 Hi-speed)	×	×
AL-2041	20CPM	20PPM	MB	×	○	×	○	×	○	○	○	×	×	○	×	○ (2.0 Hi-speed)	×	×

Descriptions of items

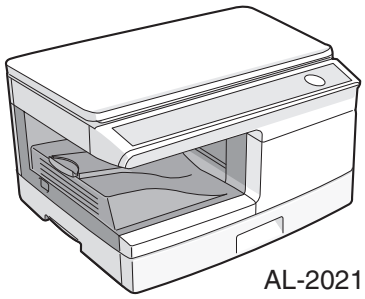
CPM:	Copy speed (Copies Per Minute)
PPM:	Print speed (Print Per Minute)
SB/MB:	SB = Manual feed single bypass, MB = Manual feed multi-bypass
2 Tray:	Second cassette unit.
SPF:	Original feed unit
R-SPF:	Duplex original feed unit
Color Scanner:	Color scanner function
GDI printer:	GDI printer function with USB
SPLC printer:	SPLC printer function
E-SORT:	Electronic sort function
Duplex:	Auto duplex copy/print function
Shifter:	Job separator function
FAX:	FAX function.
Sharpdesk:	Scanner utilities
IEEE1284:	Interface port (parallel)
USB:	Interface port (USB)
RJ45:	Interface port (Network)
External NIC:	Network expansion kit

Descriptions of table

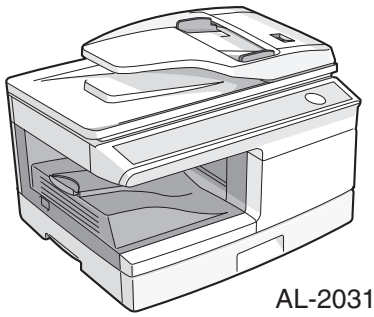
○: Standard provision

×: No function or no option available

Opt: Option



AL-2021



AL-2031/2041

[2] SPECIFICATIONS

1. Basic Specifications

Item			
Type		Desktop	
Copy system		Dry, electrostatic	
Segment (class)		Digital personal copier	
Copier dimensions	AL-2021	518mm (W) x 445mm (D) x 298mm (H) (20-1/2" (W) x 17-5/8" (D) x 11-3/4" (H))	
	AL-2031/2041	518mm (W) x 445mm (D) x 358mm (H) (20-1/2" (W) x 17-5/8" (D) x 14-1/8" (H))	
Weight (Approximately)	AL-2021	15.9kg (35.1 lbs.)	TD cartridge not included
	AL-2031/2041	17.5kg (38.6 lbs.)	

2. Operation specifications

Section, item			Details	
Paper feed section	Paper feed system			1 tray (250 sheet) + multi-bypass (50 sheet)
	AB system	Tray paper feed section	Paper size	A4, B5, A5 (Landscape)
			Paper weight	56 - 80g/m^2 (15 - 21 lbs.)
			Paper feed capacity	250 sheets
			Kinds	Standard paper, specified paper, recycled paper
			Remark	User adjustment of paper guide available
		Multi-bypass paper feed section	Paper size	Max, feedable size: A4 / Min, feedable size: 89 x 140mm
			Paper weight	56 - 128g/m^2 (15 - 34.5 lbs.)
			Paper feed capacity	50 sheets (80g/m^2)
			Kinds	Standard paper, specified paper, recycled paper, OHP, Label, (Single copy)
			Remark	User adjustment of paper guide available
	Inch system	Tray paper feed section	Paper size	8-1/2" x 14", 8-1/2" x 13", 8-1/2" x 11", 8-1/2" x 5-1/2" (Landscape)
			Paper weight	15 - 21 lbs.
			Paper feed capacity	250 sheets
			Kinds	Standard paper, specified paper, recycled paper
			Remark	User adjustment of paper guide available
		Multi-bypass paper feed section	Paper size	Max, feedable size: 8-1/2" x 14" / Min, feedable size: 3.87" x 5.83"
			Paper weight	15 - 34.5 lbs.
			Paper feed capacity	50 sheets (80g/m^2)
			Kinds	Standard paper, specified paper, recycled paper, OHP, Label, Envelop (Single copy)
			Remark	User adjustment of paper guide available
Paper exit section		Exit way		Face down
		Capacity of output tray		200 sheets
Originals		Original set		Center Registration (left edge)
		Max. original size		A4 (8-1/2" x 14")
		Original kinds		sheet, book
		Original size detection		None
Optical section	Scanning section	Scanning system		3 CCDs (RGB) sensor scanning by lighting white lamp
		CCD sensor	Resolution	600 dpi
		Lighting lamp	Type	CCFL
			Voltage	560Vrms
			Power consumption	2.8W
		Output data		Output: R, G, B 1 or 8 bits/pixel / Input: A/D 16 bits (12 bits actual)
	Writing section	Writing system		Writing to OPC drum by the semiconductor laser
		Laser unit	Resolution	600 dpi
Image forming		Photoconductor	Type	OPC (30ø)
			Life	18k
		Charger	Charging system	Saw-tooth charging with a grid, / (-) scorotron discharge
			Transfer system	(+) DC corotron system
			Separation system	(-) DC corotron system
		Developing	Developing system	Dry, 2-component magnetic brush development system
		Cleaning	Cleaning system	Counter blade system (Counter to rotation)

Section, item		Details	
Fusing section	Fusing system		Heat roller system
	Upper heat roller	Type	Teflon roller
	Lower heat roller	Type	Silicon rubber roller
	Heater lamp	Type	Halogen lamp
		Voltage	120V / 220 - 240V
		Power consumption	800W
Electrical section	Power source	Voltage	120V / 220 - 240V
		Frequency	Common use for 50 and 60Hz
	Power consumption	Max.	Less than 1000W
		Average (during copying)	350Wh/H or less
		Average (stand-by)	80Wh/H or less
		Pre-heat mode	25Wh/H or less

3. Copy performance

Section, item		Details	
▲1 Copy ratio	Document glass		Variable: 25% to 400% in 1% increments (total 376 steps) Fixed: 50%, 70%, 86%, 100%, 141%, 200% (50%, 64%, 78%, 100%, 129%, 200%)
	SPF		Variable: 50% to 200% in 1% increments (total 151 steps) Fixed: 50%, 70%, 86%, 100%, 141%, 200% (50%, 64%, 78%, 100%, 129%, 200%)
▲1 Manual steps (Text, Photo)			5 steps
Copy speed (CPM)	First-copy time *1 (Approximately)		8.0 seconds (When user program 24 is set to OFF) 10.7 seconds (paper: A4 (8-1/2" x 11"), exposure mode: AUTO, copy ratio: 100%)
	AB system A4 (Landscape)	Same size	20
	AB system B5 (Landscape)	Same size	20
	Inch system 8-1/2" x 11" (Landscape)	Same size	20
Max. continuous copy quantity			99
Void	Void area	Leading edge	1 - 4mm
		Trailing edge	4mm or less
		Side edge void area	0.5mm or more (per side) 4.5mm or less (total of both sides)
	Image loss	Leading edge	same size: 3.0mm or less (OC) / 4mm or less (SPF) Enlarge: 1.5mm or less (OC) / 3mm or less (SPF) Reduction (50%): 6.0mm or less (OC) / 8mm or less (SPF)
▲1 Warm-up time			- - -
▲1			

*1: The first-copy time is measured after the power save indicator turns off following power on, using the document glass with the polygon rotating in the copy ready state and "Selection of copy start state" set to ON in the user programs (A4 (8-1/2" x 11"), paper fed from paper tray).
The first-copy time may vary depending on machine operating conditions and ambient conditions such as temperature.

▲1 : '10/Oct/20

4. SPLC printer

Print speed	Max. 20ppm (Paper size: A4, excluding manual paper feed) * Varies depending on the PC performance.
First print time	8 sec. (without data transfer time)
Duplex	Yes (AL-2041 only)
ROPM	Yes
Memory	32MB
Interface	USB 2.0 (Hi Speed)
Emulation	SPLC
MIB support	No
Resolution	600dpi *1
Supported OS	Windows 2000 Professional, Windows XP Home Edition/Professional, Windows Vista, Windows 7
WHQL support	Yes *2
Application	Status window

*1: Engine Resolution

*2: Running change

5. Scan function

Type	Flat Bed Color Scanner
Scanning system	Original table/SPF
▲1 Light source	3 CCDs (RGB) sensor scanning by lighting white lamp (1 pcs of CCFL)
Resolution	Optical: 600 x 600dpi Setting range: 50 - 9600dpi (Preview resolution is fixed at 75dpi)
Originals	Sheet type / Book type
Output data	R, G, B 1 or 8 bits/pixel
Scan range	OC / SPF : 8.5" (H) x 14.0" (V) Original position: Left Center
Scan speed	OC / SPF : Max. 2.88ms/line
Protocol	TWAIN / WIA (XP, Vista, 7) / STI
Interface	USB 2.0 (Hi speed support)
Scanner utility	Button Manager / Sharpdesk / Composer
Scan key/lamp	Yes
Duplex scan	No
Supported OS	Windows 2000 Professional, Windows XP Home Edition/Professional, Windows Vista, Windows 7
Void area	No (User settable by PC)
WHQL supported	Yes *1

*1: By running change

6. SPF (AL-2031/2041)

Original capacity	50 sheets (56 - 90g/m^2) (15 - 23.9 lbs.) Stacking Height: less than 6.5mm or 1/4"
Original size	A4 to A5 / 8-1/2" x 14" to 5-1/2" x 8-1/2" (Landscape)
Original replacement speed	A4 about 13 sheets (65%) 8-1/2" x 11" about 14 sheets (70%)
Original placement	Face up
Original weight	56 - 90g/m^2 (15 - 23.9lbs.)
Mixed feeding (Paper size)	No
Original which cannot	Thermal papers, originals with punch holes for files, be used folded paper, transparent originals such as OHP films, stapled or clip used originals with cover up liquid used, Originals with tape sealed, originals with high level frictional coefficient such as photos or catalogs.

[3] CONSUMABLE PARTS

1. Supply system table

A. Brazil

No.	Name	Content	Life	Product name	Package
1	Develop cartridge (Black) 6K	Toner/developer cartridge x 1 IC-Chip: Yes Stirring function: Yes	6K (A4 5% document)	AL-204TD	5
2	Develop cartridge (Black) 4K	Toner/developer cartridge x 1 IC-Chip: Yes Stirring function: Yes	4K (A4 5% document)	AL-214TD	5
3	Drum cartridge	Drum cartridge x 1	18K	AL-100DR	5

B. LAG

No.	Name	Content	Life	Product name	Package
1	Develop cartridge (Black) 6K	Toner/developer cartridge x 1 IC-Chip: Yes Stirring function: Yes	6K (A4 5% document)	AL-204TD	5
2	Develop cartridge (Black) 4K	Toner/developer cartridge x 1 IC-Chip: Yes Stirring function: Yes	4K (A4 5% document)	AL-214TD	5
3	Drum cartridge	Drum cartridge x 1 Warranty card x 1	18K (A4 5% document)	AL-100DR	5

C. Europe Subsidiary

No.	Name	Content	Life	Product name	Package
1	Develop cartridge (Black) 6K	Toner/developer cartridge x 1 IC-Chip: Yes Stirring function: Yes	6K (A4 5% document)	AL-204TD	5
2	Develop cartridge (Black) 4K	Toner/developer cartridge x 1 IC-Chip: Yes Stirring function: Yes	4K (A4 5% document)	AL-214TD	5
3	Drum cartridge	Drum cartridge x 1	18K	AL-100DR	5

D. SCA/SCNZ/SBI/STCL/SRS

No.	Name	Content	Life	Product name	Package
1	Develop cartridge (Black) 6K	Toner/developer cartridge x 1 IC-Chip: Yes Stirring function: Yes	6K (A4 5% document)	AL-204TD	5
2	Develop cartridge (Black) 4K	Toner/developer cartridge x 1 IC-Chip: Yes Stirring function: Yes	4K (A4 5% document)	AL-214TD	5
3	Drum cartridge	Drum cartridge x 1	18K	AL-100DR	5

E. SRH

No.	Name	Content	Life	Product name	Package
1	Develop cartridge (Black) 6K	Toner/developer cartridge x 1 IC-Chip: Yes Stirring function: Yes	6K (A4 5% document)	AL-204TD	5
2	Develop cartridge (Black) 4K	Toner/developer cartridge x 1 IC-Chip: Yes Stirring function: Yes	4K (A4 5% document)	AL-214TD	5
3	Drum cartridge	Drum cartridge x 1	18K	AL-100DR	5

2. Environmental

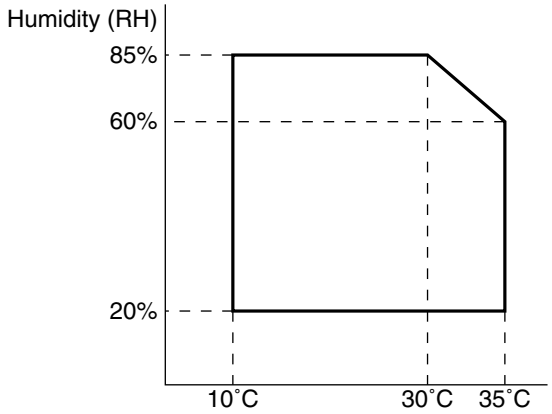
The environmental conditions for assuring the copy quality and the machine operations are as follows:

(1) Normal operating condition

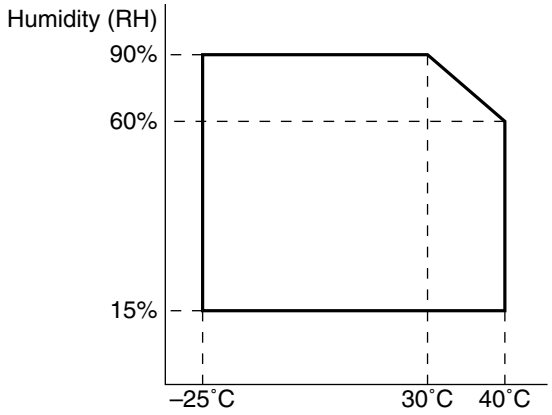
Temperature: 20°C - 25°C

Humidity: 65 ± 5%RH

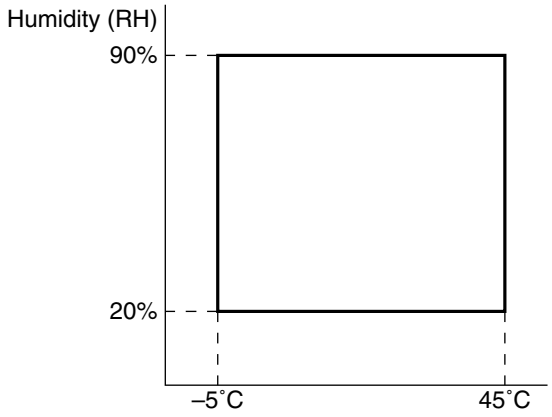
(2) Acceptable operating condition



(3) Transport condition



(4) Supply storage condition



3. Production control number (lot No.) identification

<Developing cartridge>

1

□□□□□□□□□□–◇◇–▲–◆

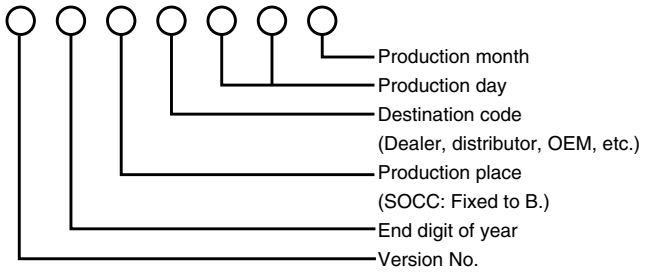
–●–○○○○○○○○–◎◎◎◎◎–△

□ : Model name
◇ : Color code
▲ : Destination
◆ : Skating
● : Production place
○ : Production date (YYYYMMDD)
◎ : Serial number
△ : Version number

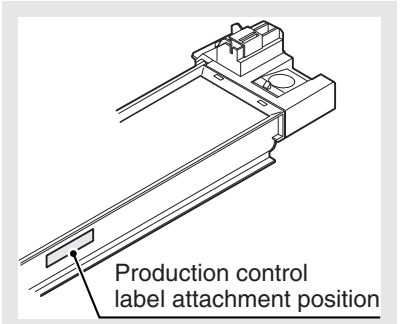
<Drum cartridge>

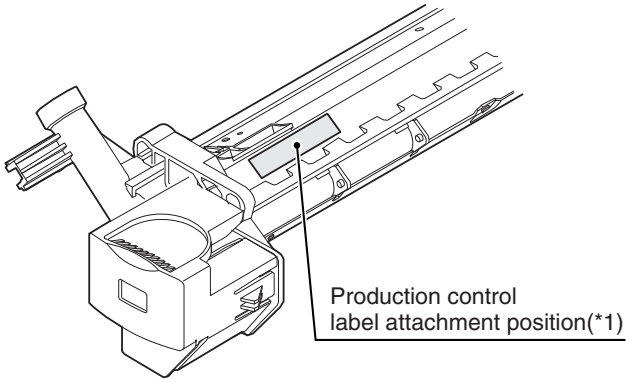
The label on the drum cartridge shows the date of production.

(SOCC production)



1

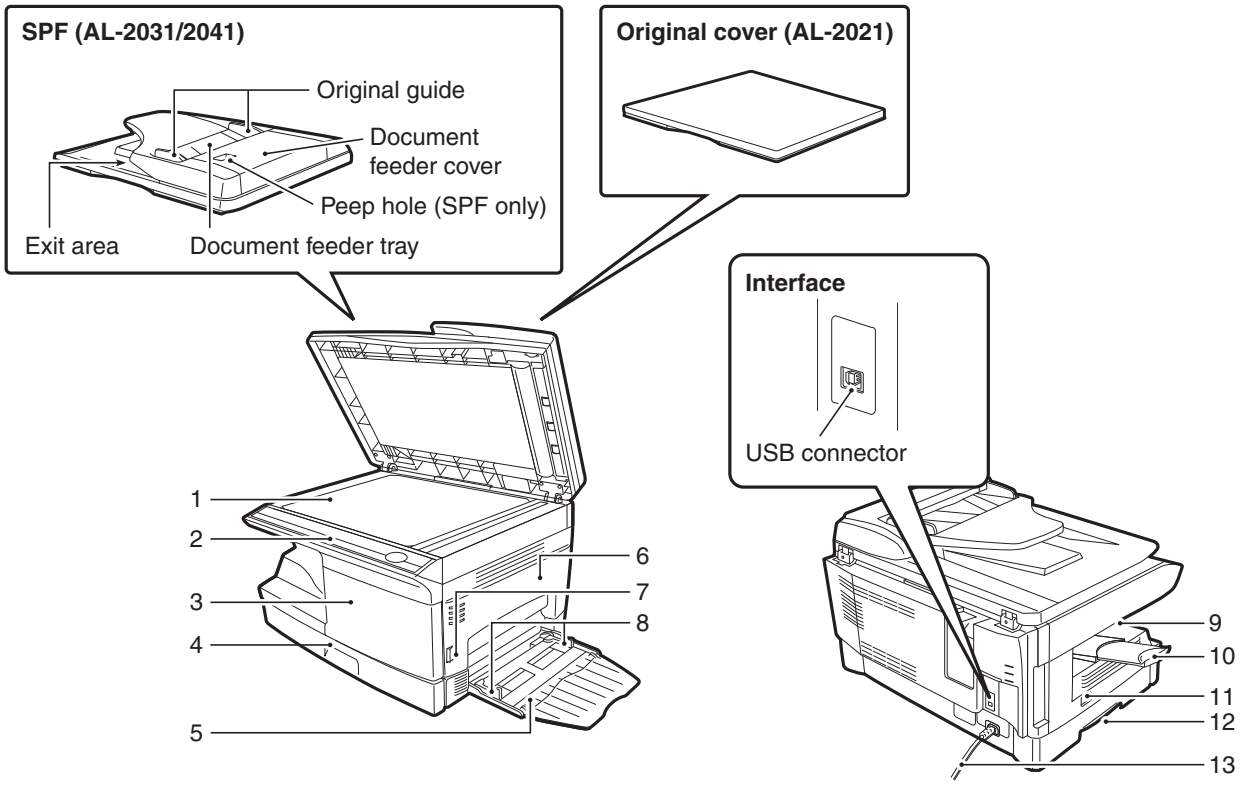




*1: The production control label is not attached to the cartridge of a China product.

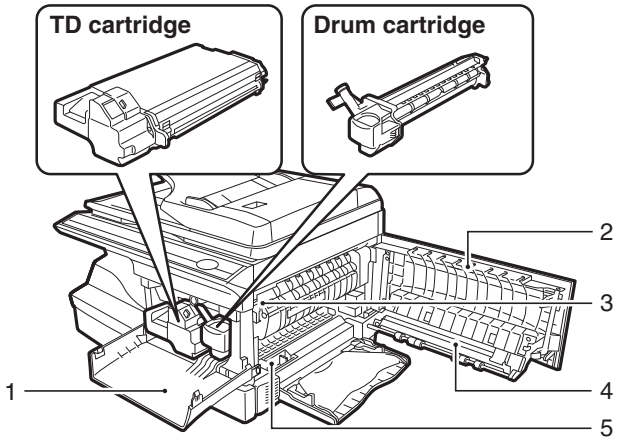
[4] EXTERNAL VIEWS AND INTERNAL STRUCTURES

1. Appearance



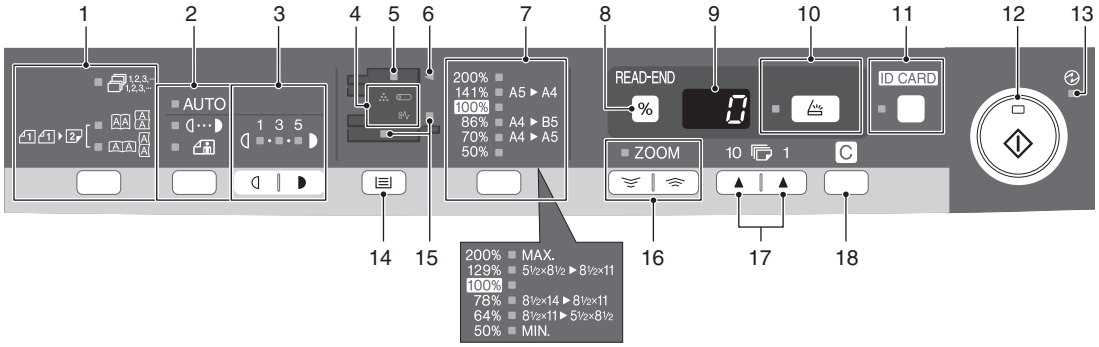
1	Document glass	2	Operation panel	3	Front cover
4	Paper tray	5	Multi-bypass tray	6	Side cover
7	Side cover open button	8	Bypass tray paper guides	9	Paper output tray
10	Paper output tray extension	11	Power switch	12	Handle
13	Power cord				

2. Internal



1	Front cover	2	Side cover	3	Fusing unit release lever
4	Transfer charger	5	Charger cleaner		

3. Operation panel



1	**Two-sided copy key[*1]/Sort key and indicators** Use to select sort mode. Two-sided copies from one-sided originals. Turn on Long Edge or Turn on Short Edge can be selected.	10	**SCAN key and indicator**
2	**Exposure mode selector key and indicators** Use to sequentially select the exposure modes: AUTO, MANUAL or PHOTO. Selected mode is shown by a lit indicator.	11	**ID CARD key and indicator** Use to copy ID card. For description, see "ID CARD COPY".
3	**Light and dark keys and indicators** Use to adjust the MANUAL or PHOTO exposure level. Selected exposure level is shown by a lit indicator. Use to start and terminate user program setting.	12	**Start key and indicator** • Copying is possible when the indicator is on. • Press to start copying. • Use to set a user program.
4	**Alarm indicators** Drum replacement required indicator Misfeed indicator TD cartridge replacement required indicator	13	**Power save indicator** Lights up when the unit is in a power save mode.
5	**SPF indicator[*2]**	14	**Tray select key** Use to select a paper feed station (paper tray or multi-bypass tray).
6	**SPF misfeed indicator[*2]**	15	**Paper feed location indicators** Light up to show the selected paper feed station.
7	**Copy ratio selector key[*3] and indicators** Use to sequentially select preset reduction/enlargement copy ratios. Selected copy ratio is shown by a lit indicator.	16	**ZOOM keys and indicator** Use to select any reduction or enlargement copy ratio from 25% to 400% in 1% increments. (When the SPF is being used, the zoom copy ratio range is 50% to 200%.)
8	**Copy ratio display (%) key/READ-END key** • Use to verify a zoom setting without changing the zoom ratio. • Use to check the number of originals that must be returned to the document feeder tray if a misfeed occurs in the machine when the SPF is used. • Use to terminate reading originals in sort mode.	17	**Copy quantity keys** • Use to select the desired copy quantity (1 to 99). • Use to make user program entries.
9	**Display** Displays the specified copy quantity, zoom copy ratio, user program code and error code.	18	**Clear key** • Press to clear the display, or press during a copy run to terminate copying. • Press and hold down during standby to display the total number of copies made to date.

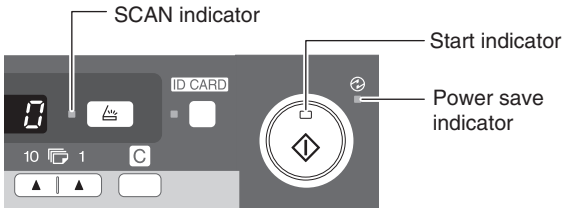
*1: AL-2041 only.

*2: AL-2031/2041 only.

*3: The indicators of the operation panel may differ depending on the country and region.

4. Indicators on the operation panel

The start ( ) indicator indicates the state of the printer or scanner.



Start indicator

On:	Indicates the unit is ready for copying or scanning is being performed.
Blinking:	The indicator blinks in the following situations: • When a print job is interrupted. • When reserving a copy job. • When toner is being replenished during a copy or print job.
Off:	The indicator is off in the following situations: • During copying or scanning. • The unit is in the auto power shut-off mode. • When a misfeed or error has occurred. • During print online.

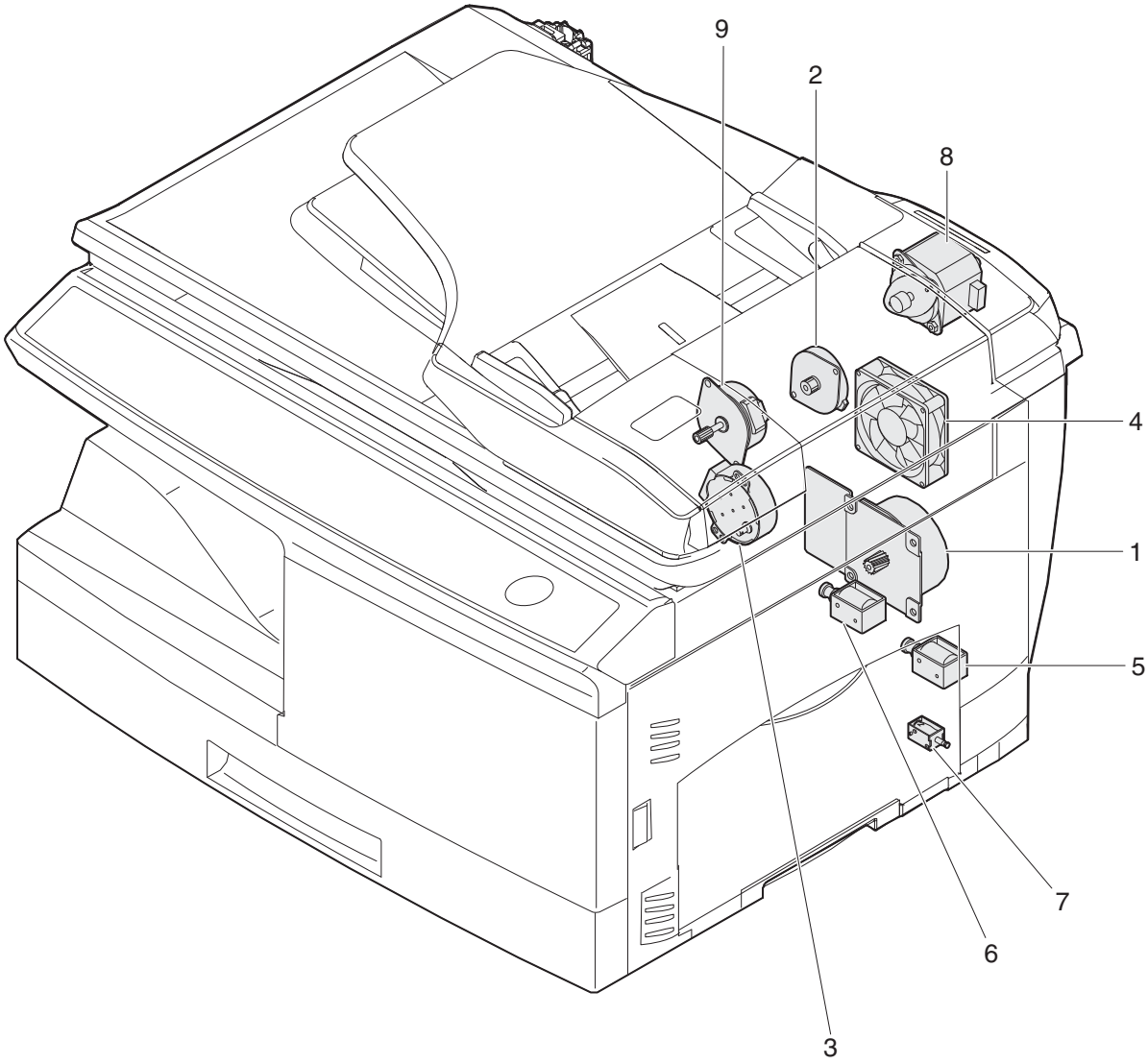
Power save indicator

On:	Indicates the unit is in a power save mode.
Blinking:	Indicates that the unit is initializing (when the side cover is opened and closed or the power turned off and on).

SCAN indicator

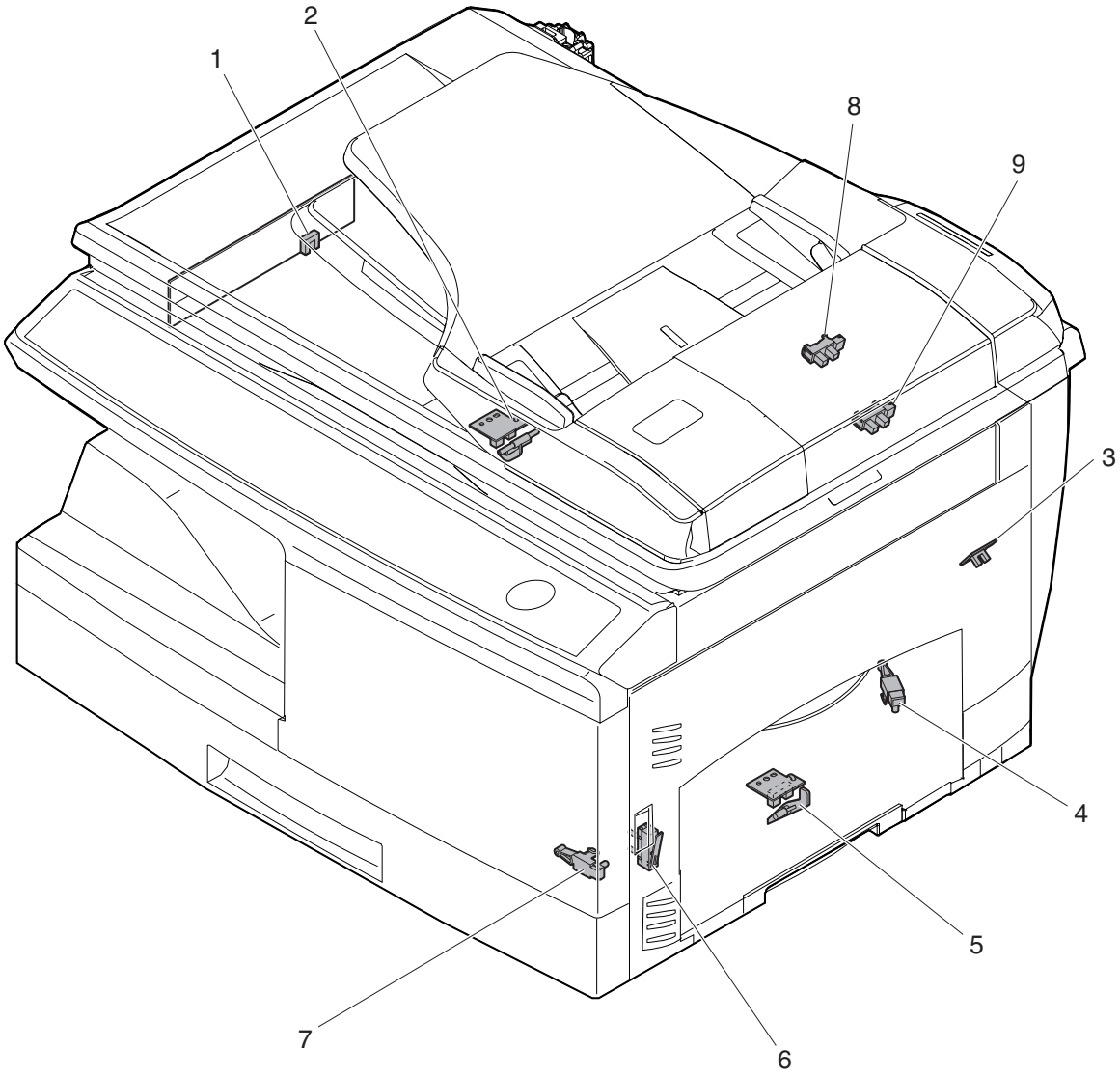
On:	The SCAN ( ) key has been pressed and the unit is in scanner mode.
Blinking:	A scan job is being executed from the computer, or scan data is stored in the unit's memory.
Off:	The unit is in the copy mode.

5. Motors and solenoids



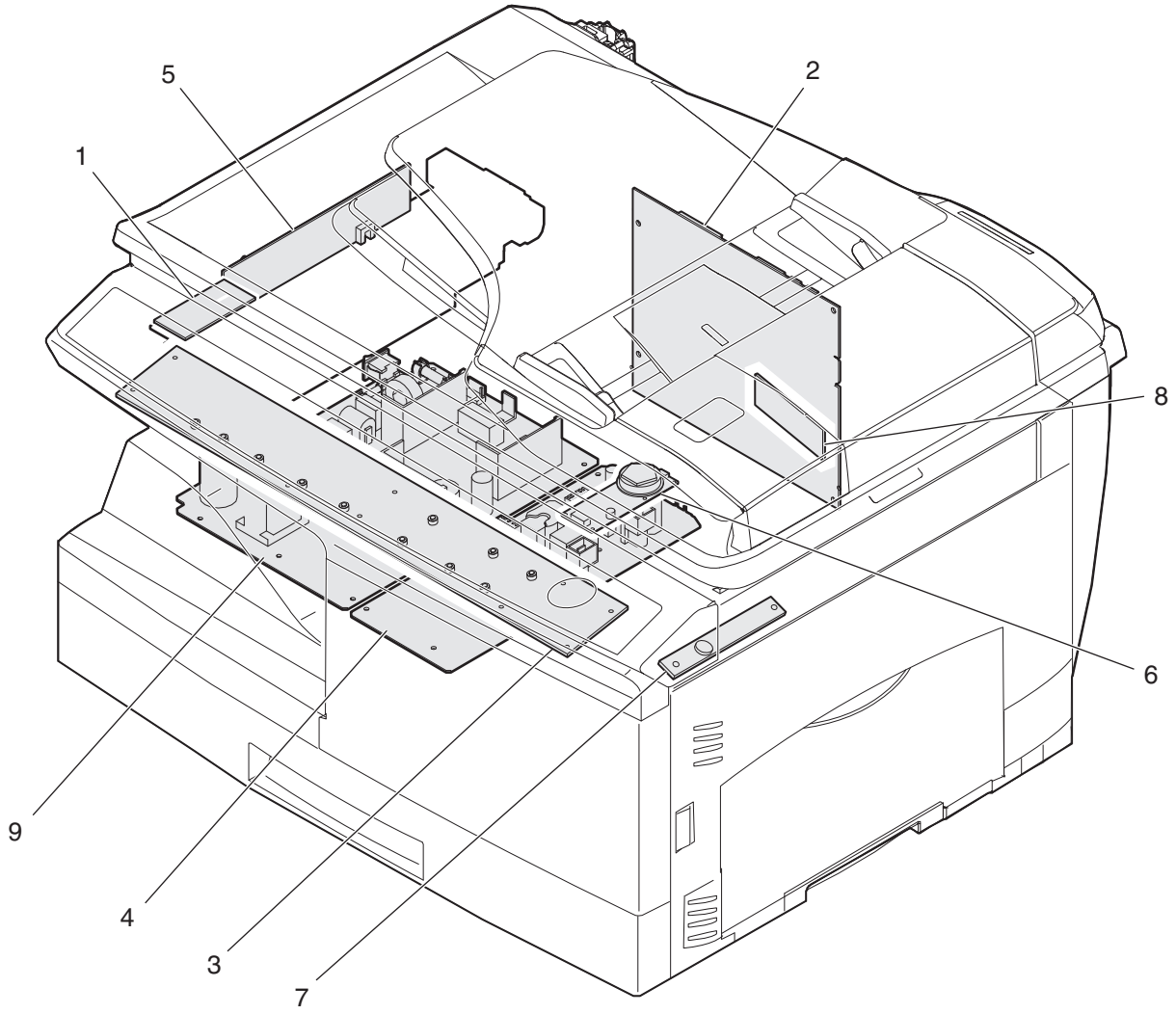
No.	Name	Control signal	Function / Operation
1	Main motor	MM	Drives the copier.
2	Scanner motor	MRMT	Drives the optical mirror base (scanner unit).
3	Toner motor	TM	Supplies toner.
4	Cooling fan motor	VFM	Cools the optical, fusing section.
5	Resist roller solenoid	RRS	Resist roller rotation control solenoid
6	Paper feed solenoid	CPFS1	Cassette Paper feed solenoid 1
7	Multi paper feed solenoid	MPFS	Multi manual pages feed solenoid
8	SPF motor	SPFM	Drives the single pass feeder (AL-2031/2041)
9	Duplex motor	DMT	Devices the duplex paper transport section (AL-2041)

6. Sensors and switches



No.	Name	Signal	Type	Function / Operation	Output
1	Scanner unit home position sensor	MHPS	Transmission sensor	Scanner unit home position detection	"H" at home position
2	POD sensor	POD	Transmission sensor	Paper exit detection	"H" at paper pass
3	PPD2 sensor	PPD2	Transmission sensor	Paper transport detection 2	"L" at paper pass
4	Cassette detection switch	CED1	Micro-switch	Cassette installation detection	"H" at cassette insertion
5	PPD1 sensor	PPD1	Transmission sensor	Paper transport detection 1	"L" at paper pass
6	Door switch	DSW	Micro-switch	Door open/close detection (safety switch for 24V)	0V at door open
7	Drum reset switch	DRST	Micro-switch	New drum detection switch	Instantaneously "H" at insertion of new drum
8	SPF sensor	SPID/ SD SW	Transmission sensor	Paper entry detection Cover open/close detection	"L" at paper pass (AL-2031/2041)
9	SPPD sensor	SPPD	Transmission sensor	Paper transport detection	"L" at paper pass (AL-2031/2041)

7. PWB unit

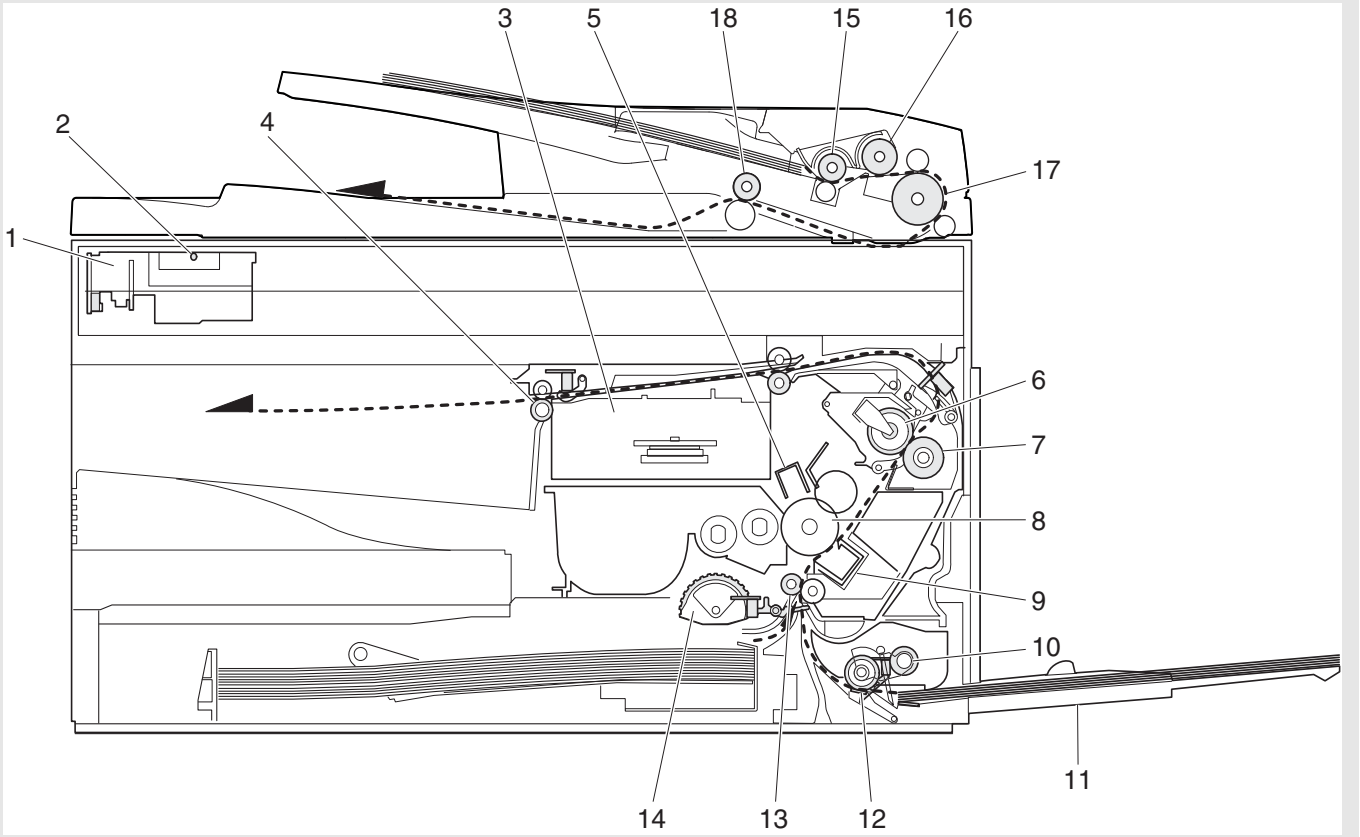


No.	Name	Function / Operation
1	Exposure lamp invertor PWB	Exposure lamp (CCFL) control
2	Main PWB (MCU)	Copier control
3	Operation PWB	Operation input/display
4	High voltage PWB	High voltage control
5	CCD sensor PWB	For image scanning
6	LSU motor PWB	For polygon motor drive
7	TCS PWB	For toner sensor control
8	LSU PWB	For laser control
9	Power PWB	AC power input, DC voltage control

⚠ : '10/Oct/20

8. Cross sectional view

⚠



No.	Name	Function / Operation
1	Scanner unit	Illuminates the original with the copy lamp and passes the reflected light to the lens unit (CCD).
2	Exposure lamp	Exposure lamp (CCFL) Illuminates original
3	LSU (Laser unit)	Converts the original image signal into laser beams and writes onto the drum.
4	Paper exit roller	Roller for paper exit
5	Main charger	Provides negative charges evenly to the drum surface.
6	Heat roller	Fuses toner on the paper. (Teflon roller)
7	Pressure roller	Fuses toner on the paper. (Silicon rubber roller)
8	Drum	Forms images.
9	Transfer unit	Transfers images onto the drum.
10	Pickup roller	Picks up the manual feed paper. (In multi feed only)
11	Manual paper feed tray	Tray for manual feed paper
12	Manual paper feed roller	Transport the paper from the manual paper feed port.
13	PS roller unit	Takes synchronization between the lead edge and the rear edge of the paper.
14	Paper feed roller	Picks up a sheet of paper from the cassette.
15	Pickup roller	Picks up documents. (AL-2031/2041)
16	Separation roller	Separates documents to feed properly. (AL-2031/2041)
17	PS roller	Feeds documents to the scanning section. (AL-2031/2041)
18	Paper exit roller	Discharges documents. (AL-2031/2041)

[5] UNPACKING AND INSTALLATION

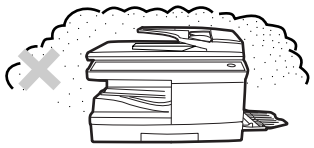
1. Copier installation

Improper installation may damage the copier. Please note the following during initial installation and whenever the copier is moved.

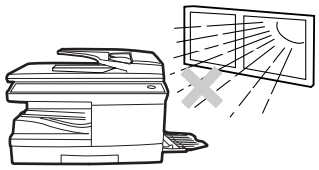
Caution: If the copier is moved from a cool place to a warm place, condensation may form inside the copier. Operation in this condition will cause poor copy quality and malfunctions.
Leave the copier at room temperature for at least 2 hours before use.

Do not install your copier in areas that are:

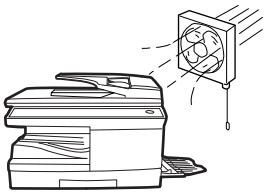
- damp, humid, or very dusty



- exposed to direct sunlight



- poorly ventilated



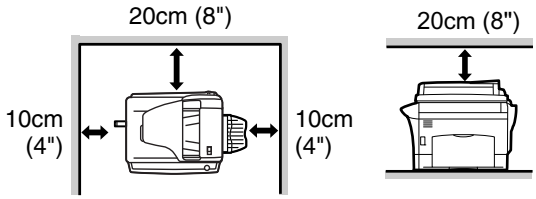
- subject to extreme temperature or humidity changes, e.g., near an air conditioner or heater.

The copier should be installed near an accessible power outlet for easy connection.

Be sure to connect the power cord only to a power outlet that meets the specified voltage and current requirements.

Also make certain the outlet is properly grounded.

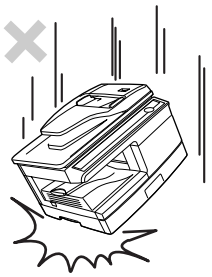
Be sure to allow the required space around the machine for servicing and proper ventilation.



2. Cautions on handling

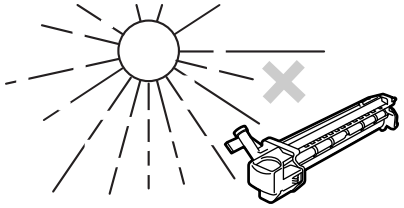
Be careful in handling the copier as follows to maintain the performance of this copier.

Do not drop the copier, subject it to shock or strike it against any object.



Do not expose the drum cartridge to direct sunlight.

Doing so will damage the surface (green portion) of the drum cartridge, causing poor print quality.



Store spare supplies such as drum cartridges and TD cartridges in a dark place without removing from the package before use.

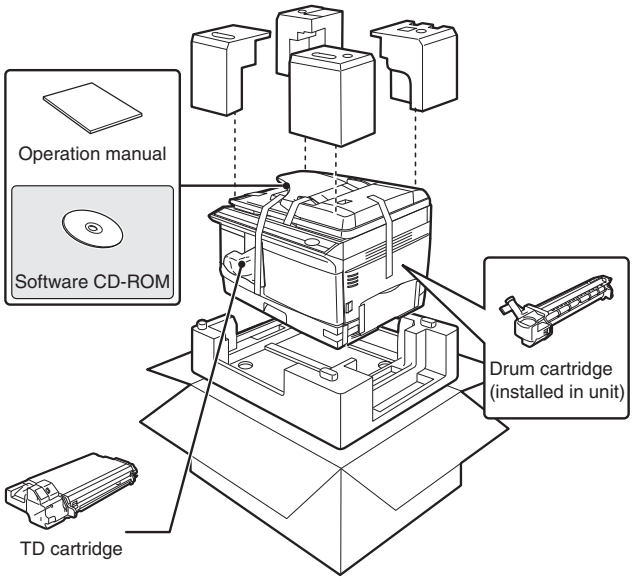
If they are exposed to direct sunlight, poor print quality may result.

Do not touch the surface (green portion) of the drum cartridge.

Doing so will damage the surface of the cartridge, causing poor print quality.

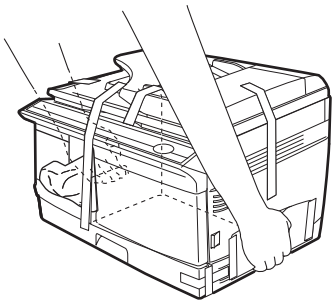
3. Checking packed components and accessories

Open the carton and check if the following components and accessories are included.



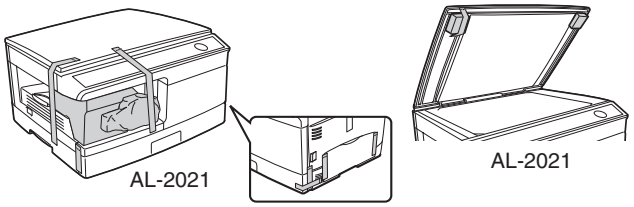
4. Unpacking

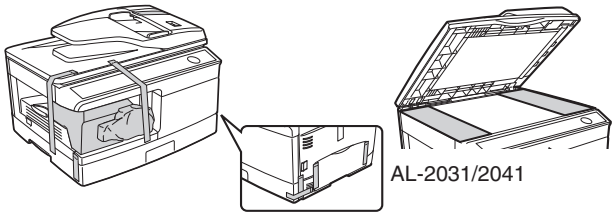
Be sure to hold the handles on both sides of the unit to unpack the unit and carry it to the installation location.



5. Removing protective packing materials

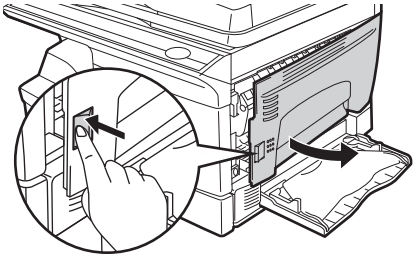
1) Remove all pieces of tape shown in the illustration below. Then open the SPF and remove protective materials. After that, take out the bag containing the TD cartridge.



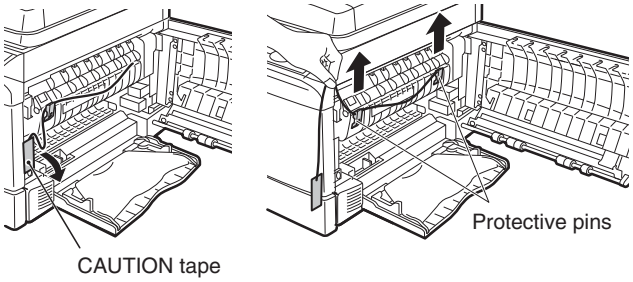


6. Installing the TD cartridge

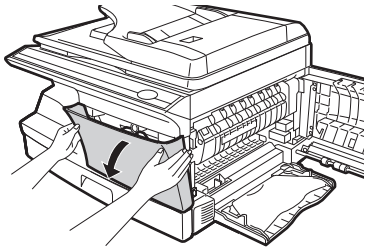
1) Open the multi-bypass tray, and then open the side cover.



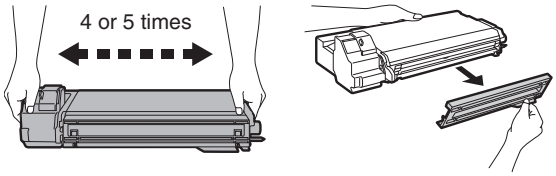
2) Remove the CAUTION tape from the front cover and remove the two protective pins from the fusing unit by pulling the strings upward one at a time.



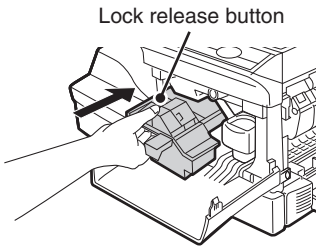
3) Push gently on both sides of the front cover to open the cover.



4) Remove the TD cartridge from the bag. Remove the protective paper. Hold the cartridge on both sides and shake it horizontally four or five times. Hold the tab of the protective cover and pull the tab to your side to remove the cover.

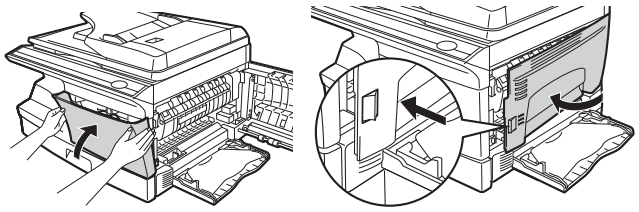


5) Gently insert the TD cartridge until it locks in place while pushing the lock release button.



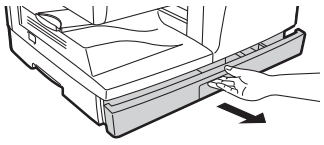
6) Close the front cover and then the side cover by pressing the round projections near the side cover open button.

Caution: When closing the covers, be sure to close the front cover securely and then close the side cover. If the covers are closed in the wrong order, the covers may be damaged.

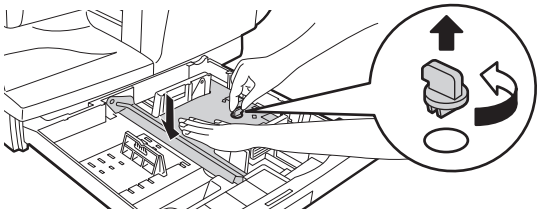


7. Loading paper

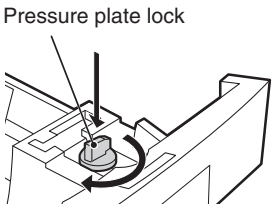
1) Raise the handle of the paper tray and pull the paper tray out until it stops.



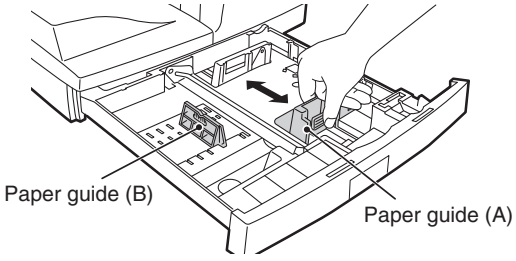
2) Remove the pressure plate lock. Rotate the pressure plate lock in the direction of the arrow to remove it while pressing down the pressure plate of the paper tray.



3) Store the pressure plate lock which has been removed in step 2). To store the pressure plate lock, rotate the lock to fix it on the relevant location.

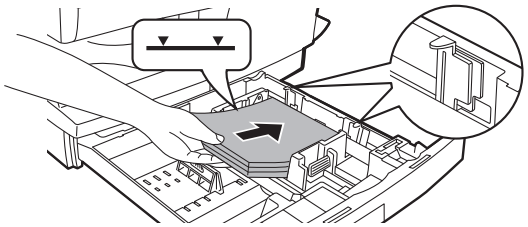


4) Adjust the paper guides on the paper tray to the copy paper width and length. Squeeze the lever of paper guide (A) and slide the guide to match with the width of the paper. Move paper guide (B) to the appropriate slot as marked on the tray.



5) Fan the paper and insert it into the tray. Make sure the edges go under the corner hooks.

Note: Do not load paper above the maximum height line (▼ ▼). Exceeding the line will cause a paper misfeed.



6) Gently push the paper tray back into the unit.

8. Power to copier

Ensure that the power switch of the unit is in the OFF position. Plug the other end of the power cord into the nearest outlet. Turn the power switch on the left side of the unit to the "ON" position. The start (⏻) indicator will light up and other indicators which show the initial settings of the operation panel will also light up to indicate the ready condition.

9. Software

The software CD-ROM that accompanies the machine contains the following software:

MFP driver

Printer driver

The printer driver enables you to use the printer function of the machine.

The printer driver includes the Print Status Window. This is a utility that monitors the machine and informs you of the printing status, the name of the document currently being printed, and error messages.

Scanner driver

The scanner driver allows you to use the scanning function of the machine with TWAIN-compliant and WIA-compliant applications.

Sharpdesk

Sharpdesk is an integrated software environment that makes it easy to manage documents and image files, and launch applications.

* Sharpdesk cannot be used in Windows 2000.

Button Manager

Button Manager allows you to use the scanner menus on the machine to scan a document.

* The scanning feature can only be used with computers that are connected to the machine by a USB cable. If you are connected to the machine by a LAN connection, only the printer function can be used.

A. Hardware and software requirements

Check the following hardware and software requirements in order to install the software.

Computer type	IBM PC/AT or compatible computer equipped with a USB 2.0*1/1.1*2
Operating system*3	Windows 2000 Professional*4, Windows XP, Windows Vista, Windows 7
Other hardware requirements	An environment on which any of the operating systems listed above can fully operate

*1: The machine's USB 2.0 port will transfer data at the speed specified by the USB 2.0 (Hi-Speed) standard only if the Microsoft USB 2.0 driver is preinstalled in the computer, or if the USB 2.0 driver for Windows 2000 Professional/XP/Vista that Microsoft provides through "Windows Update" is installed.

*2: Compatible with models preinstalled with Windows 2000 Professional, Windows XP Professional, Windows XP Home Edition, Windows Vista, or Windows 7, and which are equipped standard with a USB interface.

*3:
- The machine does not support printing from a Macintosh environment.
- Administrator's rights are required to install the software using the installer.

*4: Sharpdesk cannot be installed.

B. Installing the software

1) The USB cable must not be connected to the machine.
Make sure that the cable is not connected before proceeding.
If the cable is connected, a Plug and Play window will appear.
If this happens, click the "Cancel" button to close the window and disconnect the cable.

   Note: The cable will be connected in step 13).

2) Insert the Software CD-ROM into your computer's CD-ROM drive.

