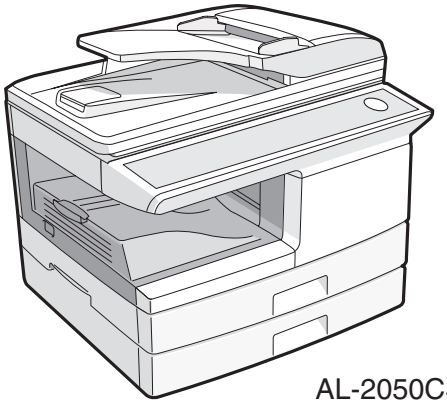
SHARP SERVICE MANUAL

CODE: 00ZAL2040CS2E



AL-2050CS

DIGITAL MULTIFUNCTIONAL SYSTEM

MODEL AL-2030 AL-2040CS AL-2050CS

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

CAUTION

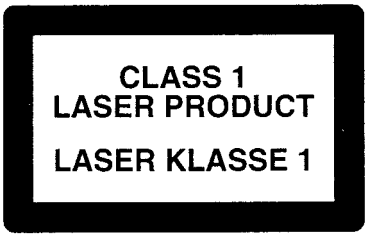
This product is a class 1 laser product that complies with 21CFR 1040 of the CDRH standard and IEC825. This means that this machine does not produce hazardous laser radiation. The use of controls, adjustments or performance of procedures other than those specified herein may result in hazardous radiation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



LASER WAVE – LENGTH : 770 ~ 795nm
Pulse times : 12.88μs ± 12.88ns/7mm
Out put power : MAX 0.2mW

CAUTION

INVISIBLE LASER RADIATION,
WHEN OPEN AND INTERLOCKS DEFEATED.
AVOID EXPOSURE TO BEAM.

VORSICHT

UNSICHTBARE LASERSTRAHLUNG,
WENN ABDECKUNG GEÖFFNET UND
SICHERHEITSVERRIEGELUNG ÜBERBRÜCKT.
NICHT DEM STRAHL AUSSETZEN.

VARO !

AVATTAESSA JA SUOJALUKITUS
OHITETTAESSA OLET ALTTIINA
NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE ÄLÄ
KATSO SÄTEESEEN.

ADVARSEL

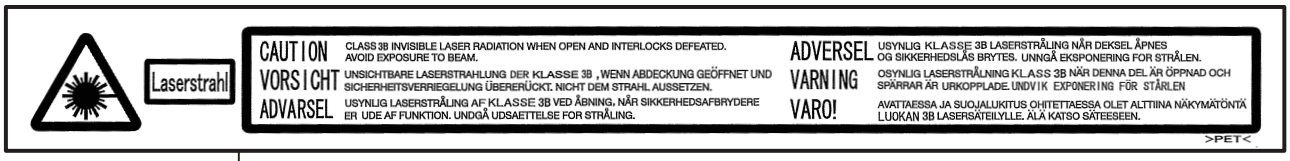
USYNLIG LASERSTRÅLNING VED ÅBNING, NÅR
SIKKERHEDSBRYDERE ER UDE AF
FUNKTION. UNDGÅ UDSAETTELSE FOR
STRÅLNING.

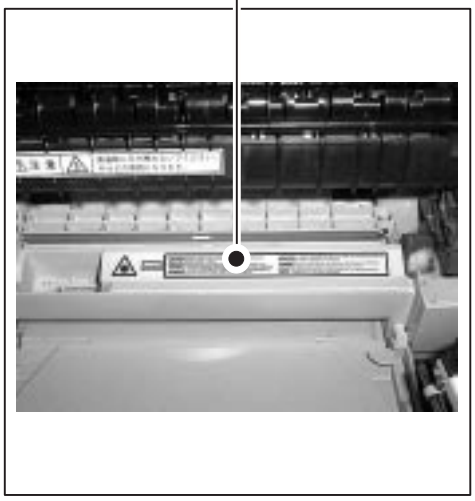
VARNING !

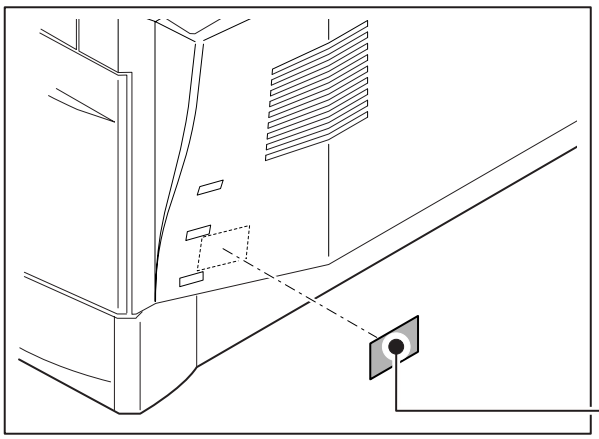
OSYNLIG LASERSTRÅLNING NÄR DENNA DEL
ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD.
BETRAKTA EJ STRÅLEN. – STRÅLEN ÄR
FARLIG.

At the production line, the output power of the scanner unit is adjusted to 0.18 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.



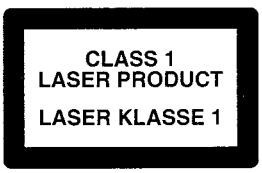




The foregoing is applicable only to the 220V model, 230V model and 240V model.

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.



LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT

CONTENTS

[1] GENERAL

1. Major functions

Configurations

Item / Model	CPM (Letter)	PPM (Letter)	SB/ MB	2 Tray	SPF	R-SPF	Color Scanner (push)	GDI printer	SPLC printer	E-SORT	Duplex	Shifter	FAX	Sharp desk	IEEE 1284	USB	RJ45	External NIC
AL-2030	20 CPM	16 PPM	MB	×	○	×	×	○	×	×	×	×	×	×	×	○ (2.0 Full)	×	×
AL-2040CS	20 CPM	16 PPM	MB	○	○	×	○	○	×	×	○	×	×	○	×	○ (2.0 Full)	○ (print only)	×
AL-2050CS	20 CPM	20 PPM	MB	○	×	○	○	×	○	○	○	○	×	○	×	○ (2.0 Hi)	○ (print only)	×

Descriptions of items

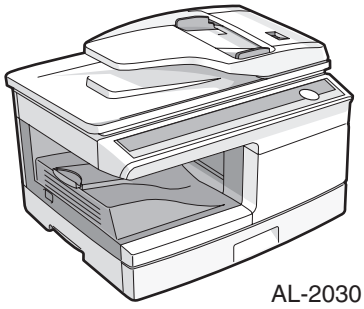
CPM:	Copy speed (Copies Per Minute)
PPM:	Print speed (Print Per Minute)
SB/MB:	SB = Manual feed single bypass, MB = Manual feed multi-bypass
2 tray:	Second cassette unit.
SPF:	Original feed unit
R-SPF:	Duplex original feed unit
Color scanner:	Color scanner function
GDI printer:	GDI printer function with 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

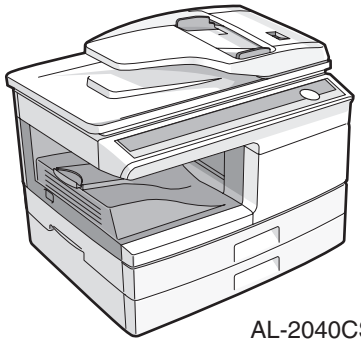
○: Standard provision

×: No function or no option available

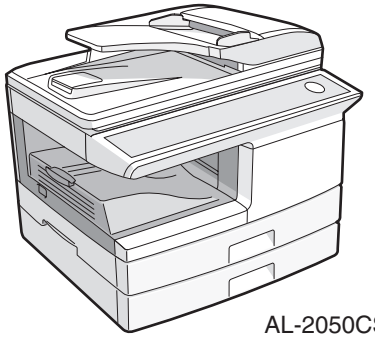
Opt: Option



AL-2030



AL-2040CS



AL-2050CS

[2] SPECIFICATIONS

1. Basic Specifications

Item			
Type		Desktop	
Copy system		Dry, electrostatic	
Segment (class)		Digital personal copier	
Copier dimensions	AL-2030	20-1/2" (W) x 17-5/8" (D) x 14-1/8" (H) (518mm (W) x 445mm (D) x 358mm (H))	
	AL-2040CS	20-1/2" (W) x 17-5/8" (D) x 17-5/8" (H) (518mm (W) x 445mm (D) x 445mm (H))	
	AL-2050CS	20-1/2" (W) x 17-5/8" (D) x 18-1/8" (H) (518mm (W) x 445mm (D) x 459mm (H))	
Weight (Approximately)	AL-2030	37.9 lbs. (17.2Kg)	TD cartridge not included
	AL-2040CS	45.9 lbs. (20.8Kg)	
	AL-2050CS	51.2 lbs. (23.2Kg)	

2. Operation specifications

Section, item			Details	
Paper feed section	Paper feed system		AL-2030	1 tray (250 sheet) + multi-bypass (50 sheet)
			AL-2040CS/2050CS	2 tray (500 sheet) + multi-bypass (50 sheet)
	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
			Kinds	Standard paper, specified paper, recycled paper, OHP, Label, Envelop (Single copy)
			Remark	User adjustment of paper guide available
	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
			Kinds	Standard paper, specified paper, recycled paper, OHP, Label, (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		8-1/2" x 14" (A4)
		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

Section, item		Details	
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)
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
		Power consumption	800W
Electrical section	Power source	Voltage	120V
		Frequency	Common use for 50 and 60Hz
	Power consumption	Max.	Less than 1000W
		Average (during copying)	350Wh/H or less (AL-2030/2040CS) 380Wh/H or less (AL-2050CS)
		Average (stand-by)	80Wh/H or less
		Pre-heat mode	25Wh/H or less (AL-2030/2040CS) 28Wh/H or less (AL-2050CS)
		Auto power shut-off mode	8.8W or less (AL-2030/2040CS) 12.5W or less (AL-2050CS)

3. Copy performance

Section, item		Details	AL-2030/2040CS/2050CS
Copy magnification	Fixed magnification ratios		4 Reduction + 3 Enlargement (Inch system: 25, 50, 64, 78, 100, 129, 200, 400%) (AB system: 25, 50, 70, 86, 100, 141, 200, 400%)
	Zooming magnification ratios		25 - 400% (376 steps in 1% increments) 50 - 200% when using SPF/RSPF (151 steps in 1% increments)
Manual steps (manual, photo)			5 steps
Copy speed (CPM)	First-copy time *1 (Approximately)		AL-2030/2040CS: 8.0 seconds (When user program 24 is set to OFF) AL-2050CS: 10.7 seconds (paper: A4 (8-1/2" x 11"), exposure mode: AUTO, copy ratio: 100%)
	Inch system 8-1/2" x 11" (Landscape)	Same size	20
	AB system A4 (Landscape)	Same size	20
	AB system B5 (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/RSPF) Enlarge: 1.5mm or less (OC) / 3mm or less (SPF/RSPF) Reduction (50%): 6.0mm or less (OC) / 8mm or less (SPF/RSPF)
Warm-up time			0 sec. Immediately the ready lamp is lit.
Power save mode reset time			0 sec. Immediately the ready lamp is lit.
Paper jam recovery time			0 sec. * Jam recovery condition: Recovery time from 60 sec of door open.

*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 (8-1/2" x 11" (A4), paper fed from paper tray).
The first-copy time may vary depending on machine operating conditions and ambient conditions such as temperature.