3) Click the "Start" button, click "Computer", and then double-click the CD-ROM icon ( ).
   - In Windows XP, click the "start" button, click "My Computer", and then double-click the CD-ROM icon.
   - In Windows 2000, double-click "My Computer", and then double-click the CD-ROM icon.

4) Double-click the "Setup" icon ( ).
   - In Windows 7, if a message screen appears asking you for confirmation, click "Yes".
   - In Windows Vista, if a message screen appears asking you for confirmation, click "Allow".

5) The "SOFTWARE LICENSE" window will appear. Make sure that you understand the contents of the software license, and then click the "Yes" button.

   Note: You can show the "SOFTWARE LICENSE" in a different language by selecting the desired language from the language menu. To install the software in the selected language, continue the installation with that language selected.

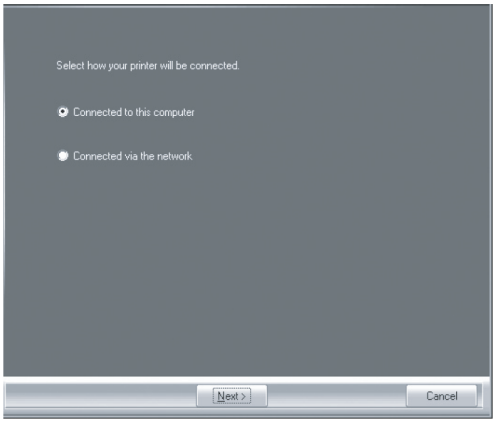
6) Read the "Readme First" in the "Welcome" window and then click the "Next" button.

7) To install all of the software, click the "Standard" button and go to step 12).
To install particular packages, click the "Custom" button and go to next step.

8) Click the "MFP Driver" button.
Click the "Display Readme" button to show information on packages that are selected.

9) Select "Connected to this computer" and click the "Next" button. Follow the on-screen instructions.

   Caution:
   - If you are using Windows Vista/7 and a security warning window appears, be sure to click "Install this driver software anyway".
   - If you are running Windows 2000/XP and a warning message appears regarding the Windows logo test or digital signature, be sure to click "Continue Anyway" or "Yes".



10) You will return to the window of step 8). If you wish to install Button Manager or Sharpdesk, click the "Utility Software" button.
If you do not wish to install the Utility Software, click the "Close" button and go to step 12).

   Note: After the installation, a message prompting you to restart your computer may appear. In this case, click the "Yes" button to restart your computer.

Installing the Utility Software

11) Click the "Button Manager" or the "Sharpdesk" button.
Click the "Display Readme" button to show information on packages that are selected.
Follow the on-screen instructions.
* In Windows 2000, The "Sharpdesk" button does not appear.

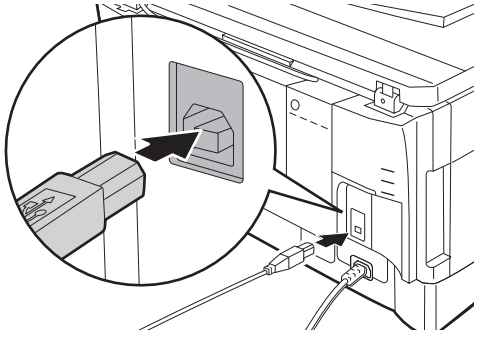
12) When installing is finished, click the "Close" button.
Caution:
- If you are using Windows Vista/7 and a security warning window appears, be sure to click "Install this driver software anyway".
- If you are running Windows 2000/XP and a warning message appears regarding the Windows logo test or digital signature, be sure to click "Continue Anyway" or "Yes".

A message will appear instructing you to connect the machine to your computer. Click the "OK" button.

Note: After the installation, a message prompting you to restart your computer may appear. In this case, click the "Yes" button to restart your computer.

13) Connect the machine to your computer with a USB cable.
<1> Make sure that the machine is powered on.
<2> Connect the cable to the USB connector (B type) on the machine.
The USB interface on the machine complies with the USB 2.0 (Hi-Speed) standard. Please purchase a shielded USB cable.
<3> Connect the other end of the cable to the USB connector (A type) on your computer.
The machine is found and a Plug and Play window appears.

Note: If your computer is not compatible with USB 2.0 (Hi-Speed), the "USB 2.0 mode switching" setting in the machine's user program must be set to "Full-Speed". For more information, see "USER PROGRAMS".



14) Follow the instructions in the plug and play window to install the driver.
When the "Found New Hardware Wizard" appears, select "Install the software automatically (Recommended)", click the "Next" button, and follow the on-screen instructions.
Caution:
- If you are using Windows Vista/7 and a security warning window appears, be sure to click "Install this driver software anyway".
- If you are running Windows 2000/XP and a warning message appears regarding the Windows logo test or digital signature, be sure to click "Continue Anyway" or "Yes".

This completes the installation of the software.

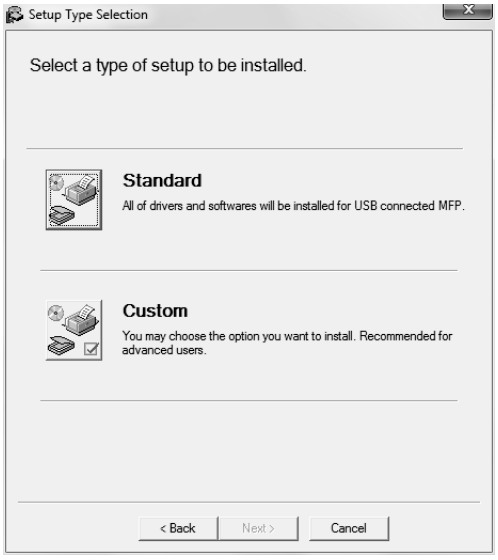
- If you installed Button Manager, set up Button Manager as explained in "SETTING UP BUTTON MANAGER".
- If you installed Sharpdesk, the Sharpdesk setup screen will appear. Follow the instructions in the screen to set up Sharpdesk.

(1) Using the machine as a shared printer

If the machine will be used as a shared printer on a network, follow these steps to install the printer driver in the client computer.

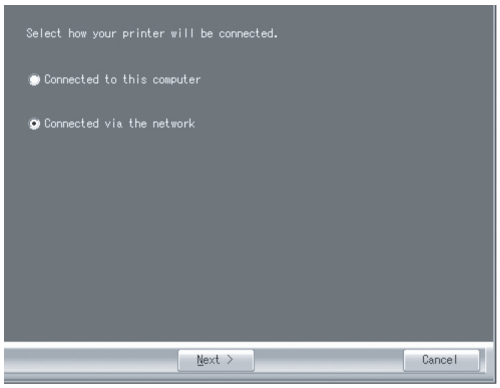
Note: To configure the appropriate settings in the print server, see the operation manual or help file of your operating system.

1) Perform steps 2) through 6) in "Installing the software".
2) Click the "Custom" button.



3) Click the "MFP Driver" button.
Click the "Display Readme" button to show information on packages that are selected.

4) Select "Connected via the network" and click the "Next" button.



5) Select the printer name (configured as a shared printer).
<1> Select the printer name (configured as a shared printer on a print server) from the list.
In Windows 2000/XP, you can also click the "Add Network Port" button displayed below the list and select the printer to be shared by browsing the network in the window that appears.
<2> Click the "Next" button.
Follow the on-screen instructions.
Note: If the shared printer does not appear in the list, check the settings on the print server.
Caution:
- If you are using Windows Vista/7 and a security warning window appears, be sure to click "Install this driver software anyway".
- If you are running Windows 2000/XP and a warning message appears regarding the Windows logo test or digital signature, be sure to click "Continue Anyway" or "Yes".

6) You will return to the window of step 3). Click the "Close" button.
Note: After the installation, a message prompting you to restart your computer may appear. In this case, click the "Yes" button to restart your computer.

This completes the installation of the software.

C. Configuring the printer driver

After installing the MFP driver, you must configure the printer driver settings appropriately for the size of paper loaded in each.

1) Click the "Start" button, click "Control Panel", and then click "Printer".
- In Windows 7, click the "start" button and then click "Devices and Printers".
- In Windows XP, click the "start" button and click "Printers and Faxes".
- In Windows 2000, click the "Start" button, select "Settings", and then click "Printers".

Note: In Windows XP, if "Printers and Faxes" does not appear in the "start" menu, select "Control Panel", select "Printers and Other Hardware", and then select "Printers and Faxes".

2) Open the printer properties window.
<1> Right-click the printer driver icon of the machine.
<2> Select "Properties".
In Windows 7, click the "Printer properties" menu.

3) Click the "Configuration" tab.

4) Click the "Set Tray Status" button and select the size of paper that is loaded in each tray.
Select a tray in the "Paper Source" menu, and select the size of paper loaded in that tray from the "Set Paper Size" menu. Repeat for each tray.

5) Click the "OK" button in the "Set Tray Status" window.

6) Click the "OK" button in the printer properties window.

D. Setting up Button Manager

Button Manager is a software program that works with the scanner driver to enable scanning from the machine.

To scan using the machine, Button Manager must be linked with the scan menu on the machine. Follow the steps below to link Button Manager to scanner events.

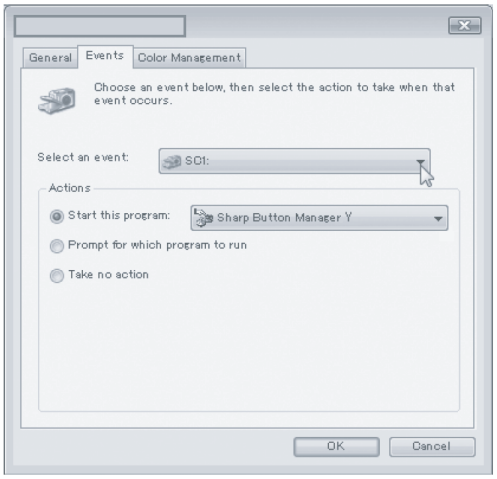
(1) Windows XP/Vista/7

1) Click the "Start" button, click "Control Panel", click "Hardware and Sound", and then click "Scanners and Cameras".
- In Windows 7, click the "start" button and then click "Devices and Printers".
- In Windows XP, click the "start" button, select "Control Panel" and click "Printers and Other Hardware", and then click "Scanners and Cameras".

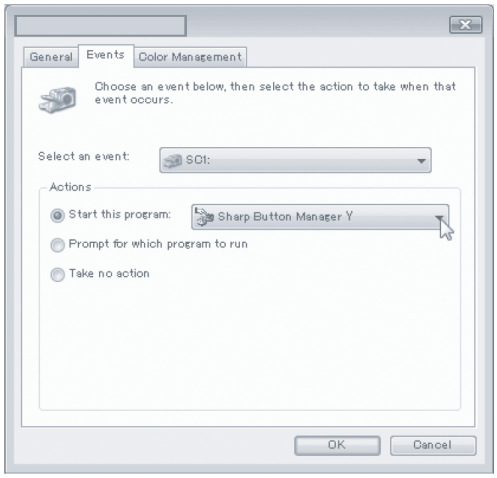
2) Click the "SHARP AL-xxxx" icon and select "Properties".
- In Windows 7, right-click the "SHARP AL-xxxx" icon and select "Scan properties".
- In Windows XP, select "Properties" from the "File" menu.

3) In the "Properties" screen, click the "Events" tab.

4) Select "SC1:" from the "Select an event" pull-down menu.



5) Select "Start this program" and then select "Sharp Button Manager Y" from the pull-down menu.

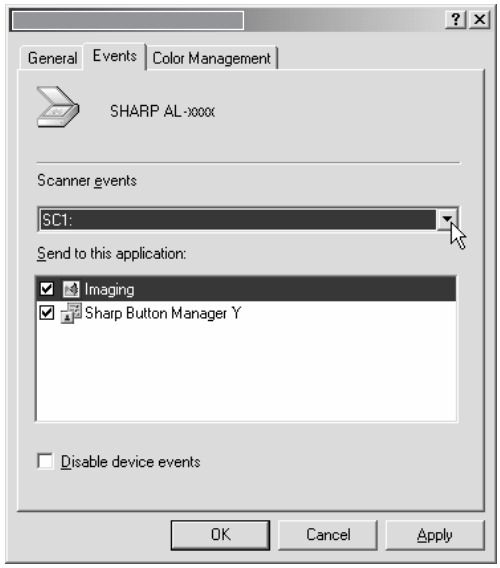


6) Repeat Steps 4 and 5 to link Button Manager to "SC2:" through "SC6:".
Select "SC2:" from the "Select an event" pull-down menu. Select "Start this program", select "Sharp Button Manager Y" from the pull-down menu. Do the same for each ScanMenu through "SC6:".

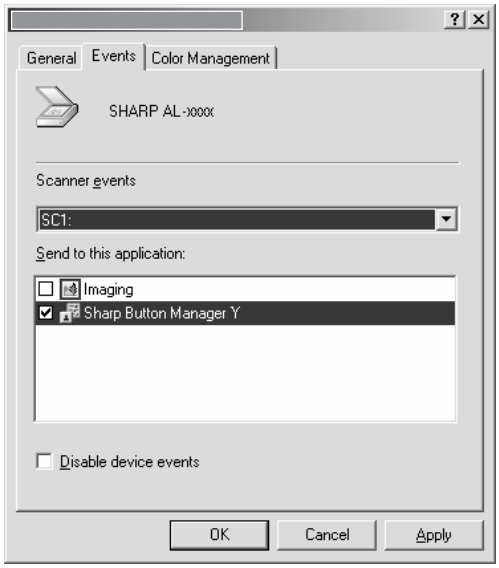
7) Click the "OK" button.
Button Manager is now linked to the scan menu (1 through 6).
The scan settings for each of scan menu 1 through 6 can be changed with the setting window of Button Manager.
For the factory default settings of the scan menu and the procedures for configuring Button Manager settings, see "Button Manager settings".

(2) Windows 2000

1) Click the "Start" button, select "Settings", and then click "Control Panel".
2) Double-click the "Scanners and Cameras" icon.
3) Select "SHARP AL-xxxx" and click the "Properties" button.
4) In the "Properties" screen, click the "Events" tab.
5) Select "SC1:" from the "Scanner events" pull-down menu.



6) Select "Sharp Button Manager Y" in "Send to this application".
Note: If other applications are shown, deselect the checkboxes for the other applications and leave only the Button Manager checkbox selected.



7) Click the "Apply" button.

8) Repeat Steps 5) through 7) to link Button Manager to "SC2:" through "SC6:".
Select "SC2:" from the "Scanner events" pull-down menu. Select "Sharp Button Manager Y" in "Send to this application" and click the "Apply" button.
Do the same for each ScanMenu through "SC6:".
When the settings have been completed, click the "OK" button to close the screen.

Button Manager is now linked to the scan menu (1 through 6).
The scan settings for each of scan menu 1 through 6 can be changed with the setting window of Button Manager.
For the factory default settings of the scan menu and the procedures for configuring Button Manager settings, see "Button Manager settings".

10. Interface

A. USB

Connector

Type-B connector

Cable

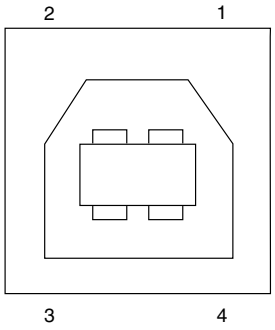
Shielded twisted pair cable

(2 m (6 feet) Max.: high-speed transmission equivalent)

Pin configuration

The pin numbers and signal names are listed in the following table.

Pin No.	Signal name
1	+5V
2	-DATA
3	+DATA
4	GND



11. Moving

Moving instructions

When moving the unit, follow the procedure below.

Note: When moving this unit, be sure to remove the TD cartridge in advance.

1) Turn the power switch off and remove the power cord from the outlet.
2) Open the side cover and front cover, in that order. Remove the TD cartridge and close the front cover and side cover, in that order.

   To open and close the side cover and front cover, and to remove the TD cartridge.
3) Raise the handle of the paper tray and pull the paper tray out until it stops.
4) Push the center of the pressure plate down until it locks in place and lock the plate using the pressure plate lock which has been stored in the front of the paper tray.
5) Push the paper tray back into the unit.
6) Lock the scan head locking switch.

Note: When shipping the unit, the scan head locking switch must be locked to prevent shipping damage.

7) Close the multi-bypass tray and the paper output tray extension, and attach the packing materials and tape which were removed during installation of the unit.
8) Pack the unit into the carton.

12. Scanner moisture-proof kit

If the machine is installed in a highly humid environment, you can alleviate dew condensation inside the scanner by installing the scanner moisture-proof kit described below.

A. Components

Scanner moisture-proof kit (DKIT-0016QSZZ)

	Name	Part code	Qty
1	Scanner condensation prevention mylar	PSHEZ0493QSZZ	3
2	Optical right hole mylar B	PSHEZ0469QSZZ	2
3	Scanner motor metal plate cushion	PMLT-0106QSZZ	2
4	Scanner upper surface cushion	PMLT-0105QSZZ	1
5	Scanner motor lower mylar	PSHEP0600QSZZ	1
6	Scanner UPG mylar J3	PSHEP0599QSZZ	1
7	Fan housing cushion	PMLT-0108QSZ1	1

B. Precautions at installation

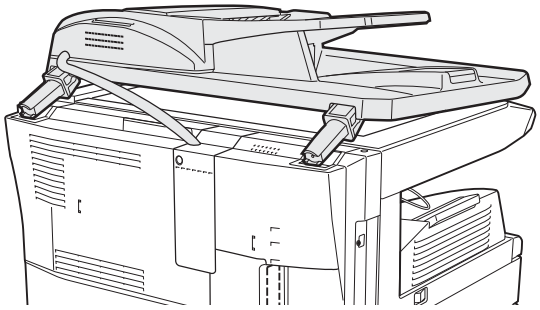
Clean the position where each cushion/mylar is attached with industrial alcohol before the work.

C. Attachment method

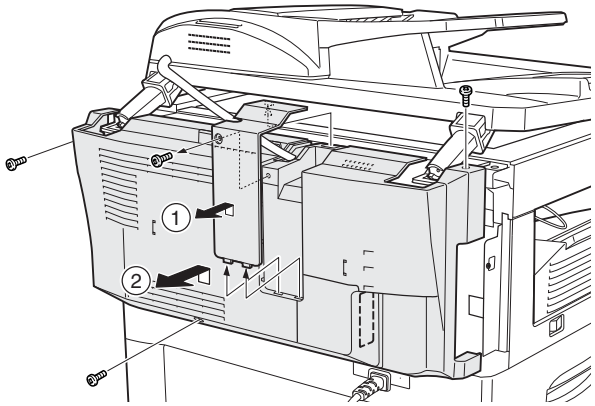
Turn the main switch to the "OFF" position and remove the power plug from the outlet.

1) Detach the SPF.

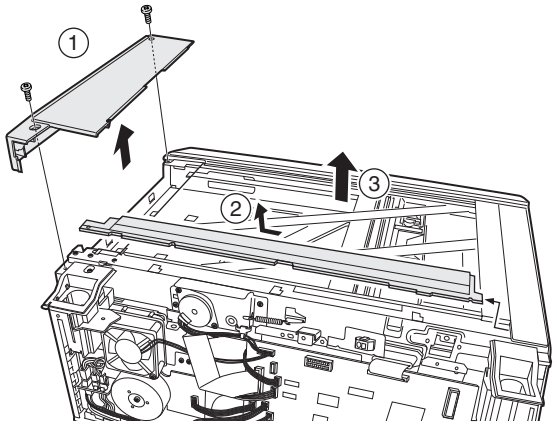
   Detach the SPF from the copier and softly place it on top of the original table as shown below.



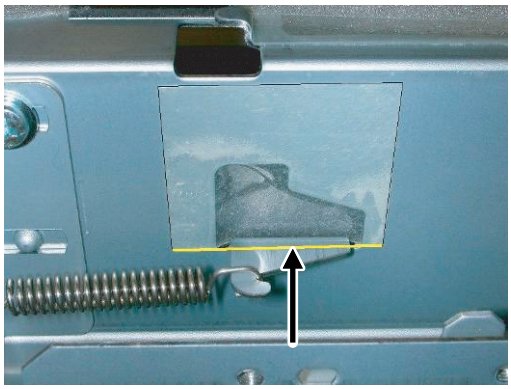
2) Remove the rear cabinet.
   - <1> Unscrew the screw and remove the rear cabinet shielding plate. (Save the screw.)
   - <2> Unscrew three screws and remove the rear cabinet. (Save the screws.)
   - <3> Disconnect the connector of the SPF, and remove the SPF from the machine.



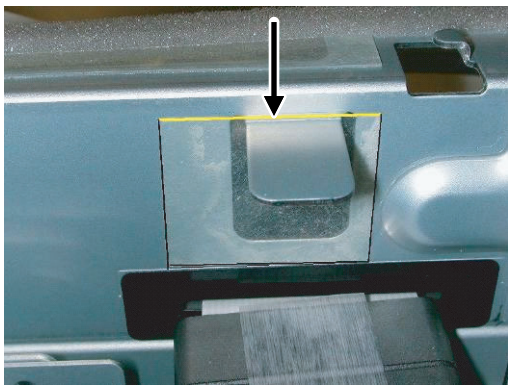
3) Remove the rear cover for the document glass.
   <1> Remove the two screws and then remove the right glass holder.
   <2> Slide the rear cover for the document glass to remove it.
   <3> Remove the table glass.



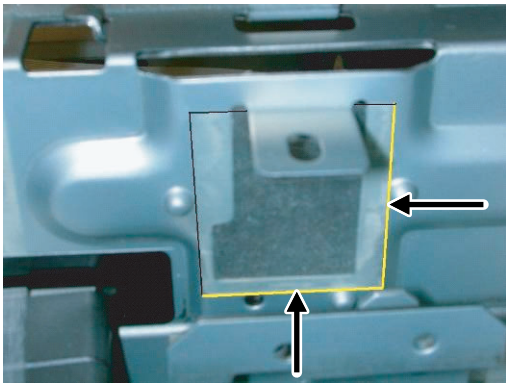
4) Attach the Scanner condensation prevention mylar at the 3 positions on the rear side of the main unit as described below.
   Note: The hole should be covered with the mylar.
   Align the edge of the mylar to the R part (the yellow line in the diagram below) so that the hole of the metal plate is covered as much as possible.



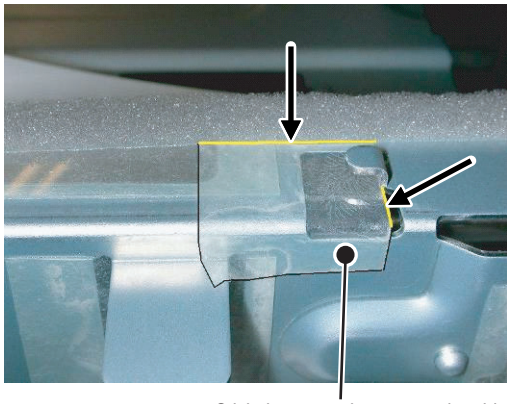
   Align the edge of the mylar to the R part (the yellow line in the diagram below) so that the hole of the metal plate is covered as much as possible.



   Attach along the edge of the projection (the yellow line in the diagram below).

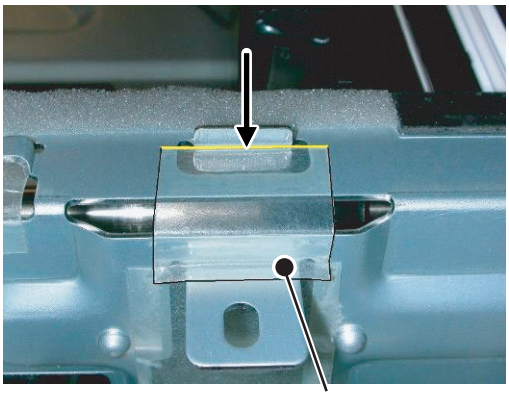


5) Attach the Optical right hole mylar B at the 2 positions shown in the diagrams below which are at the top of the rear side of the main unit.
   Note: The holes should be covered with the mylar.
   Attach along the edge of the cushion (the yellow line in the diagram below).
   Align with the inside line of the bent part (the yellow line in the diagram below).



   Stick the excessive part on the side.

   Align with the raised part (the yellow line in the diagram below).
   Match the center of the mylar (in the horizontal direction) to the center of the raised part.

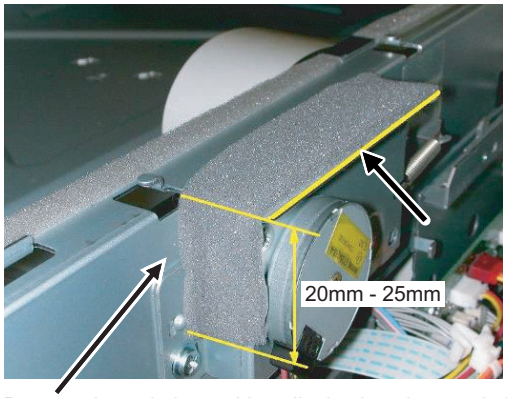


   Stick the excessive part on the side.

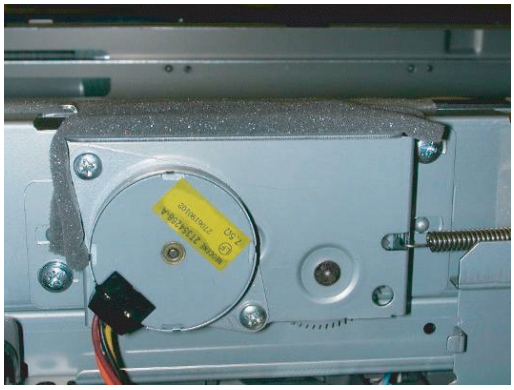
6) Attach the Scanner motor metal plate cushion at 1 position on the attachment plate of the motor on the rear side of the main unit.

Note: The hole on the top of the motor unit should be covered with the mylar.

Align the edge of the metal plate and the edge of the cushion (the yellow line in the diagram below).

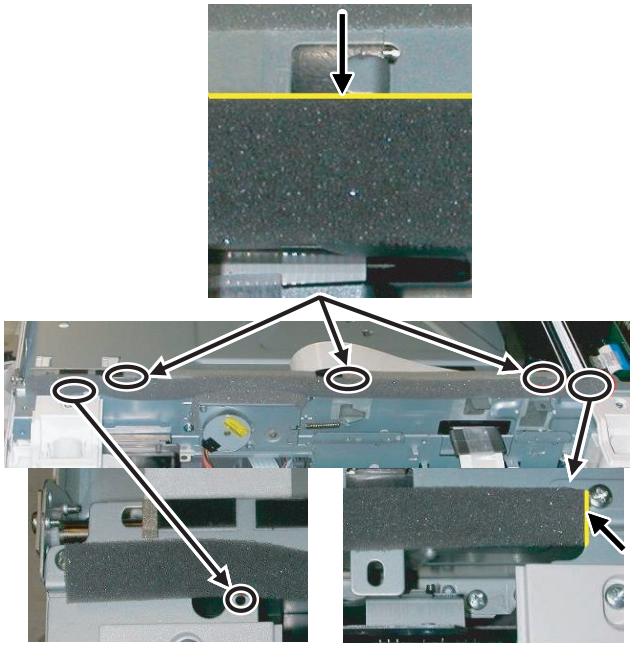


Press and attach the cushion aligning it to the metal plate so that there will be no gap between them.



7) Attach the Scanner upper surface cushion on the top and the rear side at the rear side of the main unit.

Align the cushion with the side of the raised part (the yellow line in the diagram below).



Do not cover this hole.

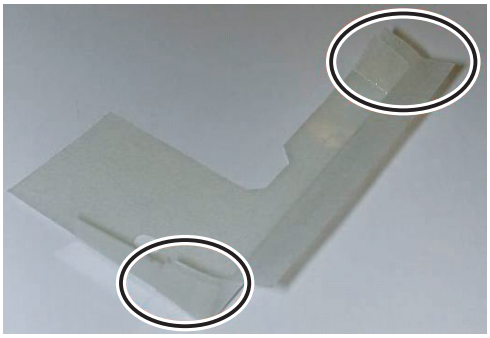
Align the edge of the cushion with the edge of the metal plate.

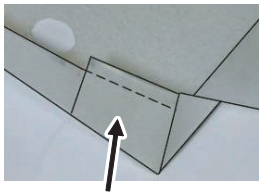
Bend the part which is sticking out to the rear side of the scanner and attach to the surface.

Press the cushion at the steps shown in the diagram so that there will be no gap.

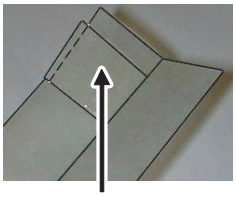
Press the cushion to make sure all the holes are covered.

8) Bend the edge of the Scanner motor lower mylar and stick together.





Stick together.



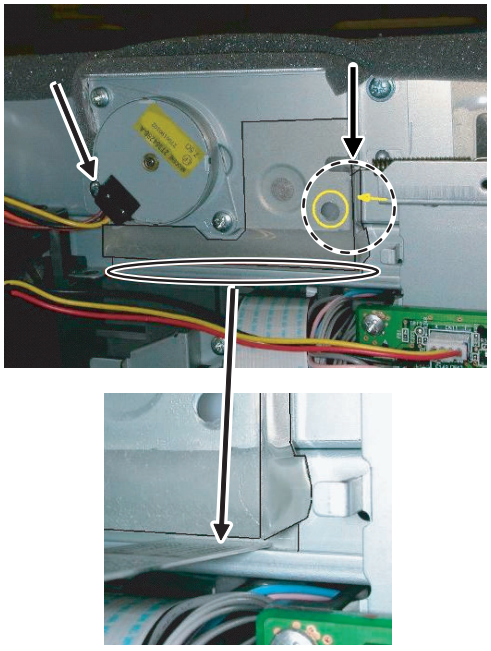
Stick together.

9) Attach the Scanner motor lower mylar at 1 position under the motor attachment plate on the rear side of the main unit.

Note: The mylar should cover the hole under the motor unit.

Attach matching the hole (the yellow mark in the diagram) and along with the side edge (the yellow arrow in the diagram).

Disconnect the motor harness from the connector and take off the snap band from the hole.

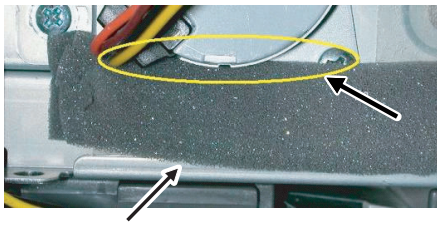


Press the mylar with a sharp-pointed stick or something so that it is stuck correctly.

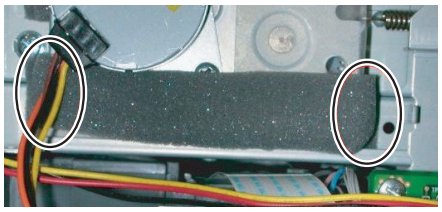
10) Attach the Scanner motor metal plate cushion covering the bottom part of the Scanner motor lower mylar.

Note: The hole under the motor unit should be covered.

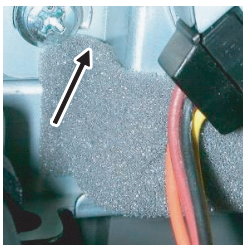
Attach the cushion to cover the gap between the mylar and the metal plate (the yellow mark).

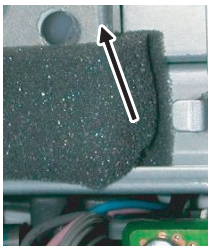


Stick the lower part of the cushion to the mylar, too.

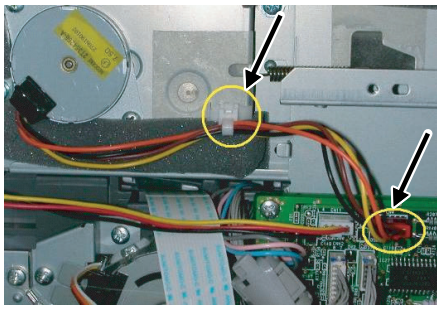


Press the cushion with a sharp-pointed stick or something to fill the gap between the mylar and the metal plate.





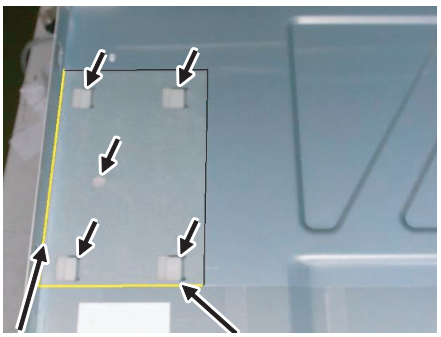
11) Attach the motor connector and the snap band to the original position.



12) Attach the Scanner UPG mylar J3 to cover the hole on the right side of inside of the scanner.

Note: The mylar should cover the hole shown by the arrow in the diagram.

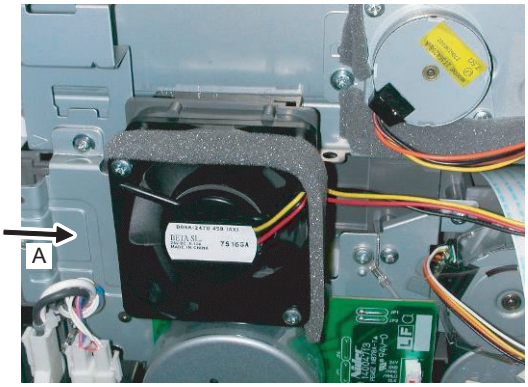
Attach along with the bent part of the metal plate and align the edge of the mylar with the line shown in the diagram (the yellow line in the diagram).

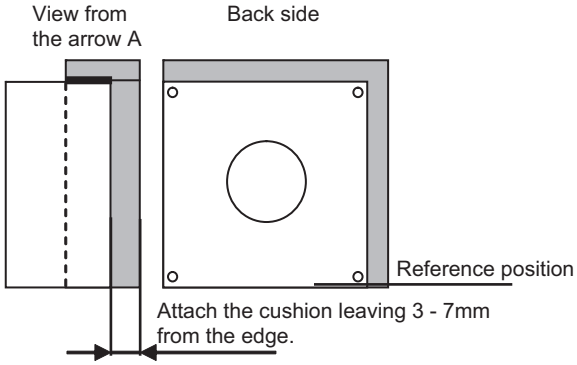


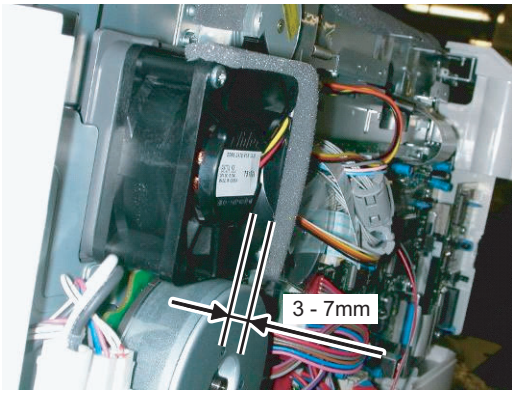
13) Attach the Fan housing cushion to the cooling fan at the position shown in the diagram below.

Cover the top and the right side of the fan housing when you see the fan housing from the backside of the machine.

Note: Please make sure the double-sided tape is not exposed where the cushion is sticking out from the edge of the fan housing.





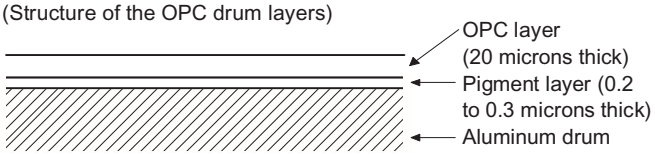


Attach the cushion leaving 3 - 7mm from the edge so that the gap between the Fan housing cushion and the filter of the rear cabinet is filled for sure.

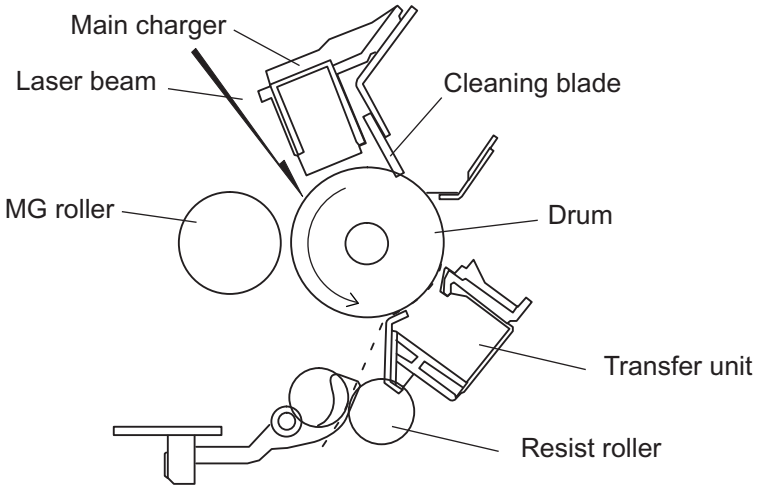
14) Attach the parts removed in the items 1), 2), and 3).

[6] COPY PROCESS

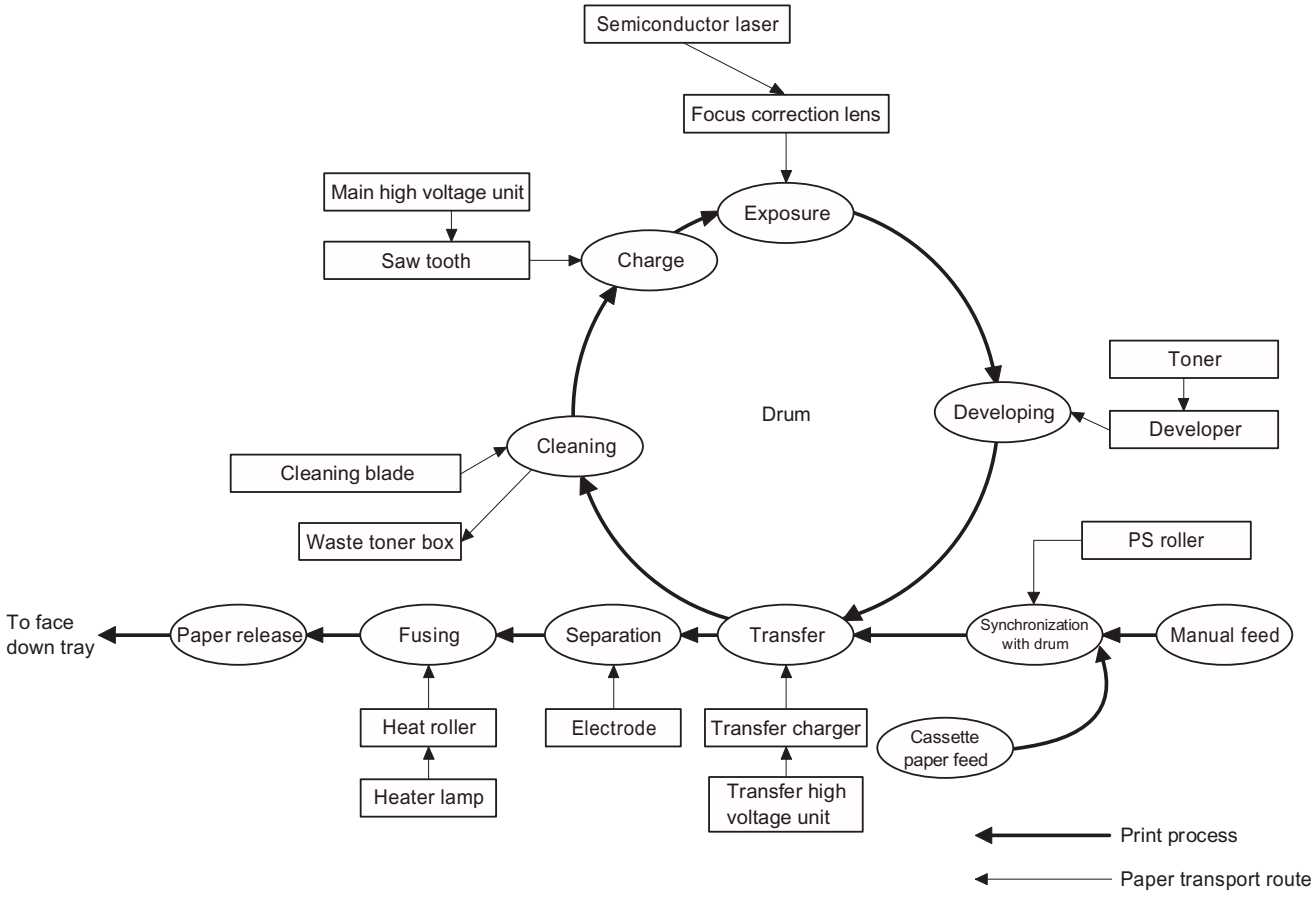
An OPC drum is used for the photoconductor.
(Structure of the OPC drum layers)



1. Functional diagram



(Basic operation cycle)



2. Outline of print process

This printer is a non-impact printer that uses a semiconductor laser and electrostatic print process. This printer uses an OPC (Organic Photo Conductor) for its photoconductive material.

First, voltage from the main corona unit charges the drum surface and a latent image is formed on the drum surface using a laser beam. This latent image forms a visible image on the drum surface when toner is applied. The toner image is then transferred onto the print paper by the transfer corona and fused on the print paper in the fusing section with a combination of heat and pressure.

Step-1: Charge

Step-2: Exposure

* Latent image is formed on the drum.

Step-3: Developing
Latent image formed on the drum is then changed into visible image with toner.

Step-4: Transfer
The visible image (toner image) on the drum is transferred onto the print paper.

Step-5: Cleaning
Residual toner on the drum surface is removed and collected by the cleaning blade.

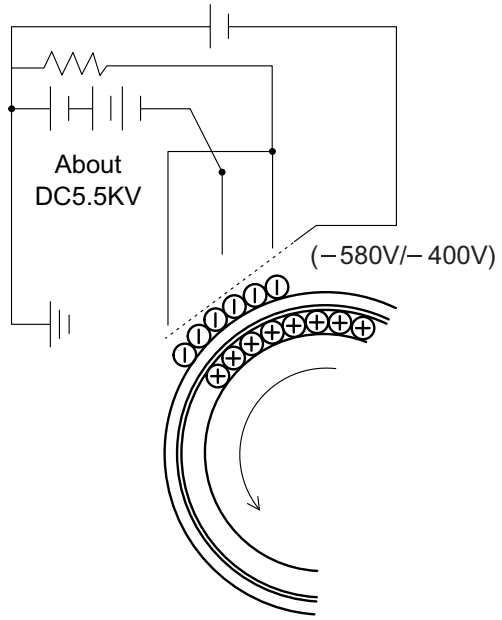
Step-6: Optical discharge
Residual charge on the drum surface is removed, by semiconductor laser beam.

3. Actual print process

Step-1: DC charge

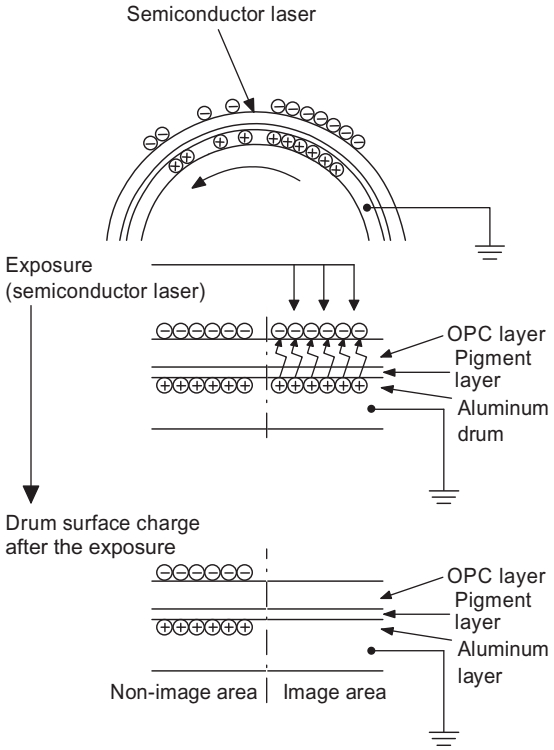
A uniform negative charge is applied over the OPC drum surface by the main charging unit. Stable potential is maintained by means of the Scorotron charger.

Positive charges are generated in the aluminum layer.



Step-2: Exposure (laser beam, lens)

A Laser beam is generated from the semiconductor laser and controlled by the print pattern signal. The laser writes onto the OPC drum surface through the polygon mirrors and lens. The resistance of the OPC layer decreases for an area exposed by the laser beam (corresponding to the print pattern signal). The beam neutralizes the negative charge. An electrostatic latent image is formed on the drum surface.

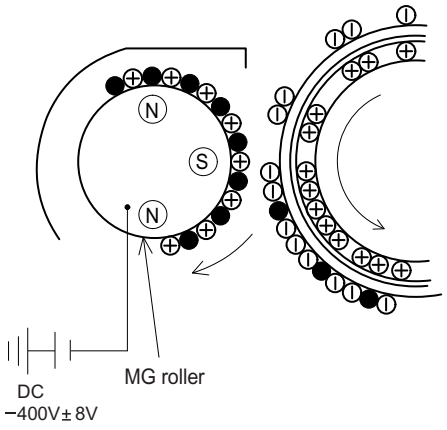


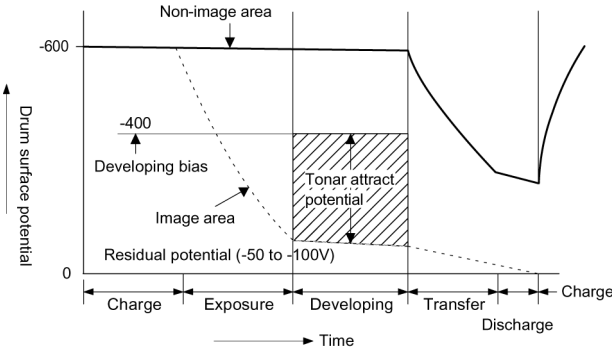
Step-3: Developing (DC bias)

A bias potential is applied to the MG roller in the two component magnetic brush developing method, and the toner is charged negative through friction with the carrier.

Non-image area of the drum surface charged with negative potential repel the toner, whereas the laser exposed portions where no negative charges exist, attract the toner. As a result, a visible image appears on the drum surface.

⊕ :Carrier (Magnetized particle)
● :Toner (Charge negative by friction)
(N) (S) Permanent magnet
(provided in three locations)

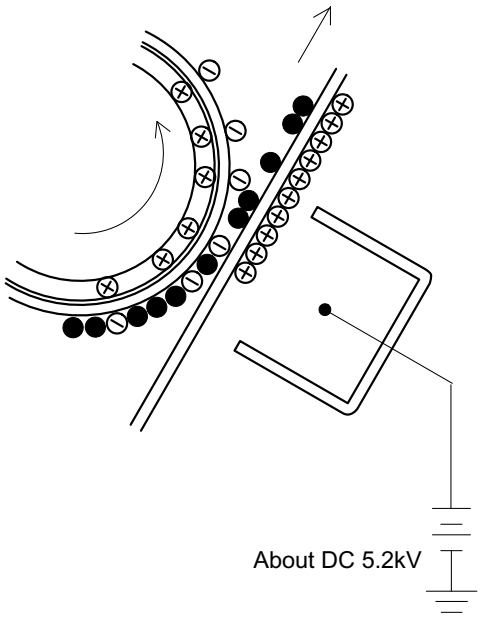




Toner is attracted over the shadowed area because of the developing bias.

Step-4: Transfer

The visible image on the drum surface is transferred onto the print paper by applying a positive charge from the transfer corona to the backside of the print paper.

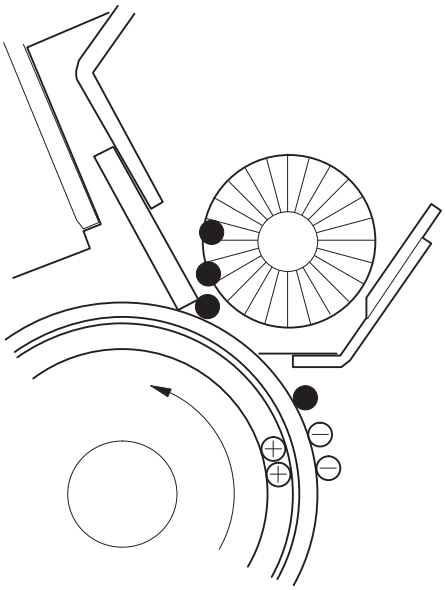


Step-5: Separation

Since the print paper is charged positively by the transfer corona, it is discharged by the separation corona. The separation corona is connected to ground.

Step-6: Cleaning

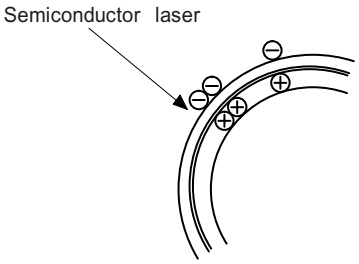
Toner remaining on the drum is removed and collected by the cleaning blade. It is transported to the waste toner collecting section in the cleaning unit by the waste toner transport roller.



Step-7: Optical discharge (Semiconductor laser)

Before the drum rotation is stopped, the semiconductor laser is radiated onto the drum to reduce the electrical resistance in the OPC layer and eliminate residual charge, providing a uniform state to the drum surface for the next page to be printed.

When the electrical resistance is reduced, positive charges on the aluminum layer are moved and neutralized with negative charges on the OPC layer.



Charge by the Scorotron charger

Function

The Scorotron charger functions to maintain uniform surface potential on the drum at all times, It control the surface potential regardless of the charge characteristics of the photoconductor.

Basic function

A screen grid is placed between the saw tooth and the photoconductor. A stable voltage is added to the screen grid to maintain the corona current on the photoconductor.

As the photoconductor is charged by the saw tooth from the main corona unit, the surface potential increases. This increases the current flowing through the screen grid. When the photoconductor potential nears the grid potential, the current turns to flow to the grid so that the photoconductor potential can be maintained at a stable level.

Process controlling

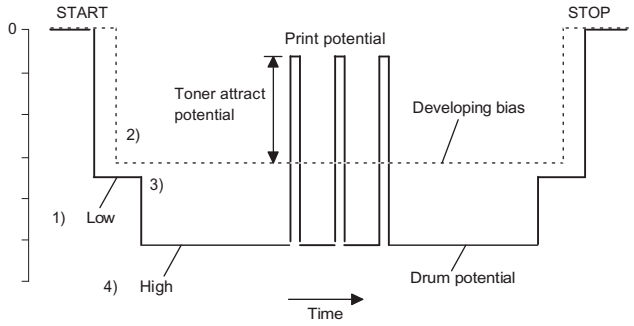
Function

The print pattern signal is converted into an invisible image by the semiconductor laser using negative to positive (reversible) developing method. Therefore, if the developing bias is added before the drum is charged, toner is attracted onto the drum. If the developing bias is not added when the drum is charged, the carrier is attracted to the drum because of the strong electrostatic force of the drum.

To avoid this, the process is controlled by adjusting the drum potential and the grid potential of the Scorotron charger.

Basic function

Voltage added to the screen grid can be selected, high and low. To make it easily understood, the figure below shows voltage transition at the developer unit.



Start

1) Because the grid potential is at a low level, the drum potential is at about -400V. (Carrier may not be attracted though the carrier is pulled towards the drum by the electrostatic force of -400V.
2) Developing bias (-400V) is applied when the photoconductor potential is switched from LOW to HIGH.
3) Once developing bias (-400V) is applied and the photo conductor potential rises to HIGH, toner will not be attracted to the drum.

Stop

The reverse sequence takes place.

Retaining developing bias at an abnormal occurrence

Function

The developing bias will be lost if the power supply was removed during print process. In this event, the drum potential slightly abates and the carrier makes deposits on the drum because of strong static power. To prevent this, the machine incorporates a function to retain the developing bias for a certain period and decrease the voltage gradually against possible power loss.

Basic function

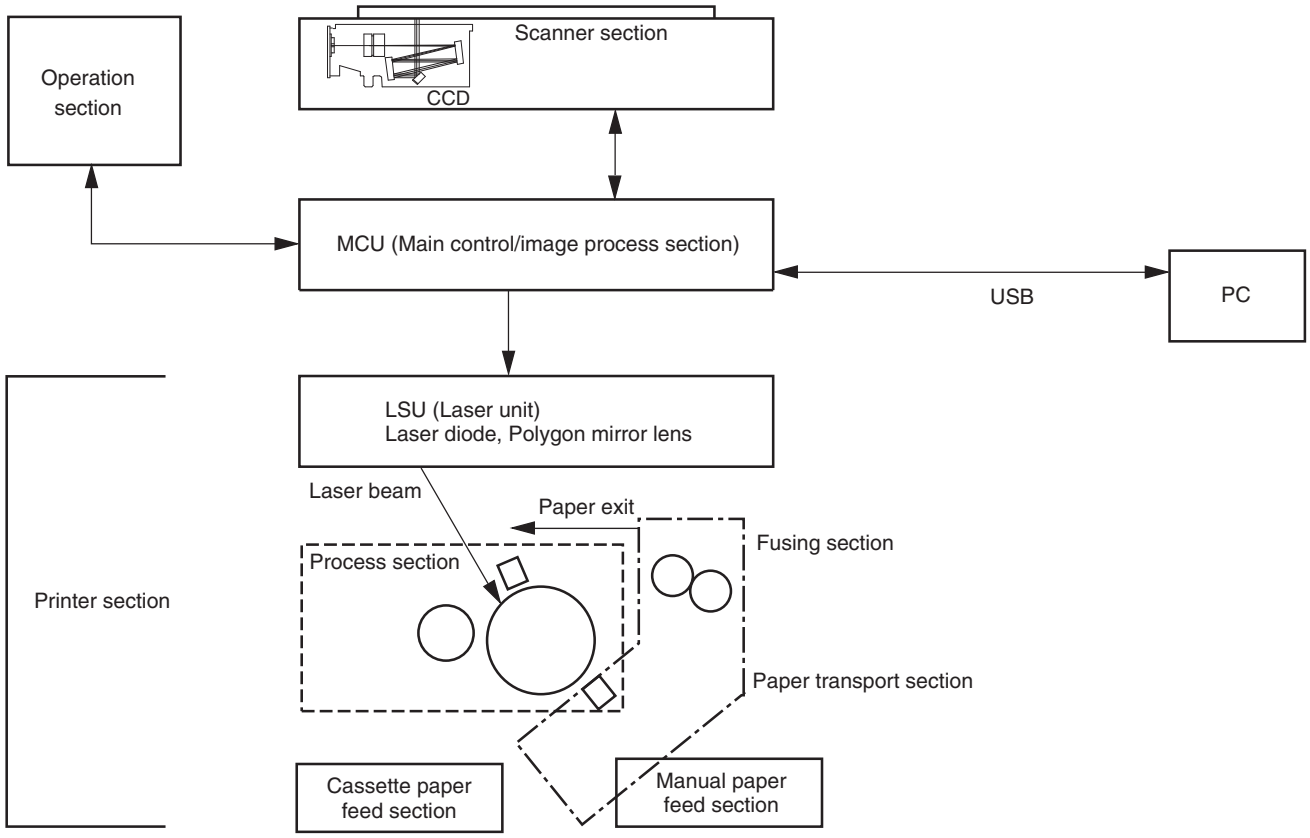
Normally, the developing bias voltage is retained for a certain time before the drum comes to a complete stop if the machine should stop before completing the normal print cycle. The developing bias can be added before resuming the operation after an abnormal interruption. Therefore, carrier will not make a deposit on the drum surface.

[7] OPERATIONAL DESCRIPTIONS

1. Outline of operation

The outline of operation is described referring to the basic configuration.

(Basic configuration)



(Outline of copy operation)

Setting conditions

1) Set copy conditions such as the copy quantity and the copy density with the operation section, and press the Start key. The information on copy conditions is sent to the MCU.

Image scanning

2) When the Start key is pressed, the scanner section starts scanning of images.
   The light from the copy lamp is reflected by the document and passed through the lens to the CCD.

Photo signal/Electric signal conversion

3) The image is converted into electrical signals by the CCD circuit and passed to the MCU.

Image process

4) The document image signal sent from the CCD circuit is processed under the revised conditions and sent to the LSU (laser unit) as print data.

Electric signal/Photo signal (laser beam) conversion

5) The LSU emits laser beams according to the print data. (Electrical signals are converted into photo signals.)
6) The laser beams are radiated through the polygon mirror and various lenses to the OPC drum.

Printing

7) Electrostatic latent images are formed on the OPC drum according to the laser beams, and the latent images are developed to be visible images (toner images).
8) Meanwhile the paper is fed to the image transfer section in synchronization with the image lead edge.
9) After the transfer of toner images onto the paper, the toner images are fused to the paper by the fusing section. The copied paper is discharged onto the exit tray.

(Outline of printer operation)

The print data sent from the PC are passed through the USB connector and the MCU to the LSU. ▲1 The procedures after that are the same as above 5) and later.

(Outline of scanner operation)

The scan data are passed through the MCU to the PC according to the conditions requested by the operations with the operation panel.

2. Scanner section

A. Scanner unit

The scanner unit in the digital copier scans images.

It is composed of the optical unit and the drive unit. The optical unit performs scanning in the main scan direction with the light receiving elements (color CCD). The drive unit performs scanning in the sub scanning direction by moving the optical unit.

B. Optical system

Two white lamps are used as the light source.

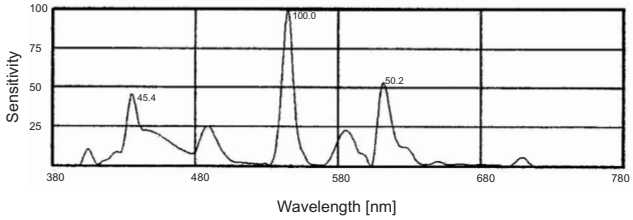
Light radiated from the light source is applied to the document on the document table. The reflected light from the document is reflected 4 times by No. 1 - No. 3 mirrors and passed through the reduction lens to form images on the light-receiving surface of 3-line CCD.