4. GDI Printer (AL-2030/2040CS)

Print speed	Max. 16ppm (excluding bypass tray, paper size A4, 8.5" x 11") (Variable depending on the PC performance)
Duplex	Yes (AL-2040CS only)
Memory	8MB (Duplex model: 16MB)
Interface	USB 2.0 (Full speed) (AL-2040CS only)
Network	Built-in NIC (10 Base) (AL-2040CS only)
Emulation	GDI
MIB support	No
Resolution	600dpi *1
Supported OS	Windows 98/Me, Windows 2000 Professional, Windows XP Home Edition/Professional, Windows Vista *2
WHQL support	Yes *2
Application	Status window

*1: Engine Resolution

*2: By running change

5. SPLC printer (AL-2050CS only)

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
ROPM	Yes
Memory	64MB
Interface	USB2.0 (Hi Speed)
Network	Built-in NIC (10 Base)
Emulation	SPLC (JBIG GDI)
MIB support	No
Resolution	600dpi *1
Supported OS	Windows 98/Me, Windows 2000 Professional, Windows XP Home Edition/Professional, Windows Vista
WHQL support	Yes *2
Application	Status window

*1: Engine Resolution

*2: Running change

6. Scan function

	AL-2030/2040CS	AL-2050CS
Type	Flat Bed Color Scanner	
Scanning system	Original table/SPF	Original table/RSPF
Light source	3 CCDs (RGB) sensor scanning by lighting white lamp (2 pcs of CCFL)	
Resolution	Optical: 600 x 1200dpi 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	OC / RSPF : 8.5" (H) x 14.0" (V) Original position: Left Center
Scan speed	OC / SPF : Max. 2.88ms/line	OC / RSPF : Max. 2.88ms/line
Protocol	TWAIN / WIA (XP, Vista) / STI	
Interface	USB2.0 (Full speed support)	USB2.0 (Hi speed support)
Scanner utility	Button Manager / Sharpdesk / Composer	
Scan key/lamp	Yes	
Duplex scan	No	Yes
Supported OS	Win 98 / Me / 2000 / XP / Vista *1	
Void area	No (User settable by PC)	
WHQL supported	Yes *1	

*1: By running change

7. SPF (AL-2030/2040CS)

Original capacity	50 sheets (15 - 23.9 lbs.) (56 - 90g/m^2) Stacking Height: less than 6.5mm or 1/4"
Original size	8-1/2" x 14" to 5-1/2" x 8-1/2" / A4 to A5 (Landscape)
Original replacement speed	8-1/2" x 11" about 14 sheets (70%) A4 about 14 sheets (70%)
Original placement	Face up
Original weight	15 - 23.9lbs. (56 - 90g/m^2)
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.

8. RSPF (AL-2050CS)

Original capacity		50 sheets (56 - 90g/m^2) or 6.5mm, 1/4" or less.	
Original size		8-1/2" x 14" to 5-1/2" x 8-1/2" / A4 to A5 (Landscape)	
Original replacement speed		8-1/2" x 11" about 14 sheets (70%) A4 about 13 sheets (65%)	
Job speed (Tray1, Landscape)	Single copy	S to S	About 14CPM (8-1/2" x 11") About 13CPM (A4)
		S to D	About 10CPM (1 - 30 sheets)(*1) About 5.6CPM (31 sheets ~)
		D to S	About 6CPM
		D to D	About 6CPM (1 - 30 sheets)(*1) About 5.6CPM (31 sheets ~)
	Multi copy	S to S	About 20CPM
		S to D	About 13CPM (1 - 30 sheets)(*1) About 5.6CPM (31 sheets ~)
		D to S	About 16CPM
		D to D	About 13CPM (1 - 30 sheets)(*1) About 5.6CPM (31 sheets ~)
Original placement		Face up	
Original weight		15 - 23.9lbs. (56 - 90g/m^2)	
Mixed feeding		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.	

[Conditions] Speed with tray 1, normal size, paper size of 8.5" x 11" (A4), and RSPF.

*1: Indicates the speed from 1st to 30th sheet (i.e., 60th surface).

[3] CONSUMABLE PARTS

1. Supply system table

A. SEC/SECL (AL-2030/2040CS/2050CS)

No.	Name	Content	Life	Product name	Package
1	Develop cartridge (Black) x 1	Toner/developer cartridge x 1	6K (5% document)	AL-100TD	5
2	Develop cartridge (Black) x 1	Toner/developer cartridge x 1	4K (5% document)	AL-110TD	5
3	Drum cartridge	Drum cartridge	18K	AL-100DR	5

B. Brazil (AL-2030/2040CS)

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

2. Environmental

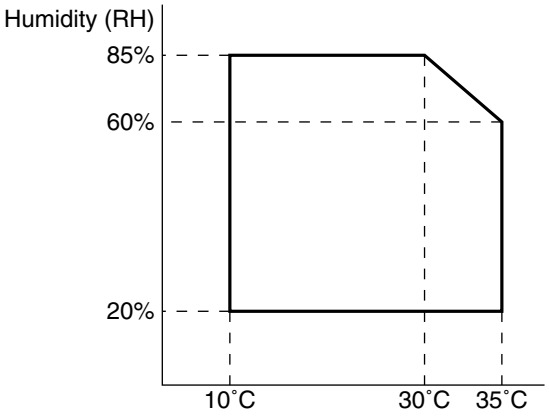
The environmental conditions for assuring the copy quality and the machine operations are as follows:

(1) Normal operating condition

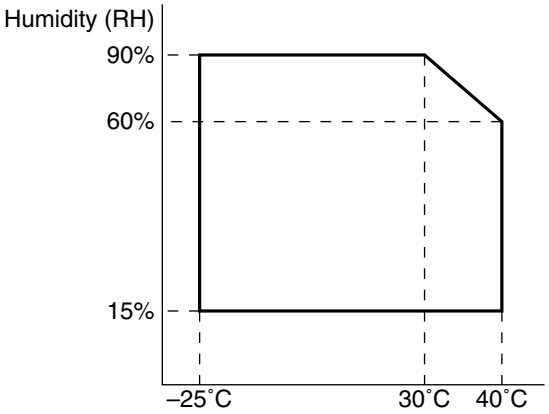
Temperature: 20°C - 25°C

Humidity: 65 ± 5%RH

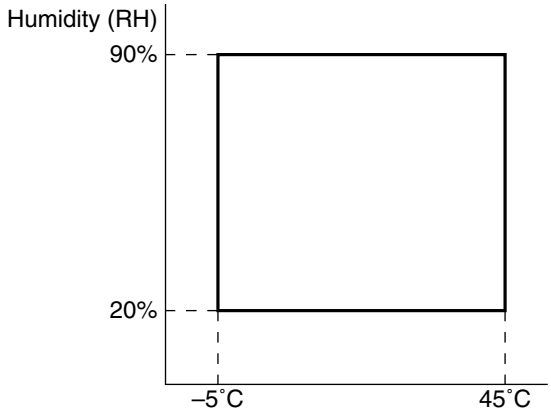
(2) Acceptable operating condition



(3) Transport condition

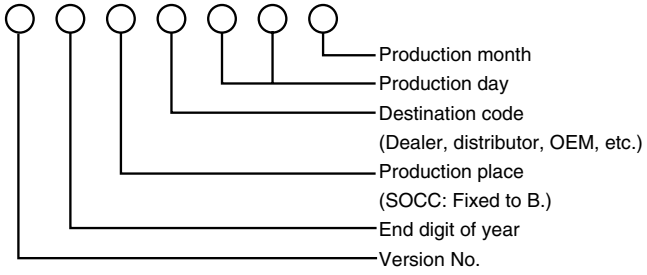


(4) Supply storage condition



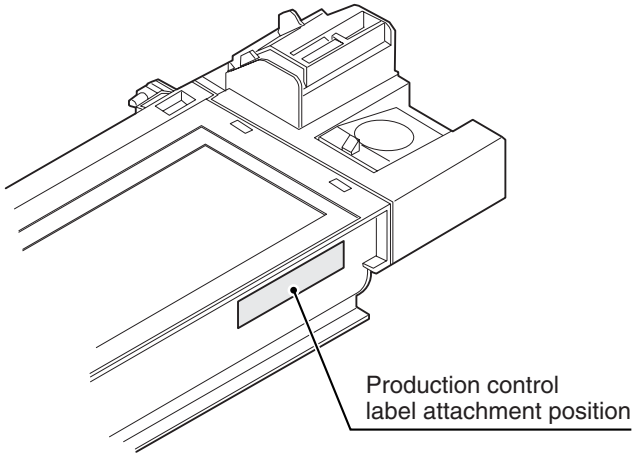
3. Production control number (lot No.) identification

<Developing cartridge>



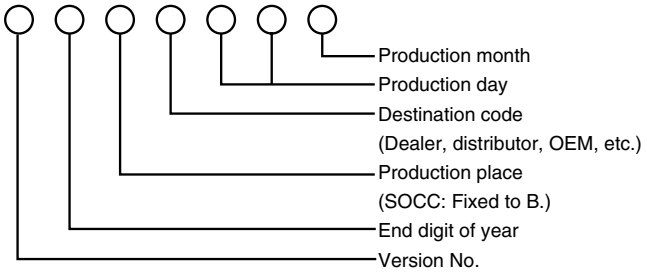
* Destination

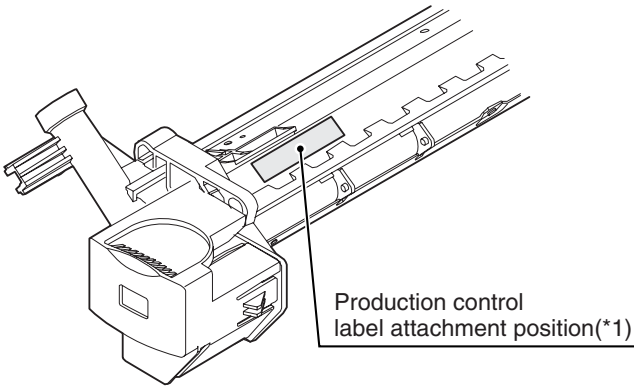
Division		No.
EX Destination	A same pack	G
	B same pack	H
Option Destination	A	P
	B	Q



<Drum cartridge>

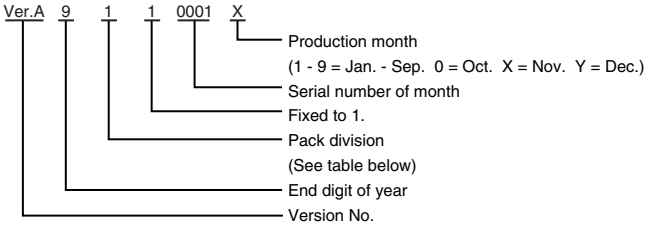
The label on the drum cartridge shows the date of production.
(SOCC production)