The light-receiving surface of the color CCD is provided with 3 line scanning sections for RGB. Separate images scanned in each color section are overlapped to complete color scanning. (When PC scanning)

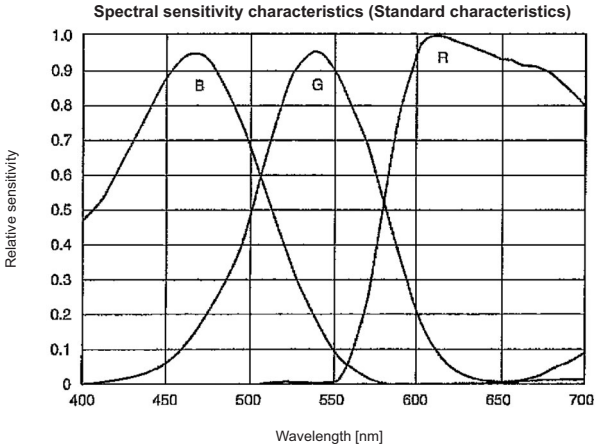
The resolution is 600dpi.

When copying, only the green component is used to print with the printer.

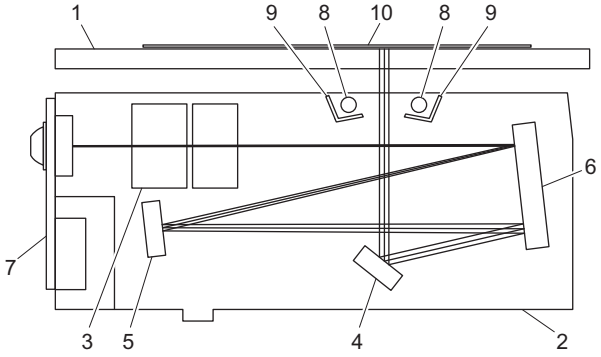
The color component for printing can be switched to red or blue by the service simulation.



(Spectrum characteristics of the lamp)



(Spectrum characteristics of the color CCD)



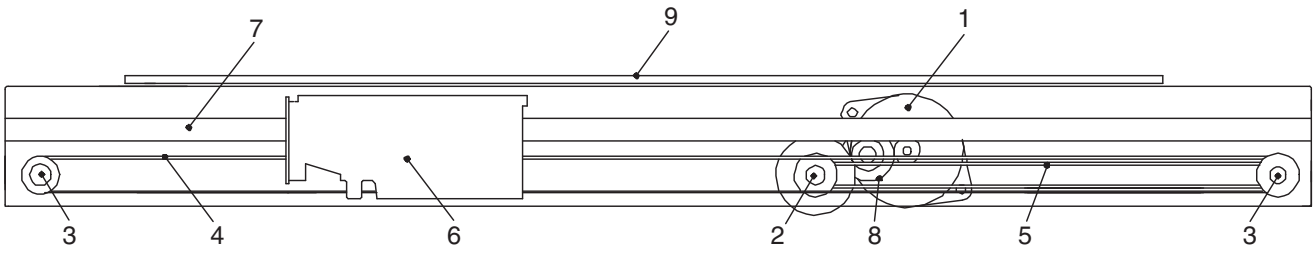
(Optical unit)

1	Table glass	2	Optical unit	3	Lens
4	Mirror 1	5	Mirror 2	6	Mirror 3
7	CCD PWB	8	Lamp	9	Reflector
10	Original				

C. Drive system

The drive system is composed of the scanner motor, the pulley gear, the idle pulley, the idle gear, the belt 473, the belt 190, and the shaft.

The motor rotation is converted into reciprocated movements of the belt 473 through the idle gear, the pulley gear, the belt 190, and the idle pulley to drive the optical unit.



1	Scanner motor	2	Pulley gear	3	Idle pulley
4	Belt 473	5	Belt 190	6	Optical unit
7	Shaft	8	Idle gear	9	Table glass

3. Laser unit

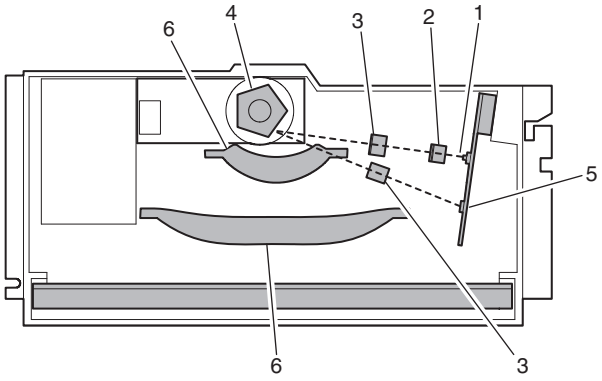
The image data sent from the MCU (image process circuit) is sent to the LSU (laser unit), where it is converted into laser beams.

A. Basic structure

The LSU unit is the writing section of the digital optical system.

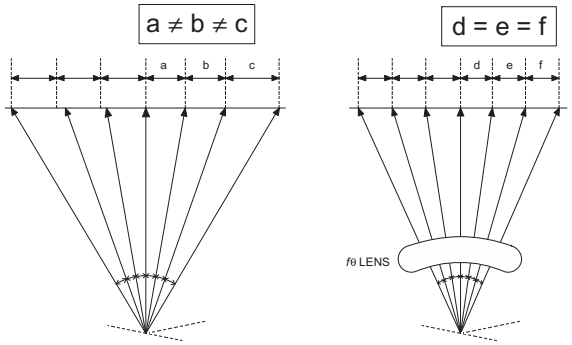
The semiconductor laser is used as the light source, and images are formed on the OPC drum by the polygon mirror and fθ lens, etc.

The laser beams are passed through the collimator lens, the cylindrical lens, the polygon mirror, the fθ lens, and the mirror to form images on the OPC drum in the main scanning direction. The laser emitting PWB is provided with the APC (auto power control) in order to eliminate fluctuations in the laser power. The BD PWB works for measurement of the laser writing start point.

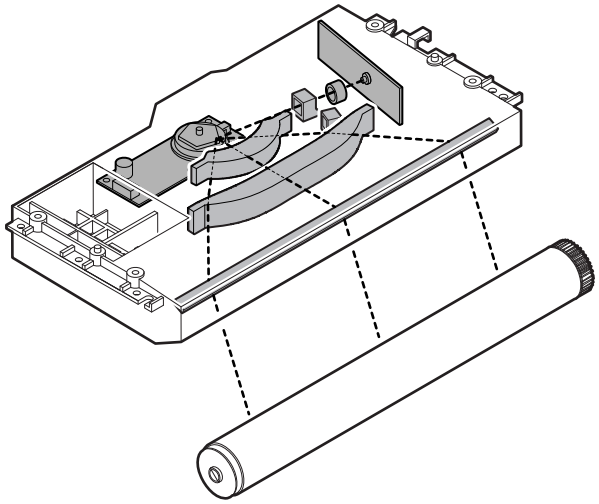


No	Component	Function
1	Semiconductor laser	Generates laser beams.
2	Collimator lens	Converges laser beams in parallel.
3	Cylinder lens	Takes the focus.
4	Polygon mirror, polygon motor	Reflects laser beams at a constant rpm.
5	BD (Lens, PWB)	Detects start timing of laser scanning.
6	fθ lens	Converges laser beams at a spot on the drum.
		Makes the laser scanning speeds at both ends of the drum same as each other. (Refer to the figure below.)

Makes the laser scanning speeds at both ends of the drum same as each other.



B. Laser beam path



C. Composition

Effective scanning width: 216mm (max.)

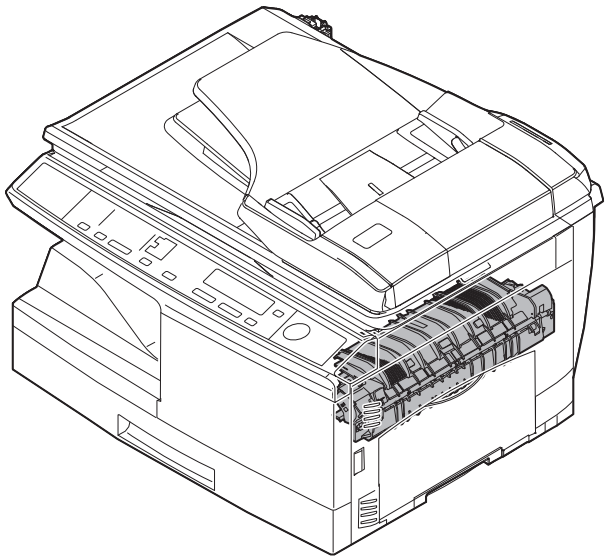
Resolution: 600dpi

Beam diameter: 75um in the main scanning direction, 85um in the sub scanning direction

Image surface power: 0.16 ± 0.01mW (Laser wavelength 770 - 795nm)

Polygon motor section: Brushless motor 35433rpm
No. of mirror surfaces: 5 surfaces

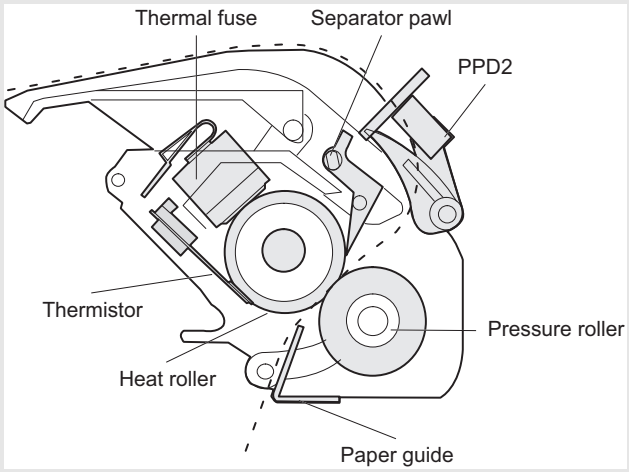
4. Fuser section



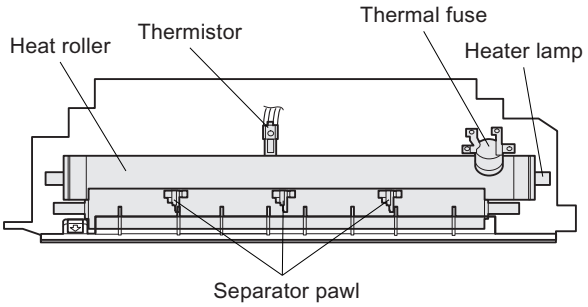
A. General description

General block diagram (cross section)

▲1



Top view



(1) Heat roller

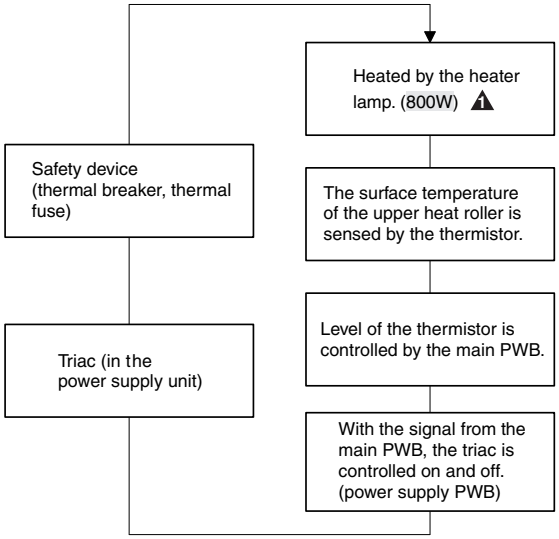
A Teflon roller is used for the heat roller and a silicone rubber roller is used for the lower heat roller for better toner fusing performance and paper separation.

(2) Separator pawl

Three separator pawls are used on the upper heat roller. The separator pawls are Teflon coated to reduce friction with the roller and prevent a smear on the paper caused by the separator pawl.

(3) Thermal control

1) The heater lamp, thermistor, main PWB, DC power supply PWB, and triac within the power supply unit are used to control the temperature in the fuser unit.
   To prevent against abnormally high temperature in the fuser unit, a thermal breaker and thermal fuse are used for safety purposes.



2) The surface temperature of the upper heat roller is set to 160 - 200°C. The surface temperature during the power save mode is set to 100°C.
3) The self-check function comes active when one of the following malfunctions occurs, and an "H" is displayed on the multicopy window.

a. When the heat roller surface temperature rises above 240°C.
b. When the heat roller surface temperature drops below 100°C during the copy cycle.
c. Open thermistor
d. Open thermal fuse
e. When the heat roller temperature does not reach 190°C within 27 second after supplying the power.

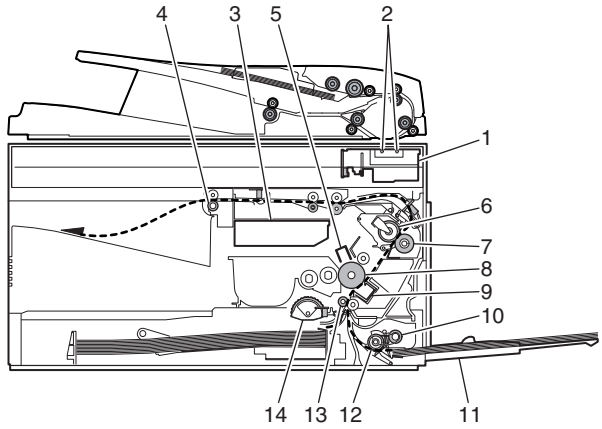
(4) Fusing resistor

This model is provided with a fusing resistor in the fusing section to improve transfer efficiency.

Since the upper heat roller is conductive, when using copy paper that contains moisture and the distance between the transfer unit and the fusing unit is short, the transfer current may find a path to ground via the copy paper, the upper heat roller and the discharging brush.

5. Paper feed section and paper transport section

A. Paper transport path and general operations



1	Scanner unit	8	Drum
2	Copy lamp	9	Transfer unit
3	LSU (Laser unit)	10	Pickup roller
4	Paper exit roller	11	Manual paper feed tray
5	Main charger	12	Manual paper feed roller
6	Heat roller	13	PS roller unit
7	Pressure roller	14	Paper feed roller

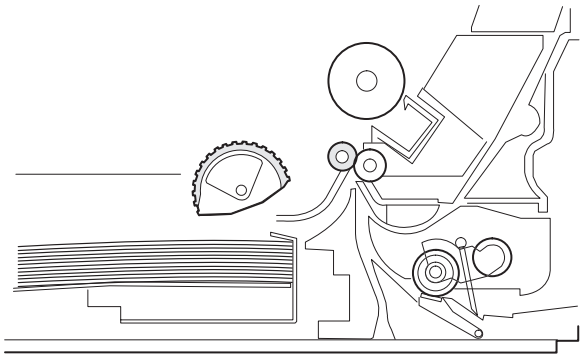
Paper feed is made in two ways; the tray paper feed and the manual paper feed. The tray is of universal-type, and has the capacity of 250 sheets.

The front loading system allows you to install or remove the tray from the front cabinet.

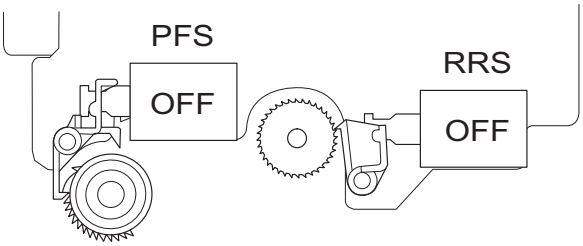
The general descriptions on the tray paper feed and the manual paper feed operation are given below.

(1) Cassette paper feed operation

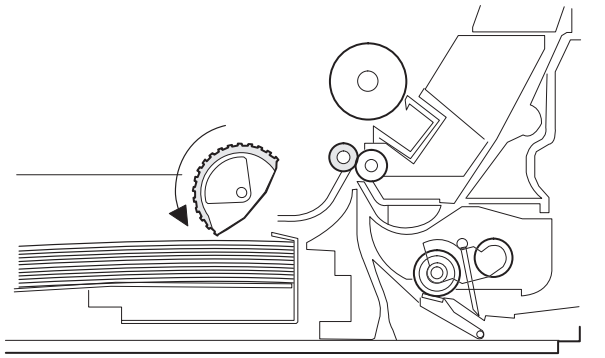
1) The figure below shows the positions of the pick-up roller, the paper feed clutch sleeve, and the paper feed latch in the initial state without pressing the Start key after lighting the ready lamp.
The paper feed latch is in contact with the projection of the clutch sleeve.

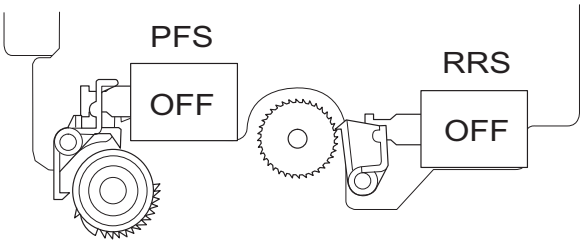


2) When the Start key is pressed, the main drive motor starts rotating to drive each drive gear.
The pick-up drive gear also is driven at that time. Since, however, the paper feed latch is in contact with the projection of the clutch sleeve, rotation of the drive gear is not transmitted to the pick-up roller, which does not rotate therefore.



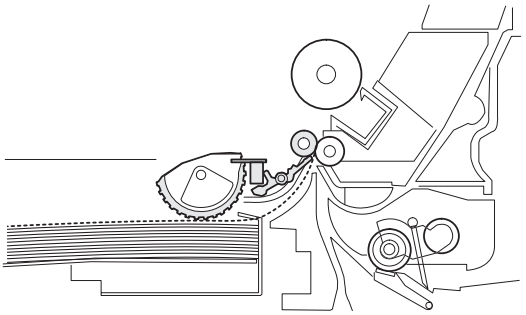
3) After about 0.1 sec from when the main motor start rotating, the tray paper feed solenoid (PFS) turns on for a moment.
This disengages the paper feed latch from the projection of the clutch sleeve, transmitting rotation of the pick-up drive gear to the paper feed roller shaft, rotating the pick-up roller to feed the paper.

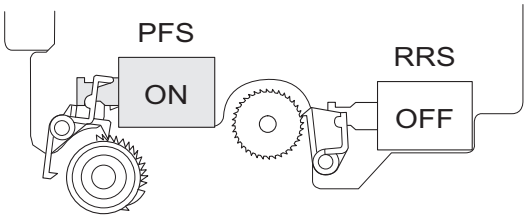




4) After more than half rotation of the pick-up roller, the paper feed latch is brought in contact with a notch on the clutch sleeve, stopping rotation of the pick-up roller.

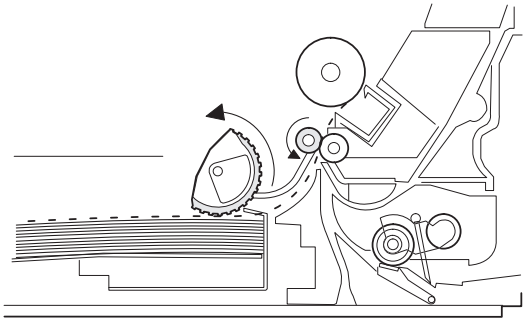
5) At this time, the paper is fed passed the paper entry detection switch (PPD1), and detected by it. After about 0.15 sec from detection of paper by PPD1, the tray paper feed solenoid (PFS) turns on so that the clutch sleeve projection comes into contact with the paper feed latch to stop the pick-up roller. Then the pick-up roller rotates for about 0.15 sec so that the lead edge of the paper is evenly pressed on the resist roller, preventing against skew feeding.

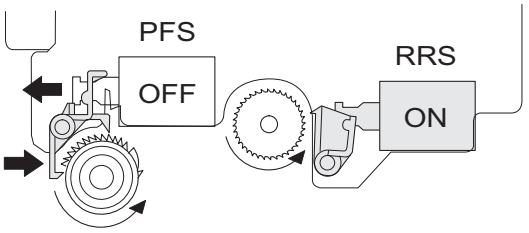




6) To release the resist roller, the tray paper feed solenoid and the resist solenoid are turned on by the paper start signal to disengage the resist start latch from the clutch sleeve, transmitting rotation of the resist drive gear to the resist roller shaft. Thus the paper is transported by the resist roller.

7) After the resist roller starts rotating, the paper is passed through the pre-transfer guide to the transfer section. Images are transferred on the paper, which is separated from the OPC drum by the drum curve and the separation section.

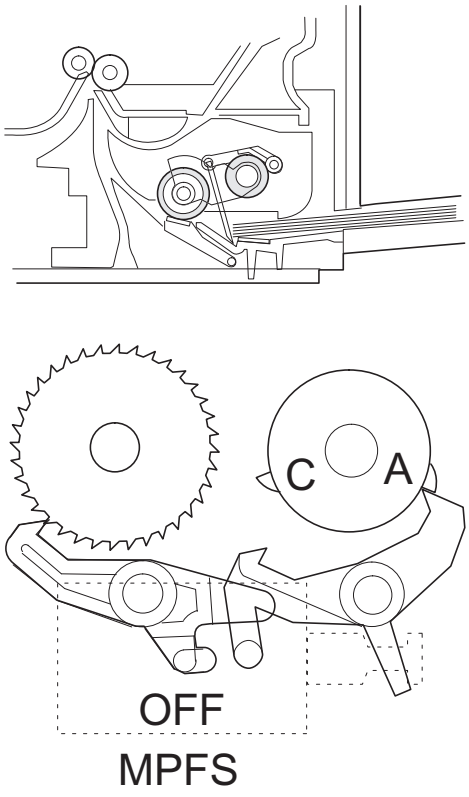




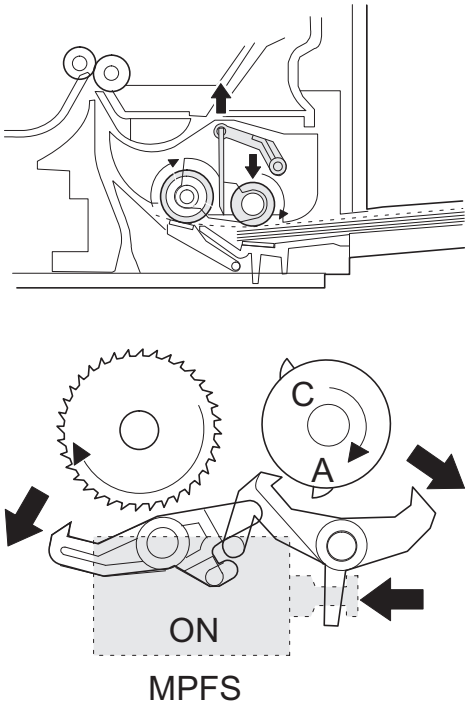
8) The paper separated from the drum is passed through the fusing paper guide, the heat roller (fusing section), POD (paper out detector) to the copy tray.

(2) Manual multi paper feed operation

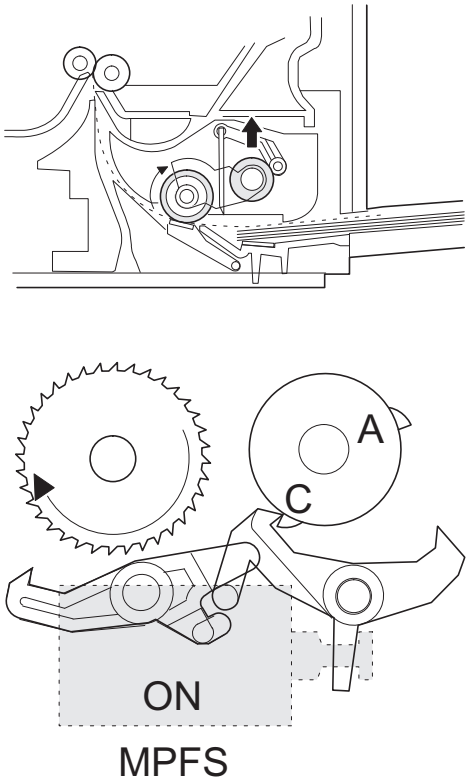
1) Before paper feed operation, the manual paper feed solenoid (MPFS) is turned OFF as shown in the figure below.



2) When the Start key is pressed, the manual paper feed solenoid (MPFS) turns on to disengage the manual paper feed latch.
A from the manual paper feed clutch sleeve A, rotating the manual paper feed roller and the manual take-up roller. At the same time, the manual paper feed stopper opens and the manual take-up roller is pressed to the surface of the paper to start paper feeding.

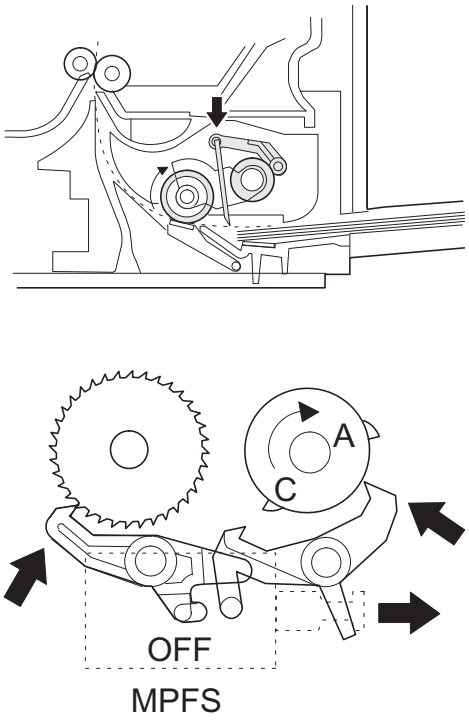


3) When pawl C of the manual paper feed clutch sleeve is engaged with the manual feed latch, the manual feed stopper falls and the manual take-up roller rises. At that time, the manual paper feed roller is rotating.



4) The lead edge of the transported paper is pressed on the resist roller by the transport roller. Then the paper is stopped temporarily to allow synchronization with the lead edge of the image on the OPC drum.
From this point, the operation is the same as the paper feed operation from the tray. (Refer to 7-5 - 8.)

5) The solenoid turns off to close the gate and return to the initial state.



(3) Conditions of occurrence of paper misfeed

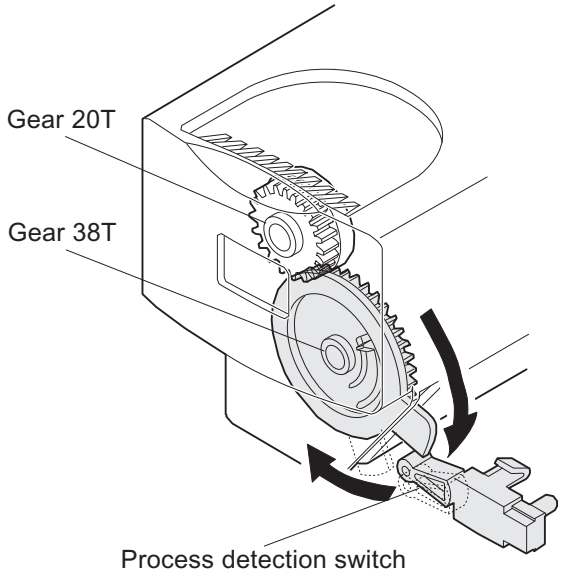
a. When the power is turned on:
PPD or POD is ON when the power is turned on.

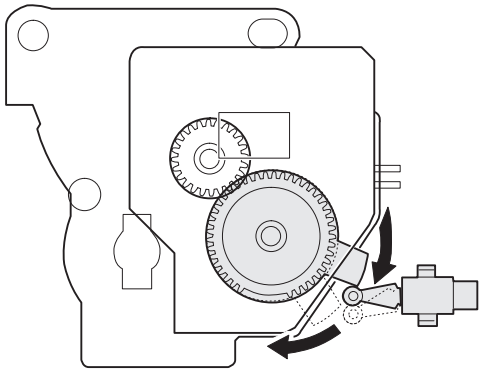
b. Copy operation

a	PPD1 jam	PPD1 does not turn off within 4 sec after turning on the resist roller.
b	PPD2 jam	PPD2 is off immediately after turning on the resist roller.
		PPD2 does not turn off within 1.2 sec after turning off the resist roller.
c	POD jam	POD does not turn on within 2.9 sec after turning on the resist roller.
		POD does not turn off within 1.5 sec - 2.7 sec after turning off PPD2.

6. Process unit new drum detection mechanism

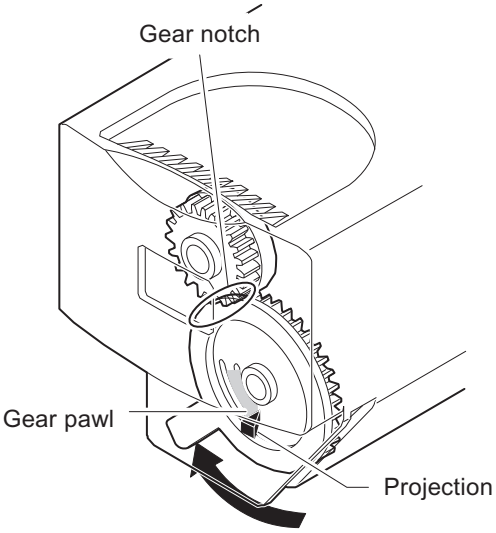
1) When the power is turned on, the detection gear 38T is rotated in the arrow direction by the detection gear 20T to push the micro-switch (process detection switch) installed to the machine sensor cover, making a judgement as a new drum.

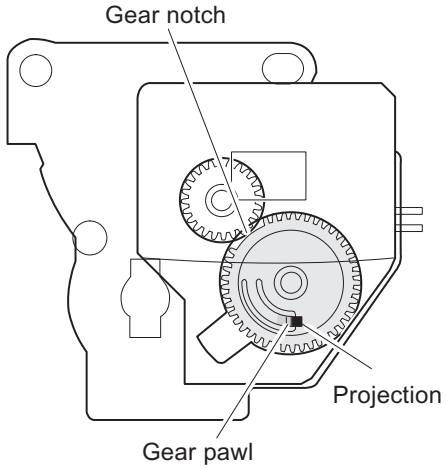




2) When the detection gear 38T turns one rotation, there is no gear any more and it stops.

The latch section of the 38T gear is latched and fixed with the projection of the process cover.





7. SPF section

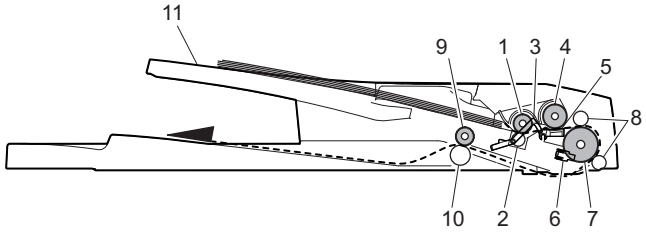
A. Outline

The SPF (Single Path Feeder) is installed to the AL-2031/2041 as a standard provision.

It automatically copies up to 50 sheets of documents of a same size. (Only one set of copies)

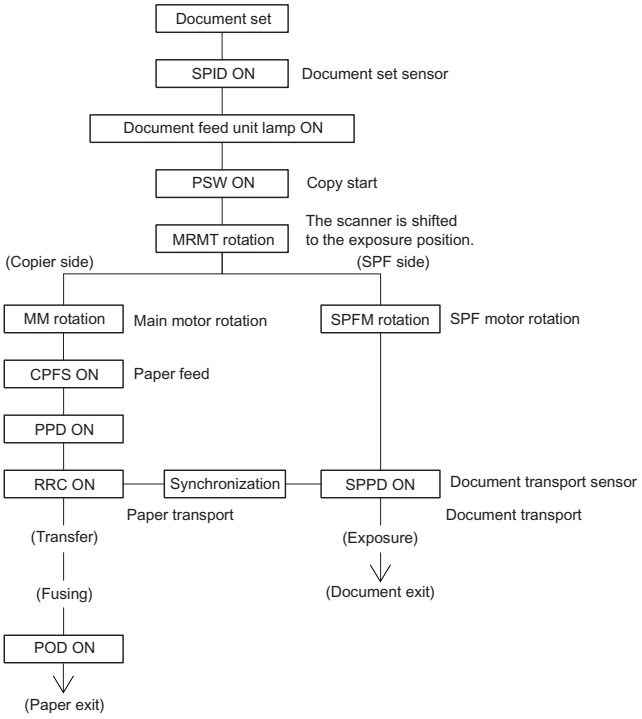
B. Document transport path and basic composition

AL-2031/2041



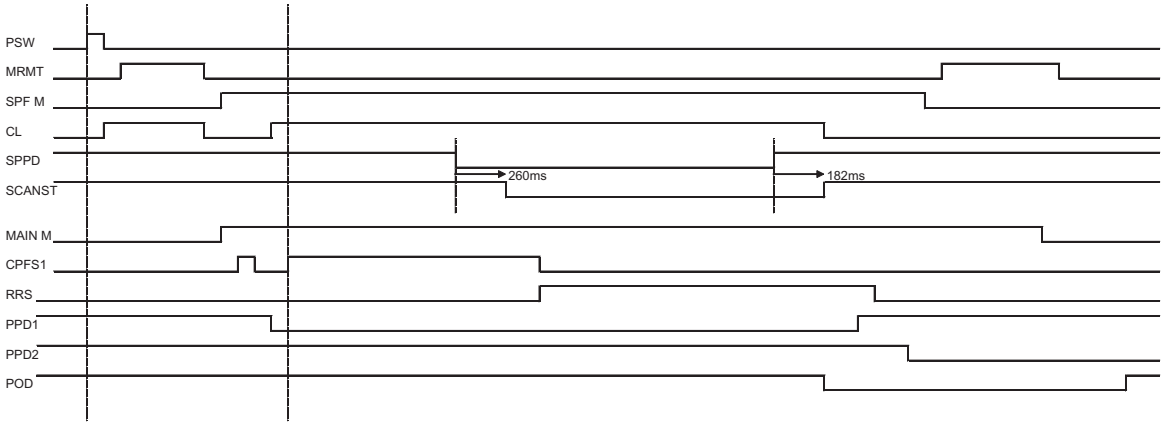
1	Pickup roller	2	Sheet of document for paper feed
3	Set detection ACT	4	Document feed roller
5	Separation sheet	6	Paper entry sensor
7	PS roller D	8	Transport follower roller
9	Paper exit roller	10	Paper exit follower roller
11	Document tray		

C. Operational descriptions



In the zooming mode, the magnification ratio in the sub scanning direction (paper transport direction) is adjusted by changing the document transport speed.

AL-2031/2041

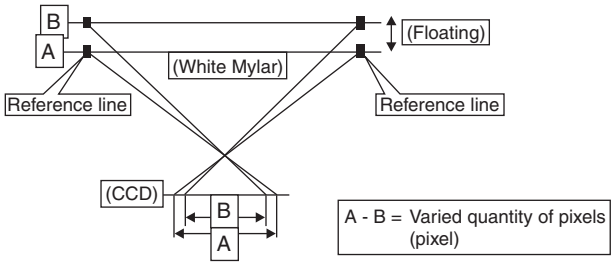


SPF JAM generation condition

1) When SPPD is ON (document remaining) in initializing
2) When SPPD is not turned ON within about 1.5 sec (at 100% copy) after starting the document feed operation.
3) When SPPD is not turned OFF within about 4.7 sec (at 100% copy) after turning on SPPD.
4) When the OC cover is opened during document transport (during SPF motor rotation) (The SPF motor is stopped during document transport, but the OC cover open error occurs instead of the SPF JAM.)

D. SPF open/close detection (book document detection)

SPF open/close detection (book document) detection is performed by detecting the interval between the reference lines on the white Mylar attached to the paper exit guide (document scanning section) by the scanner (CCD) and detecting the varied quantity.



Note: When replacing the carriage unit, be sure to execute SIM41-06.

If SIM41-06 is not executed, the carriage unit may not read the reference line on the white Mylar, preventing the document from being fed.

[8] DISASSEMBLY AND ASSEMBLY

Before disassembly, be sure to disconnect the power cord for safety.

1. **Do not disconnect or connect the connector and the harness while the machine is powered. Especially be careful not to disconnect or connect the harness between the MCU PWB and the LSU (MCU PWB: CN5) during the machine is powered. (If it is disconnected or connected during the machine is powered, the IC inside the LSU will be destroyed.)**
2. **To disconnect the harness after turning on the power, be sure to turn off the power and wait for at least 10 sec before disconnection. (Note that a voltage still remains immediately after turning off the power.)**

The disassembly and assembly procedures are described for the following sections:

1. High voltage section
2. Operation panel section
3. Optical section
4. Fusing section
5. Tray paper feed/transport section
6. Manual paper feed section
7. Rear frame section
8 Power section
9. Duplex motor section (AL-2041)
10. Reverse roller section
11. SPF section (AL-2031/2041)

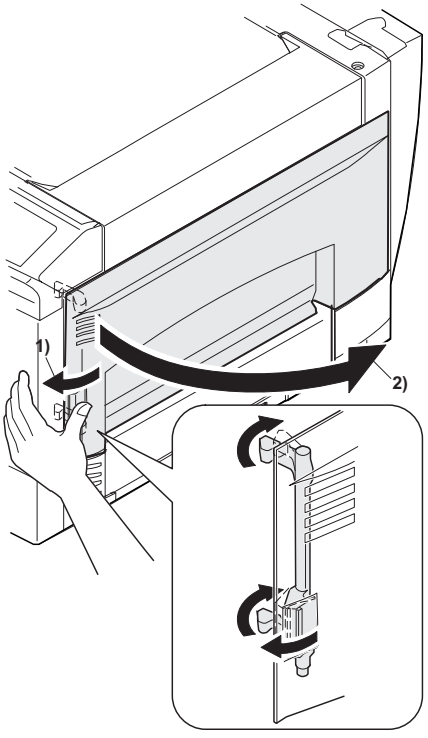
1. High voltage section

A. List

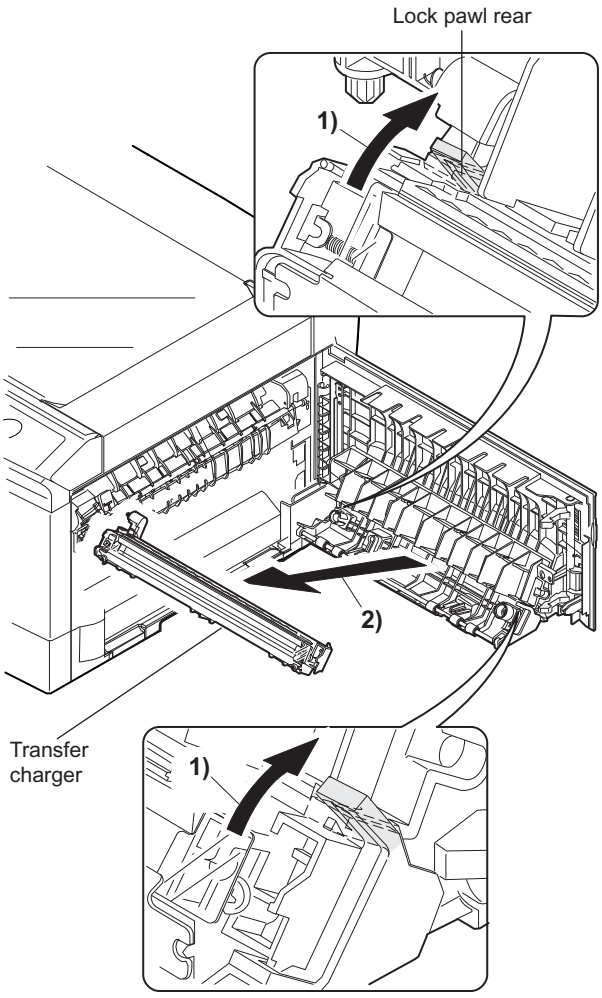
No.	Part name Ref.
1	Transfer charger unit
2	Charger wire

B. Disassembly procedure

1) Press the side cover open/close button and open the side cover.



2) Push up the lock pawls (2 positions) of the side cover, and remove the transfer charger.

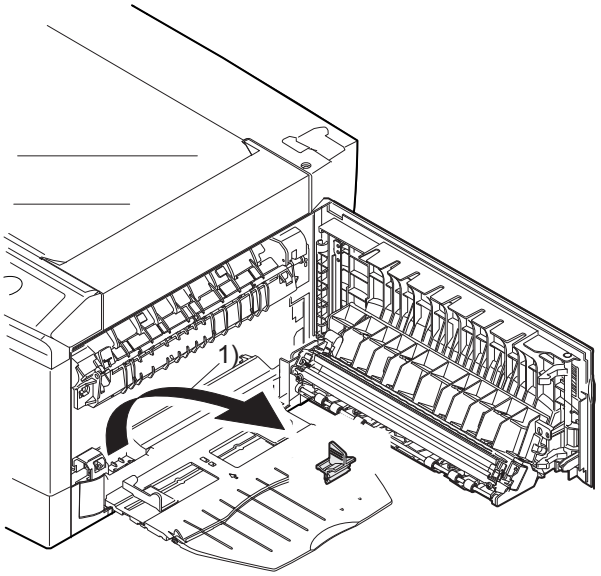


C. Assembly procedure

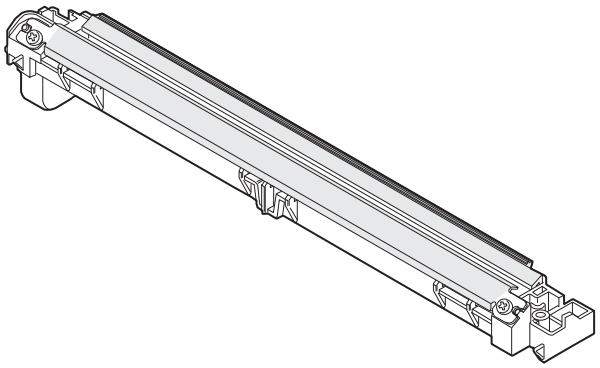
For assembly, reverse the disassembly procedure.

D. Charger wire cleaning

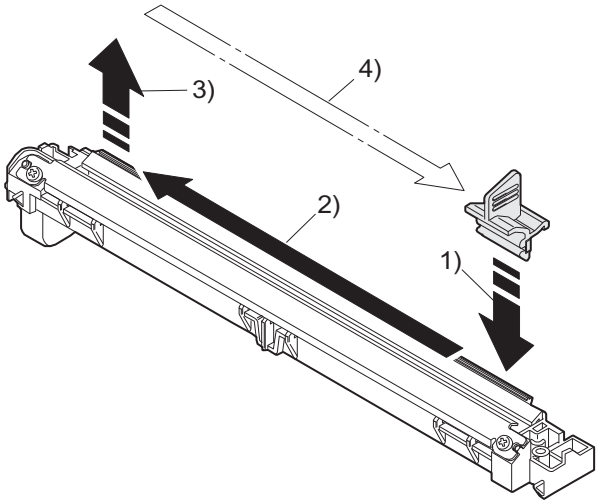
1) Remove the charger cleaner from the manual paper feed unit.



2) Clean the TC front guide and the TC holder with alcohol.



3) Set the charger cleaner to the transfer unit, and move it reciprocally a few times in the direction of the arrow shown in the figure below.



E. Charger wire replacement

1) Remove the TC cover and remove the screw.
2) Remove the spring and remove the charger wire.
3) Install a new charger wire by reversing the procedures (1) and (2).
   At that time, be careful of the following items.

- The rest of the charger wire must be within 1.5mm. Refer to Fig.1
- The spring hook section (charger wire winding section) must be in the range of the projection section.
- Be careful not to twist the charger wire.

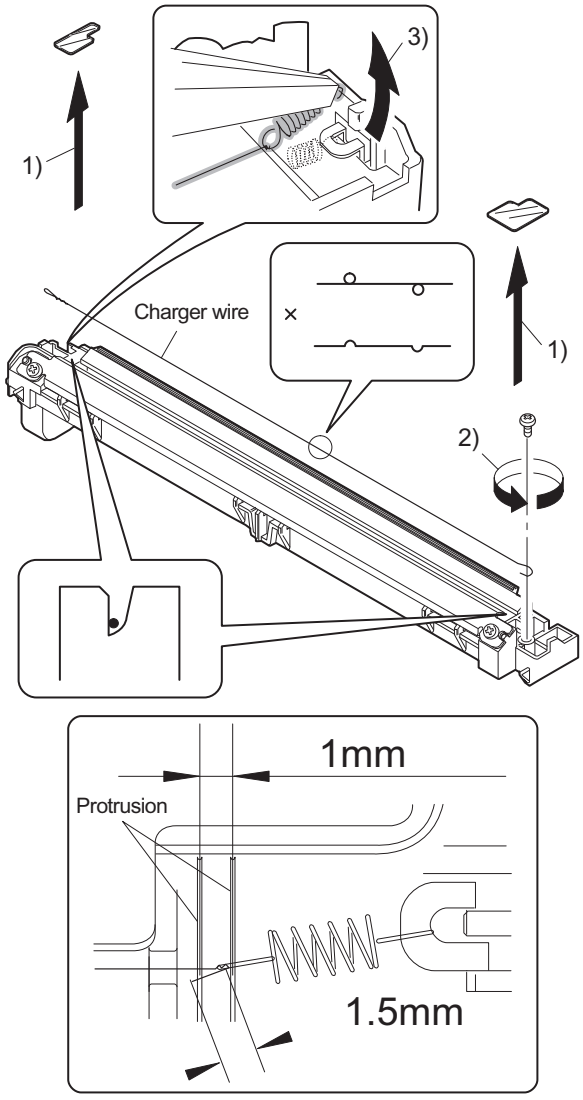


Fig.1

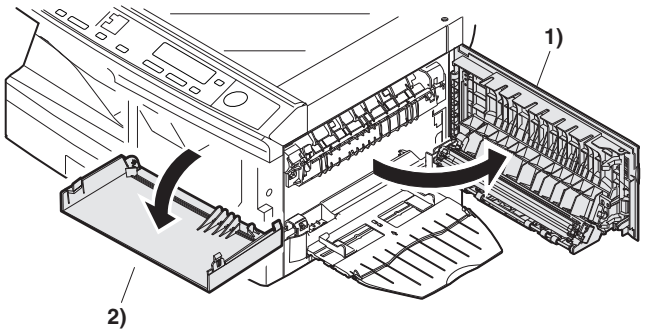
2. Operation panel section

A. List

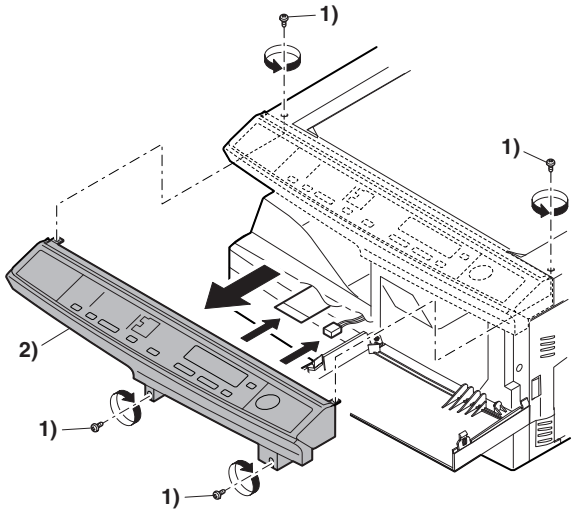
No.	Part name Ref.
1	Operation panel unit
2	Operation PWB

B. Disassembly procedure

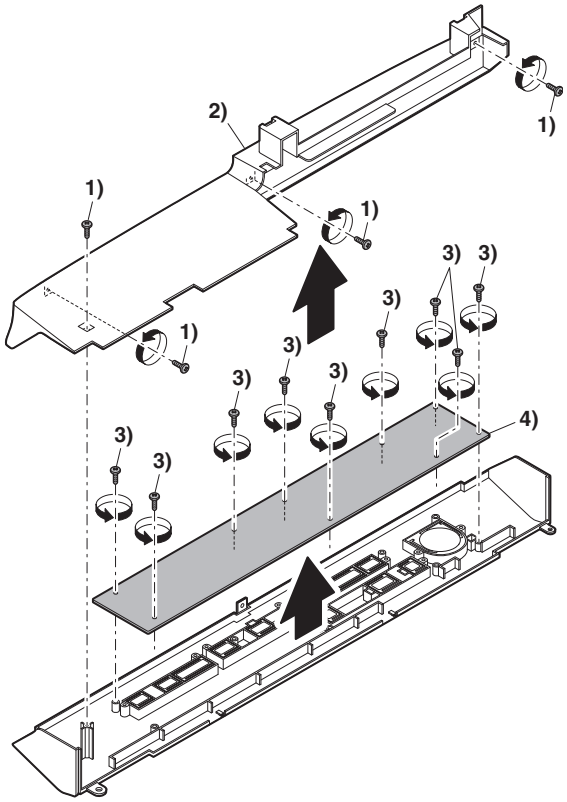
1) Open the side door, and Open the front cover.



2) Remove the screws (4 pcs.), the harness, and the operation panel unit.



3) Remove four screws, and remove the operation cabinet.
4) Remove nine screws, and remove the operation PWB.



C. Assembly procedure

For assembly, reverse the disassembly procedure

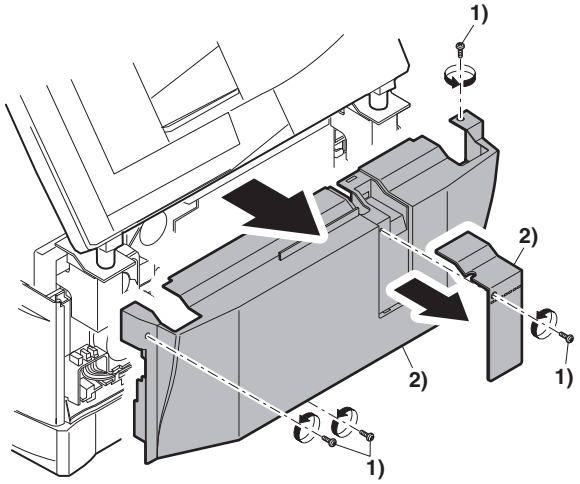
3. Optical section

A. List

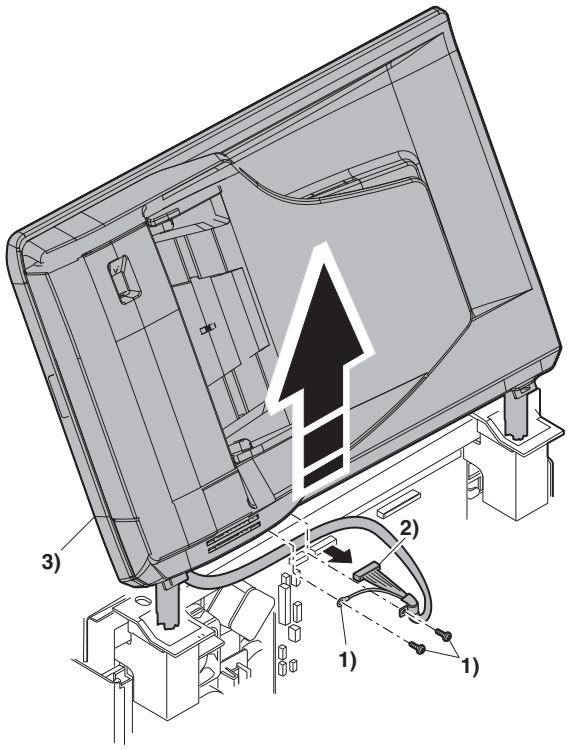
NO.	Part name Ref.
1	Copy lamp unit
2	Copy lamp
3	Lens unit

B. Disassembly procedure

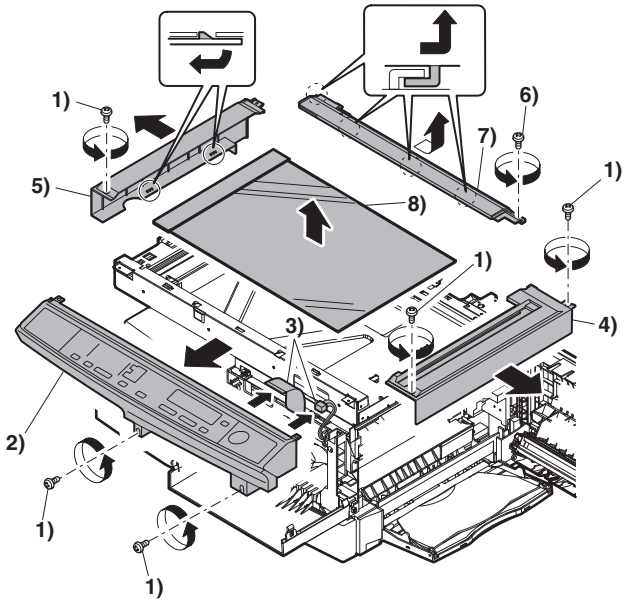
1) Remove four screws, and remove the rear cabinet and the rear cabinet cover.



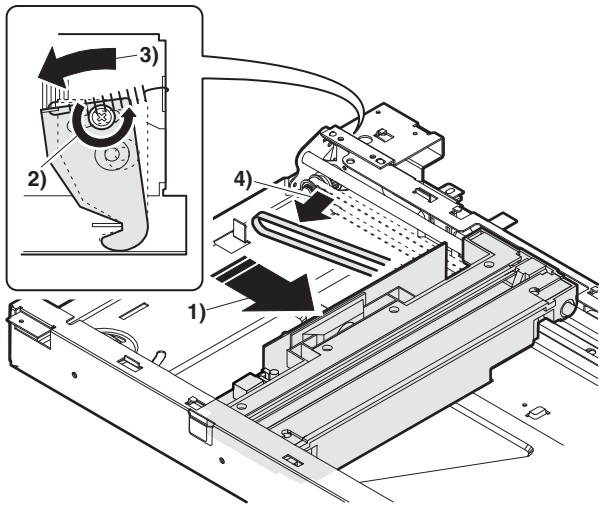
2) Remove two screws, and remove the earth wire.
3) Disconnect the connector.
4) Remove the SPF unit.



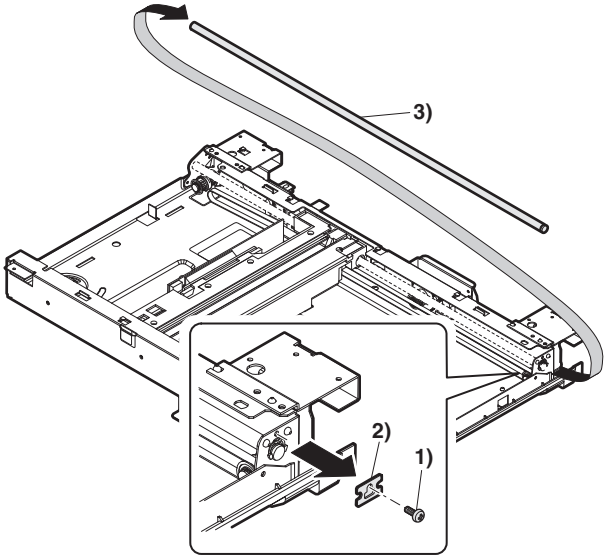
5) Remove five screws. Remove the operation unit, and disconnect the connector.
6) Remove the right cabinet.
7) Remove the left cabinet.
8) Remove the screw, and remove the rear cover.
9) Remove the table glass.



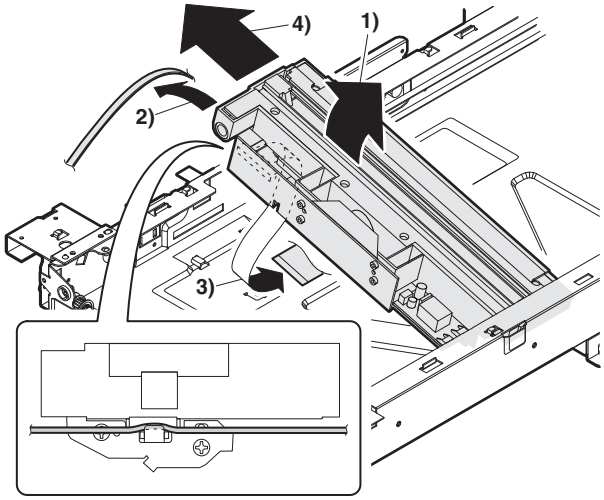
10) Move the carriage to the position indicated on the figure.
11) Loosen the screw which is fixing the tension plate.
12) Move the tension plate in the arrow direction to release the tension, and remove the belt.



13) Remove the screw, and remove the rod stopper.
14) Remove the rod.



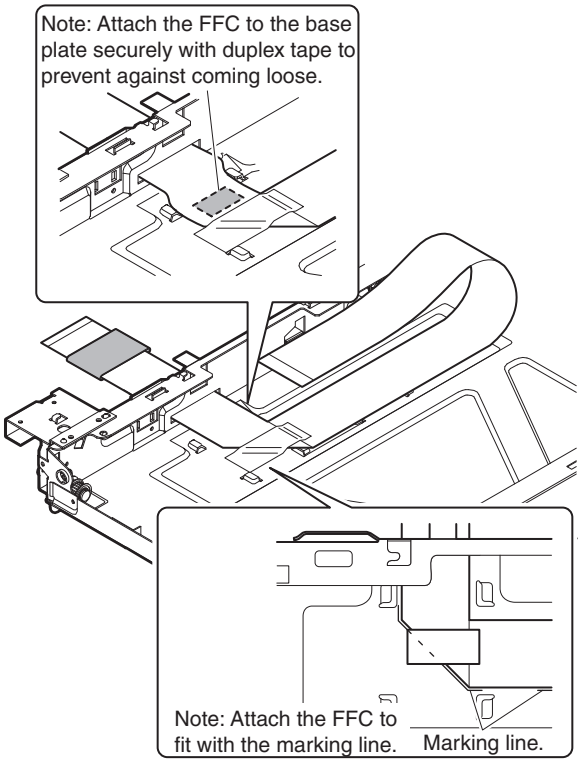
15) Lift the rear side of the carriage, remove the belt and the connector, and remove the carriage.

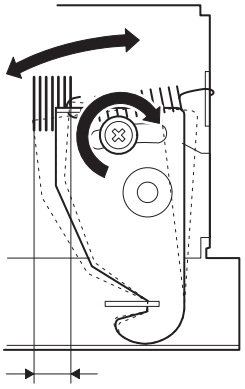


C. Assembly procedure

CCD core

1) Insert the CCD-MCU harness into the CCD PWB of the carriage unit.
2) Attach the CCD-MCU harness to the duplex tape on the back surface of the carriage unit. Clean and remove oil and dirt from the attachment surface.
3) Pass the CCD-MCU harness through the square hole in the base plate.
4) Attach the CCD-MCU harness to the base plate with duplex tape.
5) Attach two cable fixing sheets to fix the CCD-MCU harness to the base plate.
6) Pass the core through the CCD-MCU harness and fix the core.
7) Insert the CCD-MCU harness into the MCU PWB.





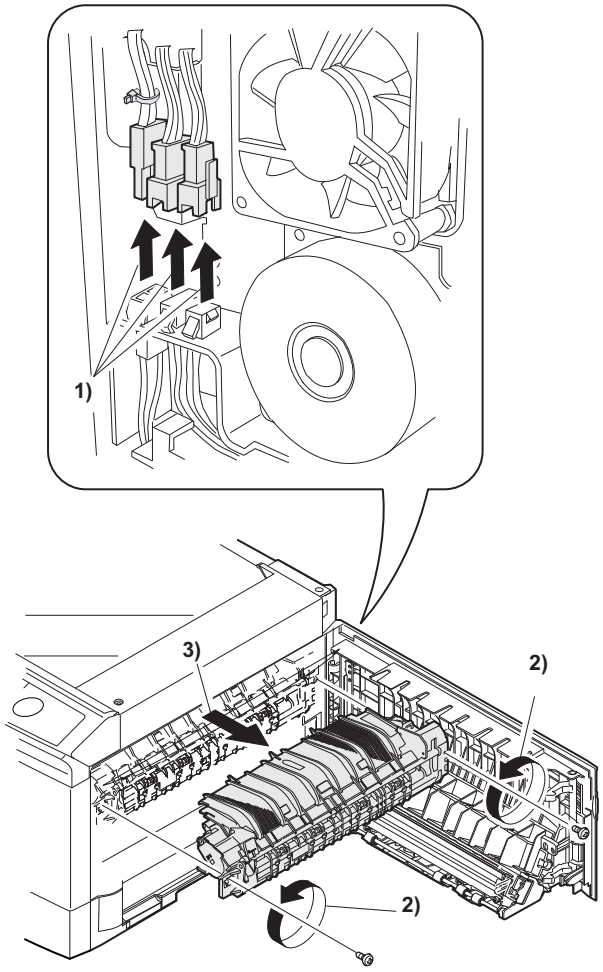
4. Fusing section

A. List

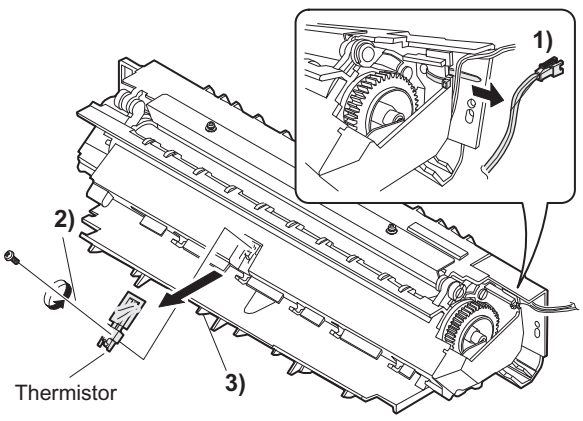
No.	Part name Ref.
1	Thermistor
2	PPD2 sensor
3	Heater lamp
4	Pressure roller
5	Heat roller

B. Disassembly procedure

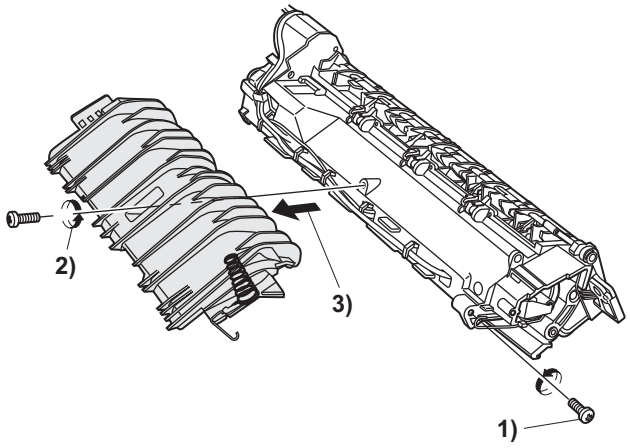
1) Remove the connectors (3 pcs.) of the rear cabinet.
2) Open the side cover, remove two screws, and remove the fusing unit.



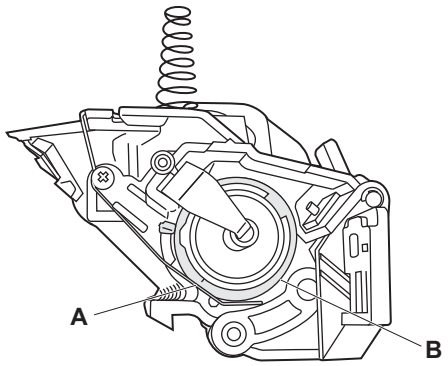
3) Cut the binding band, remove the screw, and remove the thermistor.



4) Remove the screw and remove the resistor.
Remove the screw and remove the U-turn guide.

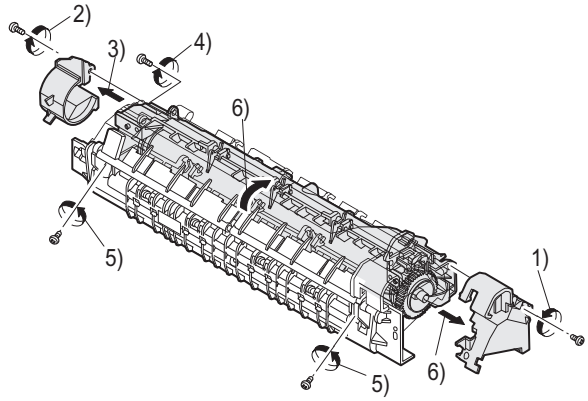


Note: Check to confirm that the fusing lower earth spring (A) does not extend over the fusing bearing (B) after tightening the screw.

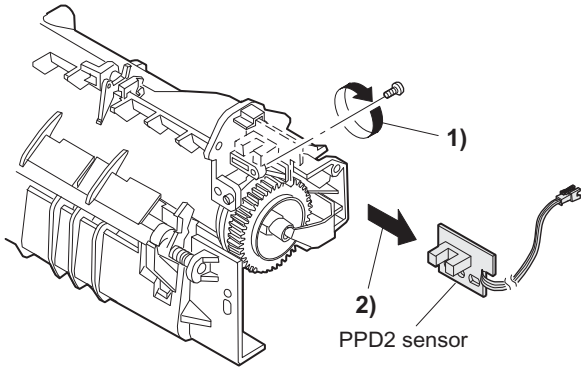


Pressure roller section disassembly

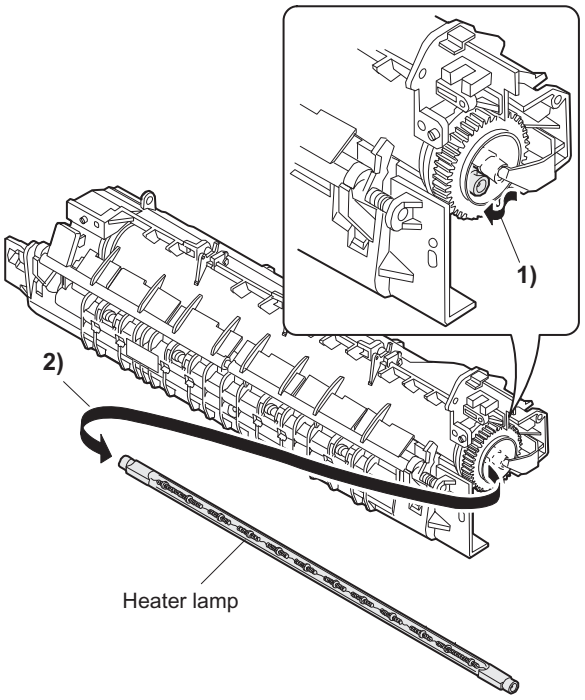
5) Remove the three screws, remove the fusing cover lower on the right side, and open the heat roller section.



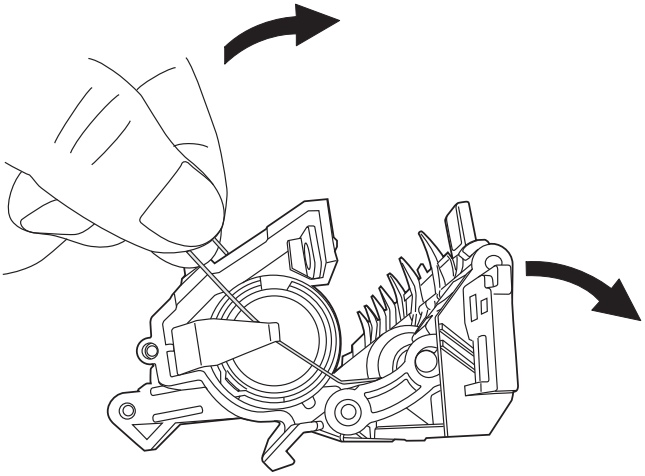
6) Remove the screw and remove the PPD2 sensor.



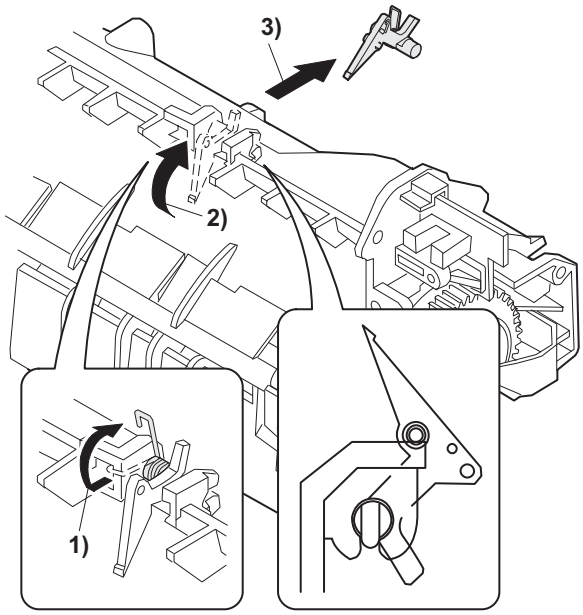
7) Remove the plate spring on the right and remove the heater lamp.



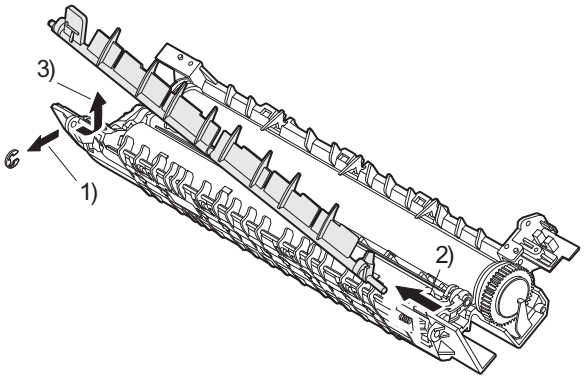
8) When opening the fusing unit, slide the fusing lower earth spring in the arrow direction, and open the unit.
If the fusing unit is opened without sliding the fusing lower earth spring, the fusing lower earth spring is deformed.
If the fusing lower earth spring is once deformed, the earth function may not work properly. Replace the deformed spring with a new one.



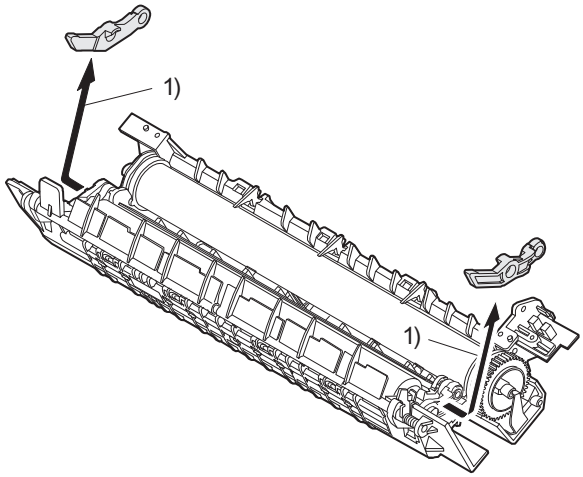
9) Remove the spring, and remove the upper separation pawls (3 pcs.).



10) Remove the E-ring and remove the reverse gate.

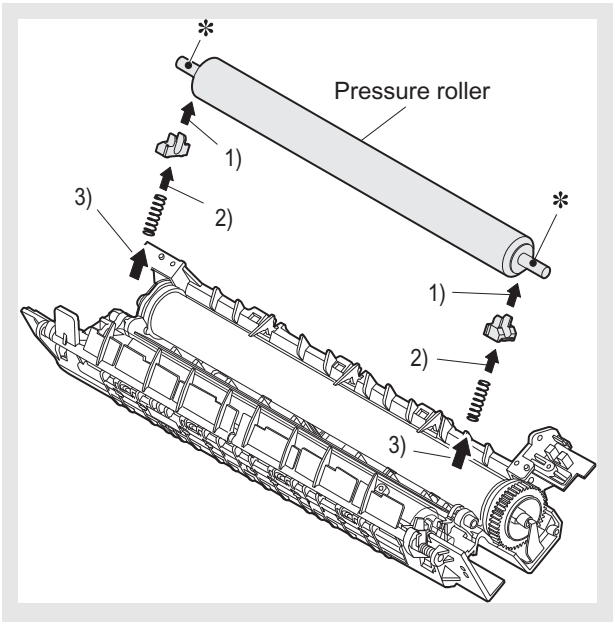


11) Remove the pressure release levers on the right and the left sides.



12) Remove the pressure roller, and the spring. ▲1

Note: Apply grease to the sections specified with an asterisk (*). ▲1
Grease: "JFE552" UKOG-0235FCZZ

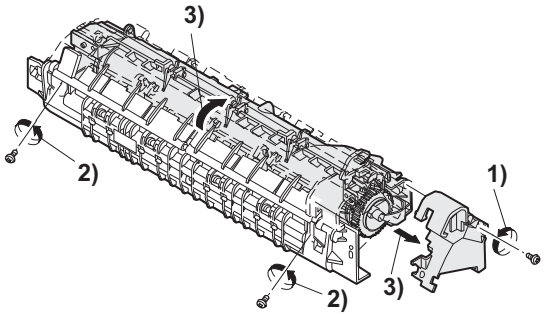


Heat roller disassembly

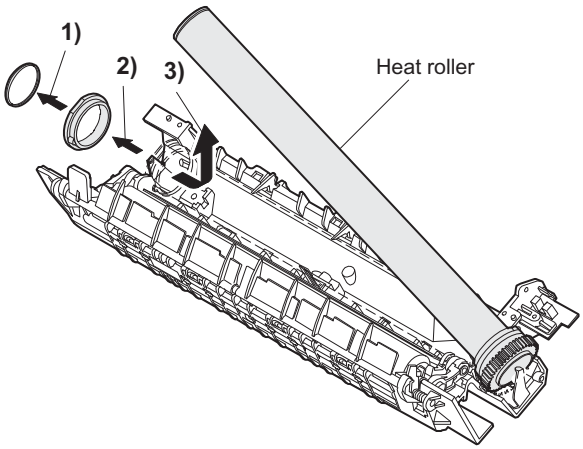
(Continued from procedure 4).)

5) Remove screws, remove the fusing cover, and open the heat roller section.

Note: When opening the fusing unit, be careful not to deform the fusing lower earth spring as described in the item 8) of "Pressure roller section disassembly.

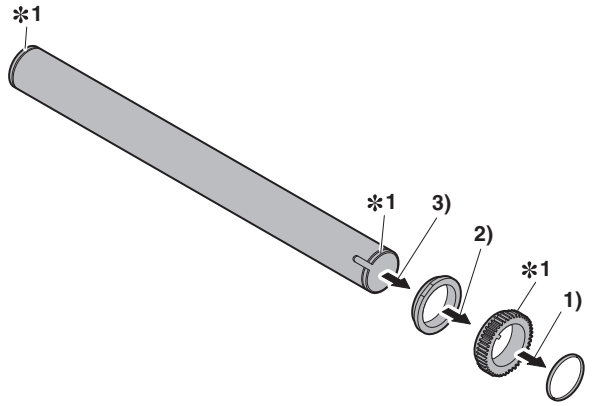


6) Remove the C-ring and the fusing bearing, and remove the heat roller.



7) Remove the parts from the heat roller.

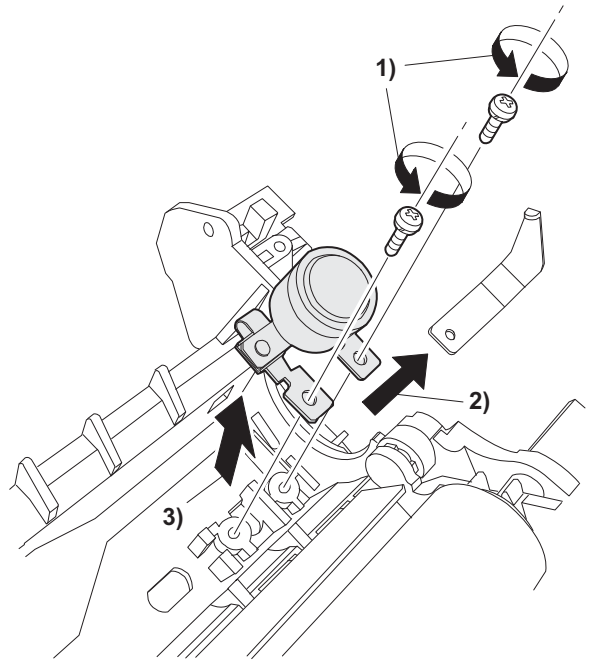
Note: Apply grease to the sections specified with *1.
Grease: "JFE552" UKOG-0235FCZZ



8) Remove two screws and remove the thermo unit.

Note: The set temperature of the thermostat differs from that of the current model.

	Temperature
AL-2021/2031/2041	230°C



C. Assembly procedure

For assembly, reverse the disassembly procedure.

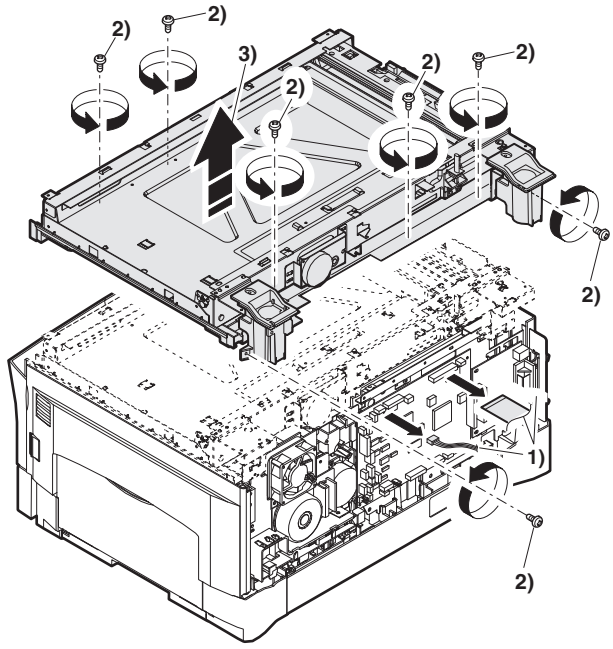
5. Tray paper feed/transport section

A. List

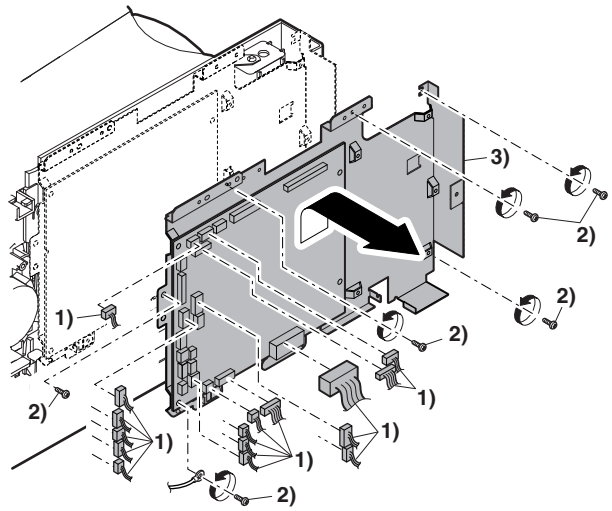
No.	Part name Ref.
1	PPD1 sensor PWB
2	POD sensor PWB
3	LSU unit
4	Intermediate frame unit
5	Paper feed roller

B. Disassembly procedure

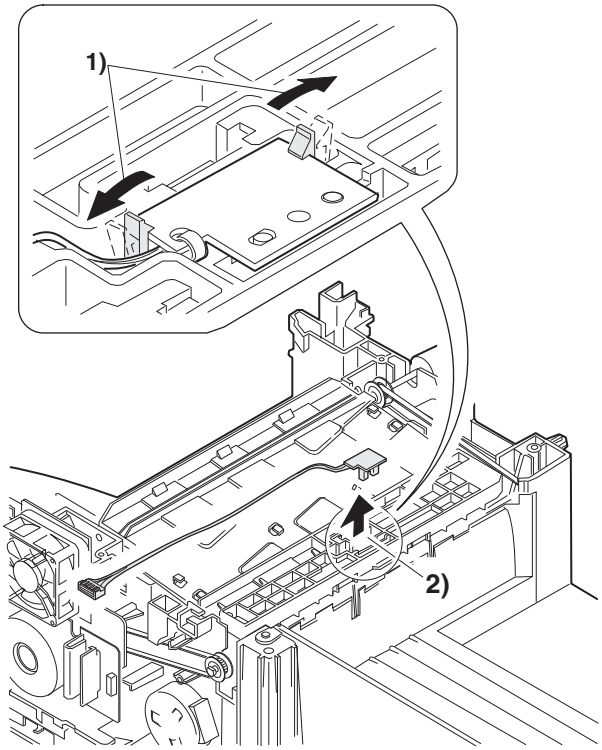
1) Remove two screws, and remove the hinge guide R.
2) Disconnect the connector. (2 positions)
3) Remove five screws, and remove the scanner unit.
4) Remove the fan duct.



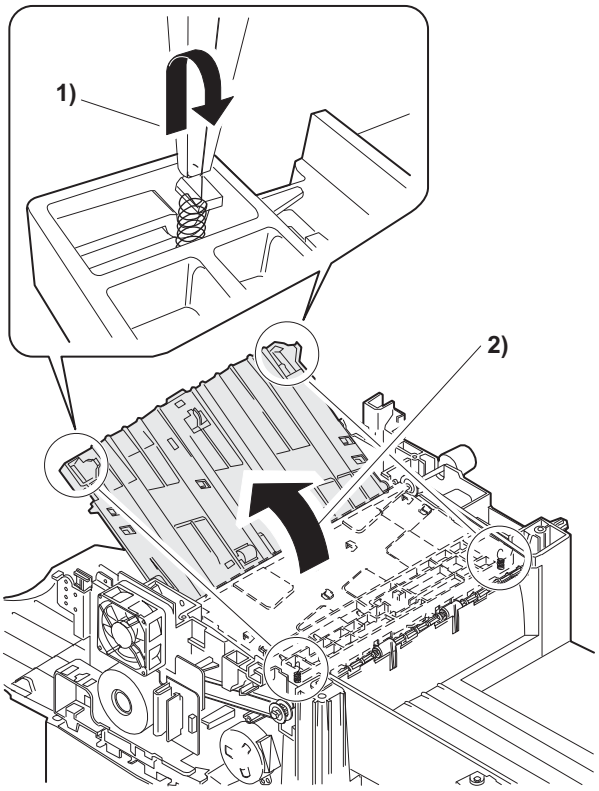
5) Remove each connector and six screws, and remove the MCU PWB. (The shape of the MCU PWB differs depending on the model.)



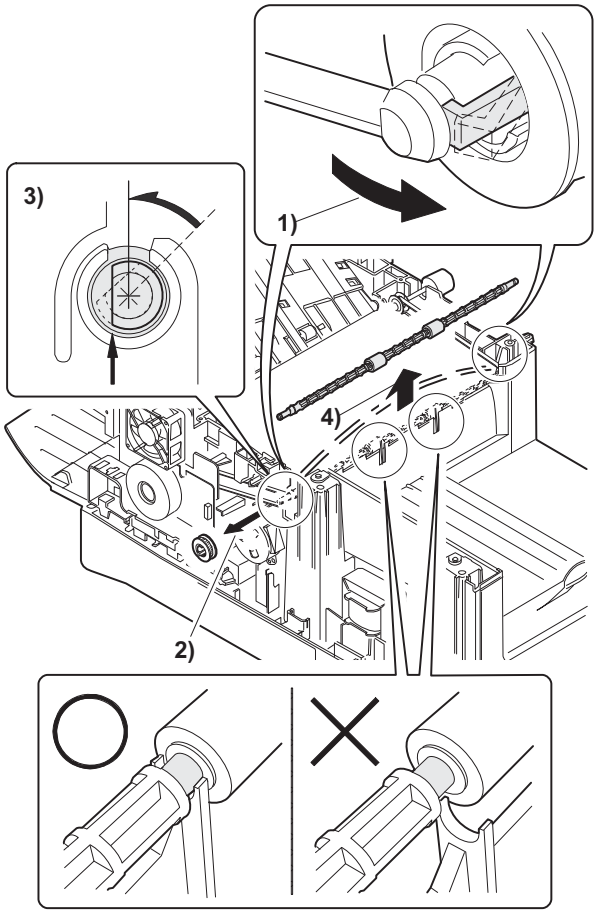
6) Remove the PWB insulation mylar and remove the paper transport detection sensor (POD).



7) Remove two springs and open the intermediate frame unit.

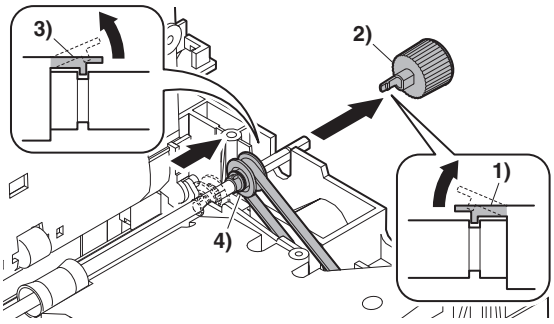


8) Remove the pulleys on the both sides and remove the paper exit roller.

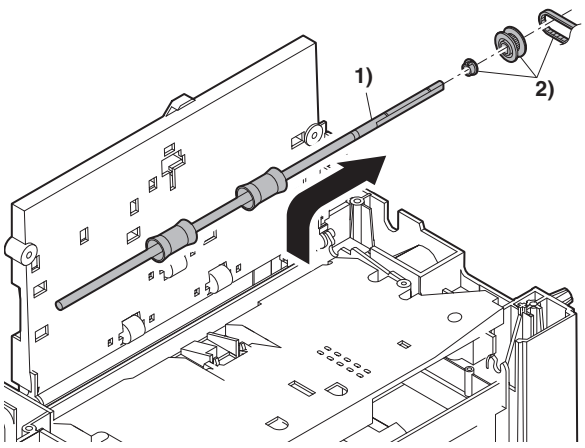


9) Disengage the pawl, and remove the roller knob.

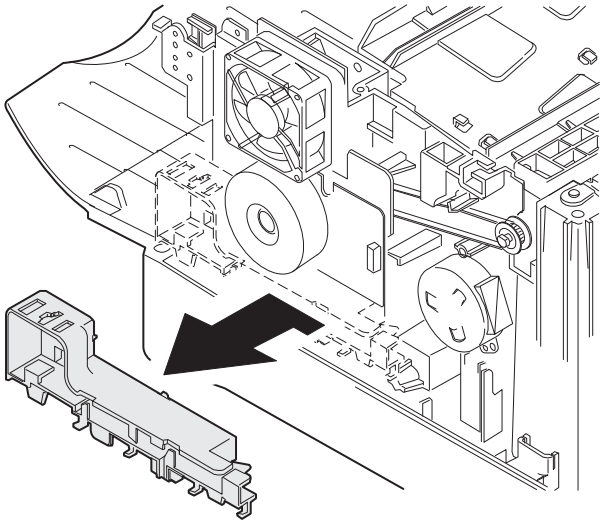
10) Disengage the pawl, and shift the pulley and the bearing.



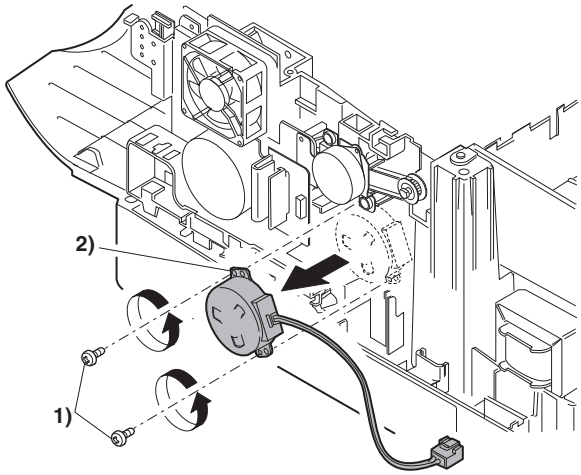
11) Remove the paper exit roller, and remove the belt, the pulley, and the bearing.



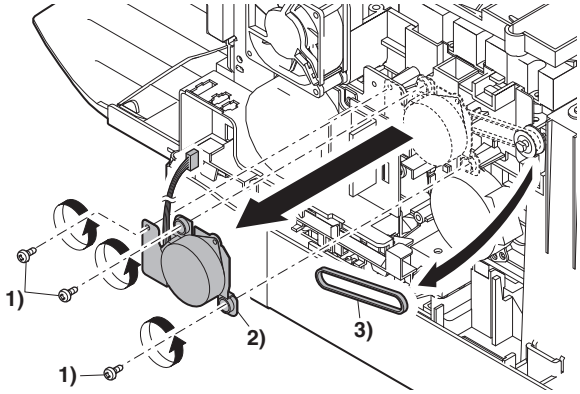
12) Remove the harness guide.



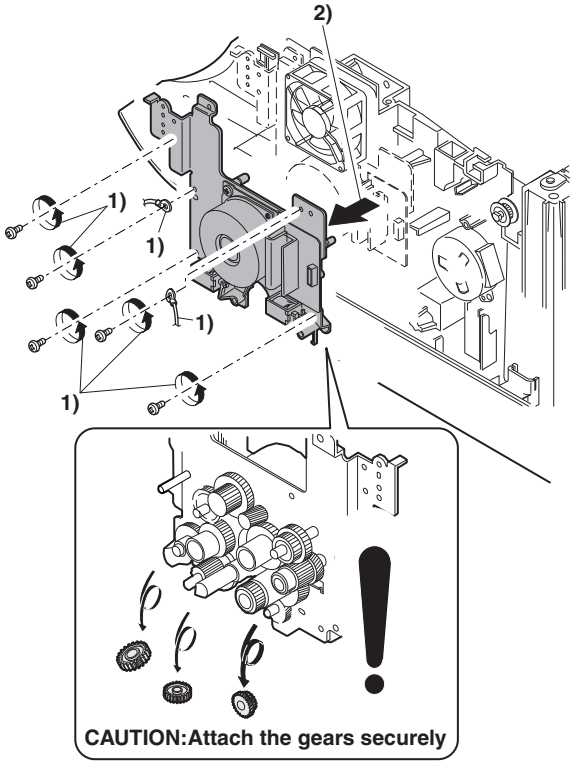
13) Remove two screws and remove the toner motor.



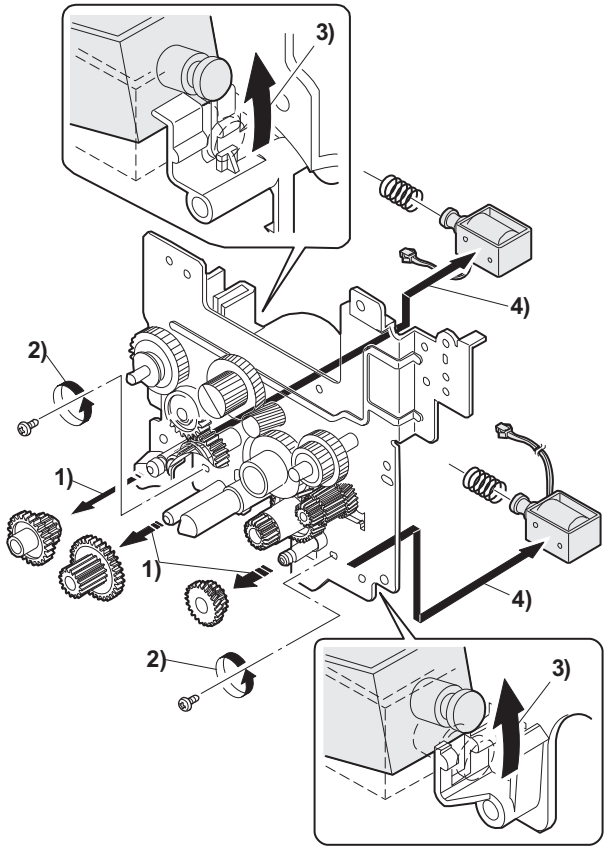
14) Remove three screws, and remove the DUP motor unit and the belt.



15) Remove five screws and the grounding wire, and remove the main drive unit.

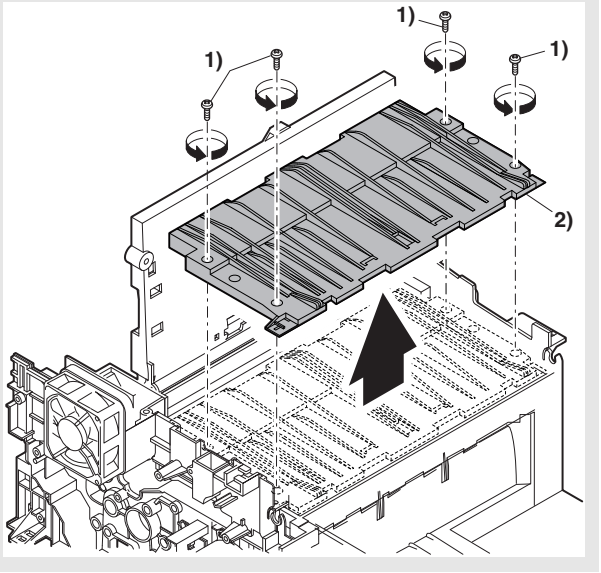


16) Remove the parts as shown below, and remove the pressure release solenoid and the paper feed solenoid.

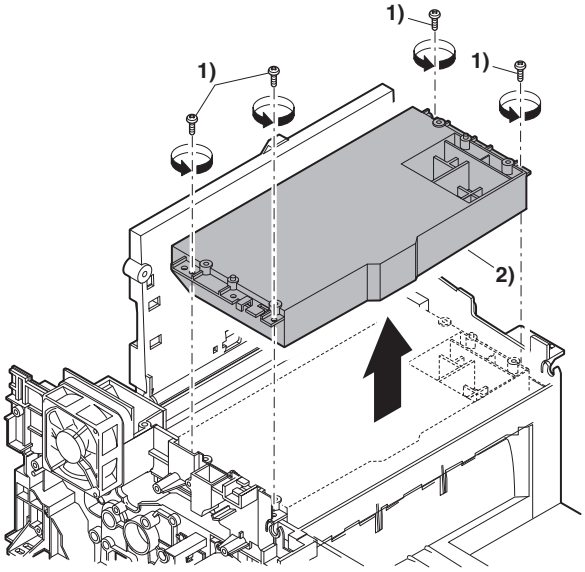


▲1 : '10/Oct/20

17) Remove four screws, and remove the paper guide unit.



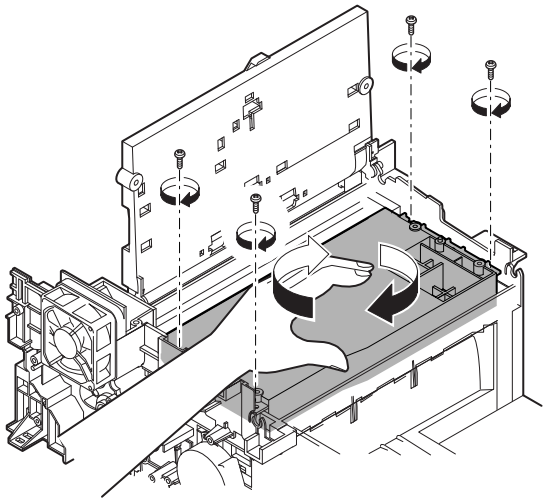
18) Remove four screws, and remove the LSU unit.



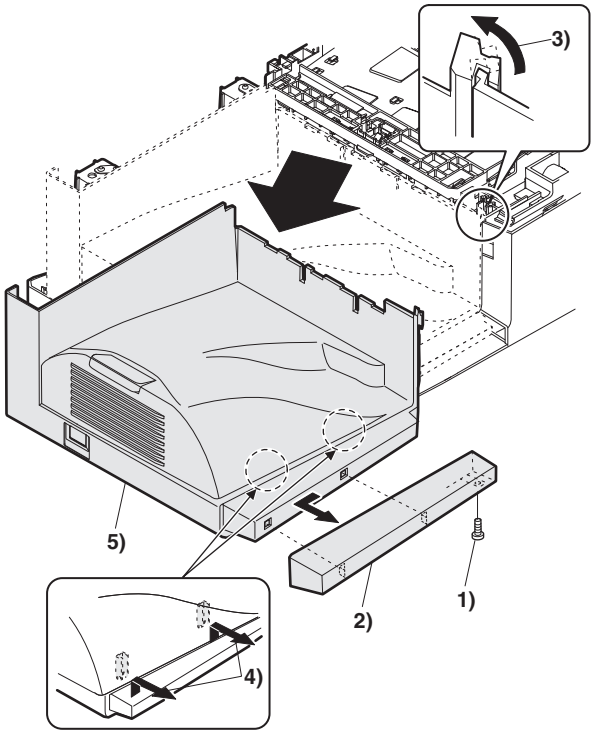
[Note for assembling the LSU]

When installing the LSU, turn the LSU clockwise and fix with screws in order to provide an attachment backlash in the proper direction.

Observe the following sequence of fixing screws.

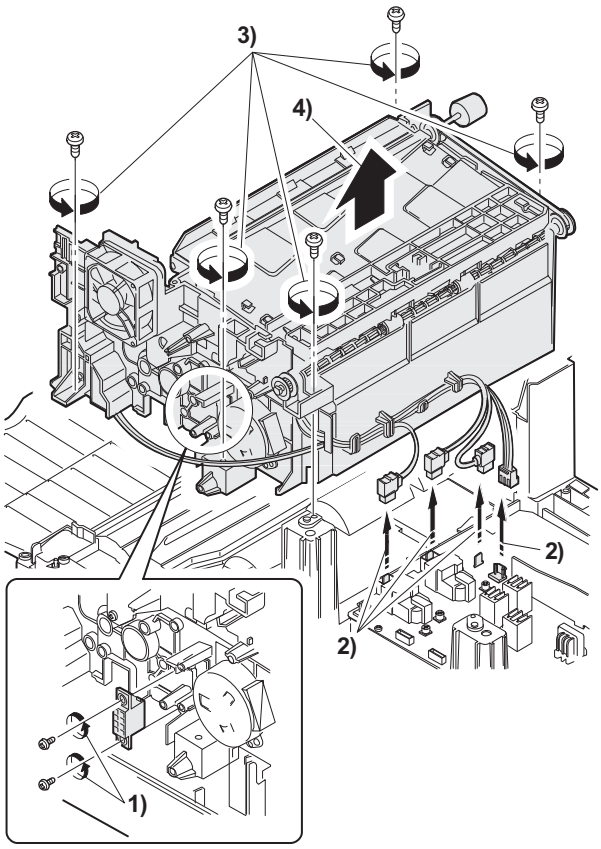


19) Remove the screw, slide the left cabinet to the left to detach it. Remove each pawl, and remove the paper exit tray.



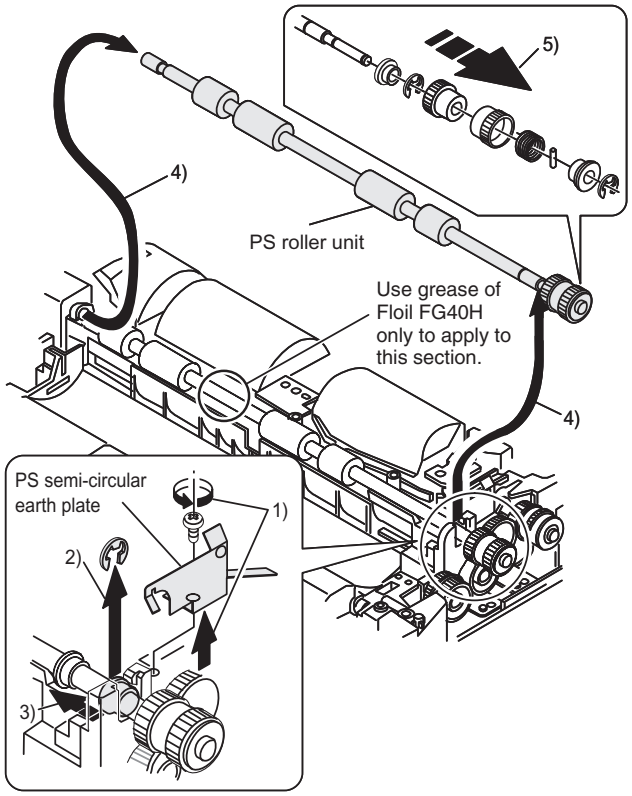
20) Remove two screws and remove the fusing connector.

21) Remove five screws and the connector, and lift the intermediate frame unit to remove.

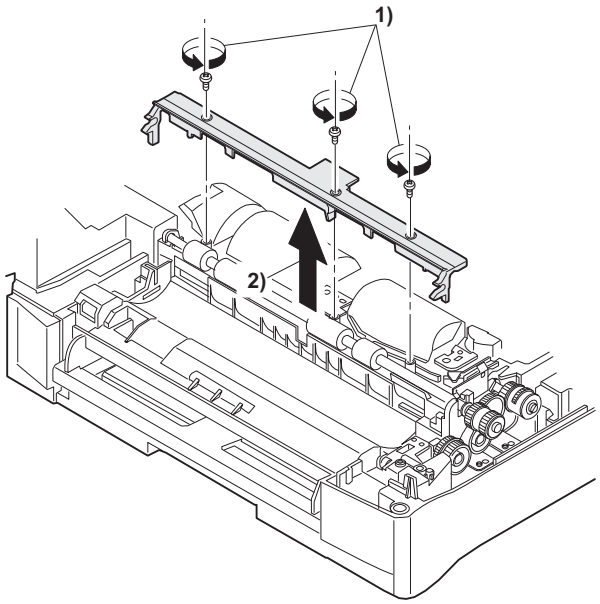


22) Remove the screw and the E-ring, and remove the PS semi-circular earth plate and the PS roller unit.

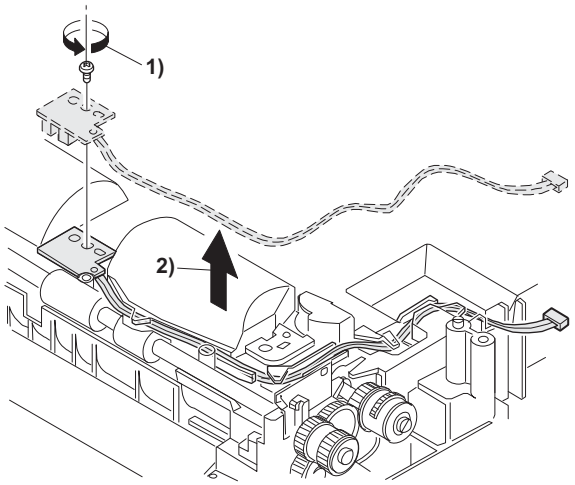
23) Remove the E-ring and remove the spring clutch from the PS roller unit.



24) Remove three screws and remove the TC front paper guide.

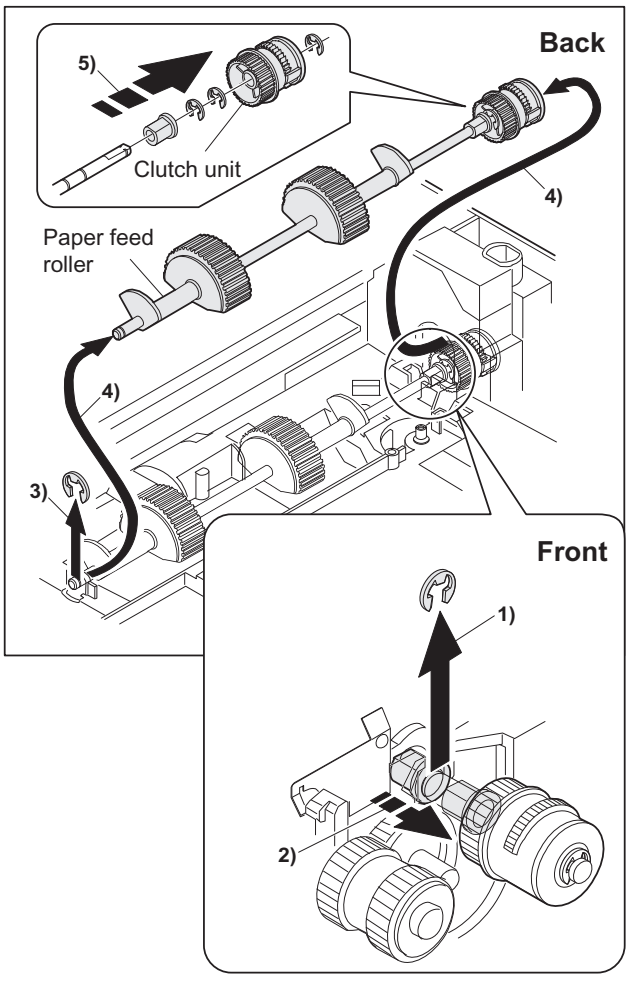


25) Remove the screw and the connector, and remove the PPD1 sensor PWB.



26) Remove two E-rings and remove the paper feed roller.

27) Remove three E-rings and remove the clutch unit.



C. Assembly procedure

For assembly, reverse the disassembly procedure.

6. Manual paper feed section

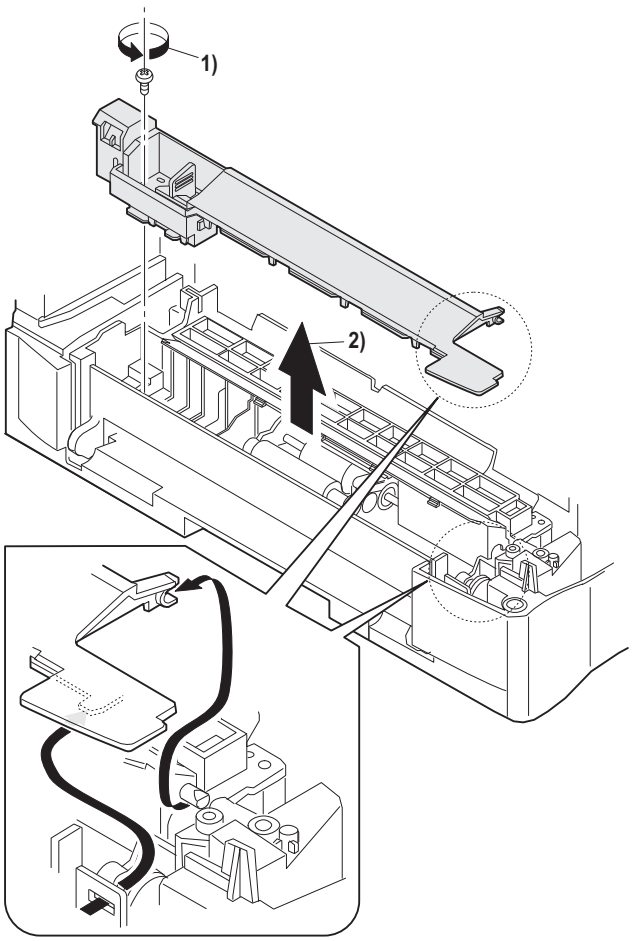
A. List

No.	Part name Ref.
1	Manual transport roller
2	Cassette detection switch
3	Side door detection unit

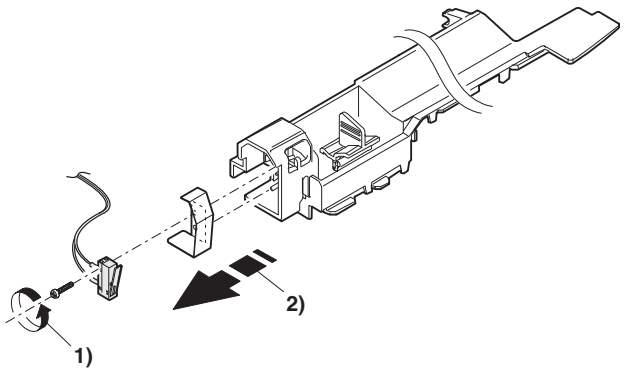
B. Disassembly procedure

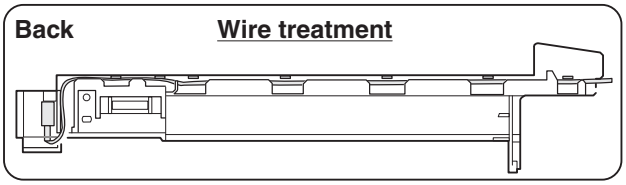
Multi unit

1) Remove the screw and remove the multi upper cover.

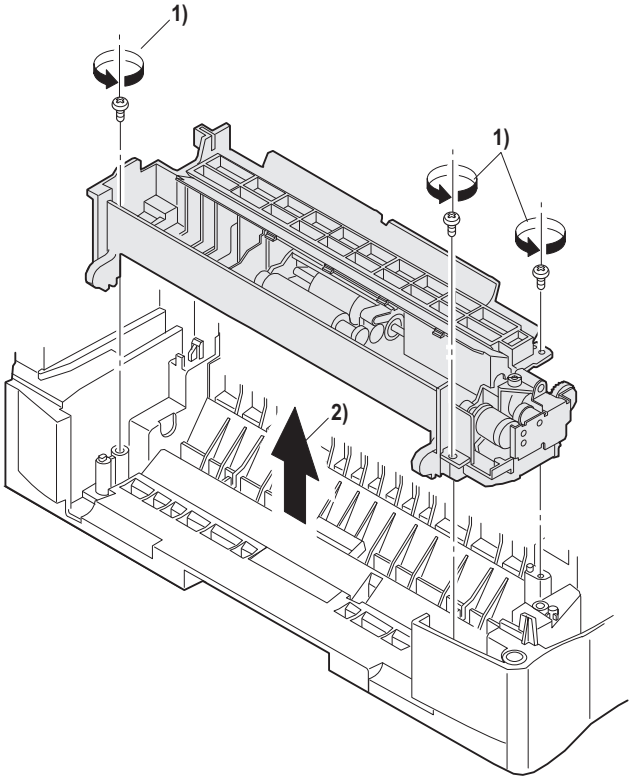


2) Remove the screw and remove the side door detection unit.

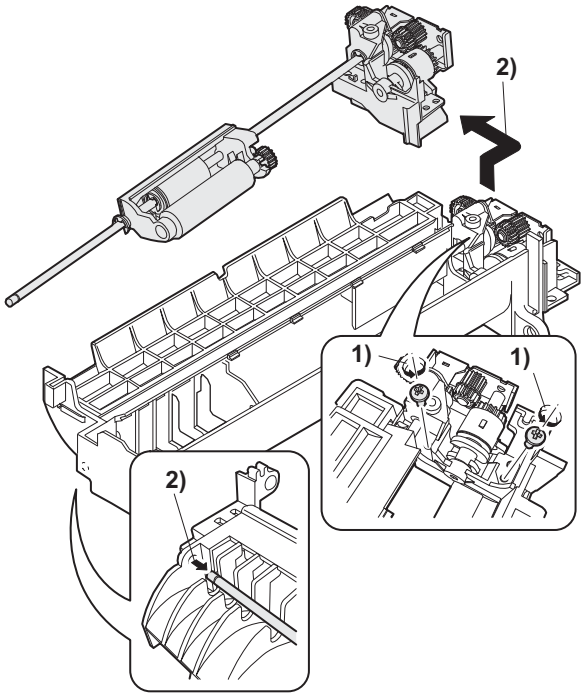




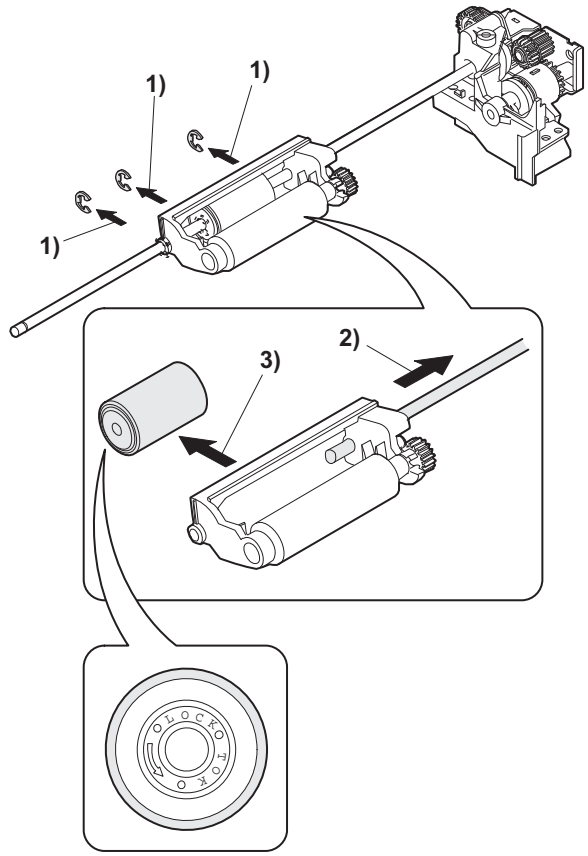
3) Remove three screws and remove the multi paper feed upper frame.



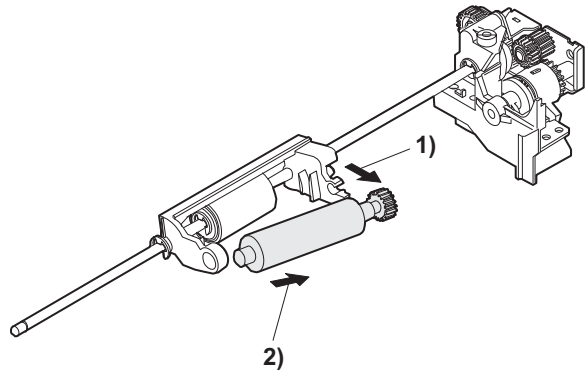
4) Remove two screws and remove the multi feed bracket unit from the multi paper feed upper frame.



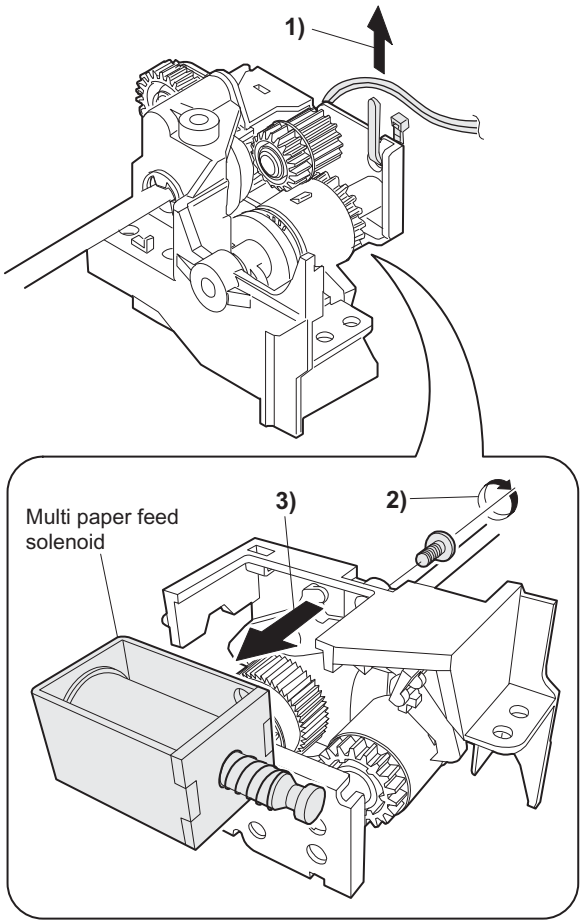
5) Remove three E-rings and remove the manual paper feed roller B9.



6) Remove the pick-up roller.



7) Cut the binding band and remove the multi paper feed solenoid.

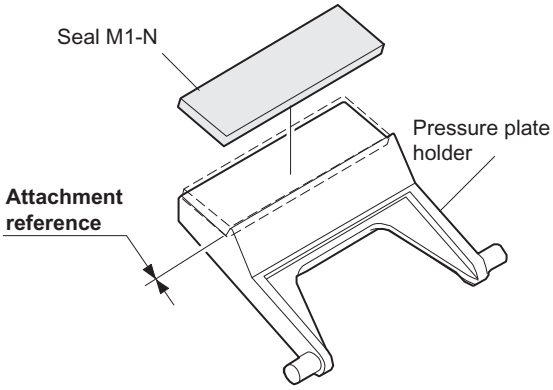


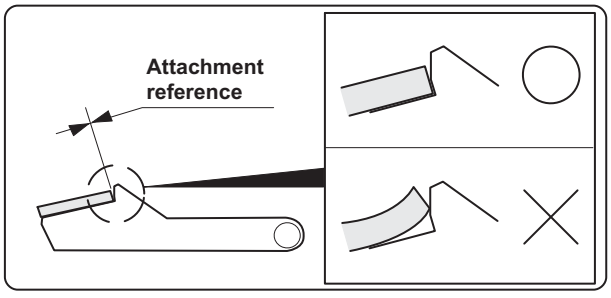
C. Assembly procedure

For assembly, reverse the disassembly procedure.

D. Pressure plate holder attachment

1) Attach the pressure plate holder so that the resin section is not covered with the seal M1-N.