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

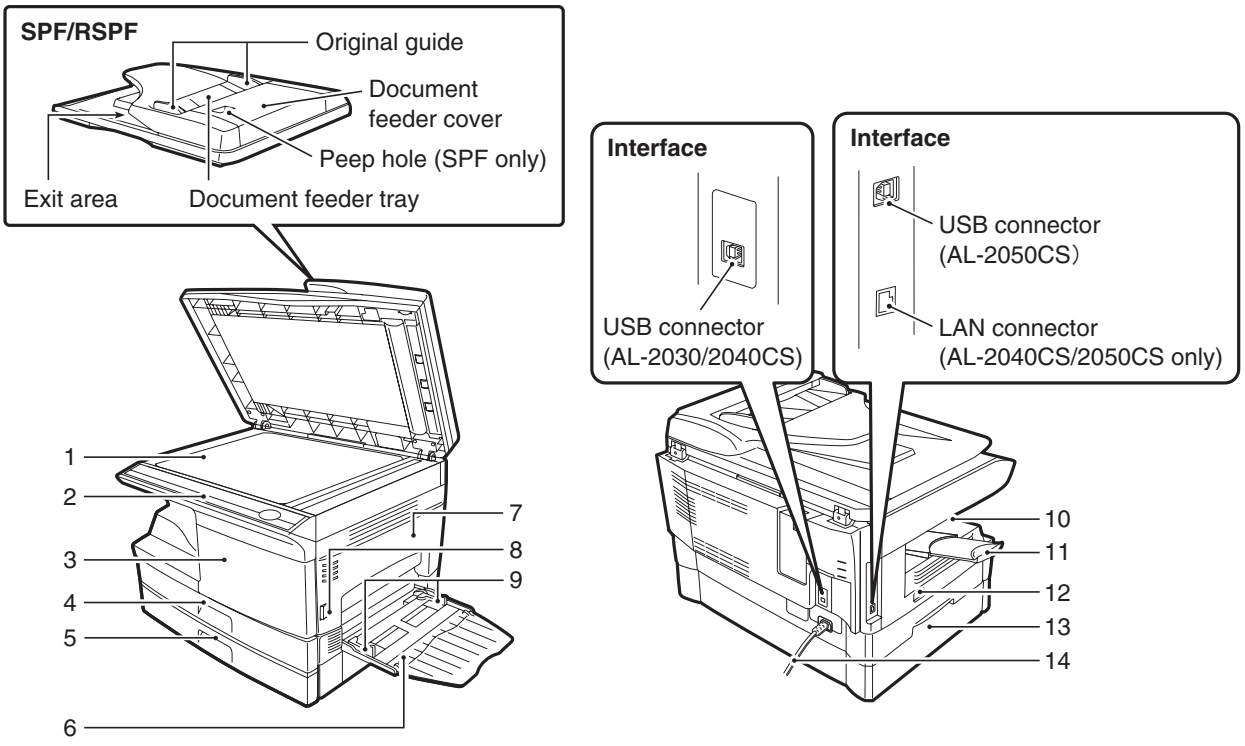
<JAPAN production>



Division	No.
Ex production	1
Option	2
Same pack	3

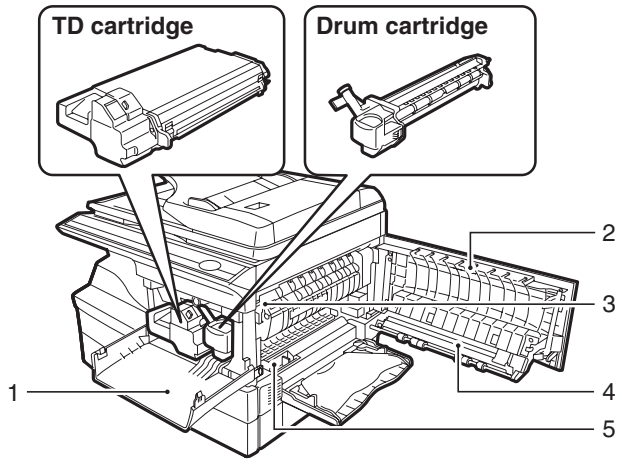
[4] EXTERNAL VIEWS AND INTERNAL STRUCTURES

1. Appearance



1	Document glass	2	Operation panel	3	Front cover
4	Paper tray 1	5	Paper tray 2 (AL-2040CS/2050CS only)	6	Multi-bypass tray
7	Side cover	8	Side cover open button	9	Bypass tray paper guides
10	Paper output tray	11	Paper output tray extension	12	Power switch
13	Handle	14	Power cord		

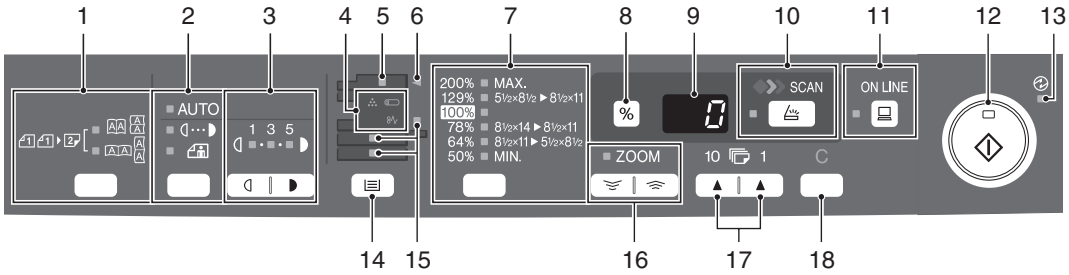
2. Internal



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

3. Operation panel

A. AL-2030/2040CS



1	**Original to copy key and indicators (AL-2040CS only)** Two-sided copies from one-sided originals. Turn on Long Edge or Turn on Short Edge can be selected.	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.
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.	4	**Alarm indicators** Drum replacement required indicator *1 Misfeed indicator TD cartridge replacement required indicator *2
5	**SPF indicator**	6	**SPF misfeed indicator**
7	**Copy ratio selector key and indicators** Use to sequentially select preset reduction/enlargement copy ratios. Selected copy ratio is shown by a lit indicator.	8	**Copy ratio display (%) 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 an original misfeed occurs while using the SPF.
9	**Display** Displays the specified copy quantity, zoom copy ratio, user program code, and error code.	10	**SCAN key and indicator (AL-2040CS only) *3, *4**
11	**ONLINE key and indicator** Lights up when the unit is used as a printer and scanner (AL-2040CS only). *3	12	**Start key and indicator** • Copying is possible when the indicator is on. • Press to start copying • Use to set a user program.
13	**Power save indicator** Lights up when the unit is in a power save mode.	14	**Tray select key** Use to select a paper feed station (paper tray 1, paper tray 2 (AL-2040CS only) or multi-bypass tray).
15	**Paper feed location indicators** Light up to show the selected paper feed station.	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%.)
17	**Copy quantity keys** • Use to select the desired copy quantity (1 to 99). • Use to make user program entries.	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: Drum cartridge replacement**

The useful life of the drum cartridge is approximately 18,000 copies*. When the internal counter reaches approximately 17,000 copies, the drum replacement required ( ) indicator will light up indicating that replacement of the drum cartridge will be needed soon. For more information on purchasing the drum cartridge, please refer to the Operation Manual. When the indicator begins to blink, the unit will stop operating until the cartridge is replaced. Replace the drum cartridge at this time.

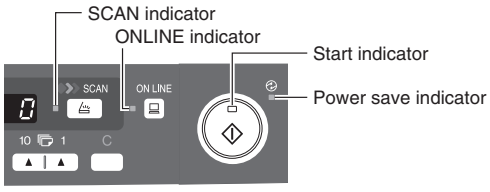
*: Based on copying onto letter size paper at 5% toned area.

***2: TD cartridge replacement**

The TD cartridge replacement required ( ) indicator will light up when toner is needed. For more information on purchasing the TD cartridge. If copying is continued while the indicator is lit, copies will gradually become lighter until the unit stops and the indicator begins blinking.

***3: Indicators on the operation panel**

The ONLINE indicator and the start ( ) indicator indicate 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.

ONLINE indicator

The ONLINE key is pressed and on line and off line are changed.

On: Indicates the unit is ready for printing or scanning is being performed. (On line)

Blinking: Printing or data is being received from a computer.

Off: Copying is being performed. (Off line)

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 (AL-2040CS only)

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.

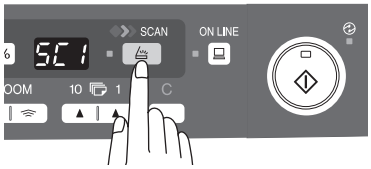
Off: The unit is in the copy mode.

***4: Using the SCAN key to begin scanning**

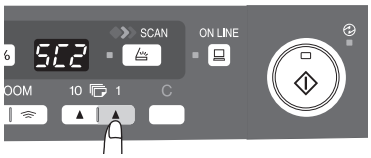
Note:

- Scanning is not possible during a copy job.
- If the SCAN ( ) key is pressed during a print job, the scan job will be stored.
- When scanning an original that has been placed in the SPF, only one original can be placed unless you are using Sharpdesk.

1) Press the SCAN ( ) key.
The unit enters scan mode.



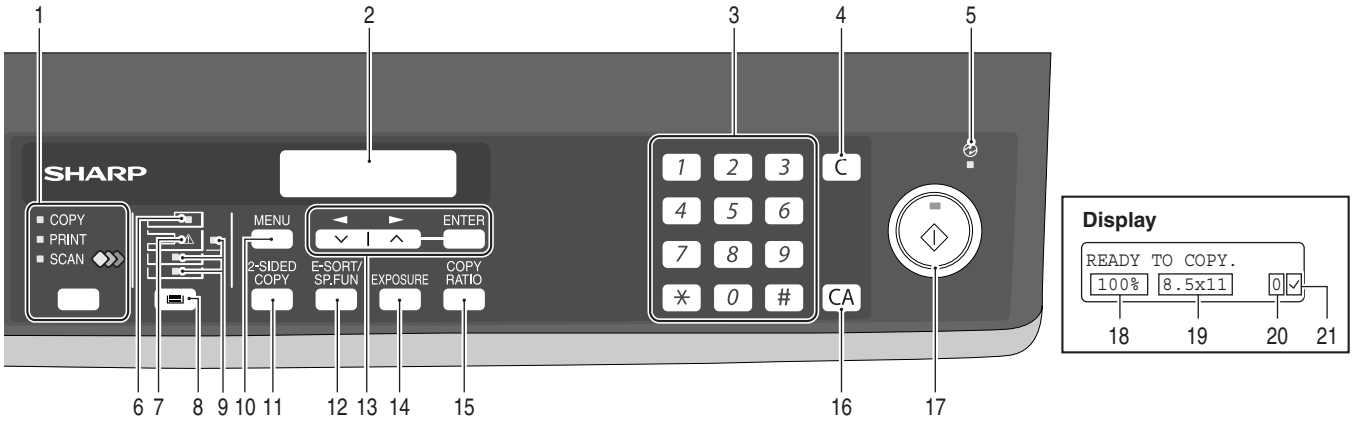
2) Place the original you wish to scan on the document glass/SPF.
3) Press the right copy quantity key to display the number of the application that you wish to use for scanning.
The application numbers are initially as follows.



Application number	Application launched
SC1	Sharpdesk (Full color) (if installed)
SC2	Sharpdesk (Monochrome) (if installed)
SC3	E-mail (your standard e-mail program in the Windows OS you are using)
SC4	Fax (if a fax program is installed)
SC5	OCR (if an OCR program is installed)
SC6	Microsoft Word (if installed)

4) Press the start ( ) key.
Scanning will start and the scanned data will be transferred to the application.