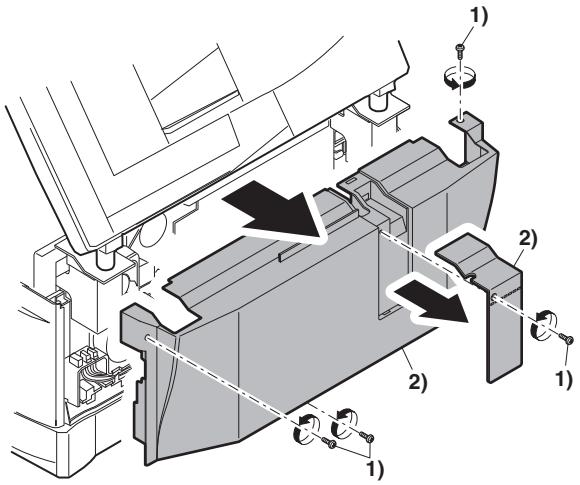
7. Rear frame section

A. List

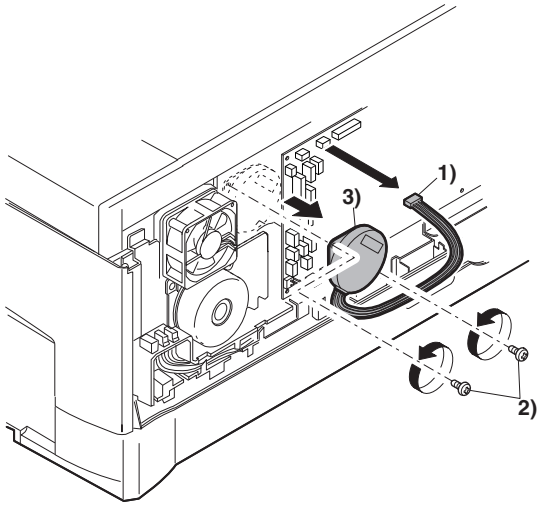
No.	Part name Ref.
1	Scanner motor
2	Main motor
3	Exhaust fan motor
4	Main PWB

B. Disassembly procedure

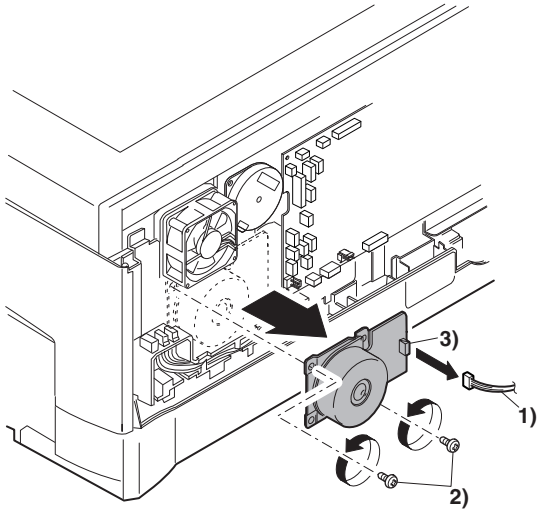
1) Remove four screws, and remove the rear cabinet and the rear cabinet cover.



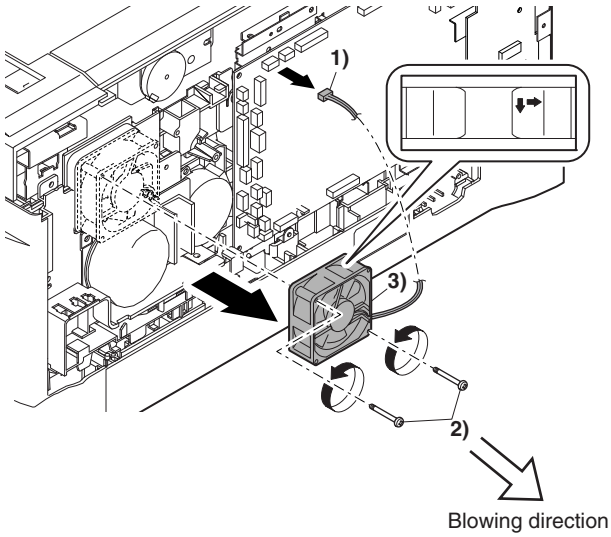
2) Disconnect the connector.
3) Remove two screws, and remove the scanner motor.



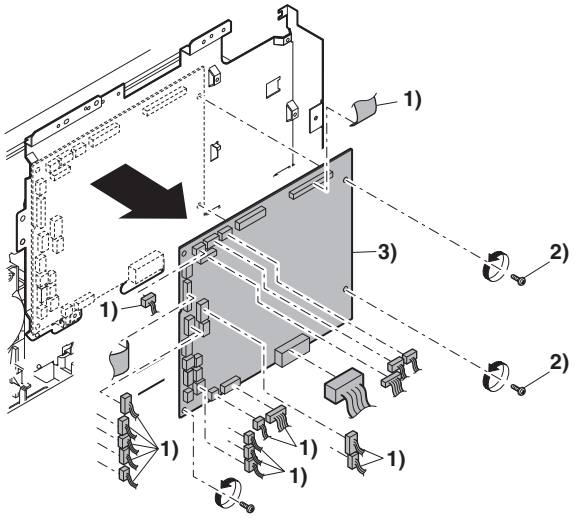
4) Remove two screws and one harness, and remove the main motor.



5) Remove two screws and one connector, and remove the exhaust fan motor.



6) Disconnect the connectors.
7) Remove the five screws, and remove the MCU PWB. (The shape of the MCU PWB differs depending on the model.)



C. Assembly procedure

For assembly, reverse the disassembly procedure.

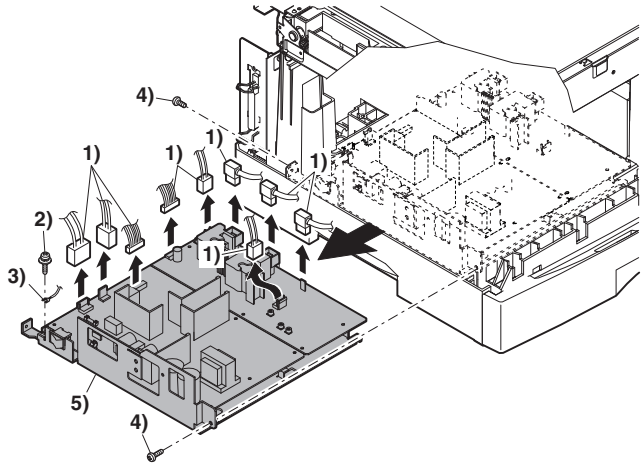
8. Power section

A. List

No.	Part name Ref.
1	Power PWB

B. Disassembly procedure

1) Disconnect each connector.
2) Remove the screw, and remove the earth line.
3) Remove two screws, and remove the power PWB unit.



C. Assembly procedure

For assembly, reverse the disassembly procedure.

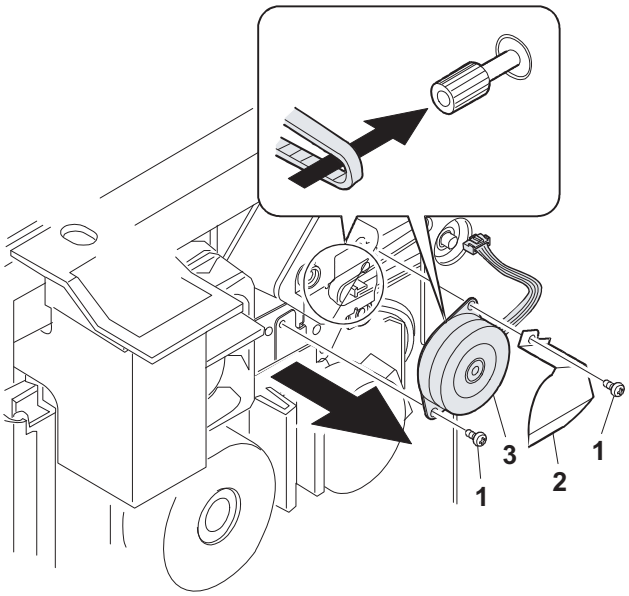
9. Duplex motor section (AL-2041)

A. List

No.	Part name Ref.
1	Duplex motor

B. Disassembly procedure

1) Remove the rear cabinet.
2) Remove two screws.
3) Remove the Duplex motor cover.
4) Remove the Duplex motor.



Note: When reassembling, be sure to engage the Duplex motor gear with the belt on the main body side.

C. Assembly procedure

For assembly, reverse the disassembly procedure.

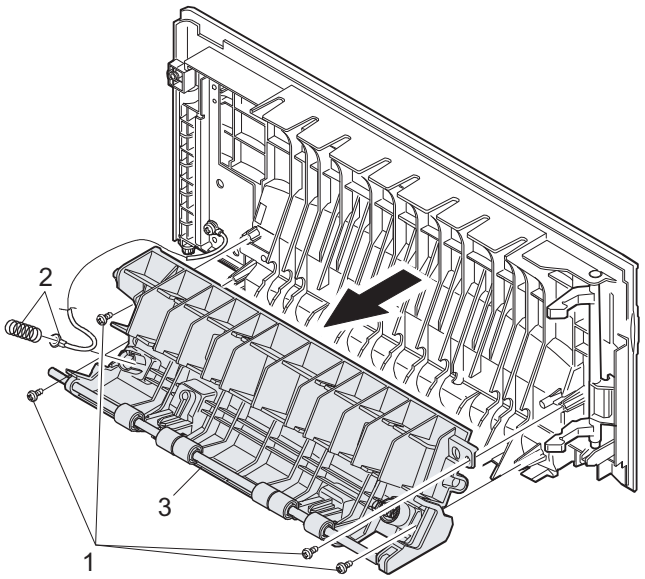
10. Reverse roller section

A. List

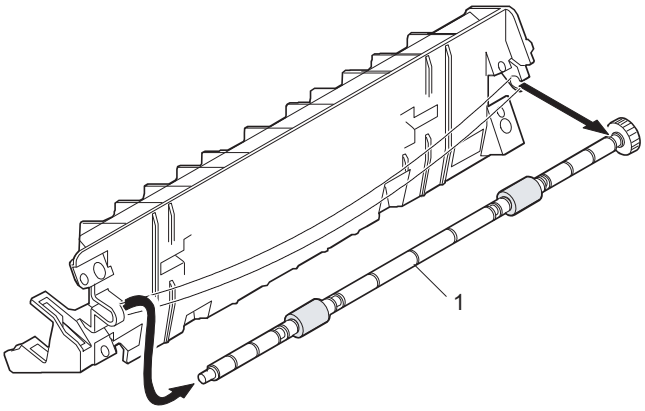
No.	Part name Ref.
1	Reverse roller

B. Disassembly procedure

1) Remove four screws.
2) Remove the spring, and the earth wire.
3) Remove the reverse unit.



4) Bend the reverse roller and remove it.



C. Assembly procedure

For assembly, reverse the disassembly procedure.

11. SPF section (AL-2031/2041)

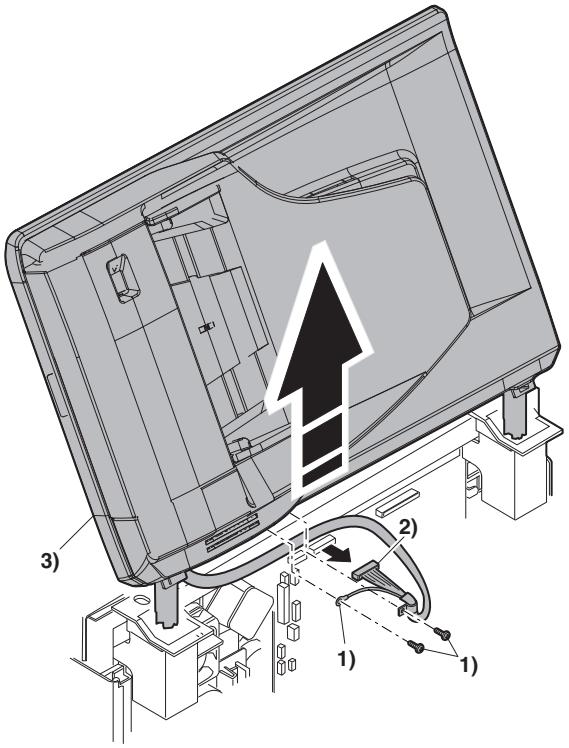
No.	Part name Ref.
A	SPF motor
B	Pick-up roller, paper feed roller
C	Paper exit roller
D	Set sensor, scan front sensor
E	Transport roller

(1) Rear cabinet disassembly

1) Remove four screws.
2) Remove the rear cabinet.

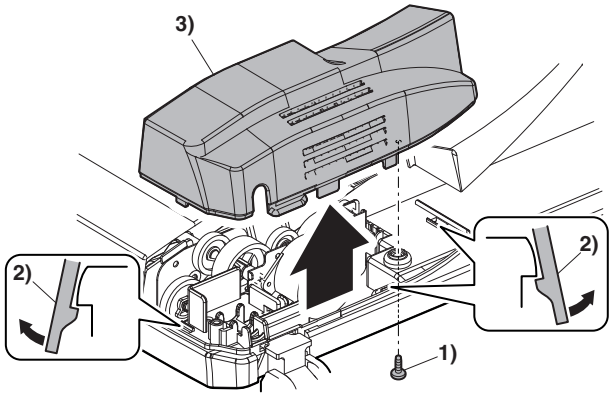
(2) Remove the SPF.

1) Remove two screws, and remove the earth wire.
2) Disconnect the connector.
3) Remove the SPF unit.

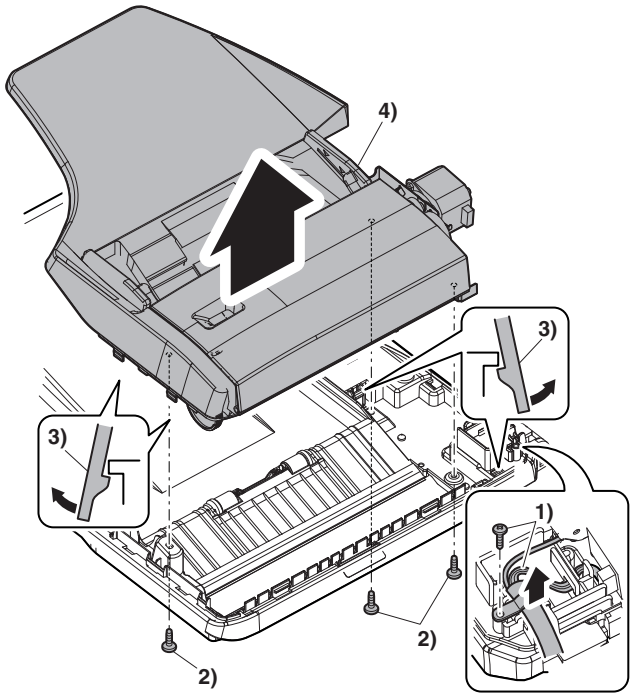


A. SPF motor

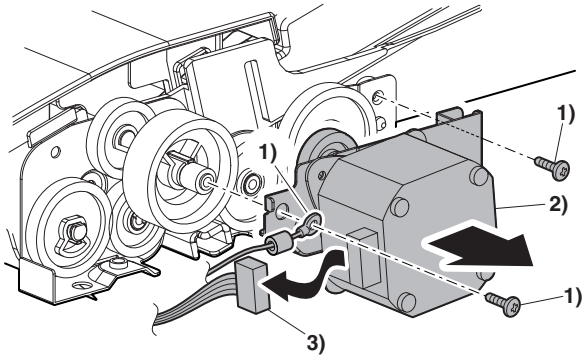
1) Remove the screw.
2) Disengage the pawl (3 positions).
3) Remove the rear cabinet.



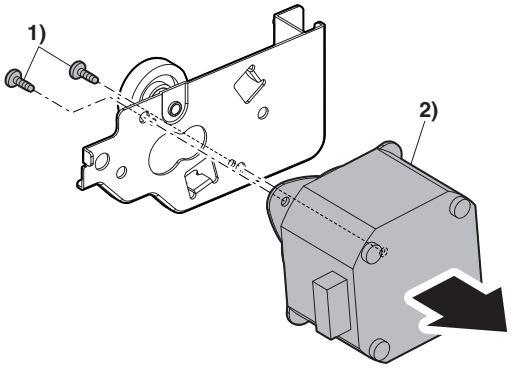
1) Remove the screw, and remove the harness.
2) Remove three screws.
3) Disengage the pawl (4 positions).
4) Remove the transport unit.



1) Remove two screws, and remove the earth wire.
2) Remove the SPF motor unit.
3) Disconnect the connector.

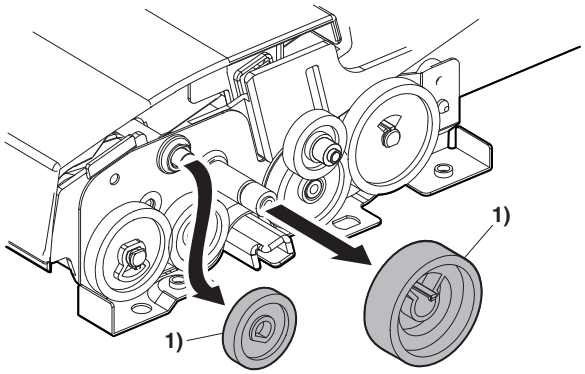


1) Remove two screws.
2) Remove the SPF motor.

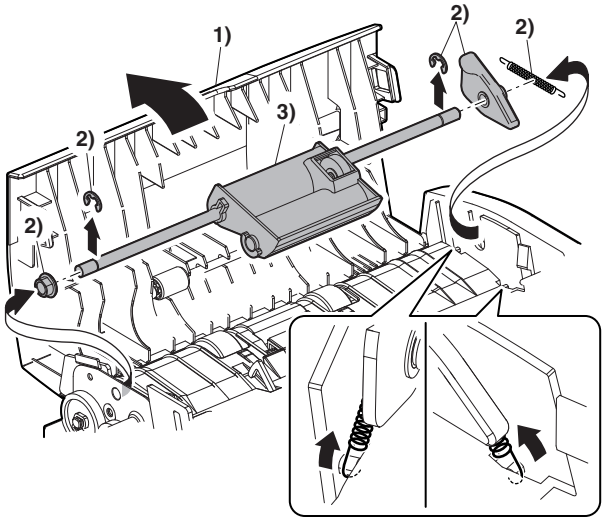


B. Pick-up roller, paper feed roller

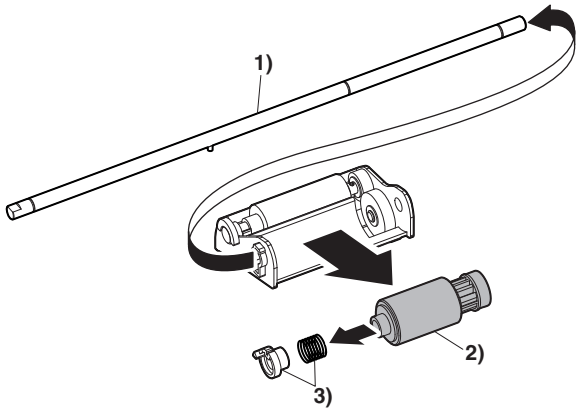
1) Remove two gears.



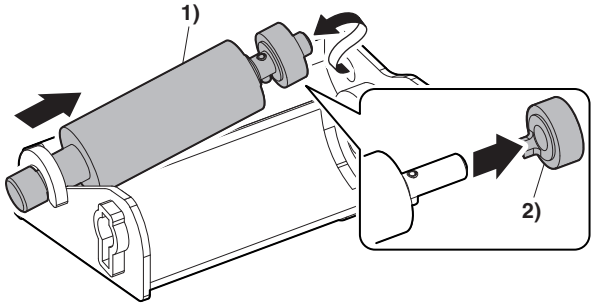
1) Open the upper door.
2) Remove two E-rings, and remove the spring, the arm, and the bearing.
3) Remove the pick-up roller unit.



1) Remove the shaft.
2) Remove the paper feed roller.
3) Remove the bearing and the spring.

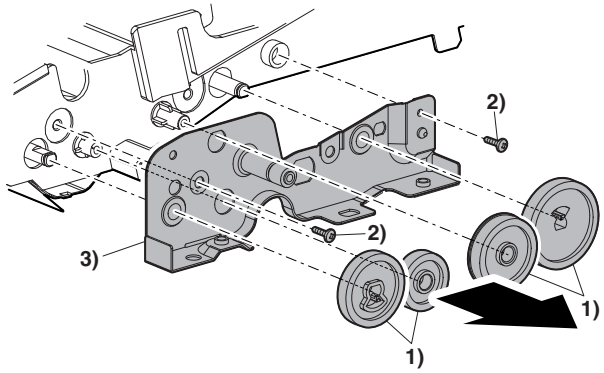


1) Remove the pick-up roller.
2) Remove the gear.

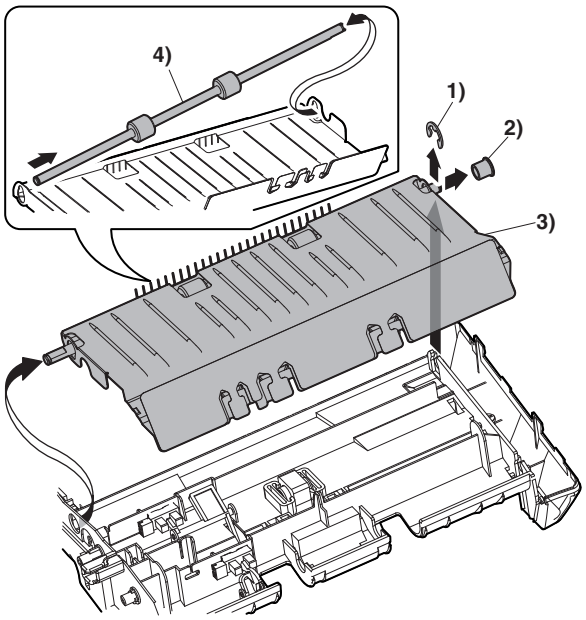


C. Paper exit roller

1) Remove four gears.
2) Remove two screws.
3) Remove the frame.



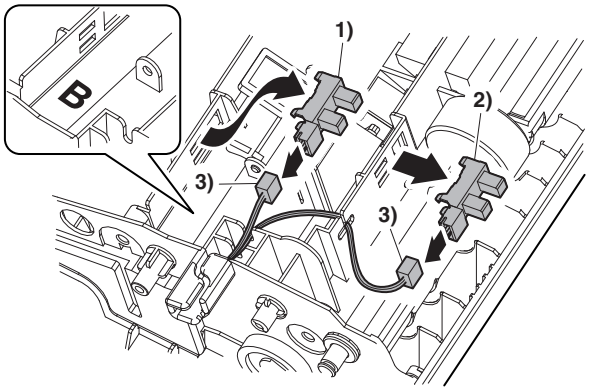
1) Remove the E-ring.
2) Remove the bearing.
3) Remove the paper guide unit.
4) Remove the paper exit roller.



D. Set sensor, scan front sensor

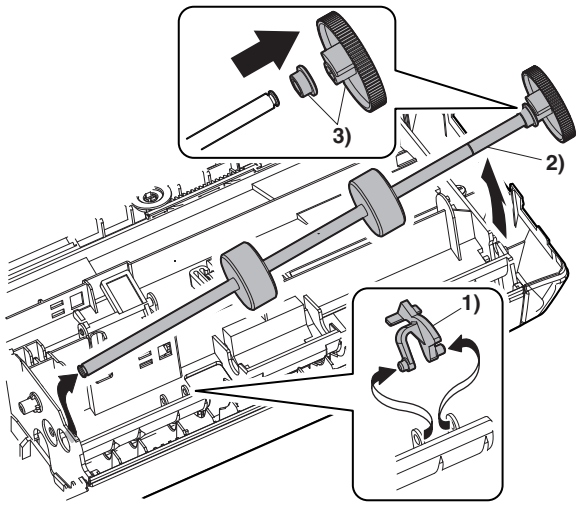
1) Remove the set sensor.
2) Remove the scan front sensor.
3) Disconnect the connectors.

* When assembling, attach the blue harness to the marking B side of the sensor, and attach the orange harness to the opposite side sensor.



E. Transport roller

1) Remove the actuator.
2) Remove the transport roller.
3) Remove the gear and the bearing.



[9] ADJUSTMENTS

1. Optical section

A. Copy magnification ratio adjustment

The copy magnification ratio must be adjusted in the main scanning direction and in the sub scanning direction. To adjust, use SIM 48-1.

(1) Outline

The main scanning (front/rear) direction magnification ratio adjustment is made automatically or manually.

Automatic adjustment: The width of the reference line marked on the shading correction plate is scanned to perform the main scanning (front/rear) direction magnification ratio adjustment automatically.

Manual adjustment: The adjustment is made by [Copy quantity] keys operations. (In either of the automatic and manual adjustments, the zoom data register set value is changed for adjustment.)

The magnification ratio in the sub scanning direction is adjusted by changing the carriage (scanner) scanning speed.

(2) Main scanning direction magnification ratio adjustment

a. Cases when the adjustment is required

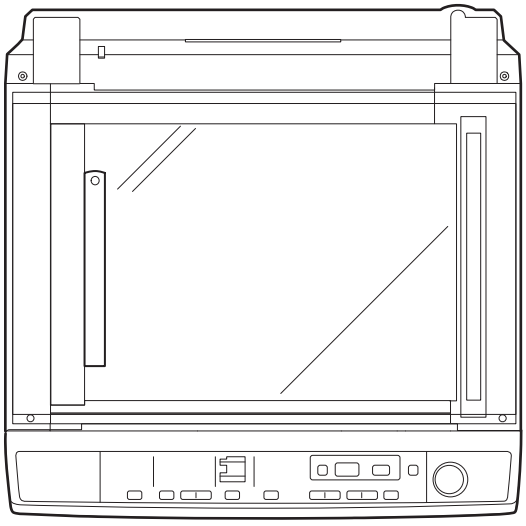
1) When the main PWB is replaced.
2) When the EEPROM in the main PWB is replaced.
3) When "U2" trouble occurs.
4) When repairing or replacing the optical section.

b. Necessary tools

- Screwdriver (+)
- Scale

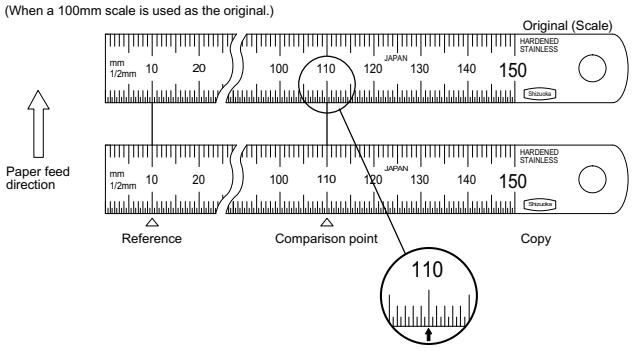
c. Adjustment procedure

1) Set the scale vertically on the document table. (Use a long scale for precise adjustment.)



2) Set the copy magnification ratio to 100%.
3) Make a copy on A4 or 81/2" x 11" paper.
4) Measure the length of the copied scale image.
5) Calculate the main scanning direction magnification ratio.
   Main scanning direction magnification ratio

$$= \frac{\text{Copy image dimensions}}{\text{Original dimension}} \times 100\ (\%)$$



6) Check that the copy magnification ratio is within the specified range. If it is not within the specified range, perform the following procedures.
7) Execute SIM 48-1 to select the main scanning direction copy magnification ratio adjustment mode.
   To select the adjustment mode, use the [Exposure mode selector] key.

In the case of the automatic adjustment, when the START switch is pressed, the mirror base unit moves to the white plate for shading to scan the width of the reference line, calculating the correction value and displaying and storing this value.

After execution of the automatic adjustment, go out from the simulation mode and make a copy to check the magnification ratio.

If the magnification ratio is not in the specified range (100 ± 1.0%), manually adjust as follows.

Adjustment mode	Display lamp	Default
Main scanning direction magnification ratio	TEXT mode lamp	50
OC mode sub scan direction magnification ratio	PHOTO mode lamp	50

8) Enter the new set value of main scanning direction copy magnification ratio with the copy quantity key, and press the [START] key.
9) Change the set value and repeat the adjustment until the ratio is within the specified range.
   When the set value is changed by 1, the magnification ratio is changed by 0.1%.

(3) Sub scanning direction copy magnification ratio

a. Cases when the adjustment is required

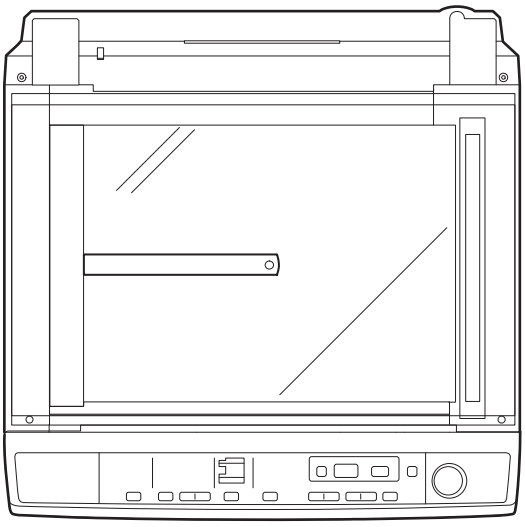
1) When the scanner unit drive section is disassembled or the part is replaced.
2) When the main PWB is replaced.
3) When the EEPROM in the main PWB is replaced.
4) When "U2" trouble occurs.

b. Necessary tools

- Scale

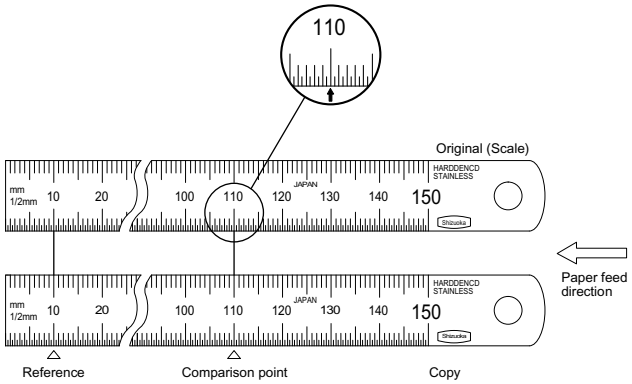
c. Adjustment procedure

1) Set the scale on the document table as shown below. (Use a long scale for precise adjustment.)



2) Set the copy magnification ratio to 100%.
3) Make a copy on A4 or 81/2" x 11" paper.
4) Measure the length of the copied scale image.
5) Calculate the sub scanning direction copy magnification ratio using the formula below.

$$= \frac{\text{Copy image dimensions}}{\text{Original dimension}} \text{ X } 100\ (\%)$$



6) Check that the actual copy magnification ratio is within the specified range. (100 ± 1.0%).
   If it is not within the specified range, perform the following procedures.
7) Execute SIM 48-1 to select the sub scanning direction copy magnification ratio adjustment mode.
   To select the adjustment mode, use the [Exposure mode selector] key. (PHOTO lamp ON)
8) Enter the new set value of sub scanning direction copy magnification ratio with the [Copy quantity] keys, and press the [START] key.

Repeat procedures 1) - 8) until the sub scanning direction actual copy magnification ratio in 100% copying is within the specified range.

When the set value is changed by 1, the magnification ration is changed by 0.1%.

B. Image position adjustment

There are following eleven kinds of image position adjustments, which are made by laser control except for the image scan start position adjustment. For the adjustments, SIM 50-01 and 50-10 are used.

No.	Mode	SIM	
1	Print start position (Main cassette paper feed)	50-01	
2	Print start position (Manual paper feed)	50-01	
3	Image lead edge void amount	50-01	
4	Image scan start position	50-01	
5	Image rear edge void amount (Cassette paper feed)	50-01	
6	Print center offset (Main cassette paper feed)	50-10	
7	Print center offset (Manual paper feed)	50-10	

To select the adjustment mode with SIM 50-01, use the [Exposure mode selector] key.

The relationship between the adjustment modes and the lighting lamps are as shown in the table below.

Adjustment mode	Lamp ON
Print start position (Main cassette paper feed)	AE, main cassette lamp
Print start position (Manual paper feed)	AE, manual feed lamp
Image lead edge void quantity	TEXT lamp
Image scan start position	PHOTO lamp
Image rear edge void quantity	AE, TEXT, PHOTO lamp

To select the adjustment mode with SIM 50-10, use the [Exposure mode selector] key.

The relationship between the adjustment modes and the lighting lamps are as shown in the table below.

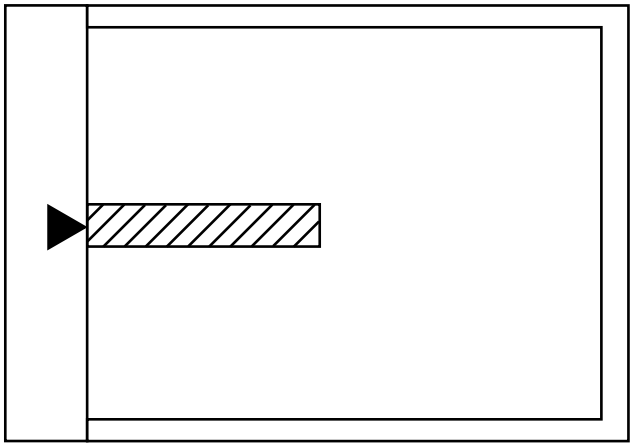
Machine with the multi manual paper feed unit

Adjustment mode	Lamp ON
Print center offset (Main cassette paper feed)	AE, main cassette lamp
Print center offset (Manual paper feed)	AE, manual paper feed lamp
☆ Second side center offset	TEXT lamp

☆: Supported for the installing model and skipped for non-installing mode.

(1) Lead edge adjustment

1) Set a scale to the center of the paper lead edge guide as shown below, and cover it with B4 or 8 1/2" x 14" paper.



2) Execute SIM 50-01

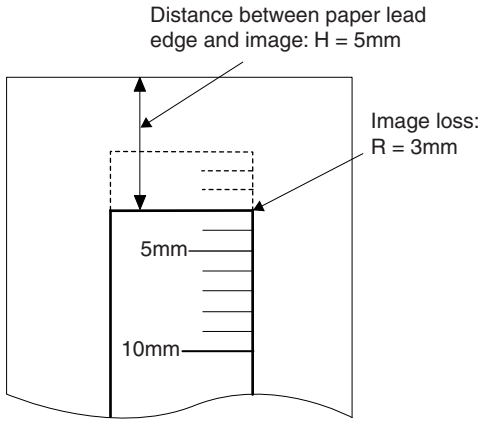
3) Set the print start position (AE lamp ON) (A), the lead edge void amount (TEXT lamp ON) (B), and the scan start position (PHOTO lamp ON) (C) to 0, and make a copy of a scale at 100%.

4) Measure the image loss amount (R mm) of the scale image.
Set C = 10 X R (mm). (Example: Set the value of C to 30.)
When the value of C is increased by 10, the image loss is decreased by 1mm. (Default: 50)

5) Measure the distance (H mm) between the paper lead edge and the image print start position.
Set A = 10 X H (mm). (Example: Set the value of A to 50.)
When the value of A is increased by 10, the image lead edge is shifted to the paper lead edge by 1mm. (Default: 50)

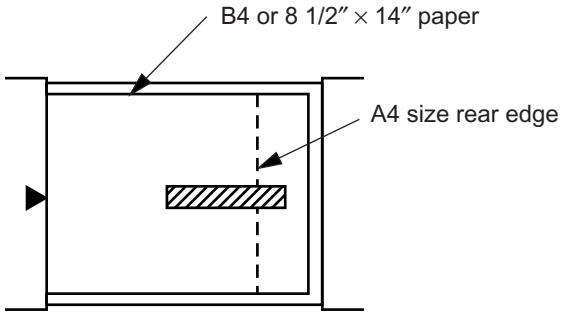
6) Set the lead edge void amount to B = 50 (2.5mm).
When the value of B is increased by 10, the void amount is increased by about 1mm. For 25 or less, however, the void amount becomes zero. (Default: 50)

(Example)



(2) Image rear edge void amount adjustment

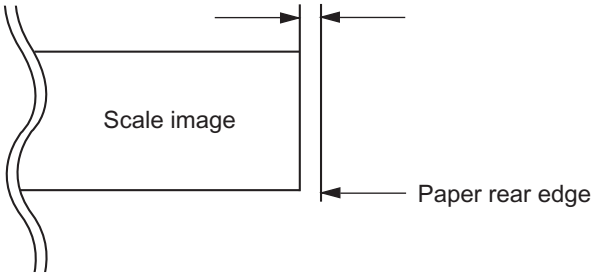
1) Set a scale to the rear edge section of A4 or 11" x 8 1/2" paper size as shown in the figure below, and cover it with B4 or 8 1/2" x 14" paper.



2) Execute SIM 50-01 to select the image rear edge void amount adjustment mode.
The set adjustment value is displayed on the copy quantity display.

3) Make a copy and measure the void amount of image rear edge.

Void amount (Standard value: 2 - 3mm)



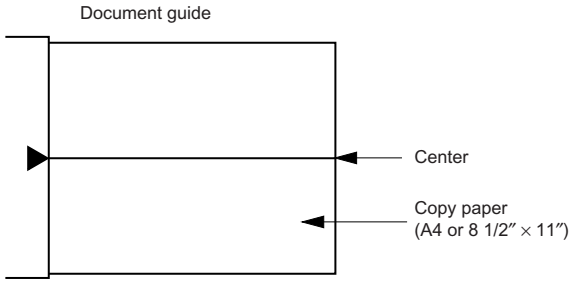
4) If the measurement value is out of the specified range, change the set value and repeat the adjustment procedure.
The default value is 50.

Note: The rear edge void cannot be checked with the first sheet after entering the simulation mode, the first sheet after turning off/on the power, or the first sheet after inserting the cassette. Use the second or later sheet to check the rear edge void.

(3) Center offset adjustment

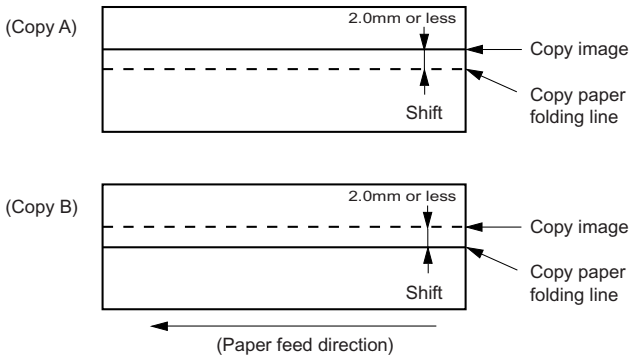
1) Set the self-made test chart for the center position adjustment so that its center line is aligned with the center mark of the document guide.

- Test chart for the center position adjustment.
Draw a line at the center of A4 or 8 1/2" x 11" paper in the paper transport direction.



2) Execute SIM 50-10 to select the print center offset (cassette paper feed) adjustment mode.
The set adjustment value is displayed on the copy quantity display.

3) Make a copy and check that the copied center line is properly positioned.
The standard value is 0 ± 2mm from the paper center.



4) If the measured value is out of the specified range, change the set value and repeat the adjustment procedure.
When the set value is increased by 1, the copy image is shifted by 0.1mm toward the rear frame.

- For the manual paper feed, change the manual paper feed adjustment mode and perform the similar procedures.
- Since the document center offset is automatically adjusted by the CCD which scan the reference lines (F/R) on the back of document guide, there is no need to adjust manually.

2. Copy density adjustment

A. Copy density adjustment timing

The copy density adjustment must be performed in the following cases:

- When maintenance is performed.
- When the developing bias/grid bias voltage is adjusted.
- When the optical section is cleaned.
- When a part in the optical section is replaced.
- When the optical section is disassembled.
- When the OPC drum is replaced.
- When the main control PWB is replaced.
- When the EEPROM on the main control PWB is replaced.
- When the memory trouble (U2) occurs.

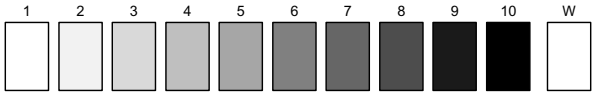
B. Note for copy density adjustment

1) Arrangement before execution of the copy density adjustment

- Clean the optical section.
- Clean or replace the charger wire.
- Check that the voltage at the high voltage section and the developing bias voltage are in the specified range.

C. Necessary tool for copy density adjustment

- One of the following test charts:
  UKOG-0162FCZZ, UKOG-0089CSZZ, KODAK GRAY SCALE
- B4 (14" x 8 1/2") white paper
- The user program AE setting should be "3."



Test chart comparison table

UKOG-0162FCZZ DENSITY No.	1	2	3	4	5	6	7	8	9	10	W
UKOG-0089CSZZ DENSITY No.	0.1		0.2		0.3				0.5	1.9	0
KODAK GRAY SCALE		1		2		3		4		19	A

D. Features of copy density adjustment

For the copy density adjustment, the image data shift function provided in the image process LSI is used.

List of the adjustment modes

Auto mode	Brightness 1 step only
Manual mode	Brightness 5 steps. Adjustment of only the center brightness is made.
Photo mode	Brightness 5 steps. Adjustment of only the center brightness is made.
Manual T/S mode	Brightness 5 steps. Adjustment of only the center brightness is made.
T/S Auto mode	Brightness 1 step only

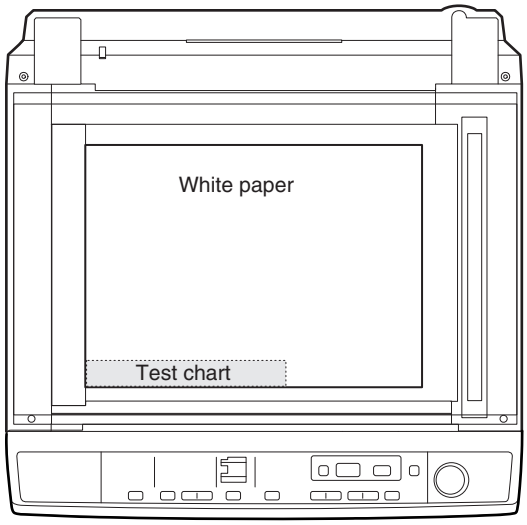
E. Copy density adjustment procedure

Use SIM 46-1 to set the copy density for each copy mode.

For selection of modes, use the [Exposure mode selector] key.

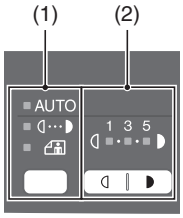
(1) Test chart (UKOG-0162FCZZ) setting

1) Place the test chart so that its edge is aligned with the A4 (Letter) reference line on the document table. Then place a A4 (14" x 8 1/2") white paper on the test chart and close the document cover.



(2) Perform the adjustment in each mode.

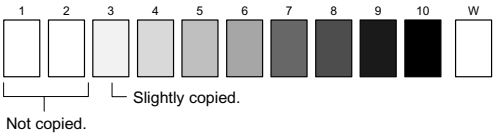
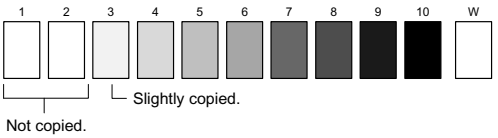
1) Execute SIM 46-01 (300dpi). To adjust in 600dpi, execute SIM 46-02.
2) Select the mode to be adjusted with the exposure mode select key. Set the exposure level to 3 for all adjustment. (Except for the auto mode.)



(1) Exposure mode select key/display lamp
(2) [Exposure mode selector] key/ display lamp

Adjustment mode	Exposure mode display lamp	Sharp gray chart adjustment level
Auto mode	Auto lamp ON	"3" is slightly copied.
Manual mode	Manual lamp ON	"3" is slightly copied.
Photo mode	Photo lamp ON	"3" is slightly copied.
Manual T/S mode	Manual lamp/Photo lamp ON	"3" is slightly copied.
Auto T/S mode	Auto lamp/Photo lamp ON	"3" is slightly copied.

3) Make a copy.
Check the adjustment level (shown in the above table) of the exposure test chart (Sharp Gray Scale).

	Sharp Gray Scale adjustment level
Non toner save mode	
Toner save mode	

(When too bright): Decrease the value displayed on the copy quantity display.

(When too dark): Increase the value displayed on the copy quantity display.

* The value can be set in the range of 1 - 99.

3. High voltage adjustment

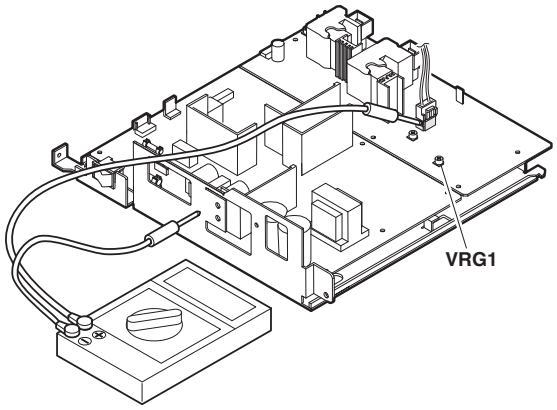
A. Main charger (Grid bias)

Note:

- Use a digital multi meter with internal resistance of 10MΩ or more measurement.
- After adjusting the grid LOW output, adjust the HIGH output. Do not reverse the sequence.

Procedures

1) Set the digital multi meter range to DC700V.
2) Set the positive side of the test rod to the connector CN11-3 (GRID) of high voltage section of the power PWB and set the negative side to the frame ground (power frame).
3) Execute SIM 8-2. (The main charger output is supplied for 30 sec in the grid voltage HIGH output mode.)
4) Adjust the control volume (VRG1) so that the output voltage is 580 ± 12V.

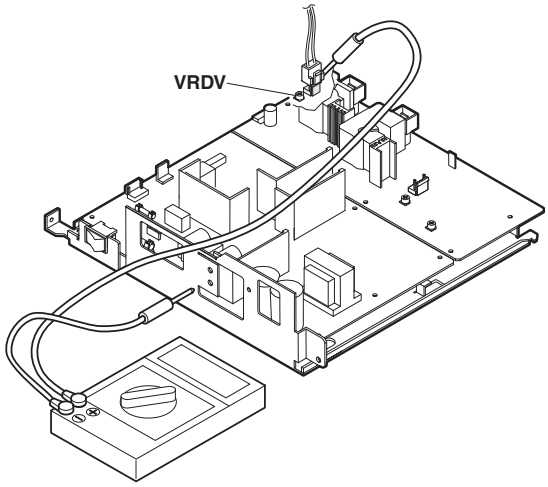


B. DV bias check

Note: • A digital multi meter with internal resistance of 1GΩ must be use for correct check.
• The adjustment volume is locked, and no adjustment can be made.

Procedures

1) Set the digital multi meter range to DC500V.
2) Set the positive side of the test rod to the connector CN-10-1 (DV BIAS) and set the negative side to the frame ground (power frame).
3) Execute SIM 8-1 to output the developing bias for 30sec, and check that the output is –400 ± 8V.



4. Duplex adjustment

A. Adjusting the paper reverse position in memory for duplex copying

This step adjusts the front surface printing (odd-number pages of a document set) in the S-D mode copying and the leading edge position of an image on even-number pages in the D-S mode.

That is, it covers the adjustment of the second surface printing mode (image loss at the front edge of an image) in which image data is once stored in memory.

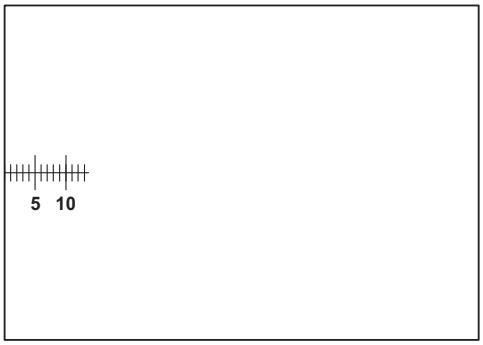
The image data is read, starting from its front end in the document delivery direction (Reference direction of document setting in the OC mode)and stored in memory.

This stored image data is printed starting at the printing start position, in the order of last-stored data to the first-stored data.

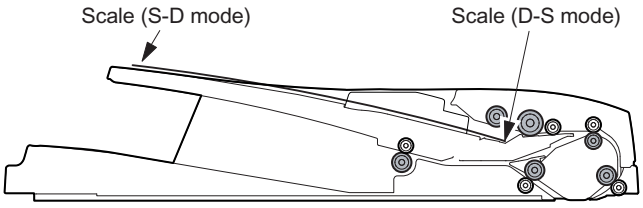
In other words, the front edge image loss of the image can be adjusted by changing the document read end position.

(Adjustment procedure)

1) Preparing test chart (Draw a scale at the rear end of one side of a sheet of A4 white paper or letter paper)



2) Set the test chart so that the scale is positioned as shown below, in the S-D mode and the D-S mode.

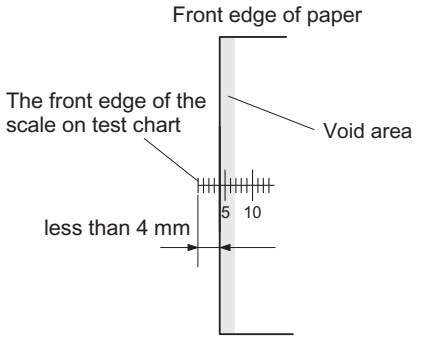


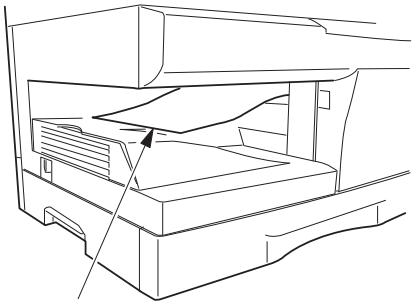
3) Execute simulation 50-18.

Mode	Display item	Default	LED
OC memory reverse output position	OC	50	COPY mode lamp
SPF memory reverse output position	SPF	50	PRINT mode lamp

Select the SPF memory reverse output position, and press [START] key to make a copy.

Adjust the setting so that the front edge image loss is less than 4.0 mm in the SPF mode.
An increase of 1 in setting represents an increase of 0.1 mm in image loss.





2nd printing surface where scale is printed (lower side)

B. Adjusting trailing edge void in duplex copy mode

This is the adjustment of the first surface printing mode (rear end void) in duplex copying.

In a duplex copying operation, the paper is delivered starting from the rear end of the first printing surface. It is therefore necessary to make a void area at the rear end on the first printing surface to prevent paper jam at the fusing part.

There are two adjustment modes:

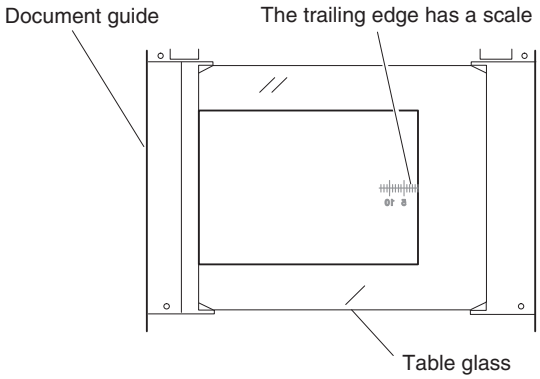
1) Paper trailing edge void quantity 50-19 (TEXT)
   This adjustment is made when the cassette paper size is recognized. The trailing edge void quantity can be adjusted by changing the trailing edge image laser OFF timing.
2) Print start position (Duplex back surface) (SPF) 50-19 (PHOTO)
   The size (length) of a document read from the SPF is detected, the image at the trailing edge of the first printing surface is cut to make a void area. (The adjustment of void quantity at the time when the cassette paper size is not recognized.)

The paper void quantity should be first adjusted before the image cut trailing edge void quantity (SPF) is adjusted.

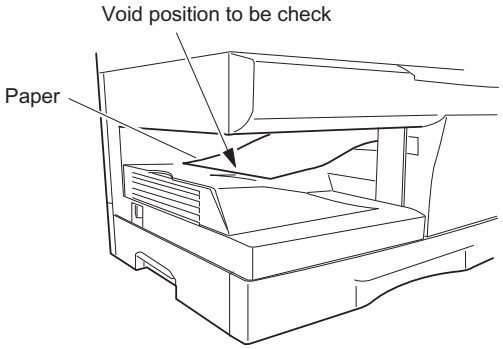
(Adjustment procedure)

(1) Paper trailing edge void quantity

1) Preparing test chart (Draw a scale at the rear end of one side of a sheet of A/4 white paper or letter paper)
2) Set the test chart on the document glass as shown below.



3) Using the user simulation [18], set the paper size of the first cassette.
   - Letter paper: 4
   - A4 paper: 3
4) Execute SIM 50-19 to turn on the TEXT lamp and make the printing mode in OC-D mode.
   Make a copy of the test chart to check the void area of the scale on the image.

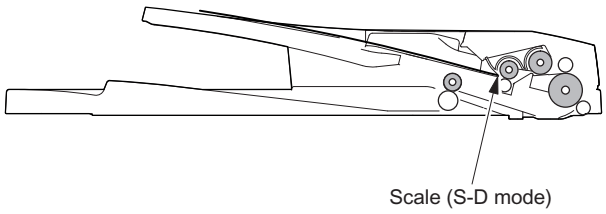


The trailing edge void on the first printing surface is shown above.

Adjust the setting so that the void area is 4 - 5 mm. An increase in 1 of setting represents 0.1 mm in void area.

(2) Print start position (Duplex back surface)

1) Set the test chart so that the scale is positioned as shown below.



2) Execute SIM 50-19 to turn on the PHOTO lamp and make the printing mode in the S-D mode.
3) Remove and reinsert the cassette.
   Note: Make sure to carry out this step before making a copy during this adjustment.
4) Make a copy and check the void area of the scale on the image.
   Adjust the setting so that the void area is 2 - 4 mm. An increase of 1 in setting represents an increase of 0.1 mm in void area.
   Void position to be checked

5. SPF scan position automatic adjustment

Place a A4 paper (white chart) so that it covers the SPF scan glass and the OC glass together, and close the SPF.

When simulation 53-08 is executed, the current adjustment value is displayed as the initial display.

* Default is 1. Adjustment range is 1 – 99. Adjustment unit 1 = about 0.127mm
* If the values are kept as the default values, SPF scan is not performed properly. The front area of the proper scan position may be scanned.

In case of AUTO, press [START] key, and the mirror unit scans from the home position to the SPF scan position with the adjustment value displayed. The SPF glass cover edge position is calculated from the difference between the SPF glass cover edge and the OC side document glass CCD output level. If the adjustment is normal, the adjusted value is displayed. If abnormal, the error LED lights up with the current set value displayed.

During the error LED is lighted, when [START] key is pressed again, execution is performed again.

Mode	Display item	Default	LED
SPF scan position auto adjustment	AUTO	1	AE mode lamp (AL-2031/2041)
SPF scan position manual adjustment	MANU	1	TEXT mode lamp (AL-2031/2041)

Operation

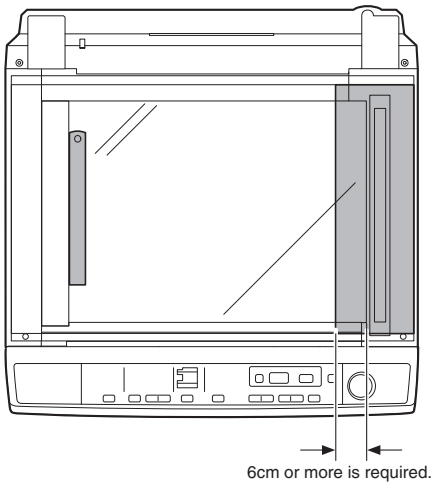
The operation is similar to simulation 46-01. (In MANUAL)

<When OK>

```
53-08 SPF AUTO
AUTO  100% **    OK
```

<When ERR>

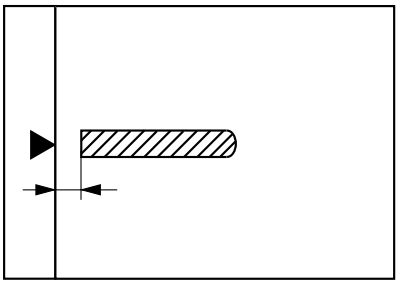
```
53-08 SPF AUTO
AUTO  100% **    ERR
```



6. SPF mode sub scanning direction magnification ratio adjustment

Note: Before performing this adjustment, be sure to check that the OC mode adjustment in copying has been completed.

1) Put a scale on the original table as shown below, and make a normal copy (100%) on the front and the back surfaces to make a test chart.



Note: Since the printed copy is used as a test chart, put the scale in paralled with the edge lines.

2) Set the test chart on the SPF and make a copy in the normal ratio (100%). (AL-2031/2041)
3) Compare the scale image and the actual image.
   If necessary, perform the following adjustment procedures.
4) Execute SIM 48-05.
5) The current sub scanning direction magnification ratio correction value is displayed in two digits on the display section.
6) Enter the set value and press the [START] key.

Mode	LED	Default
Sub scan magnification ratio adjustment on the surface of SPF document	AE mode lamp (AL-2031/2041)	50

* When there is no document in SPF, copy is inhibited.

<Adjustment specification>

Adjustment mode	Spec value	SIM	Set value	Setting range
Sub scanning direction magnification ratio (SPF mode)	At normal: ±1.0%	48-5	Add 1: 0.1% increase Reduce 1: 0.1% decrease	1 – 99

7. Automatic black level correction

a. Cases when the adjustment is required

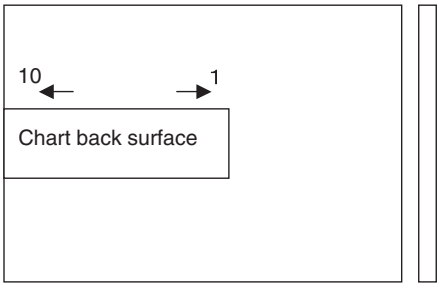
1) When the main PWB is replaced.
2) When the EEPROM in the main PWB is replaced.
3) When "U2" trouble occurs.
4) When repairing or replacing the optical section.

b. Adjustment procedure

Used to acquire the black level target value used for the black level adjustment of white balance.

When SIM 63-02 is executed, the current correction value is displayed in 3 digits of 12bit hexadecimal number.

Place the gray gradation chart (UKOG-0162FCZZ) used as the correction document so that the density 10 (black side) comes on the left side and that the chart is upside down at the center of the plate left center.



When START key is pressed, the mirror base unit scans the chart and calculates the correction value.

After completion of correction, the corrected value is displayed on the display section.

* Default: 0
* If the value is set to the default, operation is made with 0x60.