B. AL-2050CS

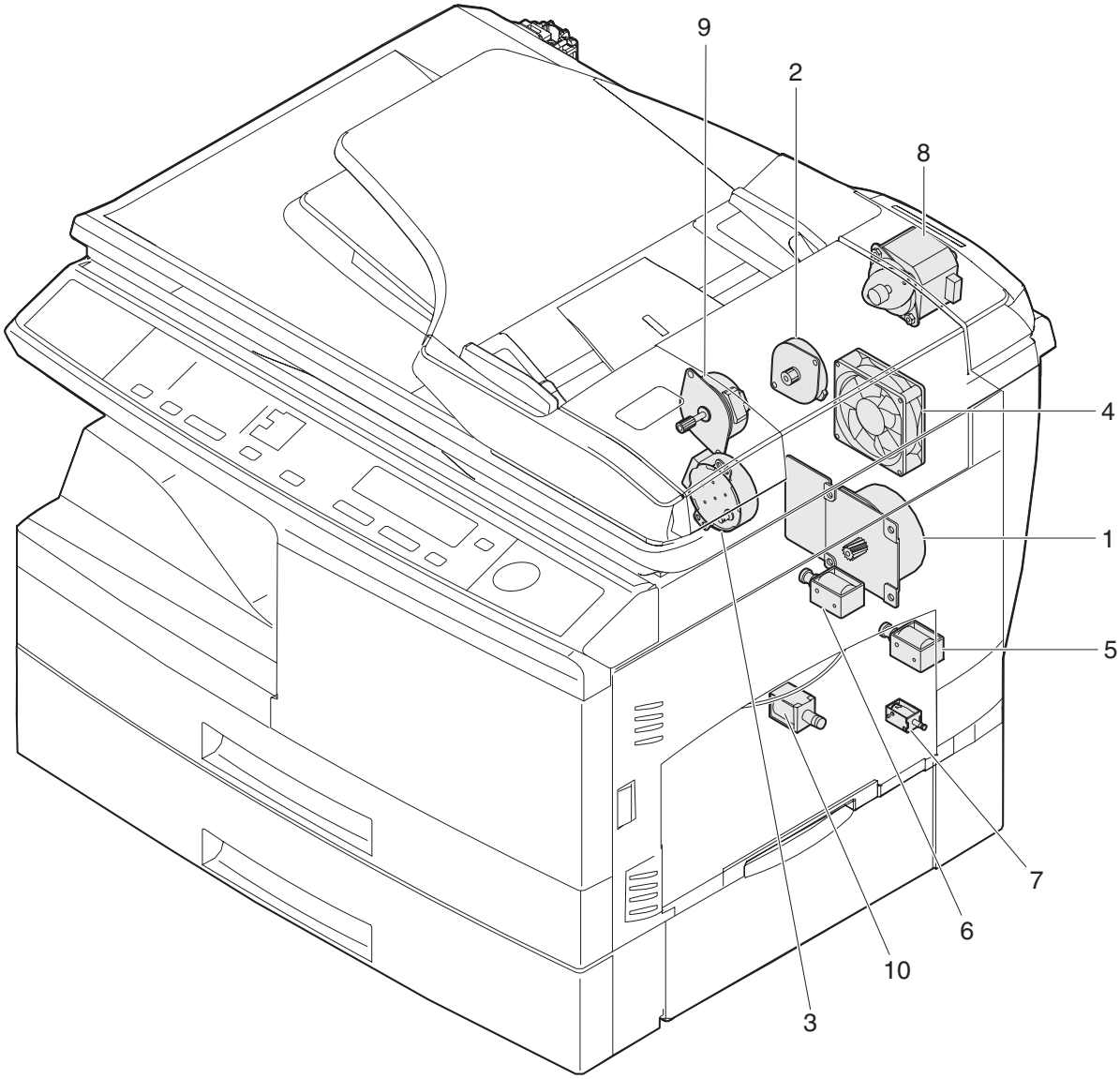


1	**[MODE SELECT] key / Mode indicators** Press this key to select the mode. The indicator of the selected mode lights (copy, printer, scanner indicators).	2	**Display** This shows messages indicating the machine status and any problems that occur, as well as user programs and function setting menus.
3	**Numeric keys** Use these to enter the number of copies and other numerical settings. The keys can also be used to select items in function setting menus.	4	**[CLEAR] key (C)** Use this to clear the set number of copies, as well as cancel a job that is in progress. When a setting menu appears, use this key to move back to the previous menu level.
5	**Power save indicator** This lights up when the power save function is activated.	6	**RSPF indicator** This lights up when an original is placed in the RSPF.
7	**Error indicator** This lights steadily or blinks when a paper misfeed or other error occurs.	8	**[TRAY SELECT] key ( )** Use to select the paper tray that has the desired paper for copying.

9	**Tray location indicator** Indicates the selected paper tray. The indicator blinks when the tray is out of paper during operation or is not closed properly.	10	**[MENU] key** Press this key to select the paper size for copying, to configure a user program or to display the total count.
11	**[2-SIDED COPY] key** Press to select the automatic two-sided copying mode.	12	**[E-SORT/SP.FUN] key** Press to select the sort function, 2 IN 1 copy function, or margin shift function.
13	**[◄] key (▽), [►] key (△), [ENTER] key** Press the [◄] key (▽) or [►] key (△) to select an item in a function setting menu. Press the [ENTER] key to enter a selection.	14	**[EXPOSURE] key** Use to switch from auto exposure adjustment to text mode or photo mode.
15	**[COPY RATIO] key** Press to select an enlargement or reduction ratio. To select a preset ratio setting, press the [COPY RATIO] key and select the desired preset ratio. To select a ratio that is not preset, press the [COPY RATIO] key, select the preset ratio that is closest to the desired ratio, and then press the [◄] key (▽) or [►] key (△) to increase or decrease the ratio in increments of 1%.	16	**[CLEAR ALL] key (CA)** This returns all functions to the default settings. When pressed in a setting menu, this returns the settings and display to the initial state.
17	**[START] key (◯) / Ready indicator** The ready indicator lights up when copying or scanning is possible. To begin copying, press the [START] key (◯). The [START] key (◯) is also pressed to return to normal operation from auto power shut-off mode.	18	Shows the current copy ratio.
19	Shows the selected paper size.	20	Shows the number of copies that has been entered with the numeric keys.
21	A checkmark " ✓ " appears when the exposure has been changed, or when two-sided copying, sort, 2 IN 1, or margin shift is selected.		

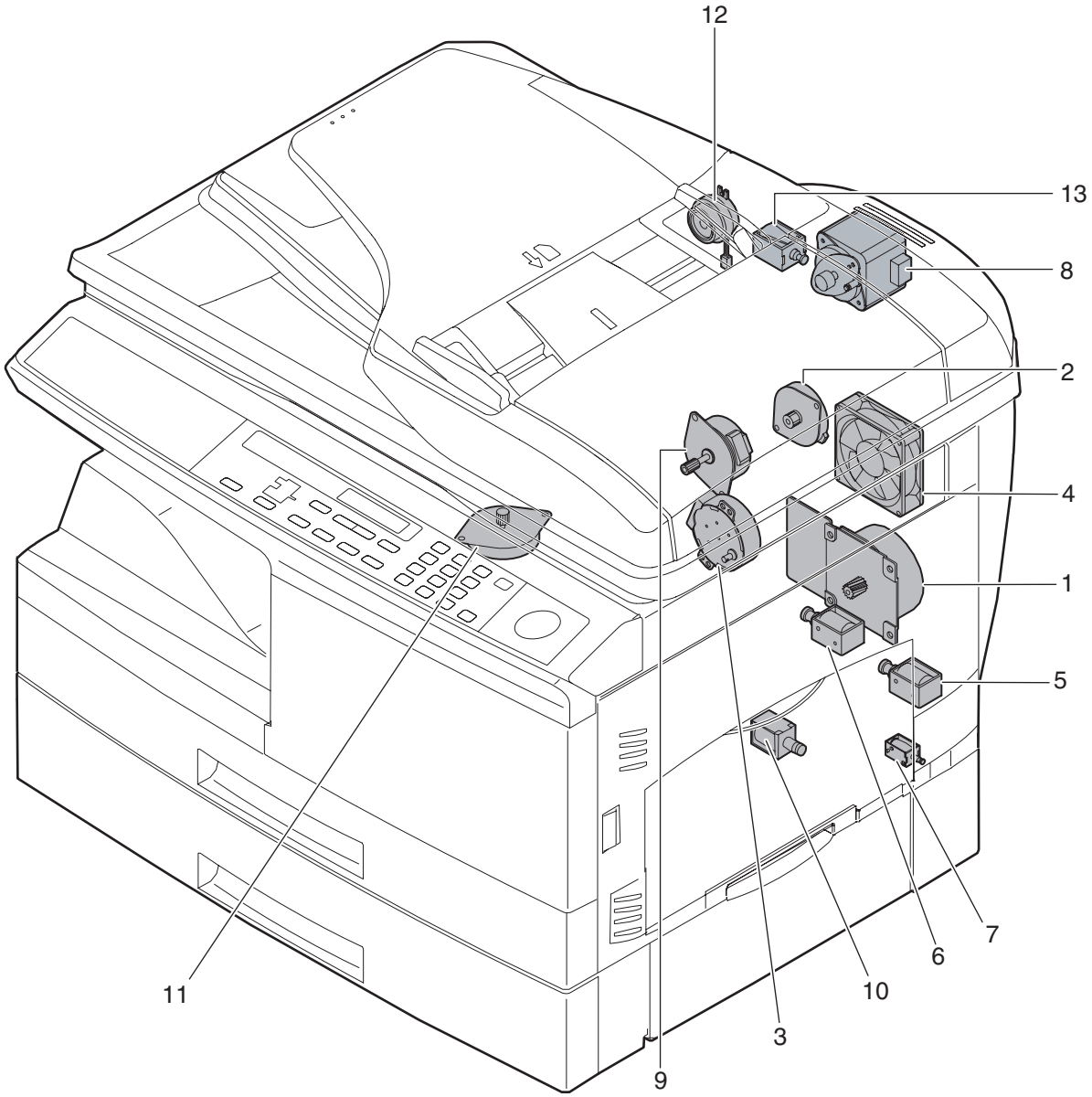
4. Motors and solenoids

A. AL-2030/2040CS



No.	Part 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
9	Duplex motor	DMT	Devices the duplex paper transport section (AL-2040CS only)
10	Paper feed solenoid	CPFS2	Cassette Paper feed solenoid 2 (AL-2040CS only)

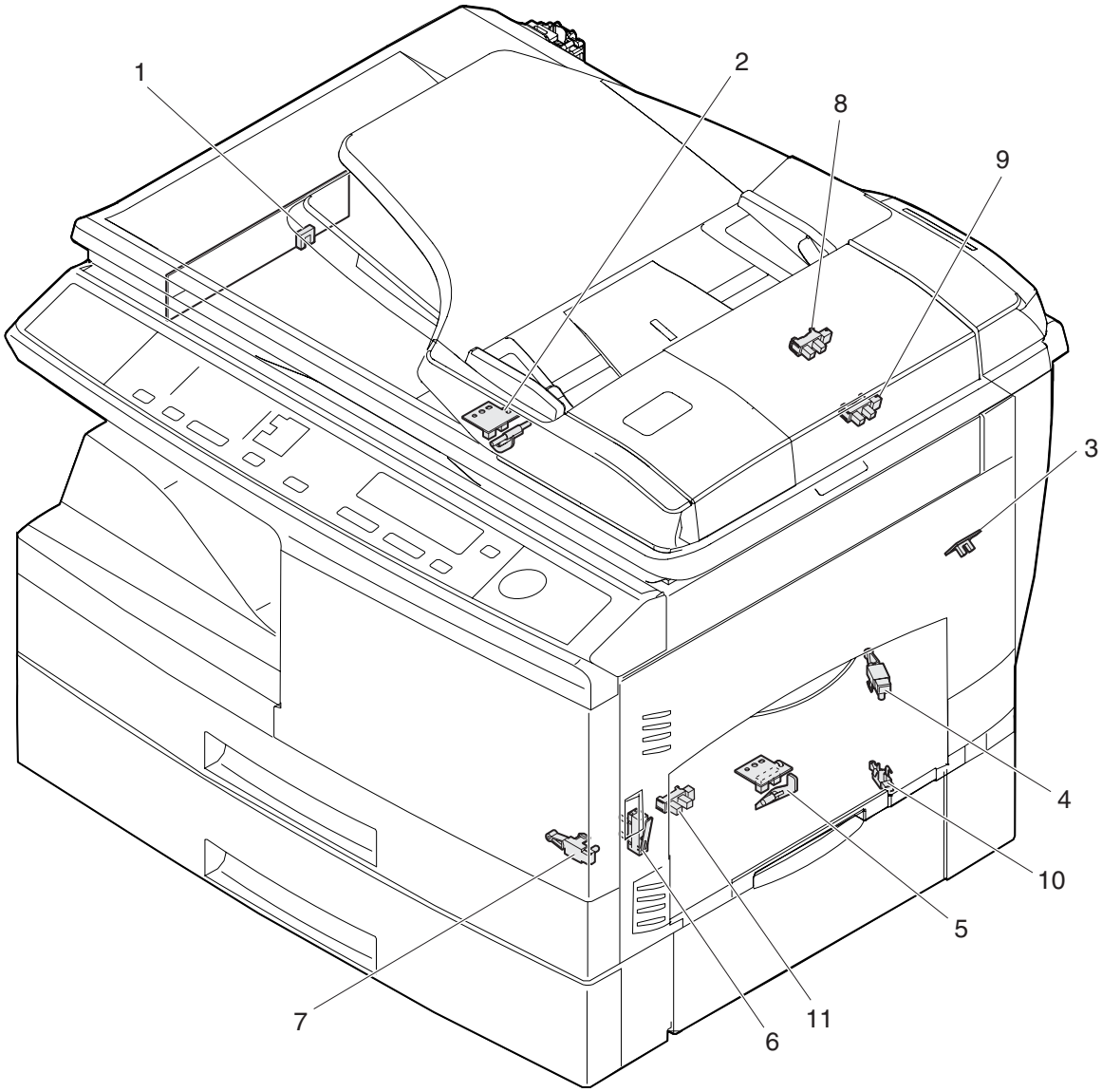
B. AL-2050CS



No.	Part 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	Ventilate the fuser 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	Drive motor	SPMT	Drives the RSPF.
9	Duplex motor	DMT	Devices the duplex paper transport section
10	Paper feed solenoid	CPFS2	Cassette Paper feed solenoid 2
11	Shifter motor	SFTM	Drives the shifter.
12	Reverse clutch	SRVC	Reverses the rotating direction of the roller.
13	Paper feed solenoid (RSPF)	SPUS	Feeds paper.