[10] SIMULATION, TROUBLE CODES

1. Entering the simulation mode

To enter the serviceman simulation mode, press the keys as follows:

[Clear] key → Exposure mode selector key → [Clear] key → Exposure mode selector key

2. Key rule

[▲] [▲] key: Entry of MAIN CODE/SUB CODE
Setting of the adjustment values for the adjustment-related simulations
When [%] key is pressed simultaneously, the value is displayed in the descending sequence such as [0] → [9], not as [0] → [1].

[START] key: Settlement
<In case of simulations for print>
[START] key: Settlement / Print

[Clear] key: (Interrupting operation check) Returns to the upper hierarchy.
On the initial display (00-00), it terminates the simulation.
Exits from the simulation mode.
For a simulation of adjustment, the display returns to the initial display (00-00).

3. List of simulations

Sim No.	Sub code	Operation
1	01	Mirror scan operation
	02	Mirror home position sensor (MHPS) status display
	06	Aging of mirror scanning
2	01	SPF aging operation (excluding AL-2021)
	02	SPF sensor status display (excluding AL-2021)
	03	SPF Motor ON (excluding AL-2021)
5	01	Operation panel display check
	02	Fusing lamp, cooling fan operation check
	03	Copy lamp ON
6	01	Paper feed solenoid ON
	02	Resist solenoid ON
7	01	Warm-up display and aging with jam
	06	Intermittent aging
	08	Shift to copy with the warm-up display
8	01	Developing bias
	02	Main charger (Grid high)
	03	Grid voltage (Low)
	06	Transfer charger
9	01	Duplex motor normal rotation operation check (AL-2041 only)
	02	Duplex motor reverse operation check (AL-2041 only)
	04	Duplex motor rotation speed adjustment (AL-2041 only)
10		Toner motor aging
14		Cancel of troubles other than U2
16		Cancel of U2 trouble
22	04	JAM total counter display
	05	Total counter display
	08	SPF counter display (excluding AL-2021)
	12	Drum counter display
	13	CRUM type display
	14	ROM version display
	16	Duplex counter display (AL-2041 only)
	17	Copy counter display
	18	Printer counter display
	19	Scanner mode counter display
	21	Scanner counter display
	22	SPF JAM counter display (excluding AL-2021)
24	01	JAM total counter clear
	04	SPF counter clear (excluding AL-2021)
	05	Duplex counter clear (AL-2041 only)
	07	Drum counter clear
	08	Copy counter clear
	09	Printer counter clear
	13	Scanner counter clear
	14	SPF JAM total counter clear (excluding AL-2021)
	15	Scanner mode counter clear
25	01	Main motor operation check (Cooling fan motor rotation check)
	10	Polygon motor ON
26	02	SPF setup (excluding AL-2021)
	04	Machine duplex setup (AL-2041 only)
	06	Destination setup
	07	Machine conditions check
	20	Rear edge void setup
	30	CE mark support control ON/OFF
	38	Cancel of stop at drum life over
	39	Memory capacity check
	40	Polygon motor OFF time setup (Time required for turning OFF after completion of printing)
	42	Transfer ON timing control setup
	43	Side void setup
	54	γ life correction setting
	62	Energy-save mode copy lamp setup
	69	CRUM toner near end environment setting
30	01	Paper sensor status display
41	06	OC cover float detection level adjustment (excluding AL-2021)
	07	OC cover float detection margin setting (excluding AL-2021)
43	01	Fusing temperature setting (Normal copy)
	04	Fusing temperature setting in multi copy
	05	Fusing temperature setup in duplex copy (AL-2041 only)
	09	Postcard size paper fusing control setting
	11	Postcard size paper fusing temperature setting
	14	Fusing start temperature setting
	15	Postcard size paper fusing control cycle synchronization setting
46	01	Copy density adjustment (300dpi)
	02	Copy density adjustment (600dpi)
	18	Image contrast adjustment (300dpi)
	19	Exposure mode setup (AE mode)
	20	SPF exposure correction (excluding AL-2021)
	29	Image contrast adjustment (600dpi)
	30	AE limit adjustment
	31	Image sharpness adjustment
	32	Copier color reproduction setup
48	01	Front/rear (main scanning) direction and scan (sub scanning) direction magnification ratio adjustment
	05	SPF mode sub scan direction magnification ratio in copying (excluding AL-2021)
49	01	Flash ROM program writing mode
50	01	Lead edge image position
	06	Copy lead edge position adjustment (SPF) (excluding AL-2021)

Sim No.	Sub code	Operation
50	10	Center offset adjustment
	12	Document off-center adjustment
	18	Memory reverse position adjustment in duplex copy (AL-2041 only)
	19	Duplex copy rear edge void adjustment (AL-2041 only)
51	02	Resist quantity adjustment
53	08	SPF scan position automatic adjustment (excluding AL-2021)
61	03	Polygon motor check (HSYNC output check)
63	01	Shading check
	02	Black level automatic correction
	12	Light quantity stabilization wait time setting
	13	Light quantity stabilization band setting
64	01	Self print

4. Descriptions of various simulations

<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td rowspan="4">1</td><td>01</td><td>Mirror scan operation</td><td>[Function]
When [OK]/[START] key is pressed, the home position is checked and the mirror base performs full scan at the speed of the set magnification ratio.
During operation, the set magnification ratio is displayed.
The mirror home position sensor status is displayed with the "Drum replacement required lamp ". (When the mirror is in the home position, the lamp lights up.)
During operation, the copy lamp lights up.
When [Clear] key is pressed, if the operation is on the way, it is terminated and the machine goes to the sub code entry standby mode.
[ZOOM UP/DOWN] key (ZOOM LED ON) or [Fixed magnification ratio select] key (Fixed magnification ratio LED ON)
∗ When [ZOOM UP/DOWN] key is pressed, the magnification ratio is displayed for a certain period, and the display returns to the sub code display.
∗ When [%] key is being pressed, the magnification ratio can be displayed.</td></tr>
<tr><td>02</td><td>Mirror home position sensor (MHPS) status display</td><td>[Function]
Monitors the mirror home position sensor, and makes the "Drum replacement required lamp" turn on during the sensor ON status.</td></tr>
<tr><td>06</td><td>Aging of mirror scanning</td><td>[Function]
When [START] key is pressed, the mirror base performs full scan at the speed of the set magnification ratio.
During operation, the set magnification ratio is displayed.
After 3sec, the mirror base performs full scan again.
∗ When [START] key is pressed once, the ready lamp remains OFF.
The mirror home position sensor status is displayed on the "Drum replacement required lamp." (The lamp is ON when the mirror is in the home position.)
During aging, the copy lamp is ON.
[Operation]
The operation is similar to simulation 1-01.</td></tr>
<tr><td rowspan="2">2</td><td>01</td><td>SPF aging operation (excluding AL-2021)</td><td>[Function]
When [START] key is pressed, the set magnification ratio is obtained. For the SPF, the single-face document transport is performed.
However, the operating conditions don't matter and the operation is not stopped even in case of a jam.
[Operation]
The operation is similar to simulation 1-01.</td></tr>
<tr><td>02</td><td>SPF sensor status display (excluding AL-2021)</td><td>[Function]
The ON/OFF status of the SPF sensors can be checked with the LED.
When a sensor is ON, the sensor name is displayed on the LED.
<table><tr><th>Sensor</th><th>Display item (AL-2031/2041)</th></tr><tr><td>Document set sensor</td><td>TD cartridge replacement required lamp</td></tr><tr><td>SPF document transport sensor</td><td>Misfeed lamp</td></tr></table></td></tr>
</table>

Main code	Sub code	Contents	Details of function/operation
2	03	SPF Motor ON (excluding AL-2021)	**[Function]** When [START] key is pressed, the motor rotates for 10sec at the speed corresponding to the set magnification ratio. **[Operation]** The operation is similar to simulation 1-01.
5	01	Operation panel display check	**[Function]** <LED check mode (All ON / Individual ON)> When [ENTER/START] key is pressed, the LED on the operation panel lights up in all pixels. The status display is as follows: • After all ON (5 sec) 7seg panel model: Returns to the sub code input standby (Sub code blinking). • During LED check mode (All ON) 7seg panel model: When [1 UNIT UP] key is pressed, the machine goes into the individual lighting mode. When [C] key is pressed, the machine enters the sub code input standby state (sub code blinking). When [START] key is pressed, the machine goes into the key input check mode. In the individual lighting mode, the LED on the operation panel moves from the top of the left edge to the bottom, then moves to the next right and from the top to the bottom. In this manner, all LED's are lighted sequentially. (For the 7seg display, the LED's of three digits are lighted at a time.) After completion of lighting all the LED's, the machine returns to the all-lighting state. It enters the sub code input standby state 5 sec after returning to the all-lighting state. (The cycle of the individual lighting mode is: ON: 300ms, OFF: 20ms) <Key input check mode> The status display is as follows: • 7seg display during the key input check mode 7seg panel model: "---" Every time a key on the operation panel is pressed, the number of input is added to be displayed on the 7seg display. The key which was pressed once is not counted again. When [START] key is pressed, the count is added. The machine goes to the LED lighting check mode (LED all-lighting state) 3sec after that.
	02	Fusing lamp, cooling fan operation check	**[Function]** When [OK]/[START] key is pressed, the fusing lamp repeats ON for 500ms and OFF for 500ms 5 times. During this period, the cooling fan motor rotates.
	03	Copy lamp ON	**[Function]** When [START] key is pressed, the copy lamp turns ON for 5sec.
6	01	Paper feed solenoid ON	**[Function]** When [START] key is pressed, the selected paper feed solenoid repeats ON for 500ms and OFF for 500ms 20times.
	02	Resist solenoid ON	**[Function]** When [START] key is pressed, the resist solenoid repeats ON for 500ms and OFF for 500ms 20 times.
7	01	Warm-up display and aging with jam	**[Function]** Copying is repeated to make the set quantity of copies. When the simulation is executed, warm-up is started and warm-up time is added for every second from 0 and displayed. When warm-up is completed, addition is stopped. When [Clear] key is pressed, the ready lamp lights up. After that, enter the copy quantity with [▲] [▲] key and press [START] key to repeat copying of the set quantity (interval 0sec). To cancel the simulation, turn off the power or execute a simulation which causes hardware reset.
	06	Intermittent aging	**[Function]** Copying is repeated to make the set quantity of copies. When the simulation is executed, warm-up is performed and the ready lamp is lighted. Enter the copy quantity with the [▲] [▲] key and press [START] key, and copying is executed to make the set quantity of copies, and the ready state is kept for 3sec, and copying is executed again to make the set quantity of copies. These operations are repeated. To cancel the simulation, turn off the power or execute a simulation which executes hardware reset.

Main code	Sub code	Contents	Details of function/operation
7	08	Shift to copy with the warm-up display	**[Function]** Enter the simulation code, and warm-up is started and warm-up time is counted for every second from 0 and displayed. When [Clear] key is pressed during counting up, "0" is displayed on the display and counting is stopped. However, warm-up is continued. After completion of warm-up, counting is terminated. (The aging function is removed from simulation 7-01.)
8	01	Developing bias	**[Function]** When [START] key is pressed, the developing bias signal is turned ON for 30sec. When, however, an actual output value is measured, use simulation 25-01. After completion of this process, the machine goes into the sub code entry standby mode.
	02	Main charger (Grid high)	**[Function]** When [START] key is pressed, the main charger is outputted for 30sec in the grid voltage HIGH move. After completion of this process, the machine goes into the sub code entry standby mode.
	03	Grid voltage (Low)	**[Function]** When [START] key is pressed, the main charger is outputted for 30sec in the grid voltage LOW move. After completion of this process, the machine goes into the sub code entry standby mode.
	06	Transfer charger	**[Function]** When [START] key is pressed, the transfer charger is outputted for 30sec. After completion of this process, the machine goes into the sub code entry standby mode.
9	01	Duplex motor normal rotation operation check (AL-2041 only)	**[Function]** Use the duplex motor Bios to drive the duplex motor in the normal direction (paper exit direction) for 30sec. After completion of this process, the machine goes into the sub code entry standby mode.
	02	Duplex motor reverse operation check (AL-2041 only)	**[Function]** Use the duplex motor Bios to drive the duplex motor in the reverse direction for 30sec. After completion of this process, the machine goes into the sub code entry standby mode.
	04	Duplex motor rotation speed adjustment (AL-2041 only)	**[Function]** When this simulation is executed, the currently set value is displayed. Enter the adjustment value with [▲] [▲] key and press [START] key. The entered value is stored and the machine goes into the sub code entry standby mode. The greater the set value is, the higher the speed is. The smaller the set value is, the lower the speed is. (Setting range: 1 - 13, Default: 6)
10		Toner motor aging	**[Function]** When [START] key is pressed, the toner motor is rotated for 30sec. After completion of this process, the machine goes into the main code entry standby mode.
14		Cancel of troubles other than U2	**[Function]** Used to cancel troubles other than U2. * Cancel troubles such as H trouble which writes data into EEPROM, and perform hardware reset.
16		Cancel of U2 trouble	**[Function]** Used to cancel U2 trouble. When [START] key is pressed, check sum of the total counter in the EEPROM is rewritten and hardware reset is made.
22	04	JAM total counter display	**[Function]** The JAM total counter is displayed. **[Operation]** The count value is displayed in 3 digits X 2 times repeatedly. <Display example: 12345> 012 → Blank → 345 → Blank → 012 0.7s 0.3s 0.7s 1.0s 0.7s
	05	Total counter display	**[Function]** The total counter value is displayed. **[Operation]** The operation is similar to simulation 22-04.
	08	SPF counter display (excluding AL-2021)	**[Function]** The SPF counter is displayed. **[Operation]** **AL-2031/2041** The operation is similar to simulation 22-04.

<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td rowspan="11">22</td><td>12</td><td>Drum counter display</td><td>[Function]
The drum counter is displayed.
[Operation]
The operation is similar to simulation 22-04.</td></tr>
<tr><td>13</td><td>CRUM type display</td><td>[Function]
When [START] key is pressed, the CRUM type which is currently set (written) in the CRUM chip is displayed.
<table><tr><th>Code number</th><th>CRUM type</th></tr><tr><td>00</td><td>Unsetting</td></tr><tr><td>01</td><td>BTA-A</td></tr><tr><td>02</td><td>BTA-B</td></tr><tr><td>03</td><td>BTA-C</td></tr><tr><td>99</td><td>Conversion</td></tr></table></td></tr>
<tr><td>14</td><td>ROM version display</td><td>[Function]
The P-ROM version is displayed.
<table><tr><th>Code number</th><th>Version</th></tr><tr><td>0</td><td>Main unit Program</td></tr></table>[Operation]
The operation is similar to simulation 22-04.</td></tr>
<tr><td>16</td><td>Duplex counter display (AL-2041 only)</td><td>[Function]
The duplex counter is displayed.
[Operation]
The count value is displayed in 3 digits X 2 times repeatedly.
<Display example: 12345>
012 → Blank → 345 → Blank → 012
0.7s 0.3s 0.7s 1.0s 0.7s</td></tr>
<tr><td>17</td><td>Copy counter display</td><td>[Function]
The copy counter is displayed.
[Operation]
The operation is similar to simulation 22-04.</td></tr>
<tr><td>18</td><td>Printer counter display</td><td>[Function]
The printer counter is displayed.
[Operation]
The operation is similar to simulation 22-04.</td></tr>
<tr><td>19</td><td>Scanner mode counter display</td><td>[Function]
The scanner mode counter is displayed.
[Operation]
The operation is similar to simulation 22-16.</td></tr>
<tr><td>21</td><td>Scanner counter display</td><td>[Function]
The scanner counter is displayed.
[Operation]
The operation is similar to simulation 22-04.</td></tr>
<tr><td>22</td><td>SPF JAM counter display (excluding AL-2021)</td><td>[Function]
The SPF JAM counter is displayed.
[Operation]
AL-2031/2041
The operation is similar to simulation 22-04.</td></tr>
<tr><td rowspan="2">24</td><td>01</td><td>JAM total counter clear</td><td>[Function]
When [START] key is pressed, the JAM total counter is cleared to 0 and "000,000" is displayed on the LED/display.
[Operation]
The operation is similar to simulation 22-04.</td></tr>
<tr><td>04</td><td>SPF counter clear (excluding AL-2021)</td><td>[Function]
When [START] key is pressed, the SPF counter value is cleared to 0 and "000,000" is displayed on the LED/display.
[Operation]
AL-2031/2041
The operation is similar to simulation 22-04.</td></tr>
</table>

Main code	Sub code	Contents	Details of function/operation
24	05	Duplex counter clear (AL-2041 only)	**[Function]** When [START] key is pressed, the duplex counter value is cleared to 0, and "000,000" is displayed on the LED/display. **[Operation]** The operation is similar to simulation 22-16.
	07	Drum counter clear	**[Function]** When [START] key is pressed, the drum counter value is cleared to 0, and "000,000" is displayed on the LED/display. **[Operation]** The operation is similar to simulation 22-04.
	08	Copy counter clear	**[Function]** When [START] key is pressed, the copy counter value is cleared to 0, and "000,000" is displayed on the LED/display. **[Operation]** The operation is similar to simulation 22-04.
	09	Printer counter clear	**[Function]** When [OK]/[START] key is pressed, the printer counter value is cleared to 0, and "000,000" is displayed on the LED/display. **[Operation]** The operation is similar to simulation 22-04.
	13	Scanner counter clear	**[Function]** When [OK]/[START] key is pressed, the scanner counter value is cleared to 0, and "000,000" is displayed on the LCD/display. **[Operation]** The operation is similar to simulation 22-04.
	14	SPF JAM total counter clear (excluding AL-2021)	**[Function]** When [START] key is pressed, the SPF JAM total counter value is cleared to 0, and "000,000" is displayed on the LCD/display. **[Operation]** **AL-2031/2041** The operation is similar to simulation 22-04.
	15	Scanner mode counter clear	**[Function]** When [START] key is pressed, the scanner mode counter value is cleared to 0, and "000,000" is displayed on the LED/display. **[Operation]** The operation is similar to simulation 22-16.
25	01	Main motor operation check (Cooling fan motor rotation check)	**[Function]** When [START] key is pressed, the main motor (and the duplex motor in the case of a duplex model) is operated for 30sec. To reduce toner consumption, if the developing unit is installed, the developing bias, the main charger, and the grid are also outputted. In this case, laser discharge is required when stopping the motor, the polygon motor is also operated at the same time. Check for installation of the developing unit. If it is not installed, the high voltage above is not outputted and only the motor is rotated. To check the developing bias, install the developing unit. After completion of 30sec operation, the machine goes into the sub code entry standby mode.
	10	Polygon motor ON	**[Function]** When [START] key is pressed, the Bios is called to rotate the polygon motor for 30sec. After completion of 30sec operation, the operation is turned off with the Bios and the machine goes into the sub code entry standby mode.
26	02	SPF setup (excluding AL-2021)	**[Function]** When this simulation is executed, the current set SPF is displayed. Enter the code number corresponding to the desired SPF and press [START] key to save the setting. Code number: 0 = SPF NO; 1 = SPF YES

<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>26</td><td>04</td><td>Machine duplex setup (AL-2041 only)</td><td>[Function]
When this simulation is executed, the current set duplex is displayed. Enter the code number corresponding to the desired duplex and press [START] key to save the setting.
<table><tr><th>Code number</th><th>Duplex</th></tr><tr><td>0</td><td>Duplex NO</td></tr><tr><td>1</td><td>Duplex YES</td></tr></table>
[Operation]
The operation is similar to simulation 26-02.</td></tr>
<tr><td></td><td>06</td><td>Destination setup</td><td>[Function]
When this simulation is executed, the current set destination is displayed. Enter the code number corresponding to the desired destination and press [OK]/[START] key to save the setting.
<table><tr><th>Code number</th><th>Destination</th></tr><tr><td>0</td><td>Inch series</td></tr><tr><td>1</td><td>EX Japan AB series</td></tr><tr><td>2</td><td>Japan AB series</td></tr><tr><td>3</td><td>China</td></tr></table>
* Code number 2 and 3 cannot be selected.
[Operation]
The operation is similar to simulation 26-02.</td></tr>
<tr><td></td><td>07</td><td>Machine conditions check</td><td>[Function]
When this simulation is executed, the current machine setting is displayed.
<table><tr><th>CPM</th><th>Copy quantity</th><th>Remark</th></tr><tr><td>20 CPM</td><td>20</td><td></td></tr></table></td></tr>
<tr><td></td><td>20</td><td>Rear edge void setup</td><td>[Function]
When this simulation is executed, the current set rear edge void is displayed. Enter the code number corresponding to the desired rear edge void and press [START] key to save the setting.
<table><tr><th>Code number</th><th>Setting</th><th>Remark</th></tr><tr><td>0</td><td>Rear edge void NO</td><td></td></tr><tr><td>1</td><td>Rear edge void YES</td><td>Default</td></tr></table>
[Operation]
The operation is similar to simulation 26-02.</td></tr>
<tr><td></td><td>30</td><td>CE mark support control ON/OFF</td><td>[Function]
When this simulation is executed, the current set CE mark support control is displayed. Enter the code number corresponding to the desired CE mark support control and press [START] key to save the setting.
<table><tr><th>Code number</th><th>Setting</th><th>Remark</th></tr><tr><td>0</td><td>CE mark support control OFF</td><td>Default (100V series)</td></tr><tr><td>1</td><td>CE mark support control ON</td><td></td></tr></table>
[Operation]
The operation is similar to simulation 26-02.</td></tr>
<tr><td></td><td>38</td><td>Cancel of stop at drum life over</td><td>[Function]
When this simulation is executed, the current setup of the code number is displayed. Enter the code number and press the [START] key to enable the setup.
<table><tr><th>Code number</th><th>Setup</th></tr><tr><td>0</td><td>Stop at drum life over * Default (AL model)</td></tr><tr><td>1</td><td>Cancel of stop at drum life over</td></tr></table>
[Operation]
The operation is similar to simulation 26-02.</td></tr>
<tr><td></td><td>39</td><td>Memory capacity check</td><td>[Function]
When the simulation is executed, the currently installed SDRAM of the main unit is displayed.
<table><tr><th>Code number</th><th>Setting</th><th>Remark</th></tr><tr><td>32</td><td>32 MBYTE</td><td></td></tr></table></td></tr>
</table>

<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>26</td><td>40</td><td>Polygon motor OFF time setup (Time required for turning OFF after completion of printing)</td><td>
[Function]
When this simulation is executed, the current setting is displayed. Enter the code number corresponding to the desired setting and press [START] key to save the setting.
<table>
<tr><th>Code number</th><th>Setting</th><th>Display item</th><th>Remark</th></tr>
<tr><td>0</td><td>0sec</td><td>0</td><td></td></tr>
<tr><td>1</td><td>30sec</td><td>30</td><td>Default</td></tr>
<tr><td>2</td><td>60sec</td><td>60</td><td></td></tr>
<tr><td>3</td><td>90sec</td><td>90</td><td></td></tr>
</table>
[Operation]
The operation is similar to simulation 26-02.
</td></tr>
<tr><td></td><td>42</td><td>Transfer ON timing control setup</td><td>
[Function]
Enter the code number with [UP/UP] key and press [START] key, and the entered set value is saved and the machine enters the sub code input standby state.
Use [Density Select] key to select a mode. The set value of the selected mode is displayed in the 7seg display.
<table>
<tr><th>Mode</th><th>LED</th><th>Default</th><th>Setting range</th></tr>
<tr><td>Front surface paper lead edge</td><td>AE mode lamp</td><td>11</td><td>0 - 21</td></tr>
<tr><td>Front surface paper rear edge</td><td>TEXT mode lamp</td><td>50</td><td>1 - 99</td></tr>
<tr><td>Back surface paper lead edge</td><td>PHOTO mode lamp</td><td>11</td><td>0 - 21</td></tr>
<tr><td>Back surface paper rear edge</td><td>AE mode lamp
TEXT mode lamp</td><td>50</td><td>1 - 99</td></tr>
</table>
<Paper lead edge adjustment table>
<table>
<tr><th>Code number</th><th>Setting</th></tr>
<tr><td>0</td><td>Default (236 msec)</td></tr>
<tr><td>1</td><td>–20 msec</td></tr>
<tr><td>2</td><td>–18 msec</td></tr>
<tr><td>3</td><td>–16 msec</td></tr>
<tr><td>4</td><td>–14 msec</td></tr>
<tr><td>5</td><td>–12 msec</td></tr>
<tr><td>6</td><td>–10 msec</td></tr>
<tr><td>7</td><td>–8 msec</td></tr>
<tr><td>8</td><td>–6 msec</td></tr>
<tr><td>9</td><td>–4 msec</td></tr>
<tr><td>10</td><td>–2 msec</td></tr>
</table>
<table>
<tr><th>Code number</th><th>Setting</th></tr>
<tr><td>11</td><td>Default (236 msec)</td></tr>
<tr><td>12</td><td>+2 msec</td></tr>
<tr><td>13</td><td>+4 msec</td></tr>
<tr><td>14</td><td>+6 msec</td></tr>
<tr><td>15</td><td>+8 msec</td></tr>
<tr><td>16</td><td>+10 msec</td></tr>
<tr><td>17</td><td>+12 msec</td></tr>
<tr><td>18</td><td>+14 msec</td></tr>
<tr><td>19</td><td>+16 msec</td></tr>
<tr><td>20</td><td>+18 msec</td></tr>
<tr><td>21</td><td>+20 msec</td></tr>
</table>
* The default value, "11," of the transfer ON timing indicates "236msec passed from PS release."
* When set to "0," it is same as setting to the default, "11."
* The transfer ON timing can be adjusted to 236msec ± 2ms.
<Front/back surface of paper rear edge adjustment table>
<table>
<tr><th>Code</th><th>Setting</th><th>Remark</th></tr>
<tr><td>1</td><td>–98 msec</td><td></td></tr>
<tr><td>. . .</td><td>. . .</td><td></td></tr>
<tr><td>49</td><td>–2 msec</td><td></td></tr>
<tr><td>50</td><td>0 msec</td><td>Default</td></tr>
<tr><td>51</td><td>+2 msec</td><td></td></tr>
<tr><td>. . .</td><td>. . .</td><td></td></tr>
<tr><td>99</td><td>+98 msec</td><td></td></tr>
</table>
* The default "50" of the transfer OFF timing indicates "210msec passed from PPD1OFF."
* The transfer OFF timing can be adjusted to 210msec ± 2ms.
</td></tr>
</table>

<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>26</td><td>43</td><td>Side void setup</td><td>
[Function]
When this simulation is executed, the currently set code of the side void quantity is displayed (initial display), and the set data are saved. (Setting range: 0 – 10, Default: 4 (= One side 2.0mm))
<table>
<tr><th>Code</th><th>Setting</th><th>Remark</th></tr>
<tr><td>0</td><td>0 mm</td><td></td></tr>
<tr><td>1</td><td>0.5 mm</td><td></td></tr>
<tr><td>2</td><td>1.0 mm</td><td></td></tr>
<tr><td>3</td><td>1.5 mm</td><td></td></tr>
<tr><td>4</td><td>2.0 mm</td><td>Default</td></tr>
<tr><td>5</td><td>2.5 mm</td><td></td></tr>
<tr><td>6</td><td>3.0 mm</td><td></td></tr>
<tr><td>7</td><td>3.5 mm</td><td></td></tr>
<tr><td>8</td><td>4.0 mm</td><td></td></tr>
<tr><td>9</td><td>4.5 mm</td><td></td></tr>
<tr><td>10</td><td>5.0 mm</td><td></td></tr>
</table>
* When the adjustment value is increased by 1, the side void is changed as follows:
Side void adjustment: The side void is increased by 0.5mm. (The side void of "Set value x 0.5mm" is made.)
[Operation]
The operation is similar to simulation 09-04.
</td></tr>
<tr><td></td><td>54</td><td>γ life correction setting</td><td>
[Function]
Used to set the γ life correction.
When this simulation is executed, the current set code number is displayed.
Enter the desired code number and press [START] key to save the setting.
(Setting range: 0 – 1, default: 1)
<table>
<tr><th>Code number</th><th>Setting</th><th>Remark</th></tr>
<tr><td>0</td><td>OFF</td><td></td></tr>
<tr><td>1</td><td>ON</td><td>Default</td></tr>
</table>
[Operation]
The operation is similar to simulation 26-02.
</td></tr>
<tr><td></td><td>62</td><td>Energy-save mode copy lamp setup</td><td>
[Function]
Used to set half-ON /OFF of the copy lamp in the pre-heat mode.
When this simulation is executed, the current set code number is displayed. Enter the desired code number and press [START] key to save the setting.
<table>
<tr><th>Code number</th><th>Setting</th><th>Remark</th></tr>
<tr><td>0</td><td>Copy lamp OFF</td><td></td></tr>
<tr><td>1</td><td>Copy lamp half-ON</td><td>Default</td></tr>
</table>
[Operation]
The operation is similar to simulation 26-02.
</td></tr>
<tr><td>▲1</td><td>69</td><td>Used to set the operating conditions for toner near end</td><td>
[Function]
This simulation is used to set the operating conditions for toner near end. The setting mode is switched by [Density select] key.
The set value of the selected mode is displayed on the 7seg display.
When the code number is entered and [START] key is pressed, the setting is switched.
<Toner near end display/No display>
Lighting LED: AE mode lamp
<table>
<tr><th>Code number</th><th>Setting contents</th></tr>
<tr><td>0</td><td>Toner near end is displayed</td></tr>
<tr><td>1</td><td>Toner near end is not displayed</td></tr>
</table>
<Setting of operations at toner end>
<table>
<tr><th>Code number</th><th>Setting contents</th></tr>
<tr><td>1</td><td>Operation setting 1</td></tr>
<tr><td>2</td><td>Operation setting 2</td></tr>
<tr><td>3</td><td>Operation setting 3</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>30</td><td>01</td><td>Paper sensor status display</td><td>[Function]
The paper sensor status is displayed on the LED.
<table><tr><th>Sensor</th><th>Signal</th><th>Display lamp</th></tr><tr><td>Paper exit sensor</td><td>POD</td><td>Photoconductor cartridge replacement lamp</td></tr><tr><td>Paper entry sensor</td><td>PPD1</td><td>Developer cartridge replacement lamp</td></tr><tr><td>Duplex sensor</td><td>PPD2</td><td>JAM lamp</td></tr><tr><td>New drum cartridge sensor</td><td>PUIS</td><td>Zoom lamp</td></tr></table>∗ Since the manual paper feed sensor is a single bypass sensor, its status is not displayed.</td></tr>
<tr><td rowspan="2">41</td><td>06</td><td>OC cover float detection level adjustment (excluding AL-2021)</td><td>[Function]
When this simulation is executed, the current set value is displayed. When [START] key is pressed, the mirror base unit moves to the SPF scan position to acquire the OC cover float detection level.
When the mirror base unit returns to the home position, the acquired value is displayed.
If the adjustment is NG, the following message is displayed.
AL-2031/2041: Misfeed lamp lights up, and the 7seg display remains unchanged.
Note that, this simulation must be executed with the OC cover closed.
∗ If the value is 0, float detection is not performed in normal jobs.</td></tr>
<tr><td>07</td><td>OC cover float detection margin setting (excluding AL-2021)</td><td>[Function]
For the number of pixels between black markers on the SPF scanning position saved in "41-06: (OC cover float detection level adjustment)", if the number of pixels between the markers when processing float detection is less than the number of pixels set with this simulation, it is judged as the float error.
When the set value of this simulation is "0," no float error occurs.
When this simulation is executed, the current set value is displayed.
Enter the adjustment value with [▲] [▲] key and press [START] key. The setting is saved and the display is shifted to the sub code input standby menu.
Setting range: 0 – 99 (Copes with margin 0 – 99 pixels.)
Default: 30 (30 pixels)
[Operation]
The operation is similar to simulation 9-04.</td></tr>
<tr><td>43</td><td>01</td><td>Fusing temperature setting (Normal copy)</td><td>[Function]
Used to set the fusing temperature of 3rd or later sheet. (For 1st and 2nd sheets, SIM 43-14 is used.)
When this simulation is executed, the current set code number is displayed. Press [▲] [▲] key to change the setting and press [START] key to save the setting into the EERPOM.
The machine goes into the sub code entry standby mode.
The [Exposure mode selector] key is used to select the mode.
<table><tr><th>Code</th><th>Set temperature (°C)</th><th>Remark</th></tr><tr><td>0</td><td>170</td><td></td></tr><tr><td>1</td><td>175</td><td></td></tr><tr><td>2</td><td>180</td><td></td></tr><tr><td>3</td><td>185</td><td></td></tr><tr><td>4</td><td>190</td><td></td></tr></table><table><tr><th>Code</th><th>Set temperature (°C)</th><th>Remark</th></tr><tr><td>5</td><td>195</td><td>Default</td></tr><tr><td>6</td><td>200</td><td></td></tr><tr><td>7</td><td>205</td><td></td></tr><tr><td>8</td><td>210</td><td></td></tr></table><table><tr><th>Mode</th><th>Display item</th></tr><tr><td>Main cassette paper feed</td><td>AE mode lamp</td></tr><tr><td>Manual paper feed</td><td>TEXT mode lamp</td></tr></table>* The cassette feed and the manual feed are controlled similarly.
[Operation]
1) Press [Exposure mode selector] key to change the mode.
2) Press [▲] [▲] key to set the value.
3) Press [START] key to fix the code number.</td></tr>
</table>

<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>43</td><td>04</td><td>Fusing temperature setting in multi copy</td><td>
[Function]
For 20th sheet or later in multi copy, the fusing temperature is automatically changed from the temperature set with simulation 43-01 to the temperature set with this simulation.
When this simulation is executed, the current set code number is displayed. Enter the code number and press [START] key to change the setting.
<table>
<tr><th>Code</th><th>Set temperature (°C)</th><th>Remark</th></tr>
<tr><td>0</td><td>165</td><td></td></tr>
<tr><td>1</td><td>170</td><td></td></tr>
<tr><td>2</td><td>175</td><td></td></tr>
<tr><td>3</td><td>180</td><td></td></tr>
<tr><td>4</td><td>185</td><td></td></tr>
<tr><td>5</td><td>190</td><td></td></tr>
<tr><td>6</td><td>195</td><td></td></tr>
<tr><td>7</td><td>200</td><td></td></tr>
</table>
<table>
<tr><th rowspan="2">Mode</th><th rowspan="2">Display lamp</th><th colspan="2">Default</th></tr>
<tr><th>North America</th><th>Europe</th></tr>
<tr><td>Main cassette paper feed</td><td>AE mode lamp</td><td>3</td><td>3</td></tr>
<tr><td>Manual paper feed</td><td>TEXT mode lamp</td><td>3</td><td>3</td></tr>
<tr><td>Main cassette paper feed (small-size)</td><td>PHOTO mode lamp</td><td>1</td><td>3</td></tr>
<tr><td>Manual paper feed (small-size)</td><td>AE mode lamp
TEXT mode lamp</td><td>1</td><td>3</td></tr>
</table>
* The cassette feed and the manual feed are controlled similarly.

[Operation]
The operation is similar to simulation 43-01.
</td></tr>
<tr><td></td><td>05</td><td>Fusing temperature setup in duplex copy (AL-2041 only)</td><td>
[Function]
In the case of duplex copy, the shift temperature set with this simulation is applied to the fusing temperature.
When this simulation is executed, the current set code number is displayed.
Enter the desired code number and press [START] key to save the setting.
<table>
<tr><th>Code</th><th>Shift temperature (°C)</th><th>Remark</th></tr>
<tr><td>0</td><td>±0</td><td>Default</td></tr>
<tr><td>1</td><td>–8</td><td></td></tr>
<tr><td>2</td><td>–6</td><td></td></tr>
<tr><td>3</td><td>–4</td><td></td></tr>
<tr><td>4</td><td>–2</td><td></td></tr>
<tr><td>5</td><td>±0</td><td></td></tr>
<tr><td>6</td><td>+2</td><td></td></tr>
<tr><td>7</td><td>+4</td><td></td></tr>
<tr><td>8</td><td>+6</td><td></td></tr>
<tr><td>9</td><td>+8</td><td></td></tr>
</table>
[Operation]
The operation is similar to simulation 26-02.
</td></tr>
<tr><td></td><td>09</td><td>Postcard size paper fusing control setting</td><td>
[Function]
When this simulation is executed, the currently set code number is displayed.
Enter the code number and press [START] key, and the setting is changed.
<table>
<tr><th>Code</th><th>Shift temperature (°C)</th><th>Remark</th></tr>
<tr><td>0</td><td>Cancel</td><td>Default</td></tr>
<tr><td>1</td><td>Set</td><td></td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>43</td><td>11</td><td>Postcard size paper fusing temperature setting</td><td>
[Function]
When the simulation is executed, the current set value is displayed.
Press [UP/UP] key to switch the setting. Press [START] key to write into the EEPROM.
The machine enters the sub code input standby state.
<table>
<tr><th>Code</th><th>Shift temperature (°C)</th><th>Remark</th></tr>
<tr><td>0</td><td>160</td><td></td></tr>
<tr><td>1</td><td>165</td><td></td></tr>
<tr><td>2</td><td>170</td><td></td></tr>
<tr><td>3</td><td>175</td><td></td></tr>
<tr><td>4</td><td>180</td><td></td></tr>
<tr><td>5</td><td>185</td><td></td></tr>
<tr><td>6</td><td>190</td><td></td></tr>
<tr><td>7</td><td>195</td><td>Default</td></tr>
<tr><td>8</td><td>200</td><td></td></tr>
</table>
</td></tr>
<tr><td></td><td>14</td><td>Fusing start temperature setting</td><td>
[Function]
When this simulation is started, the currently set code number is displayed.
Press [▲] [▲] key to switch the setting, and press [START] key to save it to the EEPROM.
The machine goes to the sub code entry standby mode.
<table>
<tr><th>Code</th><th>Set temperature (°C)</th><th>Remark</th></tr>
<tr><td>0</td><td>160</td><td></td></tr>
<tr><td>1</td><td>165</td><td></td></tr>
<tr><td>2</td><td>170</td><td></td></tr>
<tr><td>3</td><td>175</td><td></td></tr>
<tr><td>4</td><td>180</td><td></td></tr>
<tr><td>5</td><td>185</td><td></td></tr>
<tr><td>6</td><td>190</td><td></td></tr>
<tr><td>7</td><td>195</td><td>Default</td></tr>
<tr><td>8</td><td>200</td><td></td></tr>
<tr><td>9</td><td>205</td><td></td></tr>
<tr><td>10</td><td>210</td><td></td></tr>
</table>
Switching to each mode is made by [Density Select] key. The set value of the selected mode is displayed on the 7seg display.
<table>
<tr><th rowspan="2">Mode</th><th rowspan="2">LED</th><th colspan="2">Default value</th></tr>
<tr><th>AL North America</th><th>AL Europe</th></tr>
<tr><td>Maine cassette paper feed & 2nd cassette paper feed</td><td>AE mode lamp</td><td>7</td><td>7</td></tr>
<tr><td>Manual paper feed</td><td>TEXT mode lamp</td><td>7</td><td>7</td></tr>
</table>
∗ The cassette feed and the manual feed are controlled similarly.
[Operation]
The operation is similar to simulation 43-01.
</td></tr>
<tr><td></td><td>15</td><td>Postcard size paper fusing control cycle synchronization setting</td><td>
[Function]
When this simulation is executed, the currently set code number is displayed.
When [UP/UP] key is pressed, setting is switched. When [START] key is pressed, setting is written into the EEPROM, and the machine enters the sub code input standby state.
(Setting range: 0 - 20, Default: 0)
∗ When set to "0," the setting is canceled and the fusing temperature control and the paper pass timing are not synchronized. The conventional control (control same as other paper) is performed.
∗ When set to "1" - "20," postcards are passed in synchronization with the fusing temperature control, ensuring stable fusing. However, the CPM becomes smaller.
<table>
<tr><th>Code</th><th>Synchronization setting</th><th>Fusing heater lamp OFF timing temperature</th><th>Remark</th></tr>
<tr><td>0</td><td>Cancel</td><td>-</td><td>Default</td></tr>
<tr><td>1</td><td rowspan="5">Setting</td><td>+ 0.5°C</td><td></td></tr>
<tr><td>• • •</td><td>• • •</td><td></td></tr>
<tr><td>6</td><td>+ 3.0°C</td><td></td></tr>
<tr><td>• • •</td><td>• • •</td><td></td></tr>
<tr><td>20</td><td>+ 10.0°C</td><td></td></tr>
</table>
∗ When set to "1" - "20" and when "set value x 0.5°C + control temperature," the fusing heater lamp is controlled to be OFF.
</td></tr>
</table>

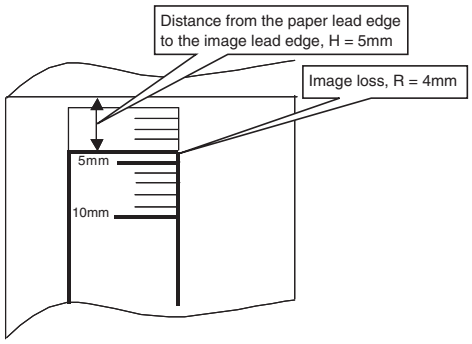
<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>46</td><td>01</td><td>Copy density adjustment (300dpi)</td><td>
[Function]
Copy density is set for each mode.
When this simulation is executed, the current set value is displayed in 2 digits (Default: 50).
Change the set value and press [START] key to make a copy under the set value.
When the set value is increased, the copy becomes darker. When the set value is decreased, the copy becomes lighter.
In this case, only Exp.3 copy is made. When, however, the setting is made to make darker copy, Exp.1 and Exp.5 copies also become darker. When made to lighter copy, Exp1. and Exp.5 copies become lighter, too.
Press [Exposure mode selector] key to switch the mode. The set value of the selected mode is displayed on the LCD/display. (Adjustment value: 1 – 99)
The setting procedure of the magnification ratio is the same as that to copy operation.
<table>
<tr><th>Mode</th><th>Display lamp</th><th>Default</th></tr>
<tr><td>AE mode (300dpi)</td><td>AE mode lamp</td><td>50</td></tr>
<tr><td>TEXT mode (300dpi)</td><td>TEXT mode lamp</td><td>50</td></tr>
<tr><td>PHOTO mode</td><td>PHOTO mode lamp</td><td>50</td></tr>
<tr><td>TS mode (TEXT) (300dpi)</td><td>TEXT mode lamp
PHOTO mode lamp</td><td>50</td></tr>
<tr><td>TS mode (AE) (300dpi)</td><td>AE mode lamp
PHOTO mode lamp</td><td>50</td></tr>
<tr><td>Dither mode</td><td>AE mode lamp
TEXT mode lamp
PHOTO mode lamp</td><td>50</td></tr>
</table>
[Operation]
1) Press [Exposure mode selector] key to change the mode.
2) Press [▲] [▲] key to set the value.
3) [START] Fixing and printing value
* Print is started in the set mode.
* To cancel the manual paper feed tray paper empty MSG, press [Any] key.
* When the AE mode exposure adjustment is made, put the chart on the rear side of the document table to avoid the center section (10cm).
</td></tr>
<tr><td></td><td>02</td><td>Copy density adjustment (600dpi)</td><td>
[Function]
Copy density is set for each mode.
When this simulation is executed, the current set value is displayed in 2 digits (Default: 50).
Change the set value and press [START] key to make a copy under the set value.
When the set value is increased, the copy becomes darker. When the set value is decreased, the copy becomes lighter.
In this case, only Exp.3 copy is made. When, however, the setting is made to make darker copy, Exp.1 and Exp.5 copies also become darker. When made to lighter copy, Exp1. and Exp.5 copies become lighter, too.
Press [Exposure mode selector] key to switch the mode. (Adjustment value: 1 – 99)
<table>
<tr><th>Mode</th><th>Display lamp</th><th>Default</th></tr>
<tr><td>AE mode (600dpi)</td><td>AE mode lamp</td><td>50</td></tr>
<tr><td>TEXT mode (600dpi)</td><td>TEXT mode lamp</td><td>50</td></tr>
<tr><td>PHOTO mode</td><td>PHOTO mode lamp</td><td>50</td></tr>
<tr><td>TS mode (TEXT) (600dpi)</td><td>TEXT mode lamp
PHOTO mode lamp</td><td>50</td></tr>
<tr><td>TS mode (AE) (600dpi)</td><td>AE mode lamp
PHOTO mode lamp</td><td>50</td></tr>
<tr><td>Dither mode</td><td>AE mode lamp
TEXT mode lamp
PHOTO mode lamp</td><td>50</td></tr>
</table>
[Operation]
The operation is similar to simulation 46-01.
</td></tr>
</table>

<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>46</td><td>18</td><td>Image contrast adjustment (300dpi)</td><td>
[Function]
Contrast is set for each mode.
When this simulation is executed, the current set value is displayed in 2 digits (Default: 50).
Change the set value and press [START] key to make a copy under the set value.
When the set value is increased, the contrast becomes higher. When the set value is decreased, the contrast becomes lower.
In this case, only Exp.3 copy is made. When, however, the setting is made to make higher contrast, Exp.1 and Exp.5 copies also become in higher contrast. When made to a lower contrast, Exp1. and Exp.5 copies become lower contrast, too.
Press [Exposure mode selector] key to switch the mode. The set value of the selected mode is displayed on the LCD/display.
(Adjustment value: 1 – 99)
<table>
<tr><th>Mode</th><th>Display lamp</th><th>Default</th></tr>
<tr><td>AE mode (300dpi)</td><td>AE mode lamp</td><td>50</td></tr>
<tr><td>TEXT mode (300dpi)</td><td>TEXT mode lamp</td><td>50</td></tr>
<tr><td>PHOTO mode</td><td>PHOTO mode lamp</td><td>50</td></tr>
<tr><td>TS mode (TEXT) (300dpi)</td><td>TEXT mode lamp
PHOTO mode lamp</td><td>50</td></tr>
<tr><td>TS mode (AE) (300dpi)</td><td>AE mode lamp
PHOTO mode lamp</td><td>50</td></tr>
<tr><td>Dither mode</td><td>AE mode lamp
TEXT mode lamp
PHOTO mode lamp</td><td>50</td></tr>
</table>
[Operation]
The operation is similar to simulation 46-01.
</td></tr>
<tr><td></td><td>19</td><td>Exposure mode setup (AE mode)</td><td>
[Function]
<γ table setting>
When this simulation is executed, the code number of the current set gamma table is displayed. (Default: 2)
Enter the code number corresponding to the desired gamma table, and press [Exposure mode selector] key to change the mode and write into the EEPROM.
<AE operation mode>
When setting the γ table, press [Exposure mode selector] key to change to the AE operation mode, and the current set code number of the AE operation mode is displayed. (Default: 0)
Enter the code number corresponding to the desired AE operation mode and press [Exposure mode selector] key to change the mode and write into the EEPROM.
<PHOTO image process setting>
When [Exposure mode selector] key is pressed in AE operation mode setting, the mode is changed to the PHOTO image process setting and the code number of the current set PHOTO image process setting is displayed. (Default: 1)
Enter the code number corresponding to the desired PHOTO image process setting and press [Exposure mode selector] key to change the mode and write into the EEPROM.
<table>
<tr><th>Mode</th><th>Display lamp</th><th>Code number</th><th>Setting content</th><th>Remark</th></tr>
<tr><td rowspan="2">γ</td><td rowspan="2">OFF</td><td>1</td><td>Image quality priority mode</td><td></td></tr>
<tr><td>2</td><td>Toner consumption priority mode</td><td>Default</td></tr>
<tr><td rowspan="2">AE</td><td rowspan="2">AE</td><td>0</td><td>Lead edge stop</td><td>Default</td></tr>
<tr><td>1</td><td>Real time process</td><td></td></tr>
<tr><td rowspan="2">PHOTO</td><td rowspan="2">PHOTO</td><td>1</td><td>Error diffusion process</td><td>Default</td></tr>
<tr><td>2</td><td>Dither process</td><td></td></tr>
</table>
[Operation]
The operation is similar to simulation 46-01.
</td></tr>
</table>

<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>46</td><td>20</td><td>SPF exposure correction (excluding AL-2021)</td><td>
[Function]
Used to adjust the exposure correction amount in the SPF mode. The adjustment is made by adjusting Vref voltage variation for the OC mode.
When this simulation is executed, the current set value is displayed in 2 digits (Default: 50). Change the set value and press [START] key to save the setting and make a copy.
When the set value is increased, copy becomes darker. When the set value is decreased, copy becomes lighter. (Adjustment range: 1 – 99)
<table>
<tr><th>Mode</th><th>Display item (AL-2031/2041)</th><th>Display lamp (AL-2031/2041)</th><th>Default</th><th>Remark</th></tr>
<tr><td>SPF</td><td>SPF</td><td>TEXT mode lamp</td><td>50</td><td></td></tr>
</table>
[Operation]
The operation is similar to simulation 46-01.
</td></tr>
<tr><td></td><td>29</td><td>Image contrast adjustment (600dpi)</td><td>
[Function]
Contrast is set for each mode.
When this simulation is executed, the current set value is displayed in 2 digits (Default: 50).
Change the set value and press [START] key to make a copy under the set value.
When the set value is increased, the contrast becomes higher. When the set value is decreased, the contrast becomes lower.
In this case, only Exp.3 copy is made. When, however, the setting is made to make higher contrast, Exp.1 and Exp.5 copies also become in higher contrast. When made to a lower contrast, Exp1. and Exp.5 copies become lower contrast, too.
Press [Exposure mode selector] key to switch the mode. The set value of the selected mode is displayed on the LCD/display. (Adjustment value: 1 – 99)
<table>
<tr><th>Mode</th><th>Display lamp</th><th>Default</th></tr>
<tr><td>AE mode (600dpi)</td><td>AE mode lamp</td><td>50</td></tr>
<tr><td>TEXT mode (600dpi)</td><td>TEXT mode lamp</td><td>50</td></tr>
<tr><td>PHOTO mode</td><td>PHOTO mode lamp</td><td>50</td></tr>
<tr><td>TS mode (TEXT) (600dpi)</td><td>TEXT mode lamp
PHOTO mode lamp</td><td>50</td></tr>
<tr><td>TS mode (AE) (600dpi)</td><td>AE mode lamp
PHOTO mode lamp</td><td>50</td></tr>
<tr><td>Dither mode</td><td>AE mode lamp
TEXT mode lamp
PHOTO mode lamp</td><td>50</td></tr>
</table>
[Operation]
The operation is similar to simulation 46-01.
</td></tr>
<tr><td></td><td>30</td><td>AE limit adjustment</td><td>
[Function]
Used to set the limit value in AE and AE (toner save).
Change the setting and press [START] key to write the setting into the EEPROM. The machine goes into the sub code entry standby mode.
By pressing [Exposure mode selector] key, setting is changed.
(Setting range: 0 – 255, Default: 196)
<table>
<tr><th>Mode</th><th>Display lamp</th><th>Remark</th></tr>
<tr><td>Limit value for AE (OC)</td><td>AE mode lamp</td><td></td></tr>
<tr><td>Limit value for AE (OC) (toner save)</td><td>TEXT mode lamp</td><td></td></tr>
<tr><td>Limit value for AE (SPF)</td><td>AE mode lamp
PHOTO mode lamp</td><td></td></tr>
<tr><td>Limit value for AE (SPF) (toner save)</td><td>TEXT mode lamp
PHOTO mode lamp</td><td></td></tr>
</table>
<Remark>
When simulation 26-06 (Destination setting) or simulation 46-19 Auto Exposure mode is changed, the setting of this simulation is also changed to the default in connection.
[Operation]
The operation is similar to simulation 46-19.
</td></tr>
</table>

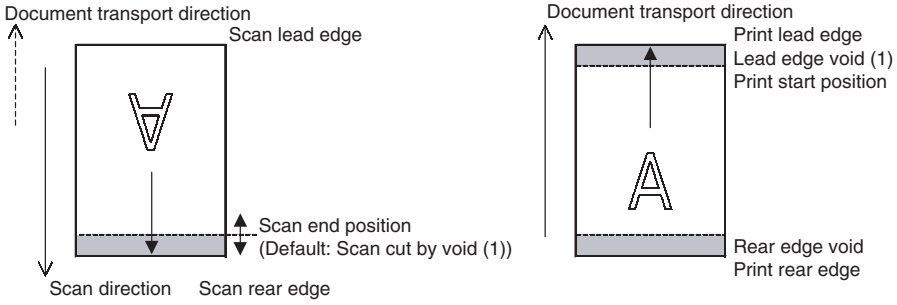
<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>46</td><td>31</td><td>Image sharpness adjustment</td><td>
[Function]
Used to adjust sharpening/blurring of image in each mode.
<table>
<tr><th>Image quality</th><th>Setting No</th><th>Remark</th></tr>
<tr><td>Blurring</td><td>0</td><td></td></tr>
<tr><td>Standard</td><td>1</td><td>Default</td></tr>
<tr><td>Sharpening</td><td>2</td><td></td></tr>
</table>
When this simulation is executed, warm-up and shading are performed and the current set value is displayed. (Default: 1)
Change the set value and press [START] key to make a copy under the set conditions.
To change the mode, press [Exposure mode selector] key. The code number of the selected mode is diplayed on the LED/display.
<table>
<tr><th>Mode</th><th>Display lamp</th><th>Default</th></tr>
<tr><td>AE mode</td><td>AE mode lamp</td><td>1</td></tr>
<tr><td>TEXT mode</td><td>TEXT mode lamp</td><td>1</td></tr>
<tr><td>PHOTO mode</td><td>PHOTO mode lamp</td><td>1</td></tr>
<tr><td>TS mode (TEXT)</td><td>TEXT mode lamp
PHOTO mode lamp</td><td>1</td></tr>
<tr><td>TS mode (AE)</td><td>AE mode lamp
PHOTO mode lamp</td><td>1</td></tr>
<tr><td>Dither mode</td><td>AE mode lamp
TEXT mode lamp
PHOTO mode lamp</td><td>1</td></tr>
</table>
[Operation]
The operation is similar to simulation 46-01.
</td></tr>
<tr><td></td><td>32</td><td>Copier color reproduction setup</td><td>
[Function]
Used to set color reproduction in each mode. Colors easy to be copied and colors difficult to be copied can be switched.
<table>
<tr><th>Set value</th><th>Colors easy to be copied</th><th>Colors difficult to be copied</th></tr>
<tr><td>0</td><td>Purple, Blue, Red</td><td>Yellow, Green, Water blue</td></tr>
<tr><td>1</td><td>Water blue, Green, Blue</td><td>Purple, Red, Yellow</td></tr>
<tr><td>2</td><td>Yellow, Red, Green</td><td>Blue, Water blue, Purple</td></tr>
</table>
* This setting has virtually no effect on black-and-white documents.
When this simulation is executed, warm-up and shading are performed and the current set value is displayed. (Default: 0)
Press [START] key to make a copy under the set conditions . At that time, color components are changed for used in copying.
To change the mode, press [Exposure mode selector] key. The code number of the selected mode is displayed on the LED/display.
<table>
<tr><th>Specification component</th><th>Setting No</th><th>Remark</th></tr>
<tr><td>Green</td><td>0</td><td>Default</td></tr>
<tr><td>Red</td><td>1</td><td></td></tr>
<tr><td>Blue</td><td>2</td><td></td></tr>
</table>
<table>
<tr><th>Mode</th><th>Display lamp</th><th>Default</th></tr>
<tr><td>AE mode (including TS)</td><td>AE mode lamp</td><td>0</td></tr>
<tr><td>TEXT mode (including TS)</td><td>TEXT mode lamp</td><td>0</td></tr>
<tr><td>PHOTO mode</td><td>PHOTO mode lamp</td><td>0</td></tr>
</table>
[Operation]
The operation is similar to simulation 46-01.
</td></tr>
</table>

<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>48</td><td>01</td><td>Front/rear (main scanning) direction and scan (sub scanning) direction magnification ratio adjustment</td><td>
[Function]
Used to adjust the magnification ratio in the main scan (front/rear) direction and sub scan direction.
Enter the adjustment value with [▲] [▲] key. Press [START] key to save the set value and make a copy. (When the adjustment value is increased by 1, the magnification ratio is increased by 0.1%.)
The adjustment mode can be changed by pressing [Exposure mode selector] key.
(Adjustment range: 1 – 99, Default: 50)
<table>
<tr><th>Mode</th><th>Display lamp</th><th>Default</th></tr>
<tr><td>Main scan direction magnification ratio</td><td>TEXT mode lamp</td><td>50</td></tr>
<tr><td>OC mode sub scan direction magnification ratio</td><td>PHOTO mode lamp</td><td>50</td></tr>
</table>
[Operation]
The operation is similar to simulation 46-01.
</td></tr>
<tr><td></td><td>05</td><td>SPF mode sub scan direction magnification ratio in copying
(excluding AL-2021)</td><td>
[Function]
Used to display the current SPF mode sub scan direction magnification ratio on the LCD/display.
When [START] key is pressed, the entered data is acquired and saved into the EEPROM, and a copy is made. (When the set value is increased by 1, the magnification ratio is increased by 0.1%.)
The adjustment mode can be changed by pressing [Exposure mode selector] key.
(Adjustment range: 1 – 99, Default: 50)
For printing, regardless of the density mode and the density level,
Density mode = TEXT
Density level = 3
<table>
<tr><th>Mode</th><th>Display lamp(AL-2031/2041)</th><th>Default</th></tr>
<tr><td>Sub scan magnification ratio adjustment on the front surface of SPF document</td><td>AE mode lamp</td><td>50</td></tr>
</table>
* When there is no document in SPF, copy is inhibited.
[Operation]
The operation is similar to simulation 46-01.
</td></tr>
<tr><td>49</td><td>01</td><td>Flash ROM program writing mode</td><td>
[Function]
When this simulation is executed, "d" is displayed on the display, the machine goes into the program writing mode from PC to Flash ROM.
Use the writing tool on the PC and write the program.
During writing, the display shows as follows:
After completion of download, turn OFF/ON the power to reset.
<table>
<tr><th>Status</th><th>Display</th><th>Pre-heat lamp</th><th>Ready lamp</th><th>Remark</th></tr>
<tr><td>Download data receiving</td><td>"d" ON</td><td>ON</td><td>OFF</td><td></td></tr>
<tr><td>Date delete start</td><td>"d" ON</td><td>OFF</td><td>ON</td><td></td></tr>
<tr><td>Data write (Boot section)</td><td>"d" ON</td><td>Blink</td><td>OFF</td><td></td></tr>
<tr><td>Data write (Program section)</td><td>"d" ON</td><td>Blink</td><td>Blink</td><td></td></tr>
<tr><td>During SUM CHECK</td><td>"d" ON</td><td>ON</td><td>ON</td><td></td></tr>
<tr><td>Download complete</td><td>"0FF" ON</td><td>OFF</td><td>OFF</td><td></td></tr>
<tr><td>Error state</td><td>"E ∗" ON</td><td>OFF</td><td>OFF</td><td></td></tr>
</table>
* "∗" in an error display indicates the error position.
<table>
<tr><td>1</td><td>Data reception error</td></tr>
<tr><td>2</td><td>Loader function transfer</td></tr>
<tr><td>3</td><td>FLASH ROM delete</td></tr>
<tr><td>4</td><td>FLASH ROM writing (Boot section)</td></tr>
<tr><td>5</td><td>FLASH ROM writing (Program section)</td></tr>
</table>
<table>
<tr><td>6</td><td>Sum check (Loader section)</td></tr>
<tr><td>7</td><td>Sum check (Boot section)</td></tr>
<tr><td>8</td><td>Sum check (Program section)</td></tr>
<tr><td>9</td><td>Sum check (EEPROM section)</td></tr>
<tr><td>10</td><td>Data error</td></tr>
</table>
To enter the download mode, there is a method to use key operations as well as to use a simulation. With the power OFF, press and hold [Exposure mode select] key + [ZOOM DOWN] key, turn on the power.
</td></tr>
</table>