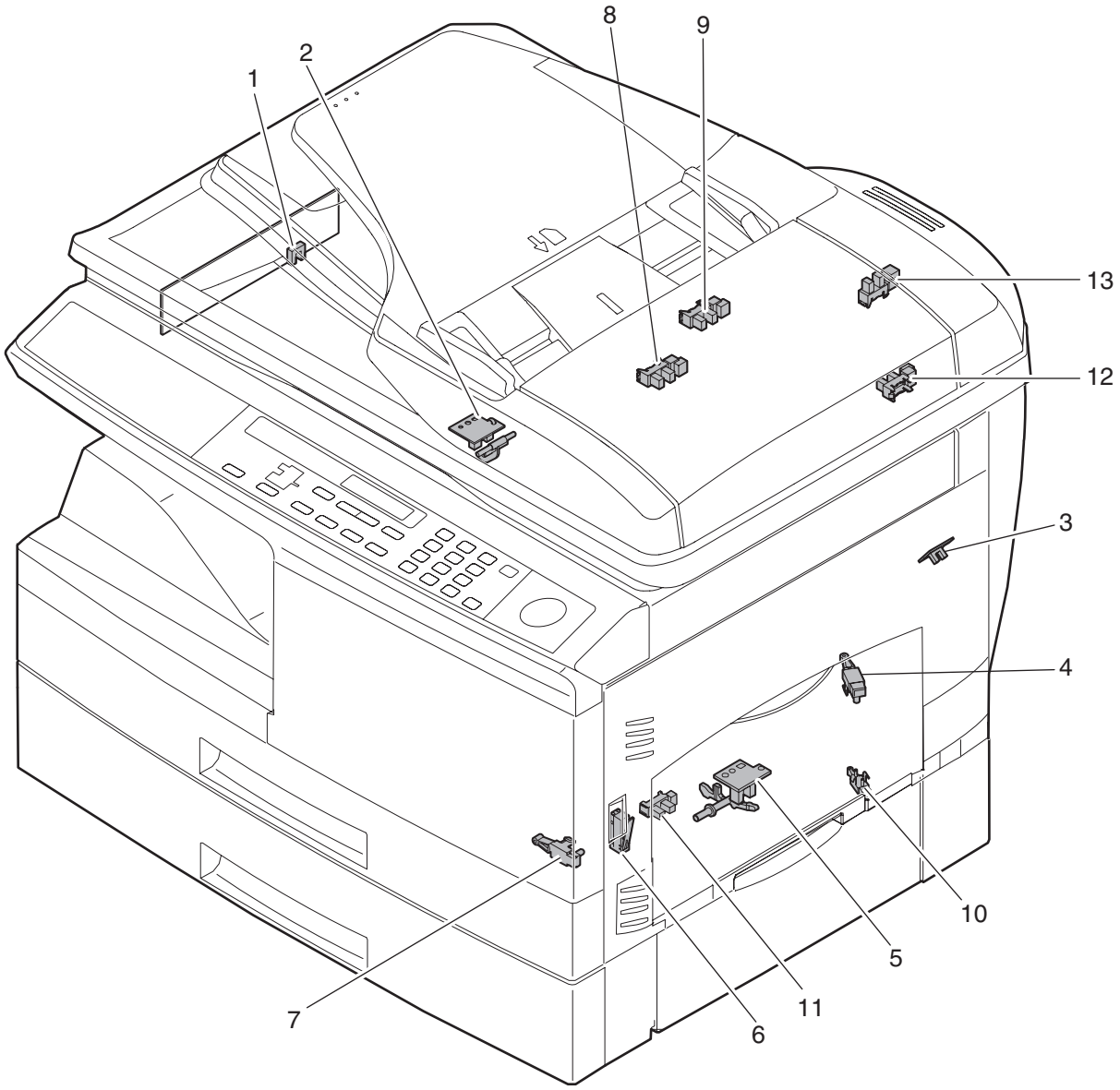
5. Sensors and switches

A. AL-2030/2040CS
(For the AL-2030, the 2nd cassette is not provided.)



No.	Name	Signal	Type	Function	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)	1 or 0V of 24V 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
9	SPPD sensor	SPPD	Transmission sensor	Paper transport detection	"L" at paper pass
10	2nd cassette	DSW	Micro-switch	2nd cassette door open detection (AL-2040CS only)	1 or 0V of 5V at door open
11	PPD3 sensor	PPD3	Transmission sensor	Paper transport detection 3	"L" at paper pass

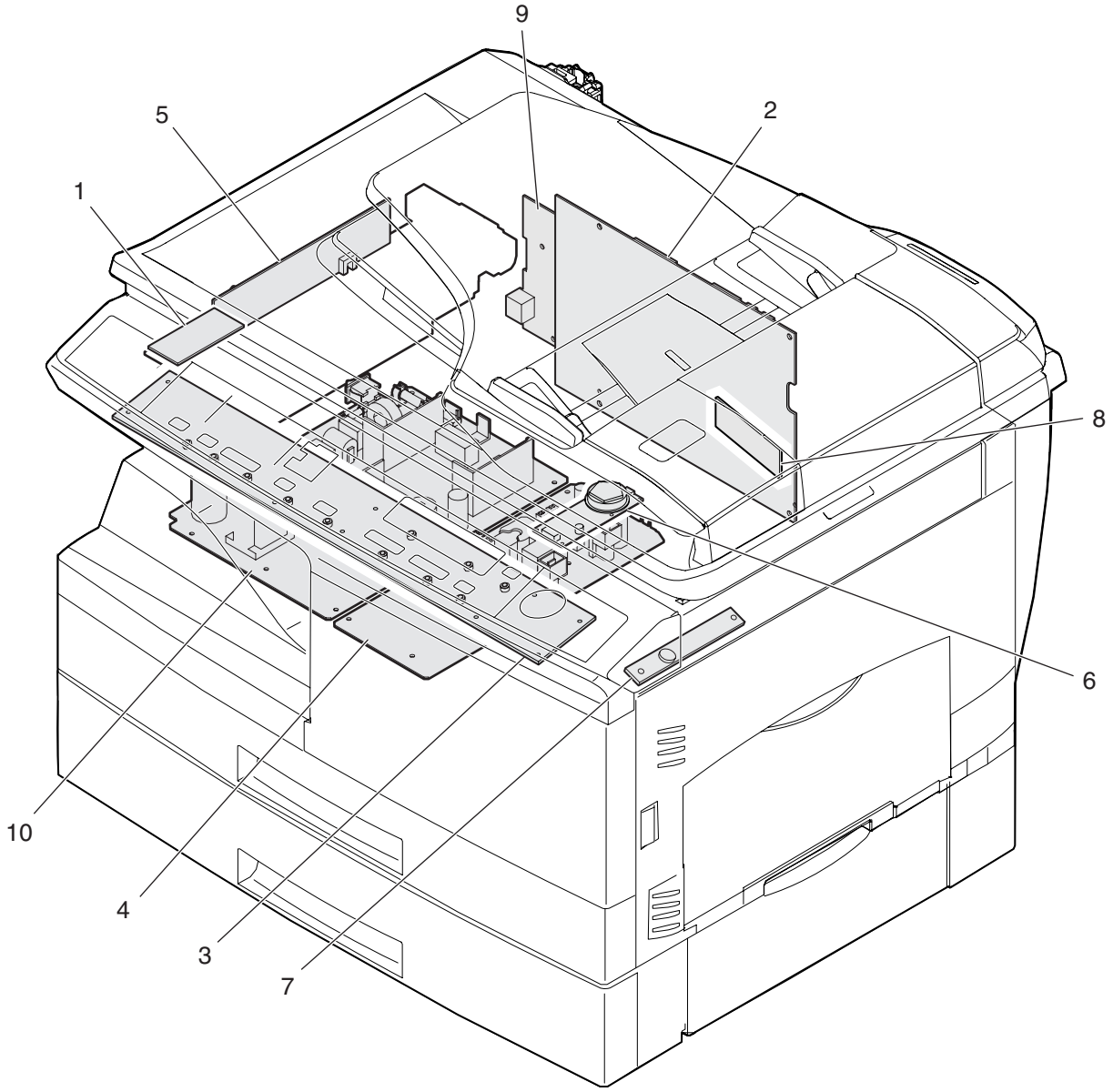
B. AL-2050CS



No.	Name	Signal	Type	Function	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)	1 or 0V of 24V at door open
7	Drum reset switch	DRST	Micro-switch	New drum detection switch	Instantaneously "H" at insertion of new drum
8	Paper empty sensor	SPID	Transmission sensor	Paper entry detection	"H" paper empty
9	Paper exit sensor	SRJD	Transmission sensor	Paper exit detection	"H" paper empty
10	2nd cassette	DSW	Micro-switch	2nd cassette door open detection	1 or 0V of 5V at door open
11	PPD3 sensor	PPD3	Transmission sensor	Paper transport detection 3	"L" at paper pass
12	Paper sensor	SPPD	Transmission sensor	Paper transport detection	"H" paper empty
13	Upper door open/close sensor	SCOD	Transmission sensor	Cover open/close detection	"L" open

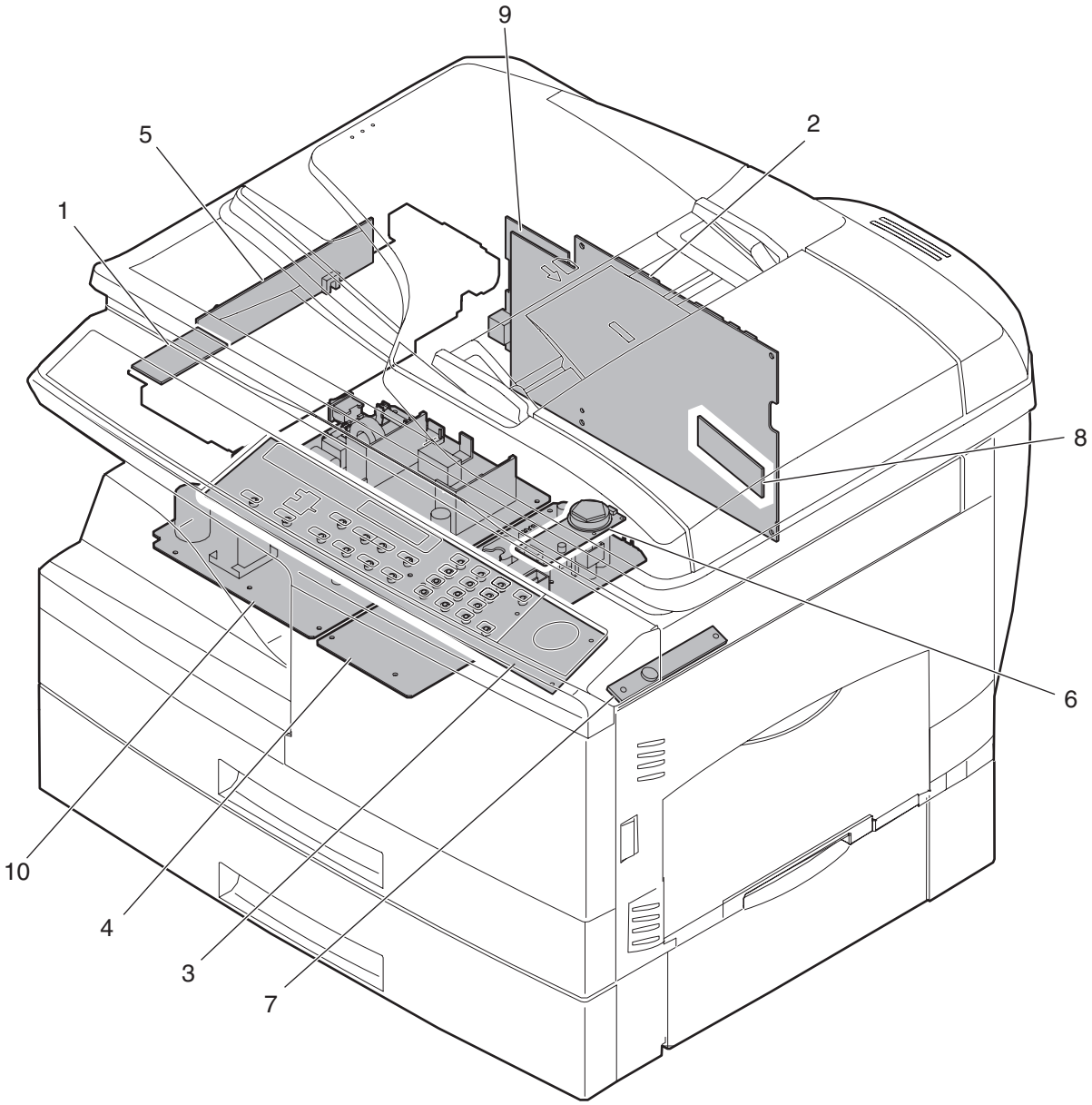
6. PWB unit

A. AL-2030/2040CS



No.	Name	Function
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	NIC PWB	Network print control (AL-2040CS only)
10	Power PWB	AC power input, DC voltage control

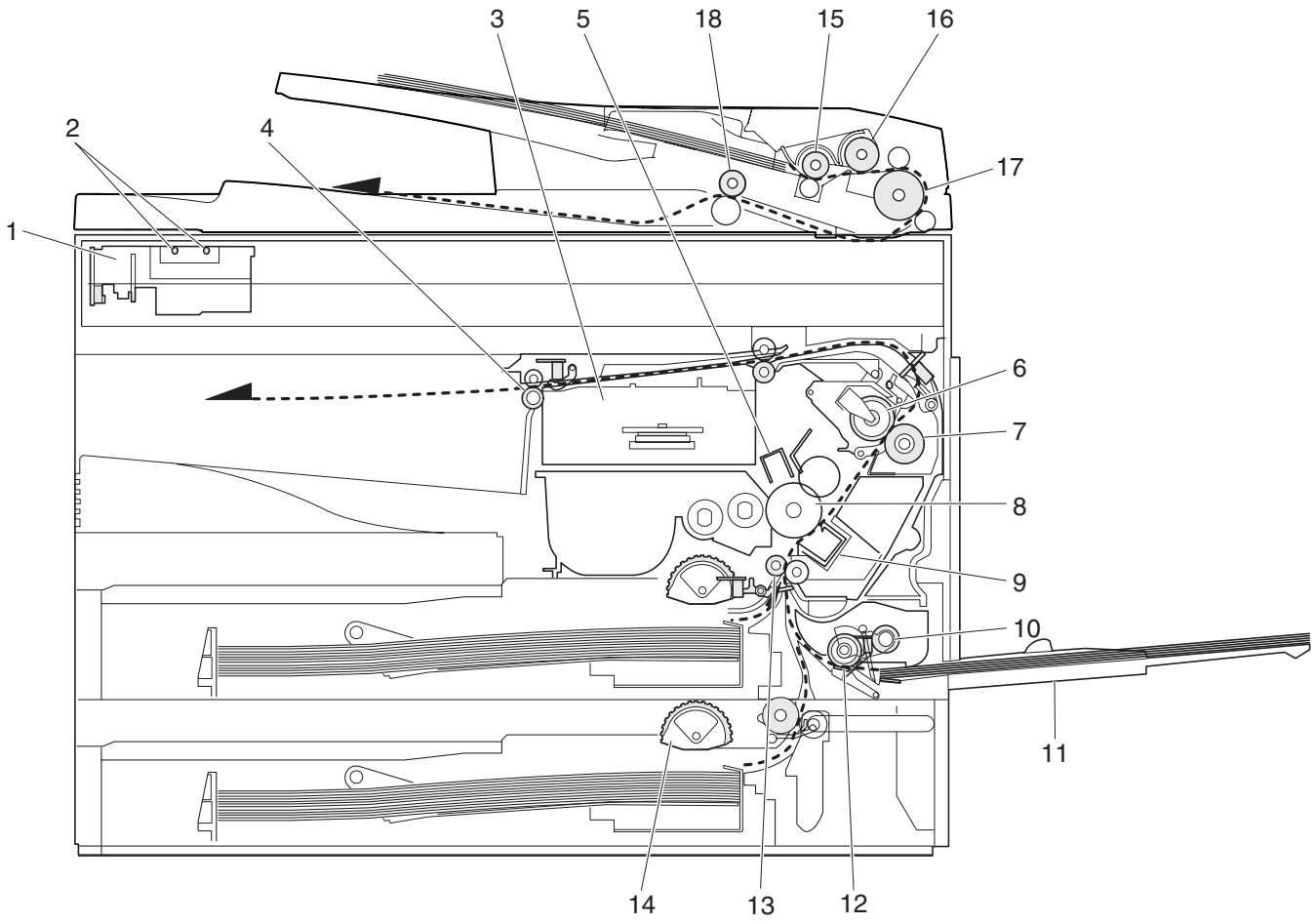
B. AL-2050CS



No.	Name	Function
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	NIC PWB	Network print control
10	Power PWB	AC power input, DC voltage control

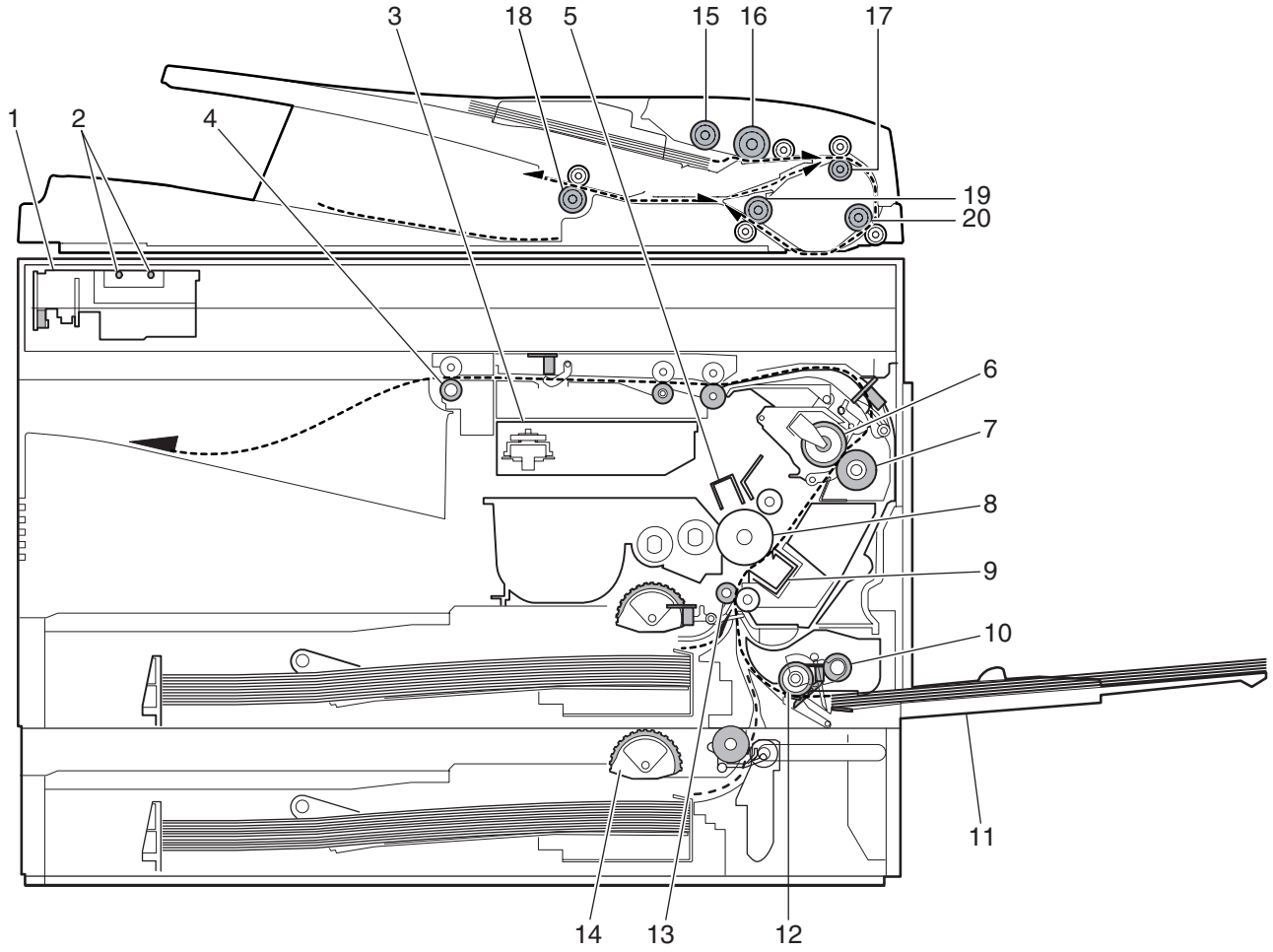
7. Cross sectional view

A. AL-2030/2040CS



No.	Part name	Function and 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.
16	Separation roller	Separates documents to feed properly.
17	PS roller	Feeds documents to the scanning section.
18	Paper exit roller	Discharges documents.

B. AL-2050CS



No.	Part name	Function and 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.
16	Separation roller	Separates documents to feed properly.
17	Upper transport roller	Transports of a document.
18	Paper exit roller	Discharges documents.
19	Lower transport roller	Transports of a document.
20	PS roller	Feeds documents to the scanning section.

[5] UNPACKING AND INSTALLATION

1. Copier installation

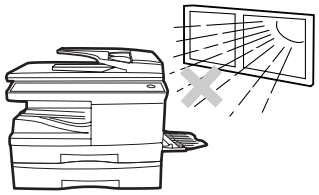
Improper installation may damage the copier. Please note the following during initial installation and whenever the copier is moved.

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.

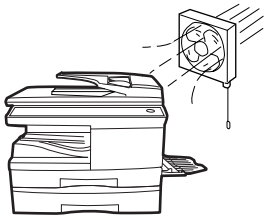
Do not install your copier in areas that are:

- damp, humid, or very dusty

- exposed to direct sunlight



- poorly ventilated



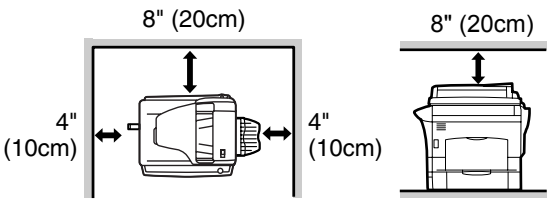
- subject to extreme temperature or humidity changes, e.g., near an air conditioner or heater.

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.

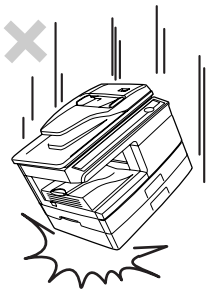
Be sure to allow the required space around the machine for servicing and proper ventilation.



2. Cautions on handling

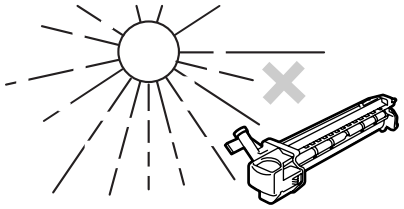
Be careful in handling the copier as follows to maintain the performance of this copier.

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.