<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>50</td><td>01</td><td>Lead edge image position</td><td>
[Function]
Used to adjust the copy image position and the lead edge void amount on copy paper. The adjustment is made by adjusting the image scan start position at 100% and the print start position (resist roller ON timing). When this simulation is executed, the current set value is displayed in 2 digits. (Center value: 50)
When [Exposure mode selector] key is pressed, the setting mode and the display are changed.
Enter the adjustment value and press [START] key to save the set value and make a copy.
When the adjustment is made by the main cassette paper feed, the adjustment values of all the paper feed ports become the same. (When the set value is increased by 1, shift is made by 0.1mm.)
<table>
<tr><th>Mode</th><th>Display lamp</th><th>Default</th></tr>
<tr><td>Print start position
(Main cassette paper feed)</td><td>AE mode lamp
Main cassette lamp</td><td>50</td></tr>
<tr><td>Print start position
(Manual paper feed)</td><td>AE mode lamp
Manual feed lamp</td><td>50</td></tr>
<tr><td>Image lead edge void amount</td><td>TEXT mode lamp
Main cassette lamp</td><td>50</td></tr>
<tr><td>Image scan start position</td><td>PHOTO mode lamp
Main cassette lamp</td><td>50</td></tr>
<tr><td>Image rear edge void amount
(Cassette paper feed)</td><td>AE mode lamp
TEXT mode lamp
PHOTO mode lamp
Main cassette lamp</td><td>50</td></tr>
<tr><td>Image rear edge void amount
(Manual paper feed)</td><td>AE mode lamp
TEXT mode lamp
Manual lamp</td><td>50</td></tr>
</table>
* When printing with the manual paper feed tray, use paper of the letter size.
[Adjustment procedure]
1) Set the print start position (AE lamp ON) (A), the lead edge void amount (TEXT lamp ON) (B), and the scan start position (PHOTO lamp ON) (C) to 0, and make a copy of a scale at 100%.
2) Measure the image loss (Rmm) of the scale.
Set C = 10 x R (mm). (Example: Set to 40.)
When the value of C is increased by 10, the image loss is decreased by 1mm. (Default: 50)
3) Measure the distance (Hmm) from the paper lead edge to the image print start position.
Set A = 10 x H (mm). (Example: Set to 50.)
When the value of A is increased by 10, the image lead edge is moved to the paper lead edge by 1mm. (Default: 50).
4) Set the lead edge void amount to B = 50 (2.5mm). (Default: 50)
When the value of B is increased by 10, the void is extended by about 0.1mm. (For 25 or less, however, the void amount is regarded as 0.)
* The SPF adjustment is made by adjusting the SPF image scan start position after OC adjustment.
(Example)


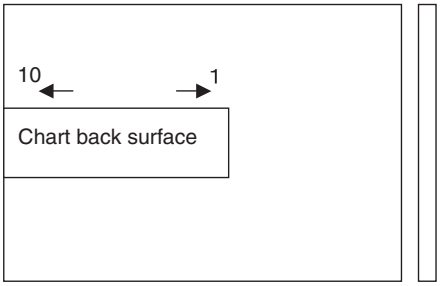
[Operation]
The operation is similar to simulation 46-01.
</td></tr>
</table>

<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td rowspan="3">50</td><td>06</td><td>Copy lead edge position adjustment (SPF) (excluding AL-2021)</td><td>[Function]
Used to adjust the SPF copy lead edge.
When the adjustment value of the document scan position adjustment is increased by 1, the scan start timing is advanced by 0.1mm.
The print result is shifted to the opposite direction of the scan start position.
The adjustment mode can be changed by pressing [Exposure mode selector] key.
(Adjustment range: 1 – 99, Default: 50)
<table><tr><th>Mode</th><th>Display lamp</th><th>Default</th></tr><tr><td>Front surface document scan position adjustment</td><td>AE mode lamp</td><td>50</td></tr><tr><td>Rear edge void adjustment (SPF)</td><td>PHOTO mode lamp</td><td>50</td></tr></table>* When there is no document in the SPF, copy is inhibited.
[Operation]
The operation is similar to simulation 46-01.</td></tr>
<tr><td>10</td><td>Center offset adjustment</td><td>[Function]
Used to adjust the center offset position of copy images on copy paper and that in scanning document.
When this simulation is executed, the current set value is displayed.
Enter the adjustment value and press [START] key to save the setting and make a copy. (When the set value is changed by 1, the center is shifted by 0.1mm.)
When the adjustment value is increased, the center is shifted to right. When decreased, the center is shifted to left.
The modes can be selected by pressing [Exposure mode selector] key.
When the set value is changed largely, the area outside the shading area may be scanned to cause black streaks on the edges.
<table><tr><th>Mode</th><th>Display lamp</th><th>Default</th></tr><tr><td>Print center offset (Main cassette paper feed)</td><td>AE mode lamp
Main cassette lamp</td><td>50</td></tr><tr><td>Print center offset (Manual paper feed)</td><td>AE mode lamp
Manual paper feed lamp</td><td>50</td></tr><tr><td>(*) 2nd print center offset (Main cassette paper feed)</td><td>TEXT mode lamp
Main cassette lamp</td><td>50</td></tr></table>(*): For Simplex models, skip.
* When printing with the manual paper feed tray, use paper of the letter size.
* In the 2nd print center offset adjustment, print is made forcibly as 1to2/Short Edge from OC regardless of duplex setting.
[Operation]
The operation is similar to simulation 46-01.</td></tr>
<tr><td>12</td><td>Document off-center adjustment</td><td>[Function]
Used to adjust document scan off-center adjustment.
The adjustment modes can be selected by pressing [Exposure mode selector] key.
(Adjustment range: 1 – 99, Default: 50)
When the adjustment value is increased, the print result is shifted to left.
<table><tr><th>Mode</th><th>Display lamp</th><th>Default</th></tr><tr><td>Platen document scan</td><td>AE mode lamp</td><td>50</td></tr><tr><td>SPF document front scan</td><td>TEXT mode lamp</td><td>50</td></tr></table>[Operation]
The operation is similar to simulation 46-01.</td></tr>
</table>

<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>50</td><td>18</td><td>Memory reverse position adjustment in duplex copy (AL-2041 only)</td><td>
[Function]
When this simulation is executed, the current set correction value is displayed.
Enter the correction value and press [START] key to save the entered correction value. (Correction value range; 1 – 99, Default: 50)
For S-D mode front surface print, reverse memory copy operation is performed from the rear edge of documents.
When, therefore, the print position adjustment of output images is required, adjust as follows:
In the reverse memory coping, when the document scan is made in the arrow direction, the output image is printed from the rear edge of scan image.
When, therefore, the print lead edge is shifted, set the reference chart so that the reference position is on the rear edge, and use this simulation to adjust the set value so that the print lead edge is matched.
Since printing is made from the image data most lately stored in memory to the lead edge data from the print start position, the image lead edge adjustment is made by changing the end data position stored in memory by the set value of this simulation.
Since it is performed by changing the scan end position, the image position adjustment is made by changing the scan end position and the end data stored in memory.
The adjustment modes can be selected by pressing [Exposure mode selector] key.
<table>
<tr><th>Mode</th><th>Display lamp</th><th>Default</th></tr>
<tr><td>OC memory reverse output position</td><td>AE mode lamp</td><td>50</td></tr>
<tr><td>SPF memory reverse output position</td><td>TEXT mode lamp</td><td>50</td></tr>
</table>


* The initial value of duplex setting is "1to2/Long Edge" for the duplex model, or "2to1" for the simplex model.
[Operation]
The operation is similar to simulation 46-01.
</td></tr>
<tr><td></td><td>19</td><td>Duplex copy rear edge void adjustment (AL-2041 only)</td><td>
[Function]
Used to adjust the rear edge void amount in duplex copy.
When this simulation is executed, the current set value is displayed in 2 digits. (Center value: 50.) The adjustment modes can be selected by pressing [Exposure mode selector] key.
(Adjustment range: 1 – 99)
Enter the adjustment value with [▲] [▲] key and press [START] key to save the set value and make a copy. (The paper information is cleared for every copy.)
When the set value is increased by 1, the void amount is increased by about 0.1mm.
<table>
<tr><th>Mode</th><th>Display lamp</th><th>Default</th></tr>
<tr><td>Paper rear edge void amount</td><td>TEXT mode lamp</td><td>50</td></tr>
<tr><td>Print start position
(Duplex back surface)</td><td>PHOTO mode lamp</td><td>50</td></tr>
</table>
* The initial value for duplex setting is "1to2/Short Edge" for the OC/SPF setting.
[Operation]
The operation is similar to simulation 46-01.
</td></tr>
</table>

<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>51</td><td>02</td><td>Resist quantity adjustment</td><td>
[Function]
Used to adjust the contact pressure of the main unit resist roller and the SPF resist roller onto paper. When this simulation is executed, the current set value is displayed.
The adjustment modes can be selected by pressing [Exposure mode selector] key.
Enter the adjustment value with [▲] [▲] key and press [START] key to save the set value and make a copy.
<table>
<tr><th>Mode</th><th>Display lamp</th><th>Default</th></tr>
<tr><td>Main cassette paper feed</td><td>AE mode lamp
Main cassette lamp</td><td>50</td></tr>
<tr><td>Manual paper feed</td><td>AE mode lamp
Manual paper feed lamp</td><td>50</td></tr>
<tr><td>Duplex back surface</td><td>TEXT mode lamp
PHOTO mode lamp
Main cassette lamp</td><td>50</td></tr>
</table>
[Operation]
The operation is similar to simulation 46-01.
</td></tr>
<tr><td>53</td><td>08</td><td>SPF scan position automatic adjustment
(excluding AL-2021)</td><td>
[Function]
Place a A4 paper (white chart) so that it covers the SPF scan glass and the OC glass together, and close the SPF.
When this simulation is executed, the current adjustment value is displayed as the initial display.
* Default is 50. Adjustment range is 1 – 99. Adjustment unit 1 = about 0.127mm
In case of AUTO, press [START] key, and the mirror unit scans from the home position to the SPF scan position with the adjustment value displayed. The SPF glass cover edge position is calculated from the difference between the SPF glass cover edge and the OC side document glass CCD output level. If the adjustment is normal, the adjusted value is displayed. If abnormal, the JAM LED lights up with the current set value displayed.
During the JAM LED is lighted, when [START] key is pressed again, execution is performed again.
<table>
<tr><th>Mode</th><th>Display lamp (AL-2031/2041)</th><th>Default</th></tr>
<tr><td>SPF scan position auto adjustment</td><td>AE mode lamp</td><td>50</td></tr>
<tr><td>SPF scan position manual adjustment</td><td>TEXT mode lamp</td><td>50</td></tr>
</table>
[Operation]
The operation is similar to simulation 46-01. (In MANUAL)
</td></tr>
<tr><td>61</td><td>03</td><td>Polygon motor check
(HSYNC output check)</td><td>
[Function]
When [START] key is pressed, HSYNC is performed and the polygon motor is rotated for 30sec.
At that time, the ZOOM lamp is lighted for 100msec every time when HSYNC is detected.
The sub code display is lighted. (After completion of execution, it blinks.)
</td></tr>
<tr><td>63</td><td>01</td><td>Shading check</td><td>
[Function]
Used to display the detection level of white plate for shading.
When [START] key is pressed, the mirror base unit moves to the white plate for shading and the copy lamp is lighted.
When the light quantity is stabilized, revision is made for every second, and the level of one pixel at the center of CCD which is not corrected is detected and the value is displayed in decimal values on the LED.
</td></tr>
</table>

Main code	Sub code	Contents	Details of function/operation
63	02	Black level automatic correction	**[Function]** Used to acquire the black level target value used for the black level adjustment of white balance. When this simulation is executed, the current correction value is displayed in 3 digits of 12bit hexadecimal number. Place the gray gradation chart (UKOG-0162FCZZ) used as the correction document so that the density 10 (black side) comes on the left side and that the chart is upside down at the center of the plate left center.  When [START] key is pressed, the mirror base unit scans the chart and calculates the correction value. After completion of correction, the corrected value is displayed on the LED/display. ∗ Default: 0 ∗ If the value is set to the default, operation is made with 0x60. ∗ Incase of an error, the JAM lamp lights up. ∗ If C key is pressed during canceling, the machine goes into the sub code entry standby mode after canceling.
	12	Light quantity stabilization wait time setting	**[Function]** Used to set the wait time before entering the light quantity level stable evaluation process in the light quantity stable process of white balance. (Note: The light quantity stable level in the previous light quantity stable state is used as the target. When the light quantity level reaches the target during the wait time, the set time of this simulation is ignored and the operation enters the stable evaluation process.) When this simulation is executed, the currently set value is displayed. Enter the adjustment value with [▲] [▲] key and press [START] key. The entered value is stored and the machine goes into the sub code entry standby mode. Setting range: 0 – 99 (Complying with the light quantity stable wait time of 0 – 99sec.) Default: 15 (15sec) **[Operation]** The operation is similar to simulation 9-04.
	13	Light quantity stabilization band setting	**[Function]** When the difference between the maximum and the minimum values of the light quantity level sampled for 3.2sec in the cycle of 100msec in the white balance light quantity stable process is within the range set with this simulation, it is judged as the light quantity is stable. (Note: The magnification ratio of the AFE gain setting is automatically reflected on the stable width.) When this simulation is executed, the currently set value is displayed. Enter the adjustment value with [▲] [▲] key and press [START] key. The entered value is stored and the machine goes into the sub code entry standby mode. Setting range: 1 – 99 (Light quantity stable width: Complying with 1 – 99 in 4095 gradations.) Default: 16 **[Operation]** The operation is similar to simulation 9-04.

<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>64</td><td>01</td><td>Self print</td><td>
[Function]
The status of the optical section is ignored and printing of one page is made. Also when the print command is received from the host, printing is made.
When this simulation is executed, warm-up is performed and the ready lamp is lighted. (Since, however, the scanner is disabled, initializing is not made.)
Enter the code number and press [START] key to start paper feed from the selected cassette and print in the selected pattern.
<table>
<tr><th>Code number</th><th>Pattern</th><th>Display item</th></tr>
<tr><td>0</td><td>1by2</td><td>1 BY 2</td></tr>
<tr><td>1</td><td>Grid pattern</td><td>CHECK</td></tr>
<tr><td>2</td><td>White paper</td><td>WHITE</td></tr>
<tr><td>3</td><td>Black background</td><td>BLACK</td></tr>
</table>
* For 4 – 99, flip.
[Operation]
The operation is similar to simulation 26-02.
</td></tr>
</table>

5. Trouble codes

A. Trouble codes list

Main code	Sub code	Details of trouble
E7	01	Image data error
	06	Image data decode error
	10	Shading trouble (Black correction)
	11	Shading trouble (White correction)
	16	Abnormal laser output
	20	LSU trouble
F2	64	Toner supply abnormality
	70	Improper cartridge
	74	Toner cartridge CRUM error
F5	02	Copy lamp lighting abnormality
H2	00	Thermistor open
H3	00	Heat roller high temperature detection
H4	00	Heat roller low temperature detection
L1	00	Feeding is not completed within the specified time after starting feeding. (The scan head locking switch is locked)
L3	00	Scanner return trouble
L4	01	Main motor lock detection
	31	Exhaust fan motor lock detection trouble
L6	10	Polygon motor lock detection
U2	00	EEPROM read/write error (Serial communication error)
	11	Counter check sum error (EEPROM)

B. Details of trouble codes

Main code	Sub code	Details of trouble	
E7	01	Content	Image data error
		Detail	Communication error with the E-sort module MCU PWB trouble ASIC trouble
		Check and remedy	Check if it occurs again when the power is turned OFF and ON. If so, replace the PWB.
	06	Content	Image data decode error
		Detail	Image expansion error
		Cause	MCU PWB abnormality USB cable trouble
		Check and remedy	Replace the MCU PWB. Replace the USB cable.
	10	Content	Shading trouble (Black correction)
		Detail	The CCD black scan level is abnormal when the shading.
		Cause	Improper connection of the CCD unit flat cable CCD unit abnormality MCU PWB abnormality
		Check and remedy	Check connection of the CCD unit flat cable. Check the CCD unit.
E7	11	Content	Shading trouble (White correction)
		Detail	The CCD white scan level is abnormal when the shading.
		Cause	Improper connection of the CCD unit flat cable Dirt on the mirror, the lens, and the reference white plate Copy lamp lighting abnormality CCD unit abnormality MCU PWB abnormality (When occurred in the SPF scan position.) Improper installation of the mirror unit
		Check and remedy	Clean the mirror, lens, and the reference white plate. Check the light quantity and lighting status of the copy lamp (SIM 05-03). Check the MCU PWB.
	16	Content	Abnormal laser output
		Detail	When the laser output is stopped, HSYNC is detected.
		Cause	Laser abnormality MCU PWB abnormality.
		Check and remedy	Check the laser emitting diode operation. Replace the MCU PWB.
	20	Content	LSU trouble
		Detail	The BD signal from the LSU cannot be detected in a certain cycle. (Always OFF or always ON)
		Cause	LSU connector or LSU harness defect or disconnection Polygon motor rotation abnormality Laser beams are not generated. MCU PWB abnormality.
		Check and remedy	Check connection of the LSU connector. Execute SIM 61-03 to check the LSU operations. Check that the polygon motor rotates normally. Check that the laser emitting diode generates laser beams. Replace the LSU unit. Replace the MCU PWB.
F2	64	Content	Toner supply abnormality
		Detail	The maximum toner supply time is greatly exceeded.
		Cause	CRUM chip trouble Improper developing unit
		Check and remedy	Replace the CRUM chip. Replace the developing unit.
	70	Content	Improper cartridge
		Detail	The destination of the main unit differs from that of the CRUM. When the life cycle information is other than Not Used (FFh).
		Cause	CRUM chip trouble Improper developing unit
		Check and remedy	Replace the CRUM chip. Replace the developing unit.

Main code	Sub code	Details of trouble	
F2	74	Content	Toner cartridge CRUM error
		Detail	PCU
		Cause	Toner cartridge (CRUM) trouble. PCU PWB trouble. Connector/harness trouble.
		Check and remedy	Replace the toner cartridge. Replace the PCU PWB. Connector and harness check.
F5	02	Content	Copy lamp lighting abnormality
		Detail	The copy lamp does not turn on.
		Cause	Copy lamp abnormality Copy lamp harness abnormality CCD PWB harness abnormality.
		Check and remedy	Use SIM 5-3 to check the copy lamp operations. **When the copy lamp lights up.** Check the harness and the connector between the CCD unit and the MCU PWB. **When the copy lamp does not light up.** Check the harness and the connector between the copy lamp unit and the MCU PWB. Replace the copy lamp unit. Replace the MCU PWB.
H2	00	Content	Thermistor open
		Detail	The thermistor is open. The fusing unit is not installed.
		Cause	Thermistor abnormality Control PWB abnormality Fusing section connector disconnection The fusing unit is not installed.
		Check and remedy	Check the harness and the connector between the thermistor and the PWB. Use SIM 14 to clear the self diagnostic display.
H3	00	Content	Heat roller high temperature detection
		Detail	The fusing temperature exceeds 240°C.
		Cause	Thermistor abnormality Control PWB abnormality Fusing section connector disconnection.
		Check and remedy	Use SIM 5-02 to check the heater lamp blinking operation. **When the lamp blinks normally.** Check the thermistor and its harness. Check the thermistor input circuit on the control PWB. **When the lamp keeps ON.** Check the power PWB and the lamp control circuit on the MCU PWB. Use SIM 14 to clear the self diagnostic display.

Main code	Sub code	Details of trouble	
H4	00	Content	Heat roller low temperature detection
		Detail	1) When the target temperature (165°C) is not reached in 55 sec after starting warming-up. 2) When the temperature below 100°C is detected for 300ms under the ready print state. * "Starting warming-up" means not only that in power supply but also reset that in reset from shut-off and in side door close. (The timing of generating H4 is not limited to that in power supply.)
		Cause	Thermistor abnormality Heater lamp abnormality Thermostat abnormality Control PWB abnormality
		Check and remedy	Use SIM 5-02 to check the heater lamp blinking operation. **When the lamp blinks normally.** Check the thermistor and its harness. Check the thermistor input circuit on the control PWB. **When the lamp does not light up.** Check for disconnection of the heater lamp and the thermostat. Check the interlock switch. Check the power PWB and the lamp control circuit on the MCU PWB. Use SIM 14 to clear the self diagnostic display.
L1	00	Content	Feeding is not completed within the specified time after starting feeding. (The scan head locking switch is locked)
		Detail	The white area and the black marking on the shading plate are used to obtain the difference in the CCD level values for judgment of lock. When the difference in the levels of which and black is small, it is judged that the black mark could not be scanned by lock and the trouble code "L1" is displayed.
		Cause	The scan head is locked by the lock switch. Mirror unit abnormality The scanner wire is disconnected. The origin detection sensor abnormality Mirror motor harness abnormality
		Check and remedy	Check to confirm that the scan head lock switch is released. Use SIM 1-1 to check the mirror reciprocating operations. **When the mirror does not feed.** Check for disconnection of the scanner wire. Check the harness and the connector between the mirror motor and the MCU PWB. Replace the mirror unit. Replace the MCU PWB. **When the mirror does feed.** Use SIM 1-2 to check the mirror home position sensor.

Main code	Sub code	Details of trouble	
L3	00	Content	Scanner return trouble
		Detail	When the mirror base is returned for the specified time (6 sec) in mirror initializing after turning on the power, the mirror home position sensor (MHPS) does not turn ON. Or when the mirror base is returned for the specified time (about 6 sec) after start of copy return, the mirror home position sensor (MHPS) does not turn ON.
		Cause	Mirror unit abnormality Scanner wire disconnection Origin detection sensor abnormality Mirror motor harness abnormality
		Check and remedy	Use SIM 1-1 to check the mirror reciprocating operations. **When the mirror does not return.** Check for disconnection of the scanner wire. Check the harness and the connector between the mirror motor and the MCU PWB. Replace the mirror unit. Replace the MCU PWB. **When the mirror does feed.** Use SIM 1-2 to check the mirror home position sensor.
L4	01	Content	Main motor lock detection
		Detail	When the main motor encoder pulse is not detected for 100 msec.
		Cause	Main motor unit abnormality Improper connection or disconnection the main motor and the harness. MCU PWB abnormality
		Check and remedy	Use SIM 25-01 to check the main motor operations. Check connection of the main motor harness/connector. Replace the main motor. Replace the MCU PWB.
	31	Content	Exhaust fan motor lock detection trouble
		Detail	The error detection is started after 2 sec from starting rotation of the exhaust fan motor. 1) The continuous rotation state of 250ms is not detected for 1 sec after starting detection. 2) When the lock sensor (in the exhaust fan) detects the HIGH level (unstable) after detection the lock state (stable state).
		Cause	Exhaust fan motor connector connection trouble Exhaust fan motor trouble MCU PWB trouble
		Check and remedy	Exhaust fan motor connector connection check Exhaust fan motor replacement Replace the MCU PWB.

Main code	Sub code	Details of trouble	
L6	10	Content	Polygon motor lock detection
		Detail	The lock signal (specified rpm signal) does not return within a certain time (about 20 sec) from starting the polygon motor rotation.
		Cause	Polygon motor unit abnormality Improper connection or disconnection of the polygon motor and the harness. MCU PWB abnormality
		Check and remedy	Use SIM 25-10 to check the polygon motor operations. Check connection of the polygon motor harness/connector. Replace the polygon motor. Replace the MCU PWB.
U2	00	Content	EEPROM read/write error (Serial communication error)
		Detail	EEPROM access process error
		Cause	EEPROM abnormality
		Check and remedy	Check that the EEPROM is properly set. Use SIM 16 to cancel the trouble. Replace the MCU PWB.
	11	Content	Counter check sum error (EEPROM)
		Detail	Check sum error of the counter area in the EEPROM
		Cause	EEPROM abnormality
		Check and remedy	Check that the EEPROM is properly set. Use SIM 16 to cancel the trouble. Replace the MCU PWB.

[11] USER PROGRAM

The user programs allow the parameters of certain functions to be set, changed, or cancelled as desired.

1. Setting the user programs

1) Press and hold down the light ( ) key for more than 5 seconds until all the alarm indicators (, ,) blink and "--" appears in the display.
2) Use the left copy quantity ( ) key to select a user program number (For the user program numbers, see the following table.).
   The selected number will blink in the left side of the display.
3) Press the start ( ) key. The entered program number will be steadily lit and the currently selected parameter number for the program will blink on the right side of the display.
4) Select the desired parameter using the right copy quantity ( ) key.
   The entered parameter number will blink on the right of the display.

Program No.	Mode	Parameters
1	Auto clear time	1 → 10 sec., 2 → 30 sec., *3 → 60 sec., 4 → 90 sec., 5 → 120 sec., 6 → OFF
2	Preheat mode	*1 → 30 sec., 2 → 60 sec., 3 → 5 min., 4 → 30 min., 5 → 60 min., 6 → 120 min., 7 → 240 min.
3	Auto power shut- off mode	*1 → ON, 2 → OFF
4	Auto power shut- off timer	*1 → 5 min., 2 → 30 min., 3 → 60 min., 4 → 120 min., 5 → 240 min.
6	SPF automatic original discharge time (AL-2031/2041)	1 → 5 min., *2 → 30 min., 3 → 60 min., 4 → 120 min., 5 → 240 min., 6 → OFF
10	Resolution of AUTO & MANUAL mode	*1 → 300dpi, 2 → 600dpi
13	Memory for printer	1 → 30%, 2 → 40%, *3 → 50%, 4 → 60%, 5 → 70%
21	Reset factory	1 → YES, *2 → NO
22	Sort auto select (AL-2031/2041)	*1 → ON, 2 → OFF
24	Prevention of OC copies when the original cover/ SPF is up function	*1 → ON, 2 → OFF
25	Copy effective paper width setting function (Bypass tray)	*1 → Large (LETTER/A4 width), 2 → Small (INVOICE/B5R width)
26	Copy effective paper width setting function (Paper tray)	*1 → Large (LETTER/A4 width), 2 → Small (INVOICE/B5R width)
28	Selection of copy start state (Polygon rotation on/off)	*1 → ON, 2 → OFF
29	Fusing temperature setting when the bypass tray is used	1 → Low, *2 → High
32	USB 2.0 mode switching	1 → Full-Speed, *2 → Hi-Speed

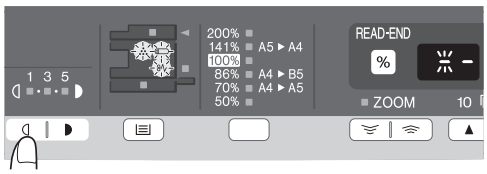
* Factory default settings are indicated with an asterisk (*).

5) Press the start ( ) key. The right-hand number in the display will be steadily lit and the entered value will be stored.
   Note: To change the setting or to set another mode, press the clear key. The unit will return to step 2.
6) Press the light ( ) key to return to the normal copy mode.

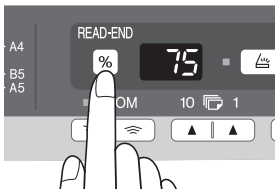
[12] CHECKING THE TONER LEVEL

The toner level is indicated by a 6-level display. Use it as a guideline for replacing the toner cartridge.

1) Hold down the light (⊡) key until the alarm indicators (⊂⊃, ⚠, ∴) blink.
   The display will show "- -".



2) Hold down the Copy ratio display (%) key for more than 5 seconds.
   The approximate quantity of toner remaining will be indicated in the display as a percentage. ("100", "75", "50", "25", "10" is displayed.)
   When the percentage is less than 10%, "LO" will be displayed.

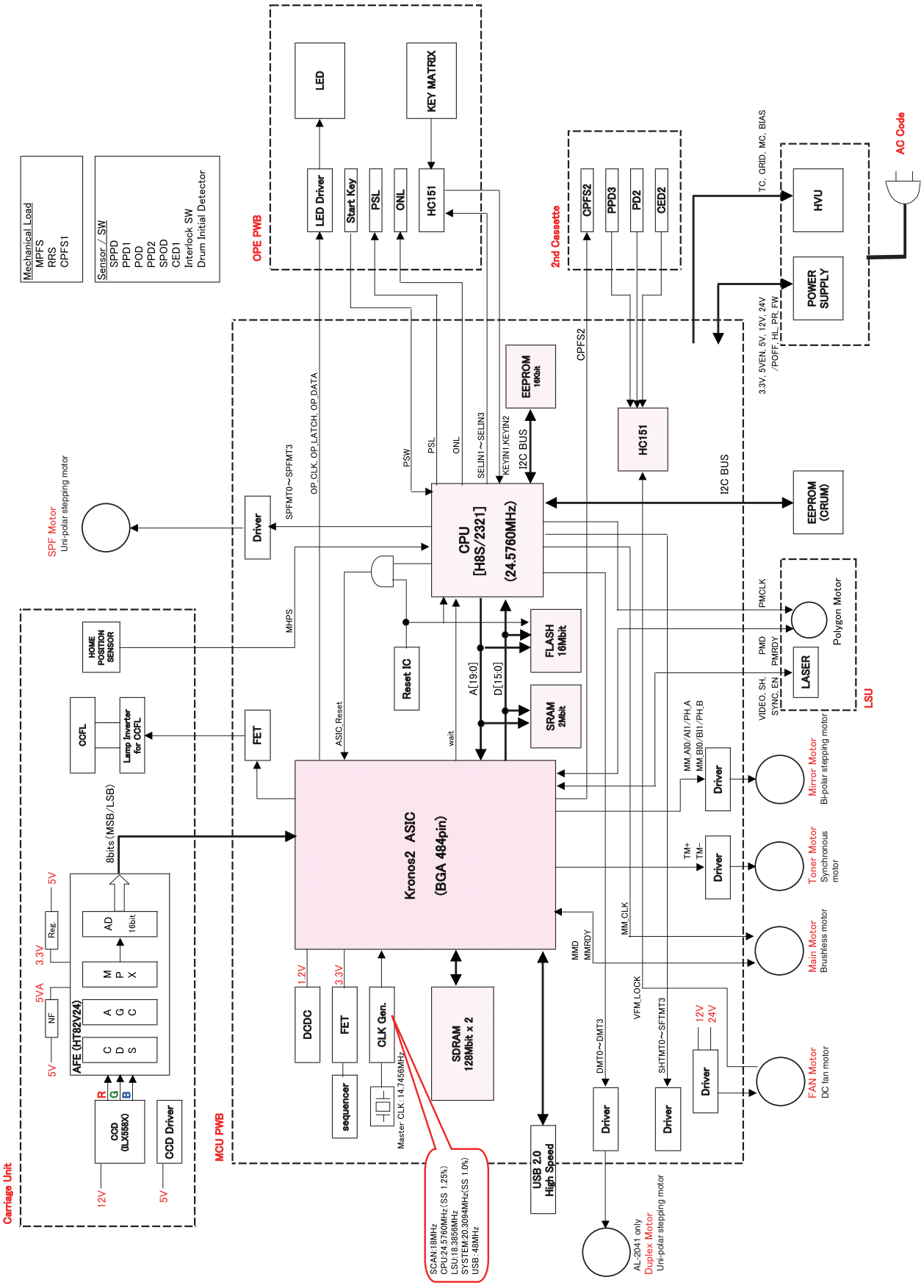


3) Press the light (⊡) key to return to the normal display.
   The alarm indicators (⊂⊃, ⚠, ∴) go off.
   The display returns to the number of copies display.

[13] ELECTRICAL SECTION

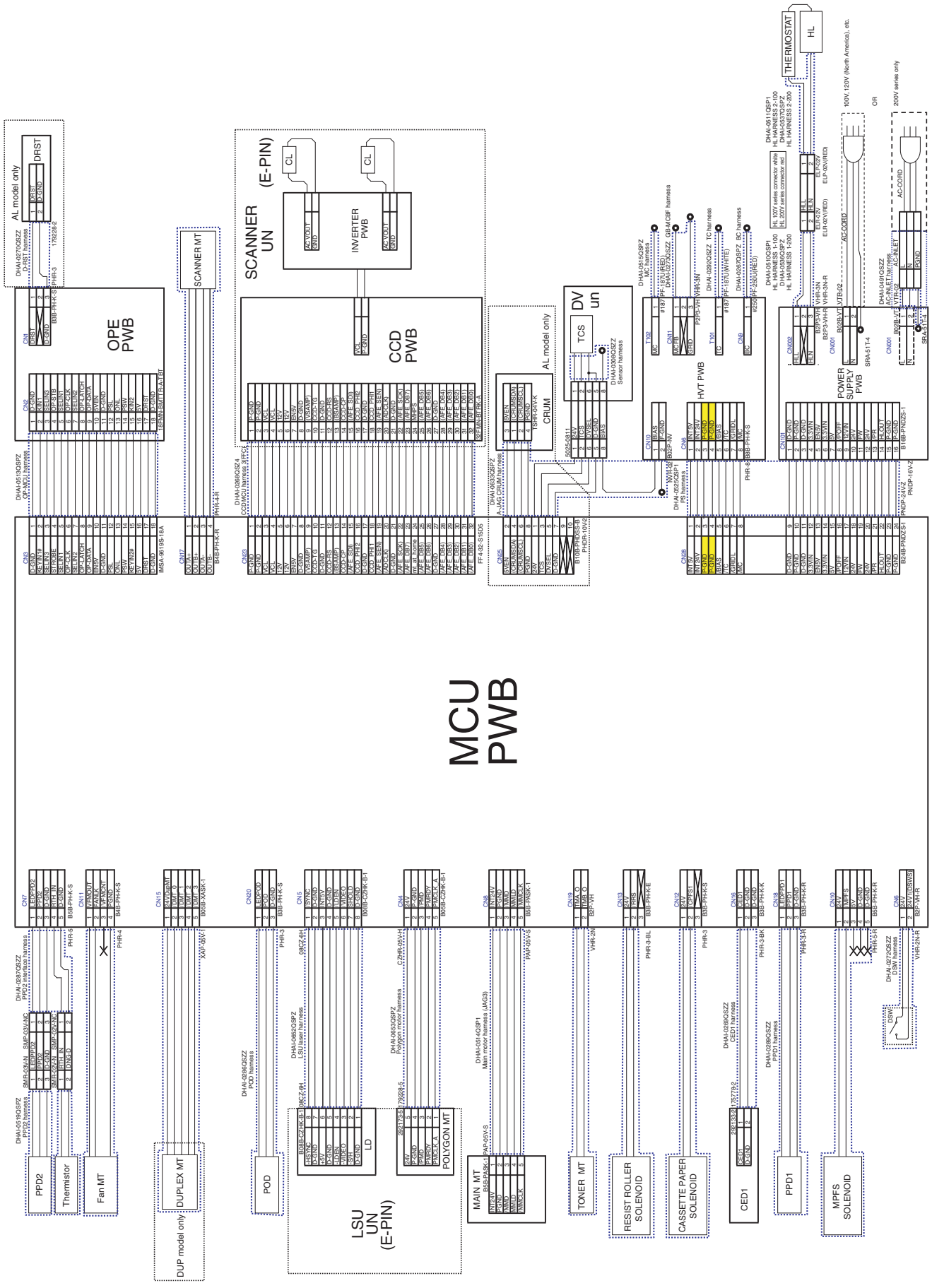
1. Block diagram

A. Overall block diagram

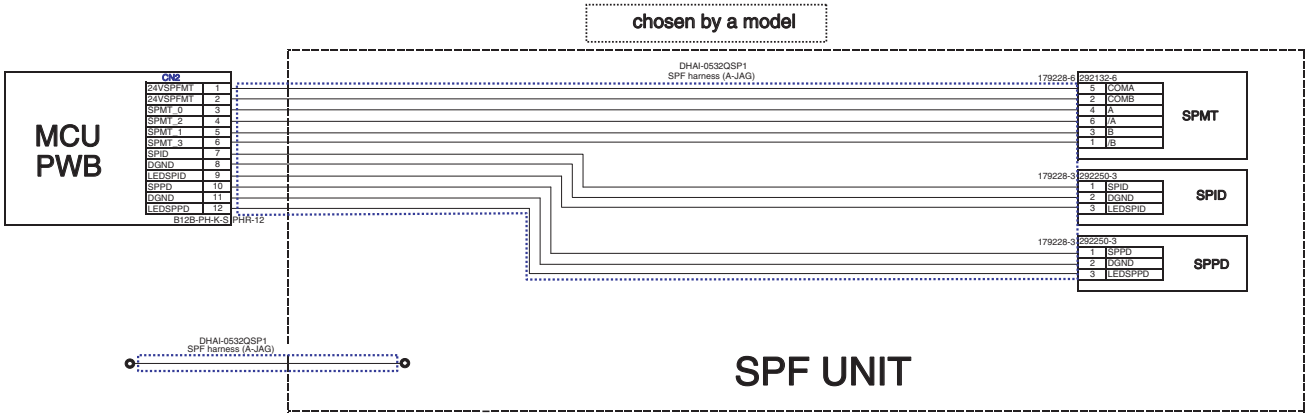


2. Actual wiring diagram

A. MCU PWB



B. SPF unit


chosen by a model
MCU PWB
CN2
24VSPFMT 1
24VSPFMT 2
SPMT_0 3
SPMT_2 4
SPMT_1 5
SPMT_3 6
SPID 7
DGND 8
LEDSPID 9
SPPD 10
DGND 11
LEDSPPD 12
B12B-PH-K-S
PHR-12
DHAI-0532QSP1
SPF harness (A-JAG)
179228-6
292132-6
5 COMA
2 COMB
4 A
6 /A
3 B
1 /B
SPMT
179228-3
292250-3
1 SPID
2 DGND
3 LEDSPID
SPID
179228-3
292250-3
1 SPPD
2 DGND
3 LEDSPPD
SPPD
DHAI-0532QSP1
SPF harness (A-JAG)
SPF UNIT

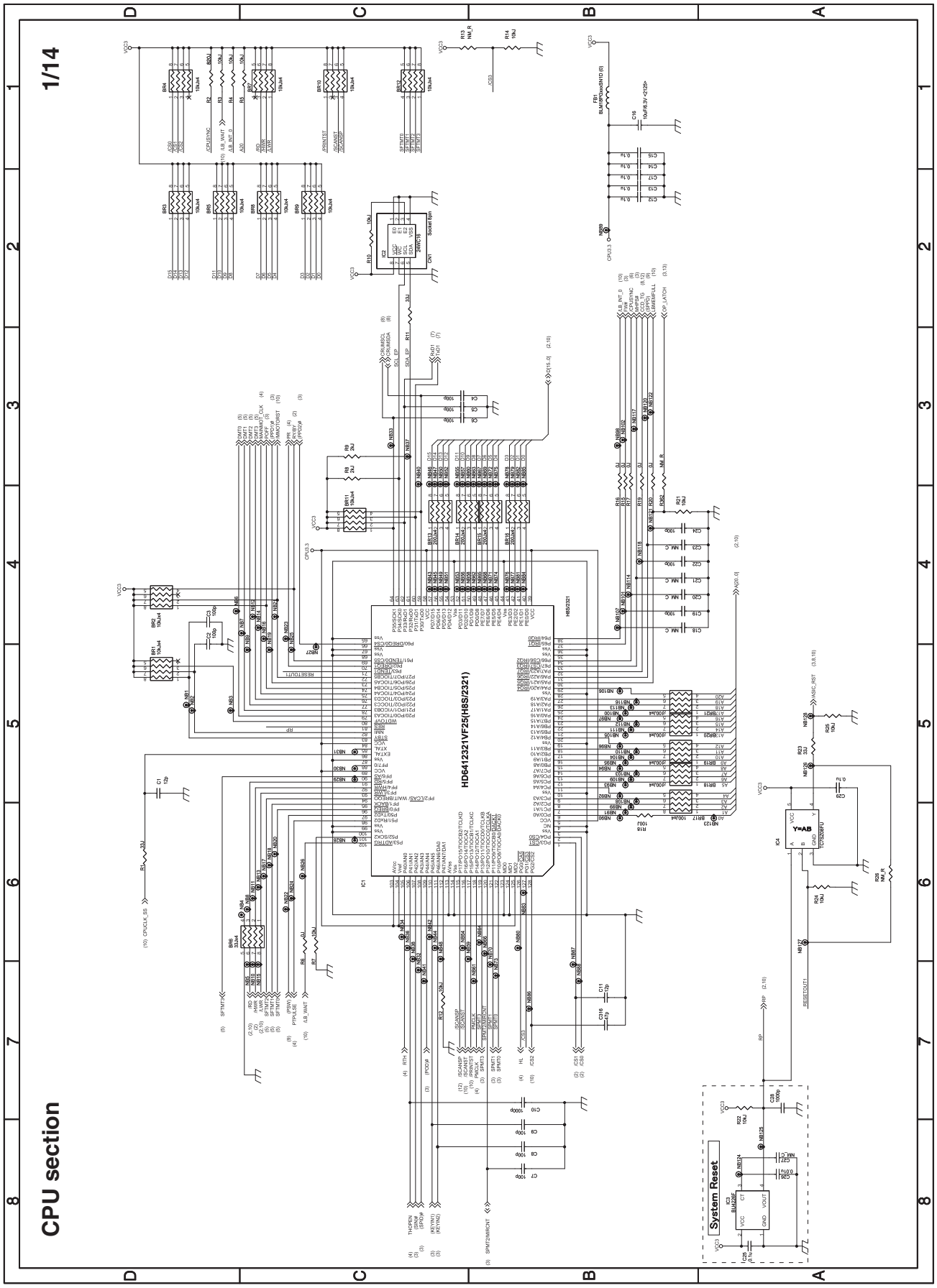
3. Signal name list

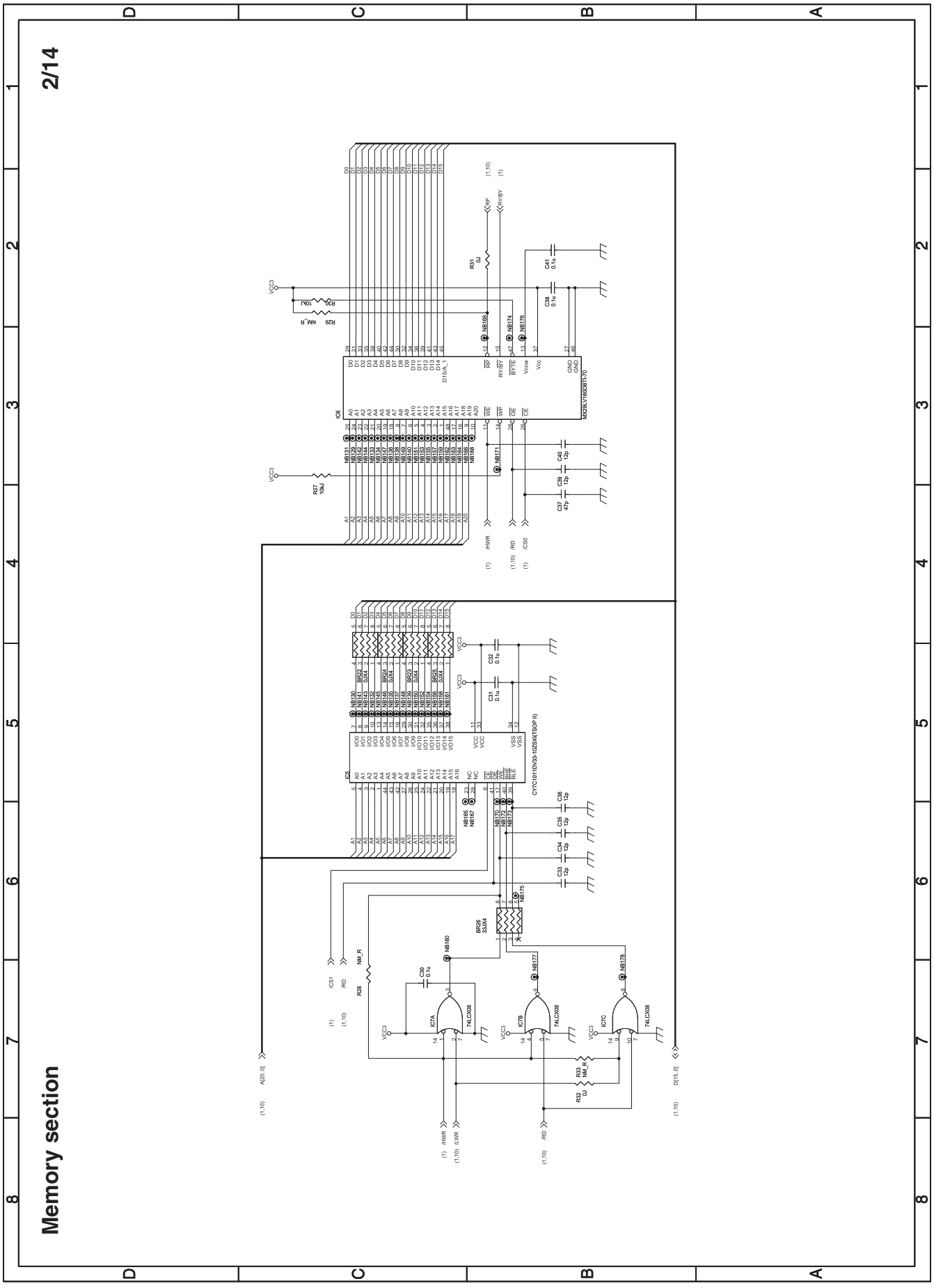
Signal name	Name	Function/Operation	Section
(ADCLK)	AFE	AFE control signal	Scanner unit section
(AFE_DB0)	AFE	Image scan data	Scanner unit section
(AFE_DB1)	AFE	Image scan data	Scanner unit section
(AFE_DB2)	AFE	Image scan data	Scanner unit section
(AFE_DB3)	AFE	Image scan data	Scanner unit section
(AFE_DB4)	AFE	Image scan data	Scanner unit section
(AFE_DB5)	AFE	Image scan data	Scanner unit section
(AFE_DB6)	AFE	Image scan data	Scanner unit section
(AFE_DB7)	AFE	Image scan data	Scanner unit section
(AFE_SCK)	AFE	AFE control signal	Scanner unit section
(AFE_SDI)	AFE	AFE serial data	Scanner unit section
(AFE_SEN)	AFE	AFE control signal	Scanner unit section
/BIAS	HV bias signal	HV bias drive	Process section
(BSAMP)	AFE	AFE control signal	Scanner unit section
CCD_PHI1	CCD	CCD control signal	Scanner unit section
CCD_PHI2	CCD	CCD control signal	Scanner unit section
CCD-CP	CCD	CCD control signal	Scanner unit section
CCD-RS	CCD	CCD control signal	Scanner unit section
CCD-TG	CCD	CCD control signal	Scanner unit section
CED1	Machine cassette detection		Paper transport section
/CPFS1	1st CS pickup solenoid		Paper transport section
/DMT_0	DUP motor	DUP motor phase control	Duplex drive section
/DMT_1	DUP motor	DUP motor phase control	Duplex drive section
/DMT_2	DUP motor	DUP motor phase control	Duplex drive section
/DMT_3	DUP motor	DUP motor phase control	Duplex drive section
DRST	Drum reset detection	CRU initial detection	Operation section
DVSEL	Developing tank detection		Developing section
FANLK	Fusing fan	Fan lock detection signal	Optical section
FW	Low voltage power	Zero cross detection	Power section
/GRIDL	HV grid signal	Main charger grid control	Process section
HLOUT	Heater lamp	Heater lamp control	Power section
KEYIN1#	Key scan input	Key detection control	Operation section
KEYIN2#	Key scan input	Key detection control	Operation section
/LDEN	Laser	Laser circuit control signal	LSU
LEDPOD	POD sensor power		Paper exit section
LEDPPD1	PPD sensor power		Paper transport section
LEDPPD2	PPD2 sensor power		Fusing section
LEDSPID	SPID sensor power		SPF section
LEDSPPD	SPPD sensor power		SPF section
/MC	HV MC signal	Main charger control	Process section
MHPS	MHPS sensor	Carriage HP detection	Optical section
/MMCLK	Main motor	Clock signal to the polygon motor	Main drive section
/MMD	Main motor	Polygon motor drive signal	Main drive section
MMLD	Main motor	Polygon motor ON/OFF detection signal	Main drive section
/MPFS	Multi bypass solenoid		Optical section
ONL	Online LED		Operation section
OP-CLK	LED driver control		Operation section
OP-DATA	LED driver control		Operation section
OP-LATCH	LED driver control		Operation section
OUTA-	Scanner motor	Scanner motor phase control	Optical drive section
OUTA+	Scanner motor	Scanner motor phase control	Optical drive section
OUTB-	Scanner motor	Scanner motor phase control	Optical drive section
OUTB+	Scanner motor	Scanner motor phase control	Optical drive section
PD1	PD SW sensor	1st CS paper width sensor	Not used
PMCLK_A	Polygon motor	Clock signal to the polygon motor	LSU
/PMD	Polygon motor	Polygon motor drive signal	LSU
PMRDY	Polygon motor	Polygon motor ON/OFF detection signal	LSU
POD	POD sensor	Paper transport detection	Paper exit section
/POFF	Low voltage power	Output power control	Power section
PPD1	PPD sensor	Paper transport detection	Paper transport section
PPD2	PPD2 sensor	Paper transport detection	Fusing section
/PR	Heater lamp	Power relay control	Power section
PSL	Power save LED		Operation section

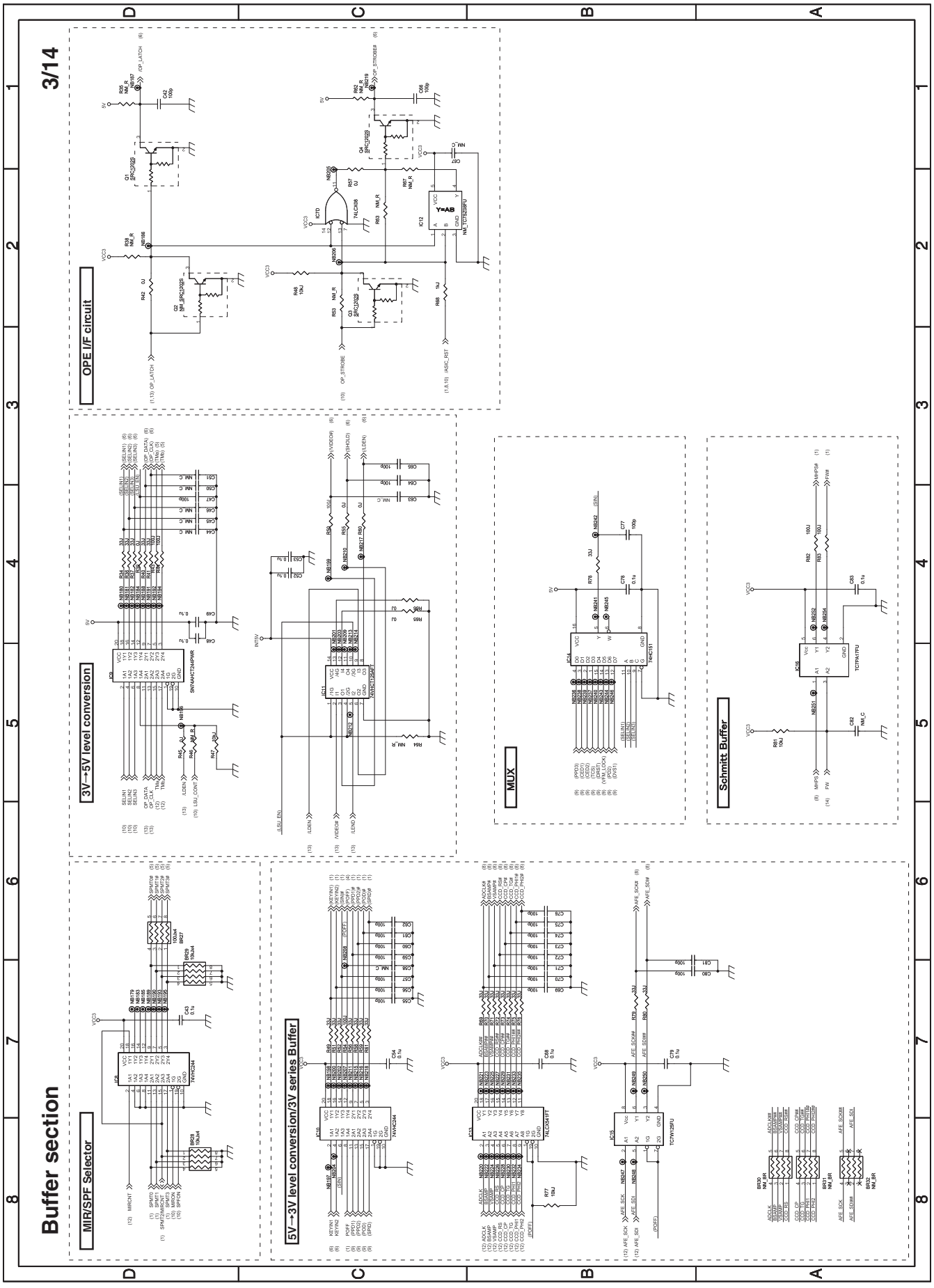
Signal name	Name	Function/Operation	Section
PSW	Start button control		Operation section
/RRS	1st transport solenoid		Paper transport section
RTH_IN	Thermistor	Fusing section thermistor temperature detection	Fusing section
SELIN1	Select signal 1	HC151 select signal	Operation section
SELIN2	Select signal 2	HC151 select signal	Operation section
SELIN3	Select signal 3	HC151 select signal	Operation section
SHOLD	Laser	Laser APC signal	LSU
SPID	SPID sensor	SPF UN paper entry sensor	SPF section
SPMT_0	SPF motor	SPF motor phase control	SPF section
SPMT_1	SPF motor	SPF motor phase control	SPF section
SPMT_2	SPF motor	SPF motor phase control	SPF section
SPMT_3	SPF motor	SPF motor phase control	SPF section
SPPD	SPPD sensor	SPF transport detection	SPF section
STROBE	LED driver control		Operation section
/SYNC	Laser	Horizontal sync signal from the LSU	LSU
/TC	HV TC signal	Transfer charger grid control	Process section
TCS	Toner sensor	Toner quantity detection	Developing section
TMA_O	Toner motor	Toner motor phase control	Toner motor drive section
TMB_O	Toner motor	Toner motor phase control	Toner motor drive section
USB +D	USB signal		USB section
USB -D	USB signal		USB section
VCL	Copy lamp	Copy lamp control	Scanner unit section
/VFMCNT	Fan speed signal	Fan rotation speed control	Optical section
VFMOUT	Fusing fan	Fan drive signal	Optical section
/VIDEO	Laser	Laser drive signal	LSU
(VSAMP)	AFE	AFE control signal	Scanner unit section

[14] CIRCUIT DIAGRAM

1. MCU PWB

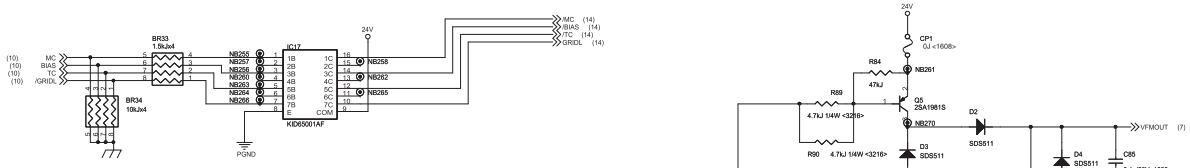



2/14
Memory section
IC6
MX29LV160DBTI-70
IC5
CY7C1011DV33-10ZSXI(TSOP II)
IC7A
IC7B
IC7C
74LCX08
R27 10u
R29 10kJ
R29_NM_R
R31 0J
R28 NM_R
R33 NM_R
R32 0J
BR26 33JX4
C30 0.1u
C31 0.1u
C32 0.1u
C33 12p
C34 12p
C35 12p
C36 12p
C37 47p
C38 0.1u
C39 12p
C40 12p
C41 0.1u
VCC3
/CS1
/RD
/HWR
/LWR
/CS0
A[20..0]
D[15..0]