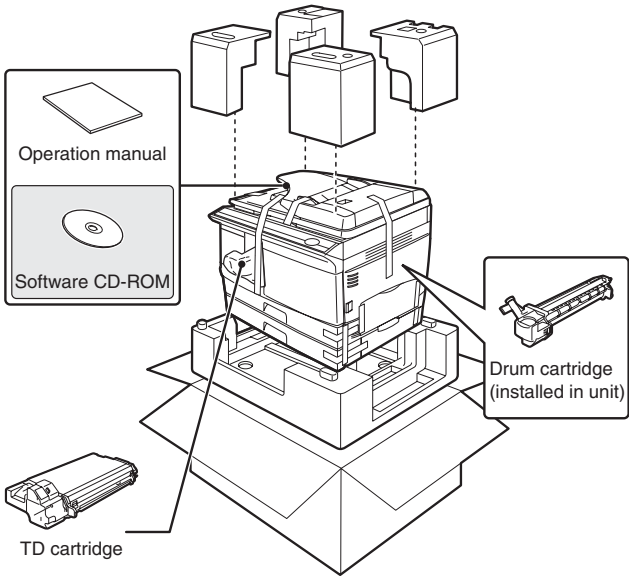
If they are exposed to direct sunlight, poor print quality may result.

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

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

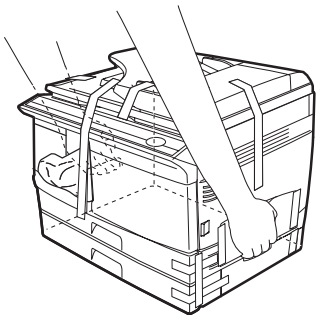
3. Checking packed components and accessories

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



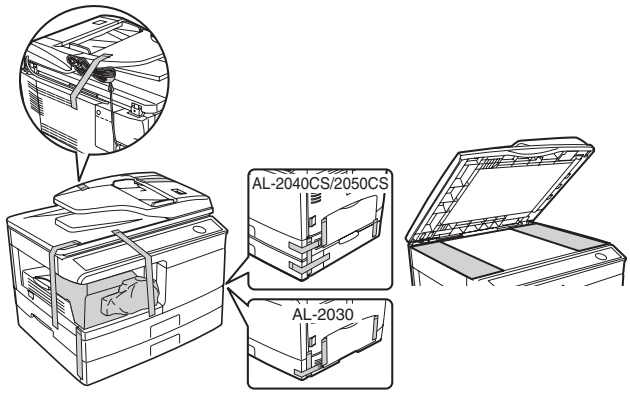
4. Unpacking

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

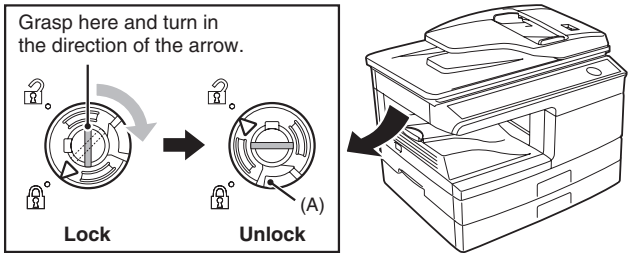
1) Remove all pieces of tape shown in the illustration below. Then open the SPF/RSPF and remove protective materials. After that, take out the bag containing the TD cartridge.



2) Release the scan head locking switch.

   The scan head locking switch is under the document glass.

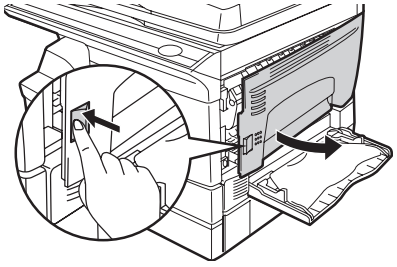
   If the switch is locked (🔒), the unit will not operate. Unlock the switch (🔓) as shown below.



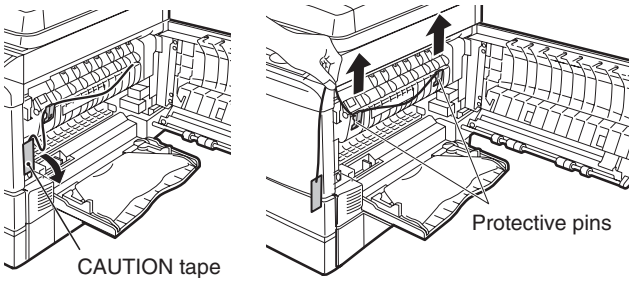
   To lock the scan head locking switch, hold up the catch in illustration (A) and turn the center knob counter-clockwise 90 degrees until you hear a click.

6. Installing the TD cartridge

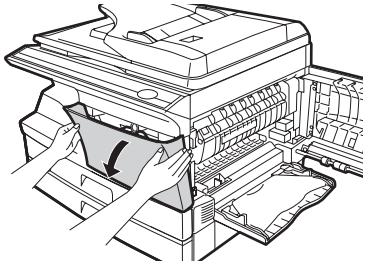
1) Open the multi-bypass tray, and then open the side cover.



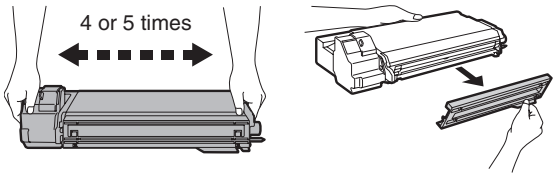
2) Remove the CAUTION tape from the front cover and remove the two protective pins from the fusing unit by pulling the strings upward one at a time.



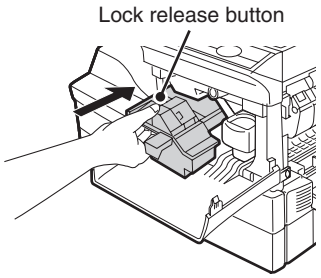
3) Push gently on both sides of the front cover to open the cover.



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.

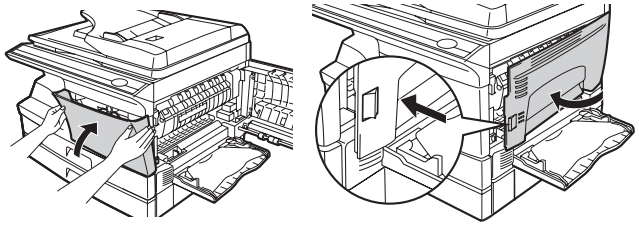


5) Gently insert the TD cartridge until it locks in place while pushing the lock release button.



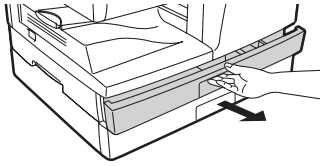
6) Close the front cover and then the side cover by pressing the round projections near the side cover open button.

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.

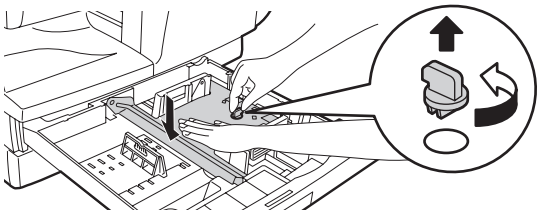


7. Loading paper

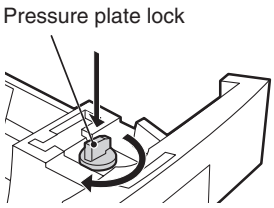
1) Raise the handle of the paper tray and pull the paper tray out until it stops.



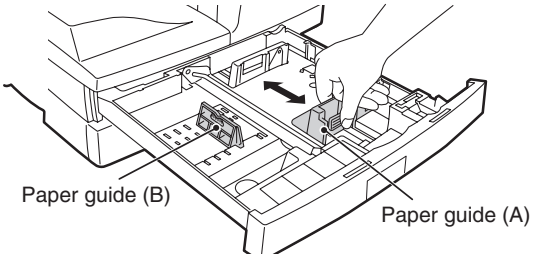
2) Remove the pressure plate lock. Rotate the pressure plate lock in the direction of the arrow to remove it while pressing down the pressure plate of the paper tray.



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.

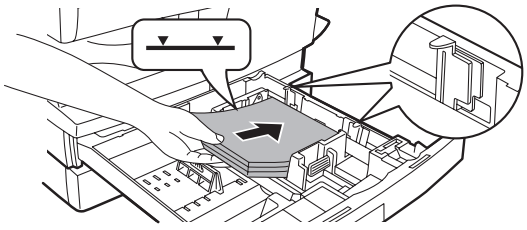


4) Adjust the paper guides on the paper tray to the copy paper width and length. Squeeze the lever of paper guide (A) and slide the guide to match with the width of the paper. Move paper guide (B) to the appropriate slot as marked on the tray.



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

Printer driver (AL-2030)

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.

Please note that the printing over a network connection is not possible.

MFP driver (AL-2040CS/2050CS)

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.

Please note that the Print Status Window does not operate when the machine is used as a network printer.

Scanner driver*

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

Sharpdesk* (AL-2040CS/2050CS)

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

Button Manager* (AL-2040CS/2050CS)

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. Before installation

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 or 10Base-T LAN interface
Operating system*3 *4	Windows 98, Windows Me, Windows 2000 Professional*5, Windows XP*5, Windows Vista*5
Display	800 x 600 dots (SVGA) display with 256 colors (or better) (AL-2030/2040CS) 1024 x 768 dots resolution and 16-bit color or higher is recommended. (AL-2050CS)
Hard disk free space	150 MB or more
Other hardware requirements	An environment on which any of the operating systems listed above can fully operate

*1: The machine's USB connector will transfer data at the speed specified by the USB 2.0 (Hi-Speed) only if the Microsoft USB 2.0 driver is installed in the computer.

*2: Compatible with Windows 98, Windows Me, Windows 2000 Professional, Windows XP or Windows Vista preinstalled model standardly equipped with a USB port.

*3: Printing is not available in MS-DOS mode.

*4: The machine does not support printing from a Macintosh environment.

*5: Administrator's rights are required to install the software using the installer.

Installation environment and usable software

The following table shows the drivers and software that can be installed for each version of Windows and interface connection method.

Cable	Operating system	Printer driver	Scanner driver	Button Manager	Sharpdesk
USB	Windows 98/ Me/2000/XP/ Vista*1	Available*2	Available		
LAN	Windows 98/ Me/2000/XP/ Vista*1		Not Available*3		

*1: By running change

*2: The printer driver that is installed will vary depending on the type of connection between the machine and your computer.

*3: Although it is possible to install Button Manager and Sharpdesk on Windows 98/Me/2000/XP/Vista, neither Button Manager nor the scanner function of Sharpdesk can actually be used. (AL-2030/2040CS)

B. Installing the software

Note:

- If you need to use a different connection method after installing the software using a USB or network connection, you must first uninstall the software and then install it using the new connection method.
- In the following explanations it is assumed that the mouse is configured for right hand operation.
- The scanner function only works when using a USB cable.
- If an error message appears, follow the instructions on the screen to solve the problem. After the problem is solved, the installation procedure will continue. Depending on the problem, you may have to click the "Cancel" button to exit the installer. In this case, reinstall the software from the beginning after solving the problem.

(1) Using the machine with a USB connection

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 CD-ROM into your computer's CD-ROM drive.

3) Click the "start" button, click "My Computer", and then double-click the CD-ROM icon.
   - In Windows Vista, click the "Start" button, click "Computer", and then double-click the CD-ROM icon.
   - In Windows 98/Me/2000, double-click "My Computer", and then double-click the CD-ROM icon.

4) Double-click the "setup" icon.

   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.

(AL-2030)

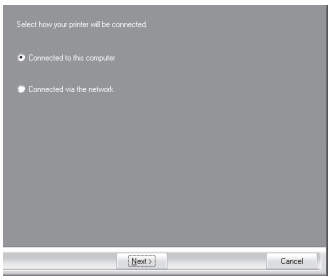
7) To install all of the software, click the "Standard" button and go to step 12).

   To install particular packages, click the "Custom" button and go to next step.