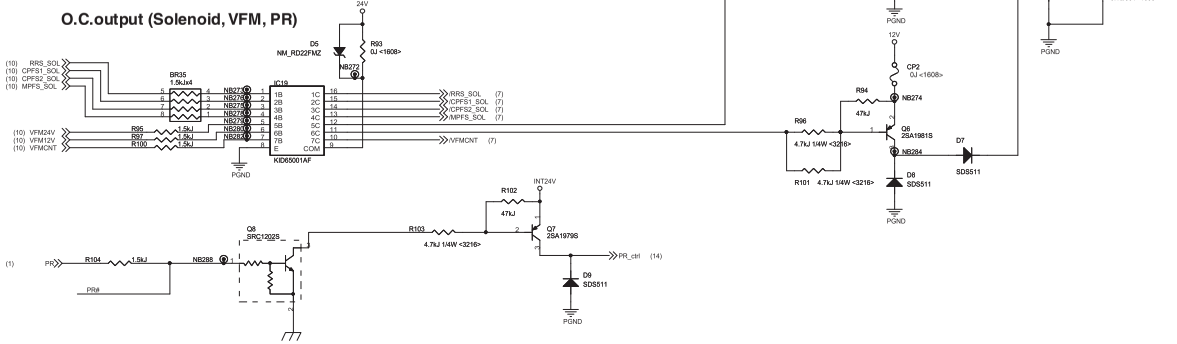

3/14
Buffer section
MIR/SPF Selector
5V→3V level conversion/3V series Buffer
3V→5V level conversion
OPE I/F circuit
MUX
Schmitt Buffer

Driver section 1

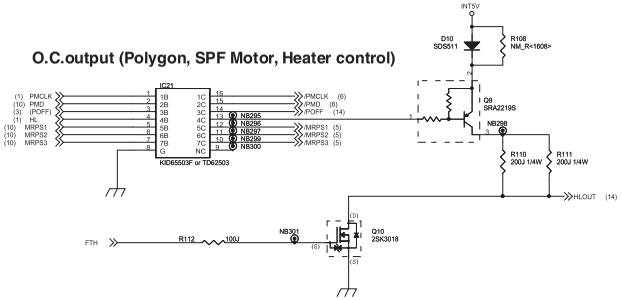
O.C.output (HV control)



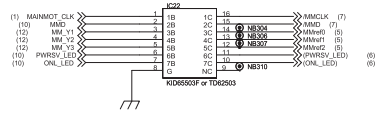
O.C.output (Solenoid, VFM, PR)



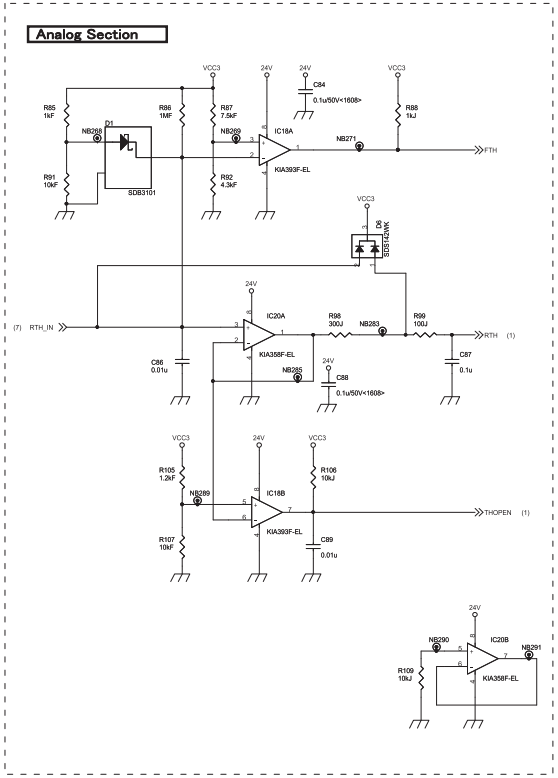
O.C.output (Polygon, SPF Motor, Heater control)



3.3V/5V series O.C.output (Main, Mirror)

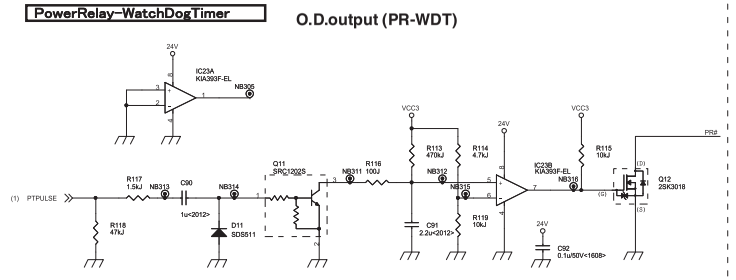


Analog Section



PowerRelay–WatchDogTimer

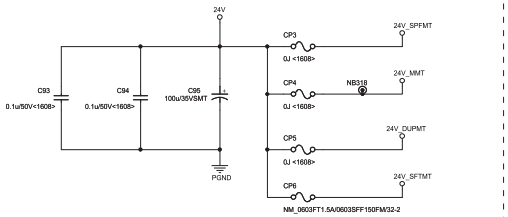
O.D.output (PR-WDT)



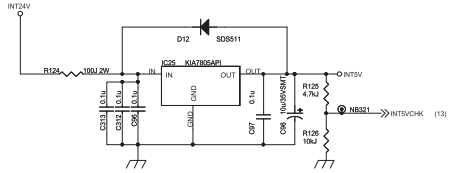
Driver section 2

5/14

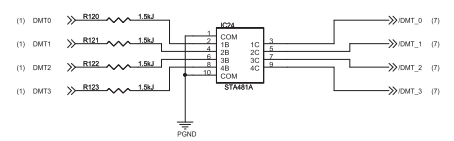
Motor Power Source



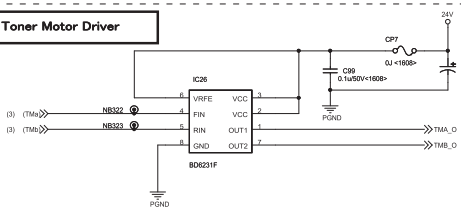
InterLock 5V



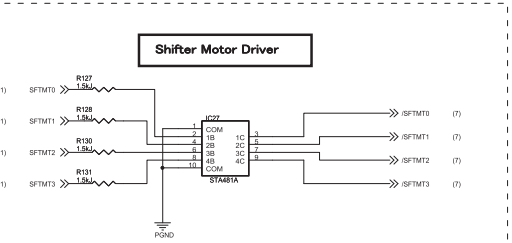
Duplex Motor Driver



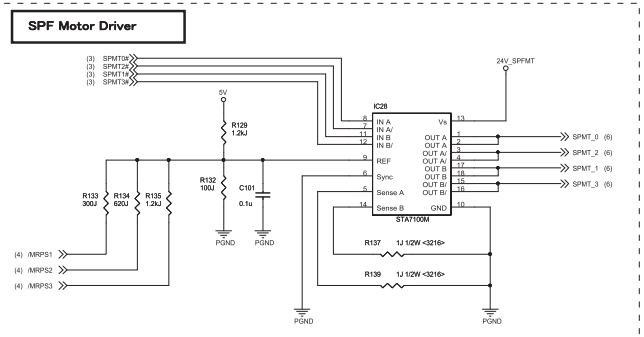
Toner Motor Driver



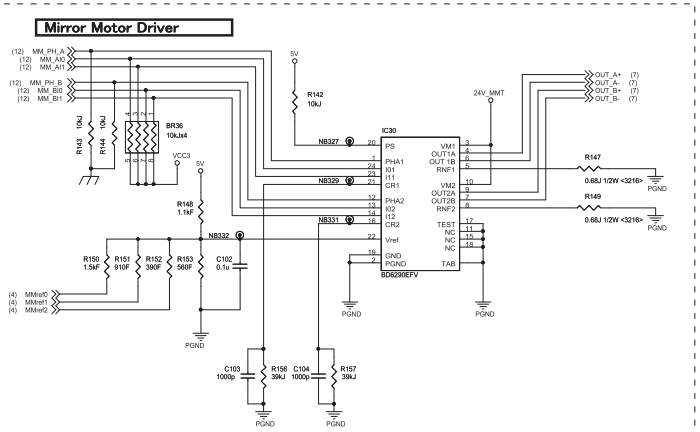
Shifter Motor Driver



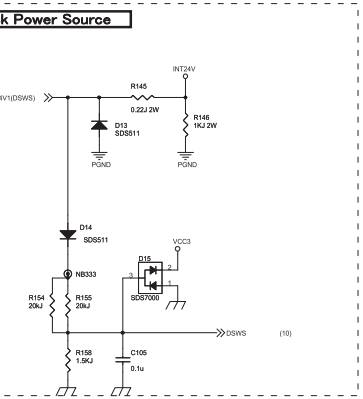
SPF Motor Driver

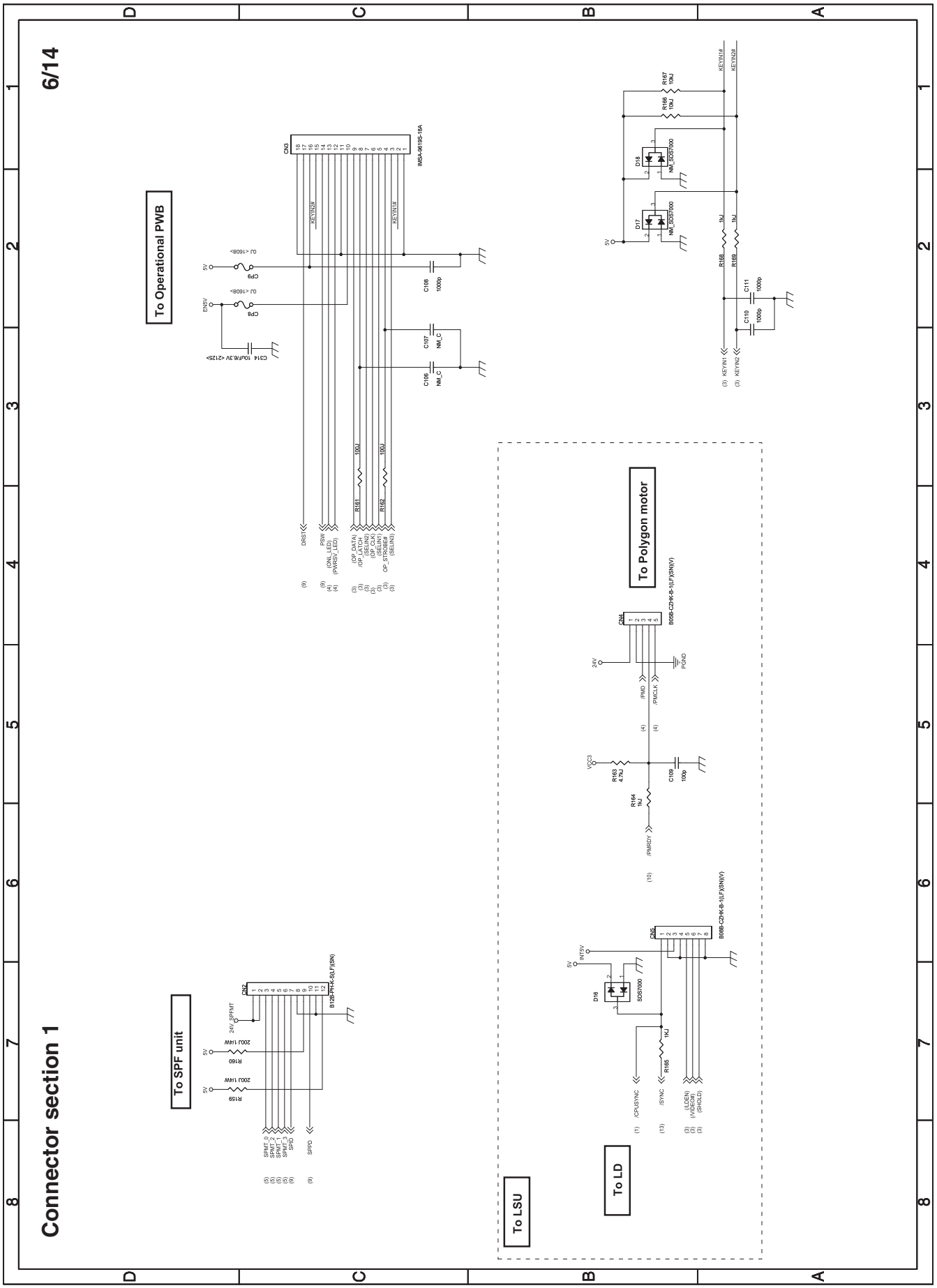


Mirror Motor Driver

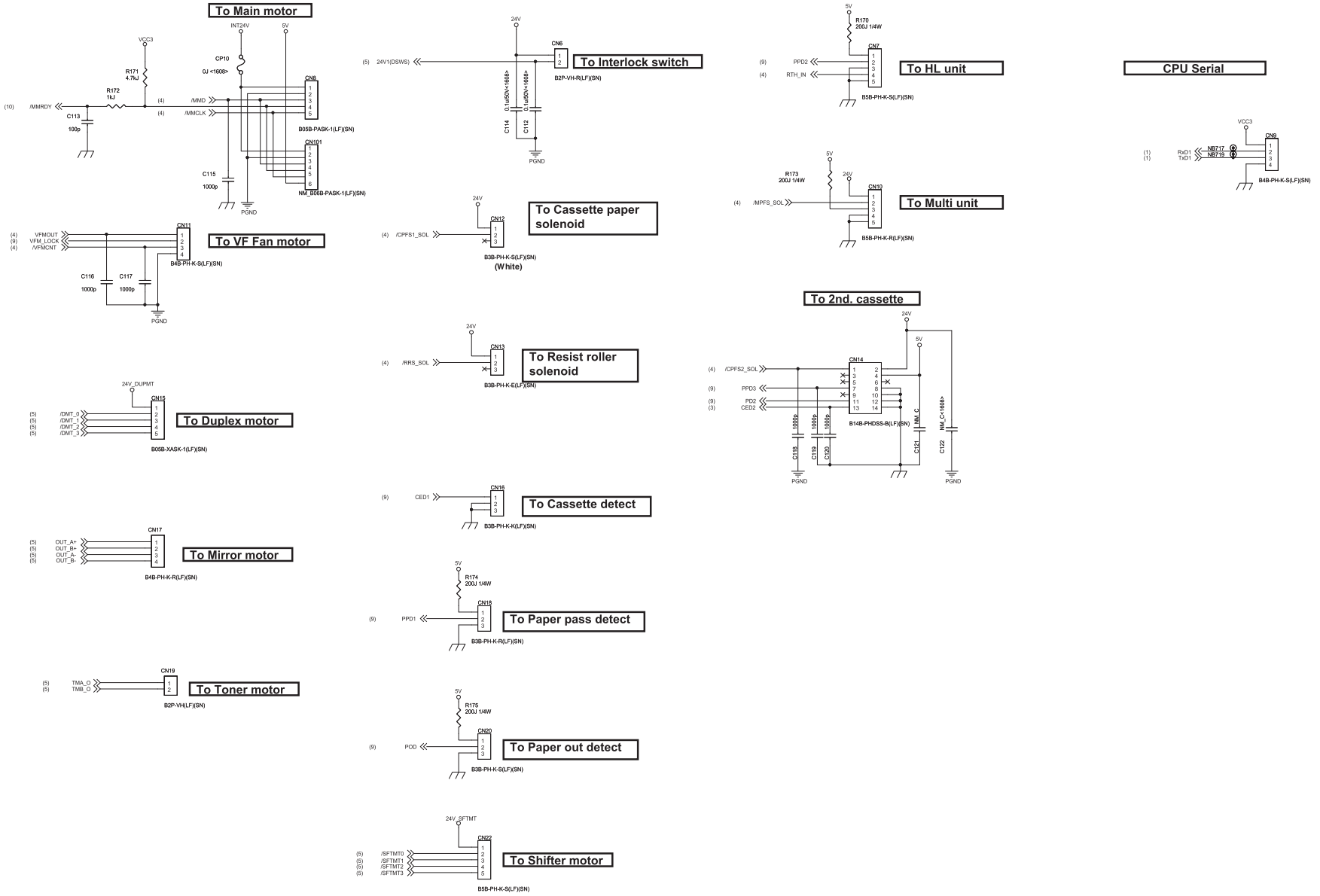


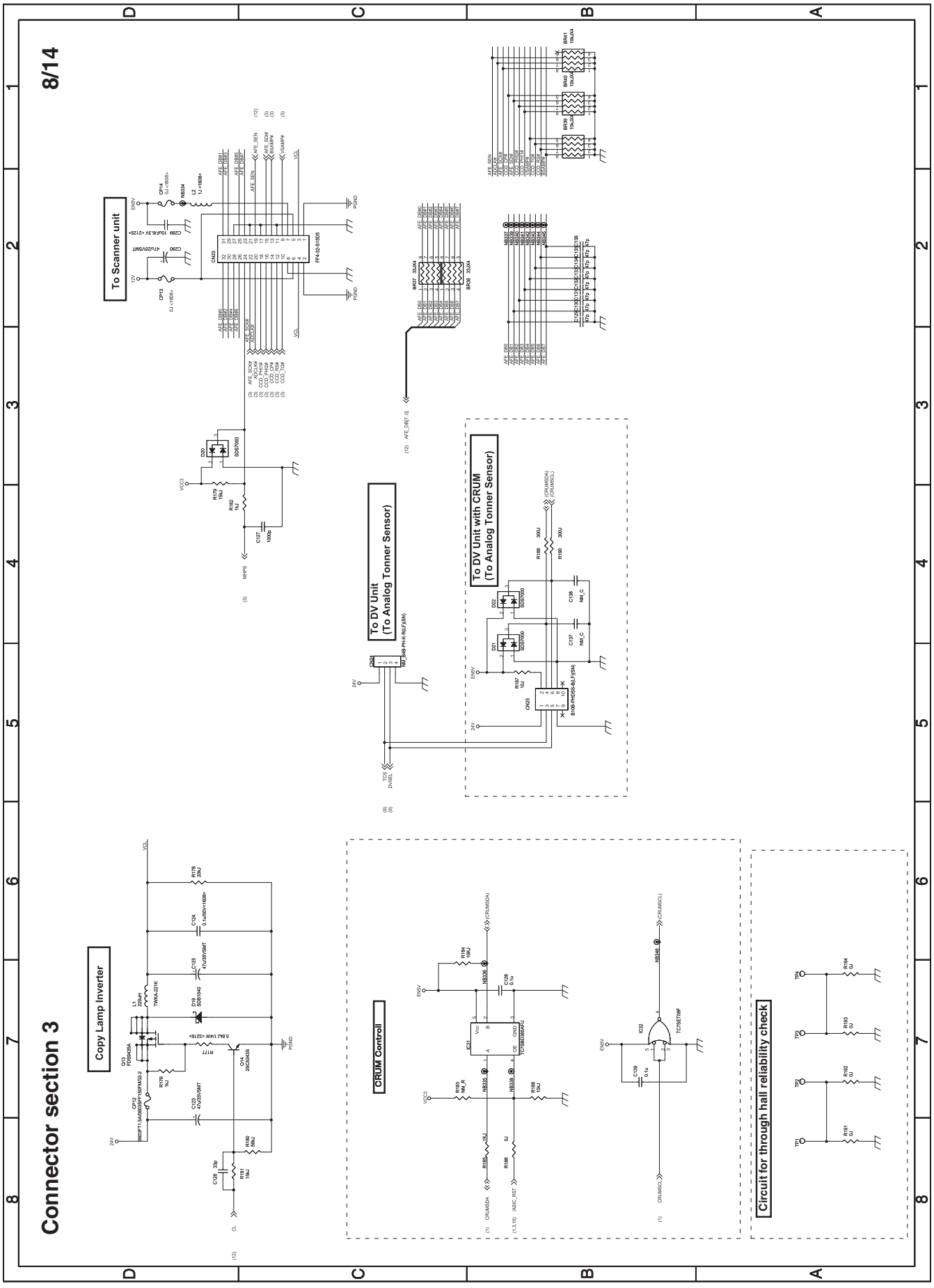
InterLock Power Source

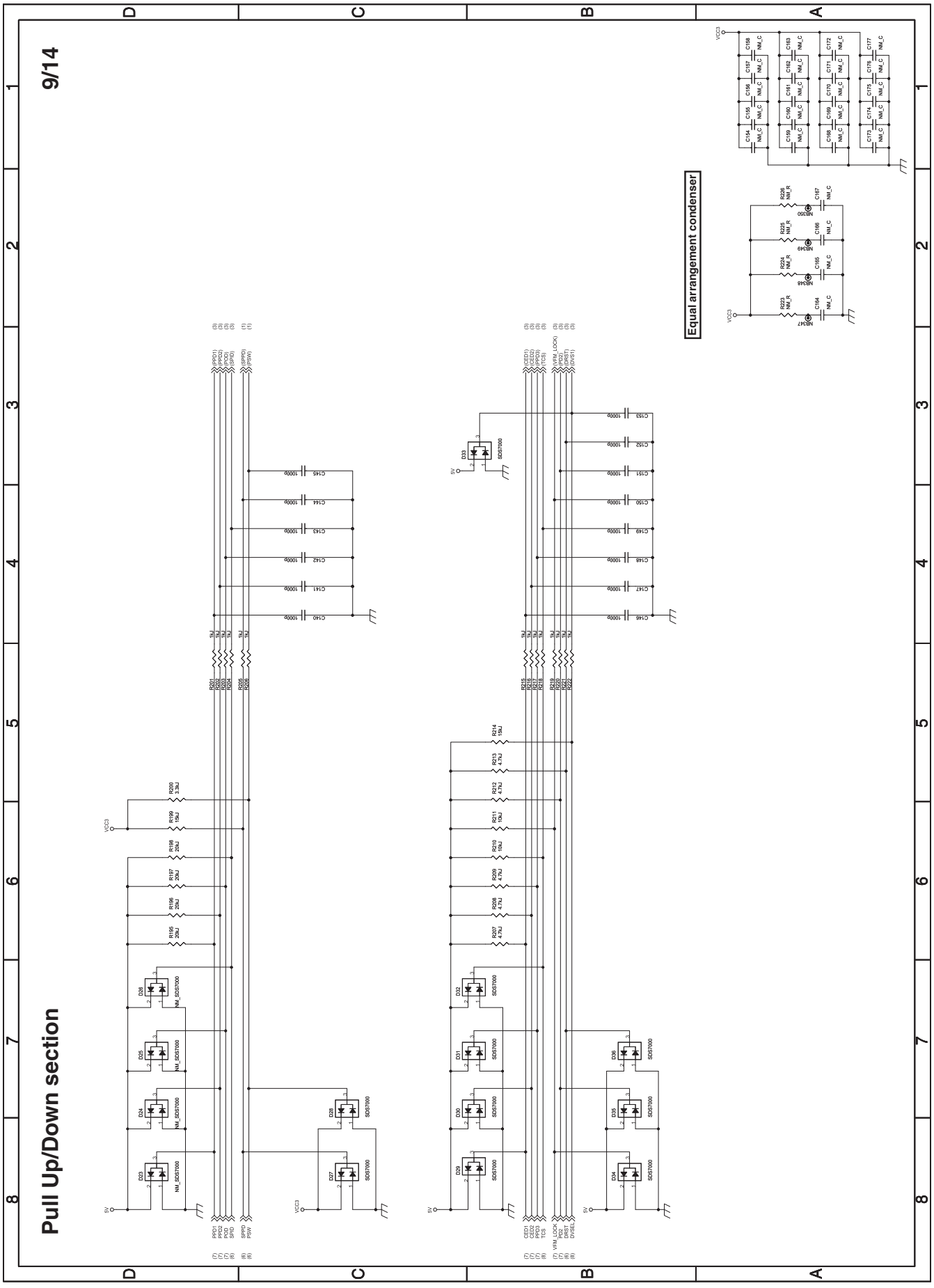


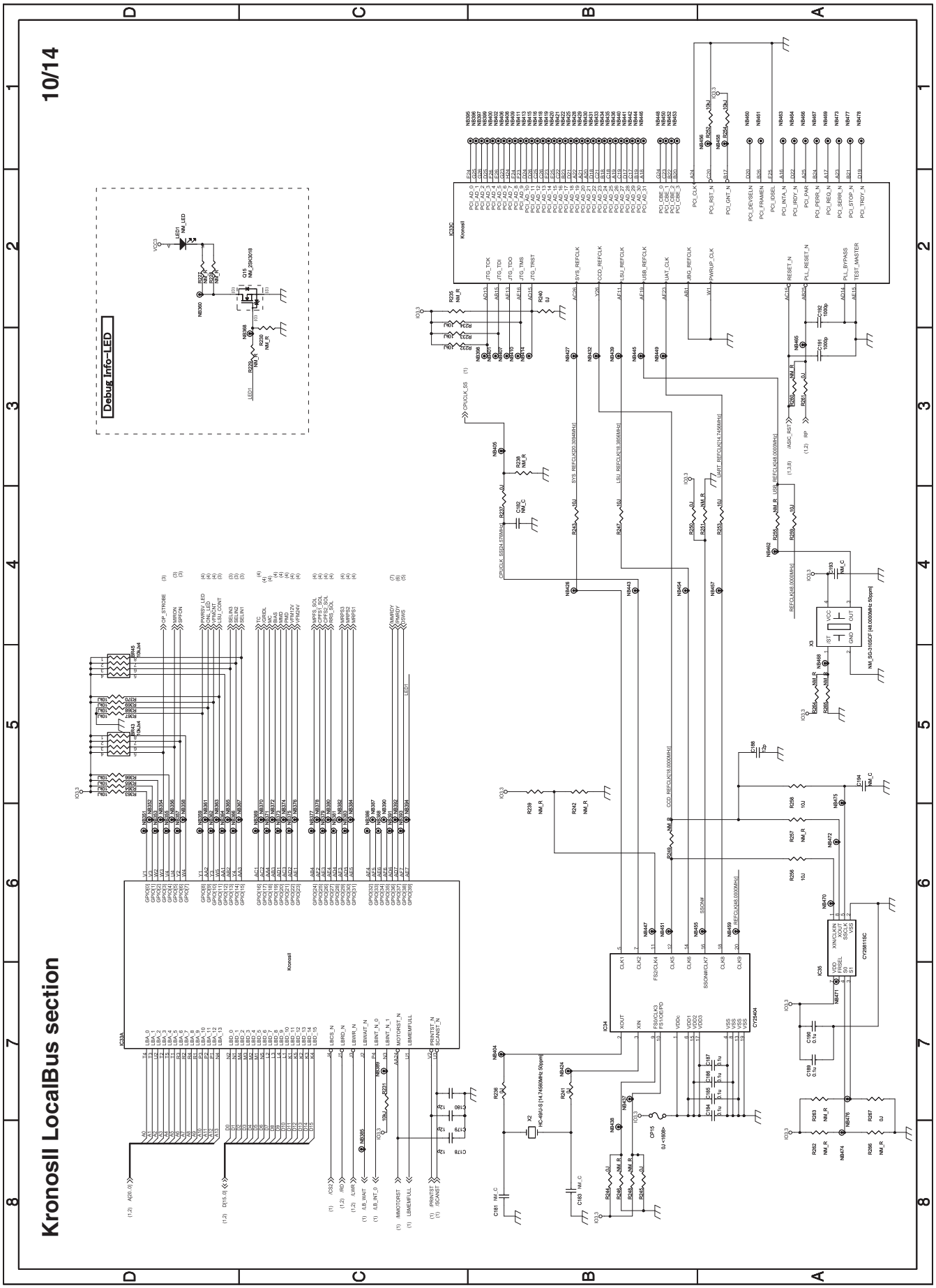

Connector section 1
6/14
To SPF unit
To LSU
To LD
To Polygon motor
To Operational PWB

Connector section 2



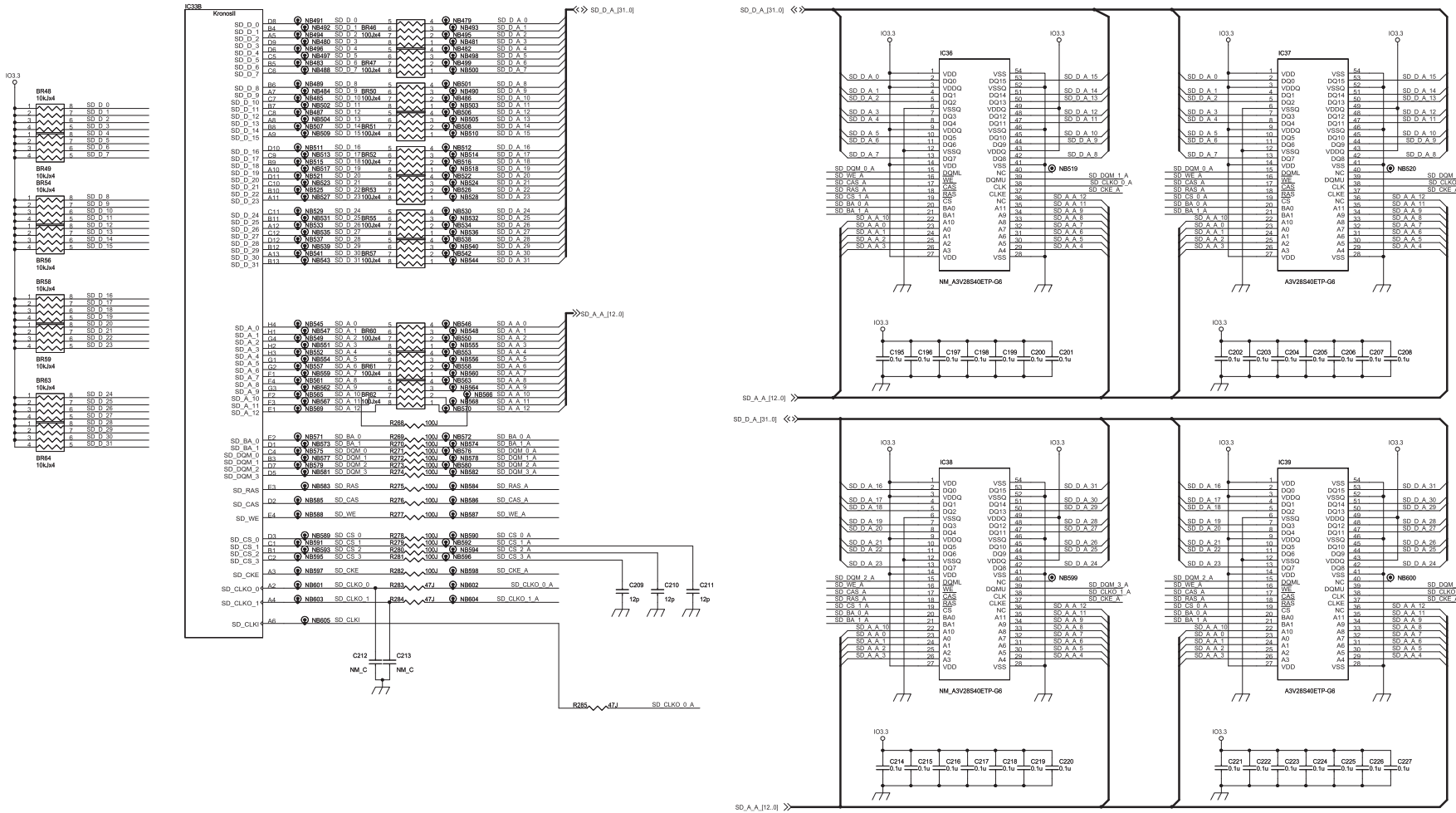

8/14
Connector section 3
To Scanner unit
To DV Unit
(To Analog Tonner Sensor)
To DV Unit with CRUM
(To Analog Tonner Sensor)
Copy Lamp Inverter
CRUM Controll
Circuit for through hall reliability check


9/14
Pull Up/Down section
Equal arrangement condenser

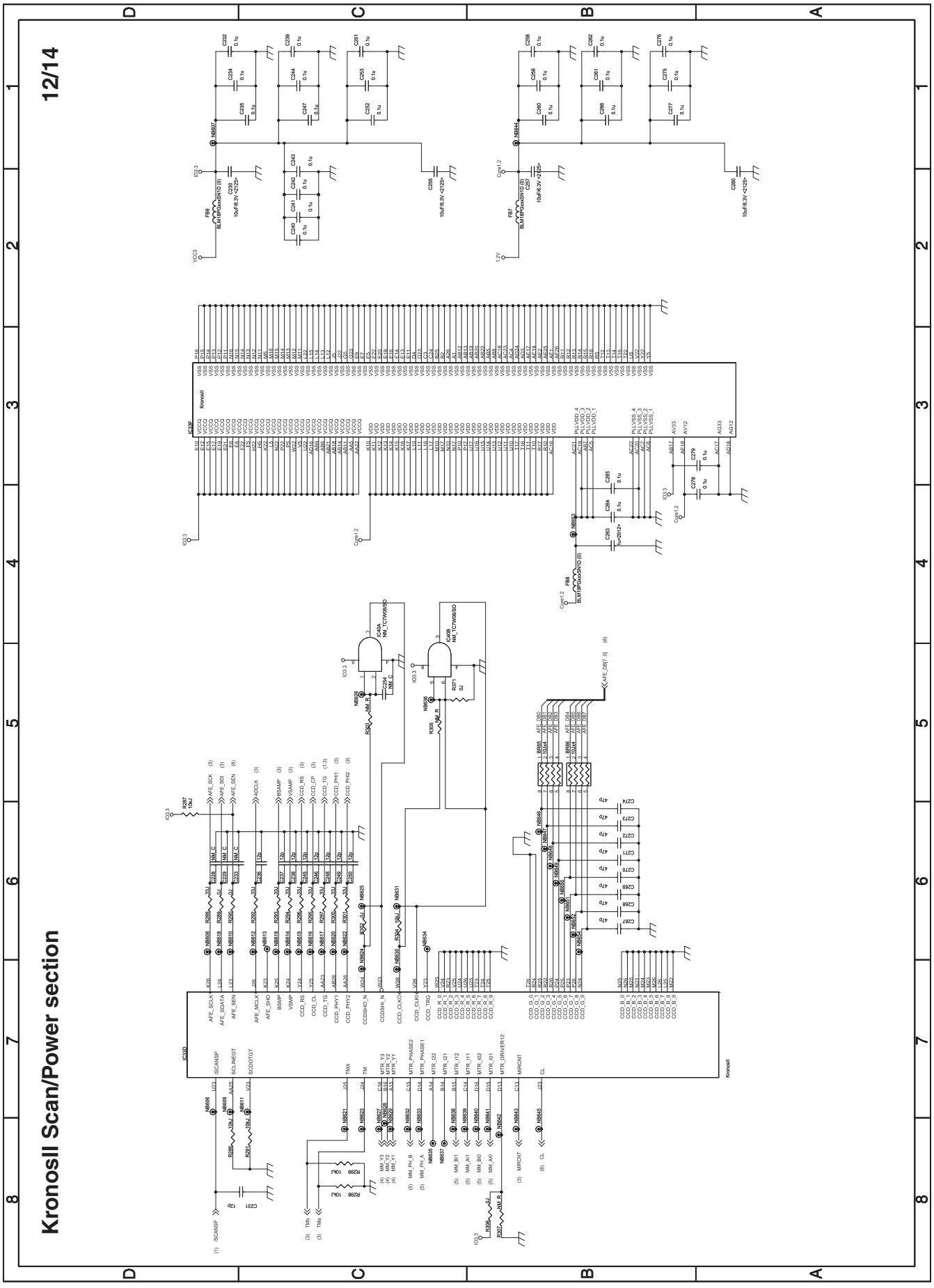

KronosII LocalBus section
10/14
Debug Info-LED

KronosII SDRAM section

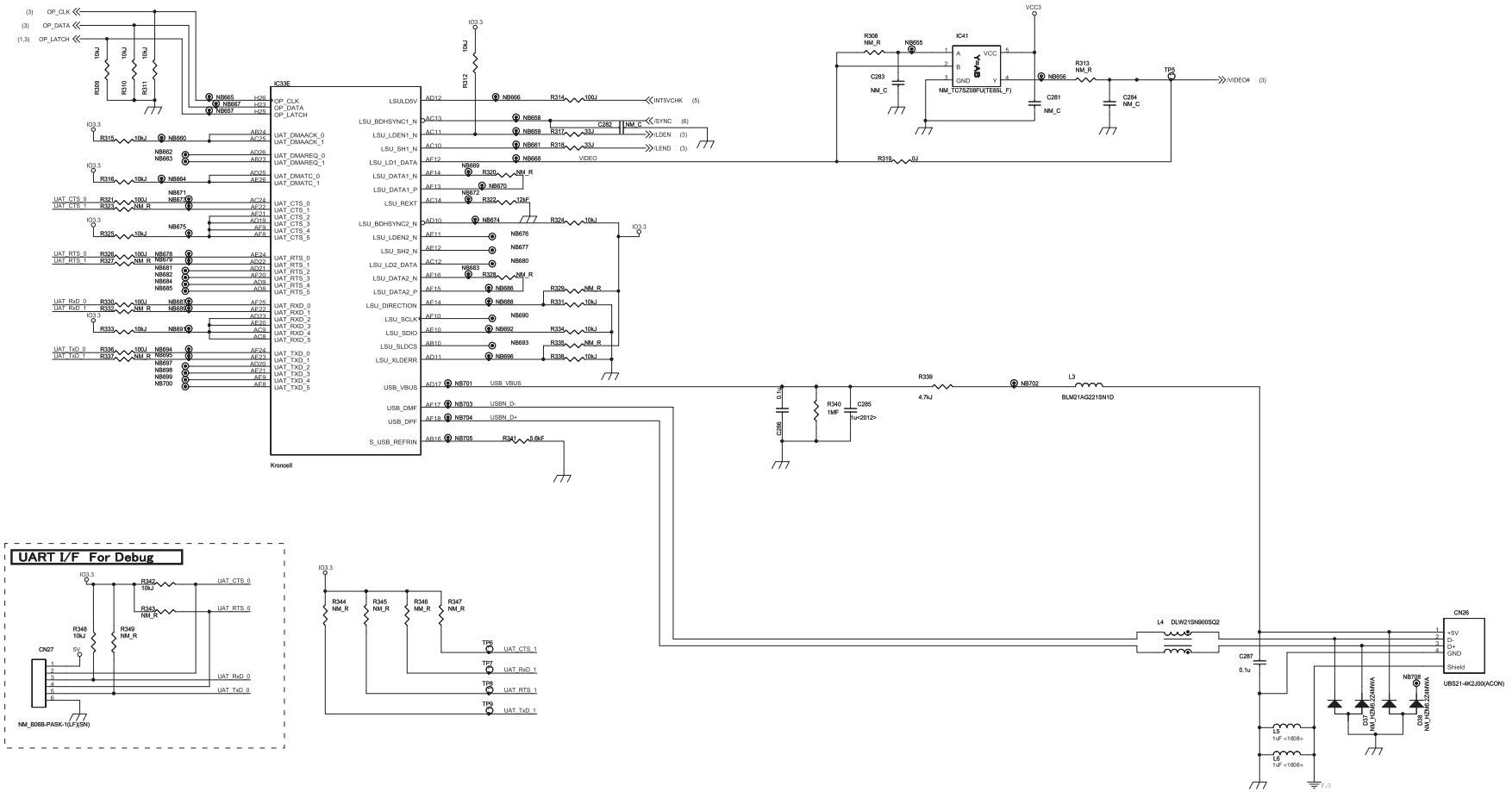
11/14

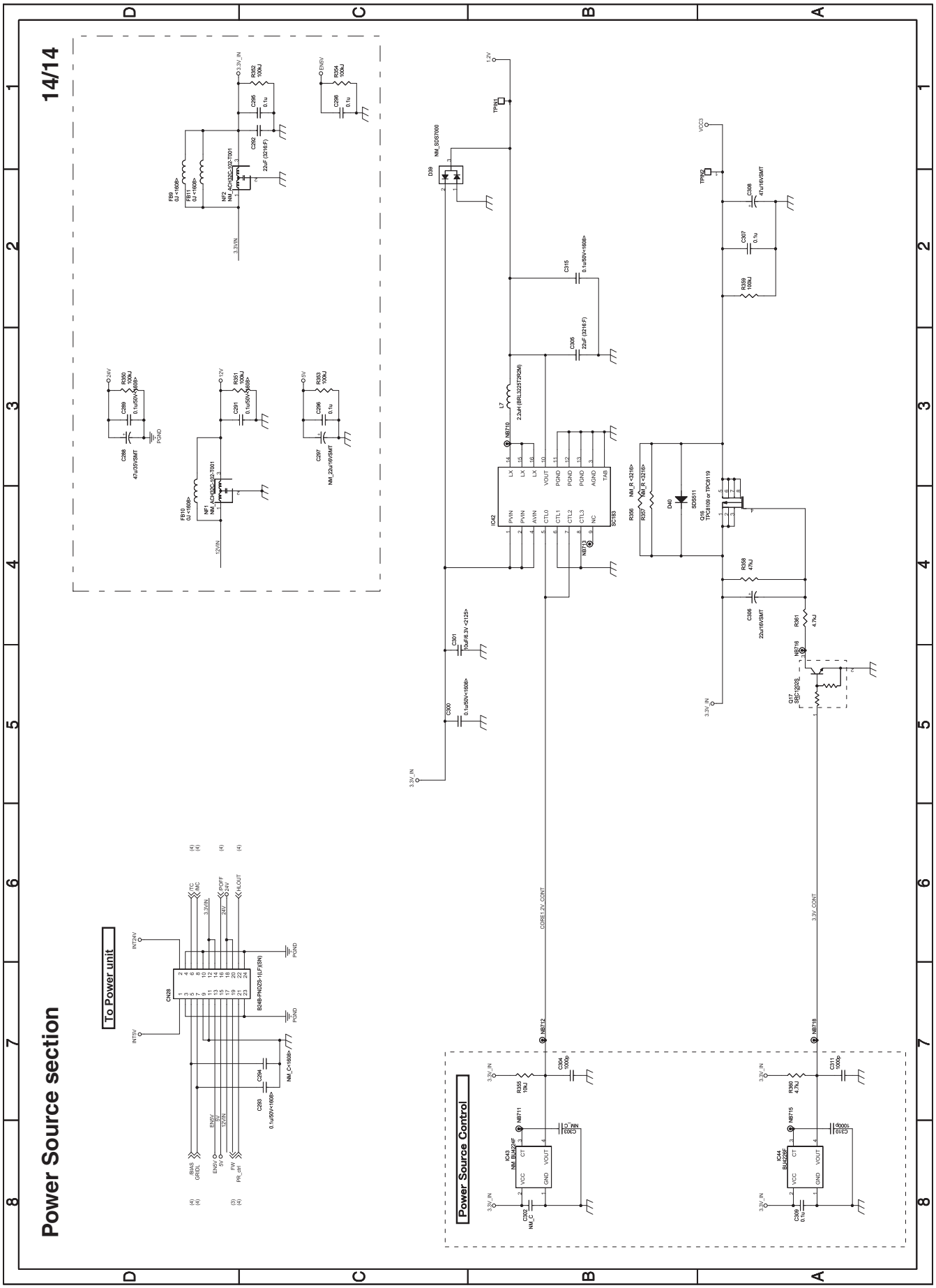


AL-2041 CIRCUIT DIAGRAM 14 - 11

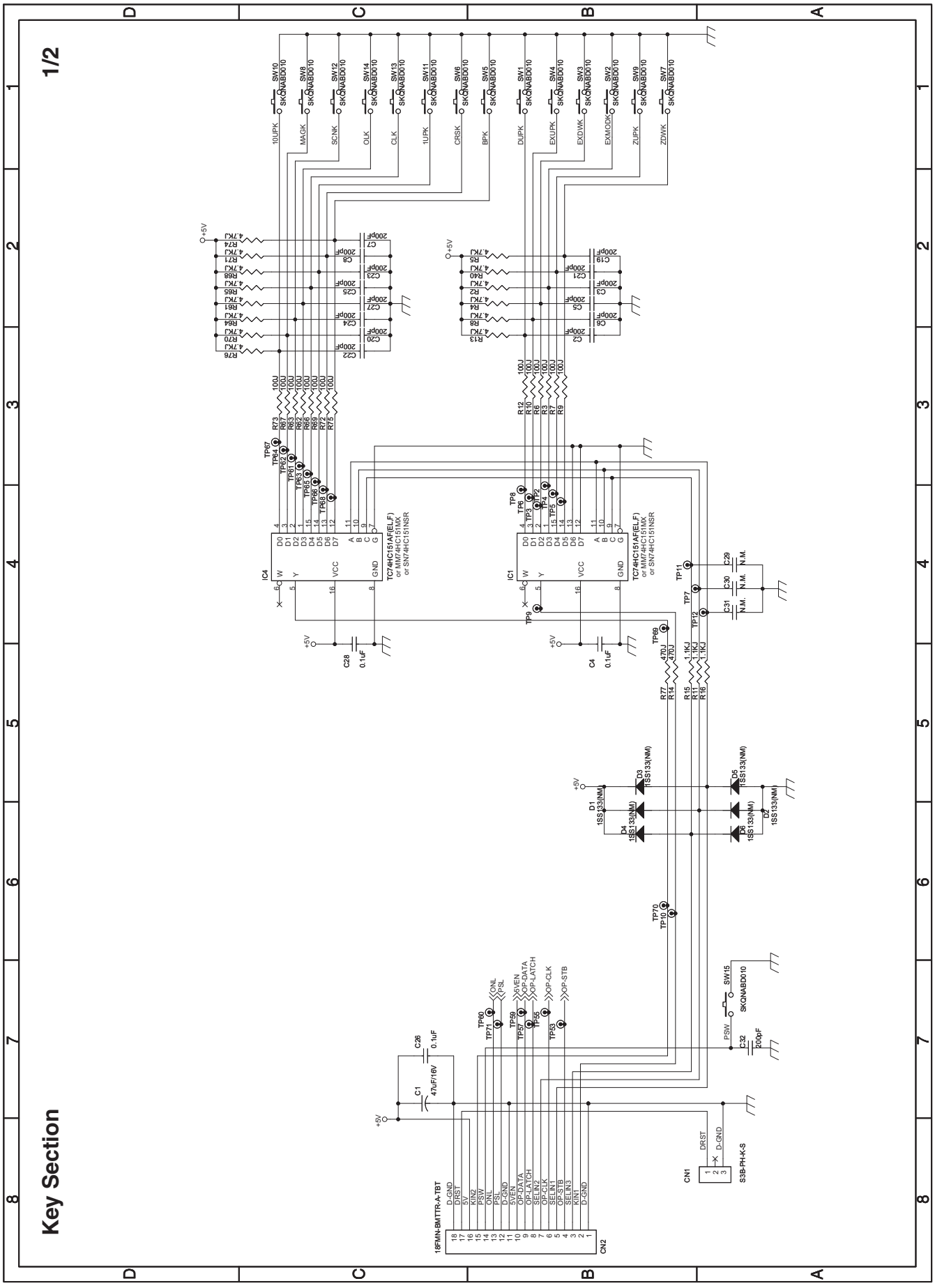

12/14
KronosII Scan/Power section

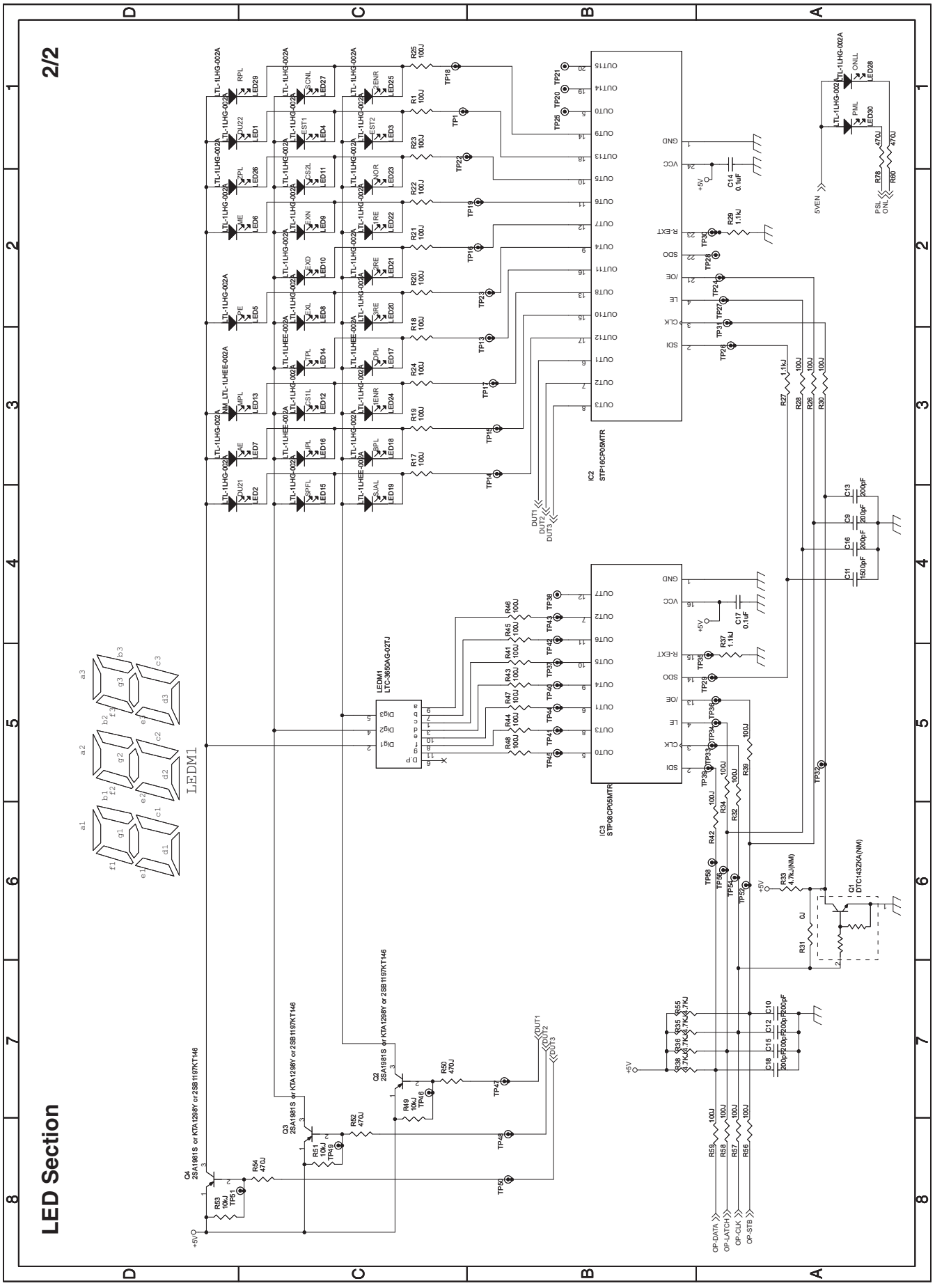
KronosII USB/LSU section




Power Source section
14/14
To Power unit
Power Source Control
CN28
B24B-PNDSS-1LF(SN)
IC42
SC183
IC43
NM_BU4224F
IC44
BU4226F
D39
NM_SDS7100
D40
SDS511
CR
TPC3109 or TPC3119
Q17
SSC2205
L7
2.2uH (IRL3225T2R2M)
FB9
FB11T
FB10
FB12T
NF2
NM_ACH32C-102-T001
NF1
NM_ACH32C-103-T001
C315
0.1u/50V<1608>
C305
22uF (3216-F)
C306
47u/16VSMT
C307
0.1u
R359
100kJ
C301
10uF/6.3V <2125>
C300
0.1u/50V<1608>
C286
22u/16VSMT
R358
47kJ
R361
4.7kJ
R356
NM_R <3216>
R357
NM_R <3216>
C288
47u/35VSMT
C289
0.1u/50V<1608>
C291
0.1u/50V<1608>
C296
0.1u
C297
NM_22u/16VSMT
C292
22uF (3216-F)
C295
0.1u
C298
0.1u
C293
0.1u/50V<1608>
C294
NM_C<1608>
C303
NM_C
C304
1000p
C310
1000p
C311
1000p
C309
0.1u
C302
NM_C
R355
10kJ
R360
4.7kJ
R350
100kJ
R351
100kJ
R353
100kJ
R352
100kJ
R354
100kJ
TPIN1
TPIN2
NB710
NB711
NB712
NB713
NB714
NB715
NB716
NB718
3.3V_IN
1.2V
12VIN
3.3VIN
5V
24V
PGND
INT24V
INT5V
ENSV
CORE1.2V_CONT
3.3V_CONT
IRIAS
GRIDL
FIV
PR_det

2. OPE PWB

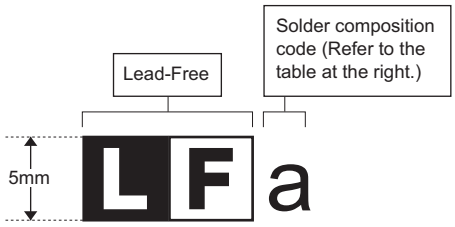

1/2
Key Section
SW10 SKQNABD010
SW8 SKQNABD010
SW12 SKQNABD010
SW14 SKQNABD010
SW13 SKQNABD010
SW11 SKQNABD010
SW6 SKQNABD010
SW5 SKQNABD010
SW1 SKQNABD010
SW4 SKQNABD010
SW3 SKQNABD010
SW2 SKQNABD010
SW9 SKQNABD010
SW7 SKQNABD010
10UPK
MAGK
SCNK
OLK
CLK
1UPK
CRSK
BPK
DUPK
EXUPK
EXDWK
EXMODK
ZUPK
ZDWK
IC4
IC1
TC74HC151AF(ELF)
or MM74HC151MX
or SN74HC151NSR
C28 0.1uF
C4 0.1uF
C1 47uF/16V
C26 0.1uF
C29 N.M.
C30 N.M.
C31 N.M.
C32 200pF
D1 1SS133(NM)
D2 1SS133(NM)
D3 1SS133(NM)
D4 1SS133(NM)
D5 1SS133(NM)
D6 1SS133(NM)
SW15 SKQNABD010
PSW
CN1
S3B-PH-K-S
DRST
D-GND
CN2
18FMN-BMTTR-A-TBT
D-GND
DRST
5V
KEYIN2
PSW
ONL
PSL
D-GND
5VEN
OP-DATA
OP-LATCH
SELIN2
OP-CLK
OP-STB
SELIN3
KIN1
D-GND
+5V


2/2
LED Section
LEDM1
IC2
STP16CP05MTR
IC3
STP08CP05MTR
LTC-3650AG-027J
OP-DATA
OP-LATCH
OP-CLK
OP-STB
5VEN
PSL
ONL
+5V

LEAD-FREE SOLDER

The PWB's of this model employs lead-free solder. The "LF" marks indicated on the PWB's and the Service Manual mean "Lead-Free" solder.
The alphabet following the LF mark shows the kind of lead-free solder.

Example:



<Solder composition code of lead-free solder>

Solder composition	Solder composition code
Sn-Ag-Cu	a
Sn-Ag-Bi Sn-Ag-Bi-Cu	b
Sn-Zn-Bi	z
Sn-In-Ag-Bi	i
Sn-Cu-Ni	n
Sn-Ag-Sb	s
Bi-Sn-Ag-P Bi-Sn-Ag	p

(1) NOTE FOR THE USE OF LEAD-FREE SOLDER THREAD

When repairing a lead-free solder PWB, use lead-free solder thread.

Never use conventional lead solder thread, which may cause a breakdown or an accident.

Since the melting-point of lead-free solder thread is about 40°C higher than that of conventional lead solder thread, the use of the exclusive-use soldering iron is recommended.

(2) NOTE FOR SOLDERING WORK

Since the melting-point of lead-free solder is about 220°C, which is about 40°C higher than that of conventional lead solder, and its soldering capacity is inferior to conventional one, it is apt to keep the soldering iron in contact with the PWB for longer time. This may cause land separation or may exceed the heat-resistive temperature of components. Use enough care to separate the soldering iron from the PWB when completion of soldering is confirmed.

Since lead-free solder includes a greater quantity of tin, the iron tip may corrode easily. Turn ON/OFF the soldering iron power frequently.

If different-kind solder remains on the soldering iron tip, it is melted together with lead-free solder. To avoid this, clean the soldering iron tip after completion of soldering work.

If the soldering iron tip is discolored black during soldering work, clean and file the tip with steel wool or a fine filer.

CAUTION FOR BATTERY REPLACEMENT

(Danish) ADVARSEL !
Lithiumbatteri – Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri
af samme fabrikat og type.
Levér det brugte batteri tilbage til leverandoren.

(English) Caution !
Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type
recommended by the manufacturer.
Dispose of used batteries according to manufacturer's instructions.

(Finnish) VAROITUS
Paristo voi räjähtää, jos se on virheellisesti asennettu.
Vaihda paristo ainoastaan laitevalmistajan suosittelemaan
tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden
mukaisesti.

(French) ATTENTION
Il y a danger d'explosion s' il y a remplacement incorrect
de la batterie. Remplacer uniquement avec une batterie du
même type ou d'un type équivalent recommandé par
le constructeur.
Mettre au rebut les batteries usagées conformément aux
instructions du fabricant.

(Swedish) VARNING
Explosionsfara vid felaktigt batteribyte.
Använd samma batterityp eller en ekvivalent
typ som rekommenderas av apparattillverkaren.
Kassera använt batteri enligt fabrikantens
instruktion.

(German) Achtung
Explosionsgefahr bei Verwendung inkorrekter Batterien.
Als Ersatzbatterien dürfen nur Batterien vom gleichen Typ oder
vom Hersteller empfohlene Batterien verwendet werden.
Entsorgung der gebrauchten Batterien nur nach den vom
Hersteller angegebenen Anweisungen.

CAUTION FOR BATTERY DISPOSAL

(For USA, CANADA)
"BATTERY DISPOSAL"
THIS PRODUCT CONTAINS A LITHIUM PRIMARY (MANGANESS DIOXIDE) MEMORY BACK-UP BATTERY THAT MUST BE DISPOSED OF PROPERLY. REMOVE THE BATTERY FROM THE PRODUCT AND CONTACT YOUR LOCAL ENVIRONMENTAL AGENCIES FOR INFORMATION ON RECYCLING AND DISPOSAL OPTIONS.

"TRAITEMENT DES PILES USAGÉES"
CE PRODUIT CONTIENT UNE PILE DE SAUVEGARDE DE MÉMOIRE LITHIUM PRIMAIRE (DIOXYDE DE MANGANÈSE) QUI DOIT ÊTRE TRAITÉE CORRECTEMENT. ENLEVEZ LA PILE DU PRODUIT ET PRENEZ CONTACT AVEC VOTRE AGENCE ENVIRONNEMENTALE LOCALE POUR DES INFORMATIONS SUR LES MÉTHODES DE RECYCLAGE ET DE TRAITEMENT.

SHARP

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