8) Click the "Printer 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.

   When "The installation of the SHARP software is complete." appears, click the "OK" button and go to step 12).

   Caution:

   - If you are using Windows Vista 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".

(AL-2040CS/2050CS)

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) The files required for installation of the MFP driver are copied.

   Follow the on-screen instructions.

   When "The installation of the SHARP software is complete." appears, click the "OK" button.

   Caution:

   - If you are using Windows Vista 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).

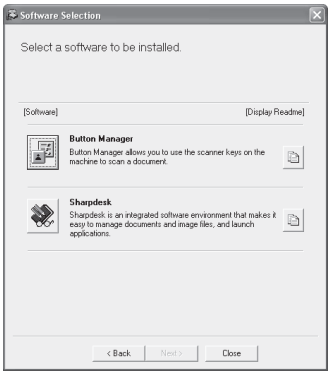
    Note: After the installation, a message prompting you to restart your computer may appear. In this case, click the "Yes" button to restart your computer.

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.

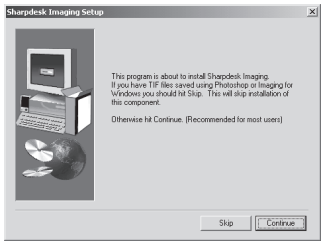
    Follow the on-screen instructions.



    Caution: In Windows 98/Me/2000, if the following screen appears, click the "Skip" button or the "Continue" button as appropriate to continue the Sharpdesk installation.

    If "Skip" is selected, the Sharpdesk installation will continue without installing Sharpdesk Imaging.

    If "Continue" is selected, Sharpdesk Imaging will be installed. If Imaging for Windows is installed on your computer, Sharpdesk Imaging will overwrite Imaging for Windows.



12) When installing is finished, click the "Close" button.

    Caution:

    - If you are using Windows Vista 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) Make sure that the power of the machine is turned on, and then connect the USB cable (p.5-6).

    Windows will detect the machine and a Plug and Play screen will appear.

14) Follow the instructions in the plug and play window to install the driver.

    Follow the on-screen instructions.

    Caution:

    - If you are using Windows Vista 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".

Note: A "USB 2.0 Composite Device" installation window may appear prior to this procedure. In this case, follow the instructions in the window to install the USB 2.0 Composite Device.

This completes the installation of the software.

- If you installed Button Manager, set up Button Manager as explained in "Setting up the Button Manager" (p.5-9).
- If you installed Sharpdesk, the Sharpdesk setup screen will appear. Follow the instructions in the screen to set up Sharpdesk.

(2) Connecting a USB cable

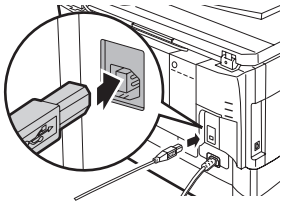
Follow the procedure below to connect the machine to your computer.

A USB cable for connecting the machine to your computer is not included with the machine. Please purchase the appropriate cable for your computer.

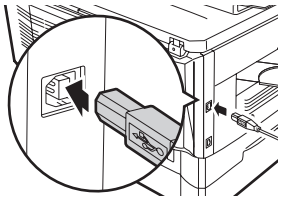
Caution:

- USB is available with a PC/AT compatible computer that was originally equipped with USB and had Windows 98, Windows Me, Windows 2000 Professional, Windows XP Professional or Windows XP Home Edition preinstalled.
- Do not connect the USB cable before installing the printer driver. The USB cable should be connected during installation of the printer driver.

1) Insert the cable into the USB connector on the machine.



(AL-2030/2040CS)



(AL-2050CS)

2) Insert the other end of the cable into your computer's USB port.

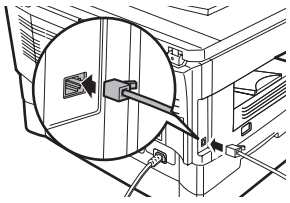
(3) Using the machine as a network printer (AL-2040CS/2050CS only)

Note:

- Interface cables for connecting the machine to your computer are not included with the machine. Please purchase the appropriate cable for your computer.
- If you intend to use the machine as a scanner, it must be connected to your computer with a USB interface cable. The scanner function cannot be used if the machine is connected with a LAN cable.

1) Insert the LAN cable into the LAN connector on the machine.

   Use a network cable that is shielded.



2) Turn on the machine.
3) Insert the CD-ROM into your computer's CD-ROM drive.
4) Click the "start" button, click "My Computer", and then double-click the CD-ROM icon.
   - In Windows Vista, click the "Start" button, click "Computer", and then double-click the CD-ROM icon.
   - In Windows 98/Me/2000, double-click "My Computer", and then double-click the CD-ROM icon.
5) Double-click the "setup" icon.

   In Windows Vista, if a message screen appears asking you for confirmation, click "Allow".

6) 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.

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

   Note: To set the IP address of the machine, follow the steps below. If the machine is already connected to the network and its IP address has been set, go to "LPR (TCP/IP) direct printing" (p.5-7).

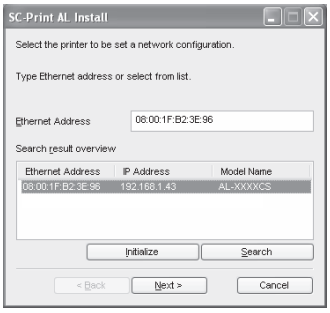
Set the IP Address

This setting is only required once when using the machine on a network.

8) Click the "Set the IP Address" button.

9) The printer or printers connected to the network will be detected.

   Click the printer to be configured (the machine) and click the "Next" button.



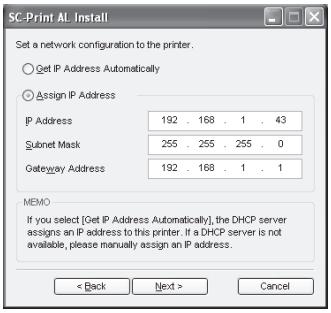
Note:

- The "Ethernet Address" is indicated on the left side of the machine near the LAN connector.
- If the machine can not be recognized, enter the Ethernet Address and click the "Initialize" button to initialize the IP address. Follow the on-screen instructions to click the "OK" button and then the "Search" button. If the machine is still not recognized, disable your computer's firewall and then repeat the installation from the beginning.

10) Enter the IP address, subnet mask, and default gateway.

The settings in the above window are examples.

Be sure to ask your network administrator for the correct IP address, subnet mask, and default gateway to be entered.



Note: When "Get IP Address Automatically" is selected, the IP address may at times change automatically. This will prevent printing. In this event, select "Assign IP Address" and enter the IP address.

11) Click the "Next" button.

12) Click the "Yes" button in the confirmation dialog box that appears.

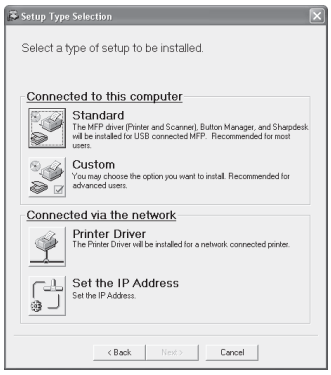
Go to "LPR (TCP/IP) direct printing" step 11).

LPR (TCP/IP) direct printing

After step 1) - 7) on page 5-6.

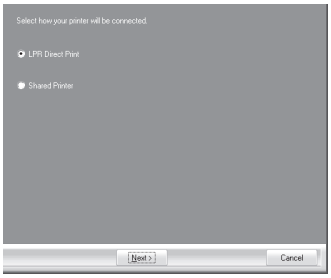
8) Click the "Printer Driver" button.

If you have not set the IP Address, click the "Set the IP Address" button first and go to step 8).



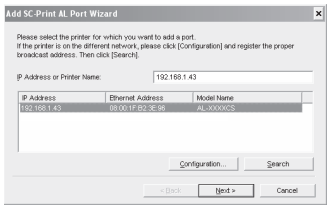
9) Read the message in the "Welcome" window and then click the "Next" button.

10) Select "LPR Direct Print" and click the "Next" button.



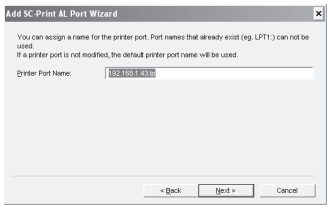
11) The printer or printers connected to the network will be detected.

Click the printer to be configured (the machine) and click the "Next" button.



Note: If the machine's IP address cannot be found, make sure the machine is powered on, make sure the network cable is connected correctly, and then click the "Search" button.

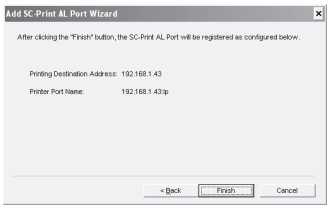
12) In the window for setting the destination print port name, make sure that ":lp" appears at the end of the IP address and click the "Next" button.



Note: Any name can be entered in "Printer Port Name" (maximum of 38 characters).

13) A window appears to let you check your entries. Make sure that the entries are correct and then click the "Finish" button.

If any of the entries are incorrect, click the "Back" button to return to the appropriate window and correct the entry.



14) Select the port you want to use with the machine, and click the "Next" button.

15) Select whether or not you wish the printer to be your default printer and click the "Next" button.

Follow the on-screen instructions.

Caution:

- If you are using Windows Vista 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".

16) When "The installation of the SHARP software is complete." appears, click the "OK" button.

17) When the "Finish" screen appears, 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.

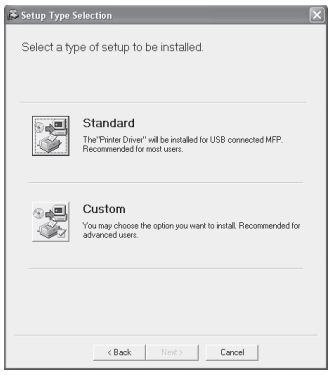
This completes the installation of the software.

(4) Using the machine as a shared printer (AL-2030)

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.

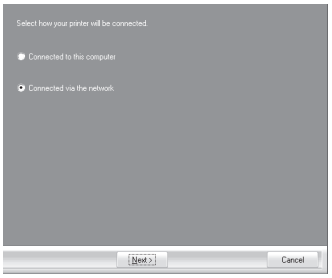
1) Perform steps 2) through 6) in "Using the machine with a USB connection" (p.5-4).
2) Click the "Custom" button.



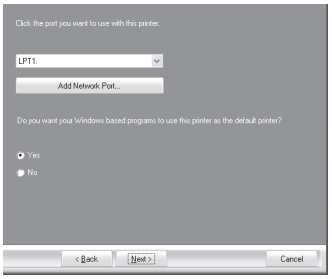
3) Click the "Printer Driver" button.

   Click the "Display Readme" button to show information on packages that are selected.

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

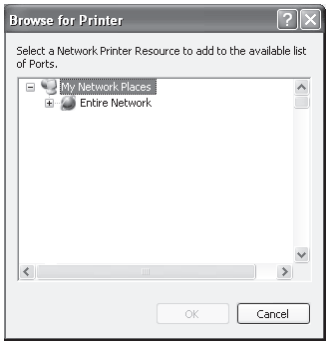


5) Click the "Add Network Port" button.



6) Select the network printer that is shared and click the "OK" button.

   Ask your network administrator for the server name and printer name of the machine on the network.



7) In the printer port selection window, verify the network printer that is shared and whether the machine is to be used as the default printer, make the selections and click the "Next" button.

   Follow the on-screen instructions.

   Caution: 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".

8) 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.

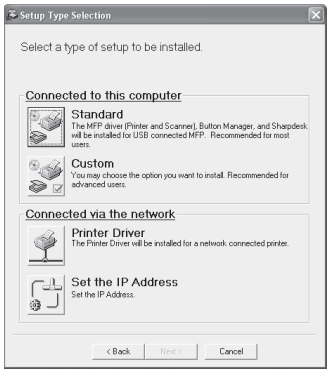
This completes the installation of the software.

(5) Sharing the printer using windows networking (AL-2040CS/2050CS)

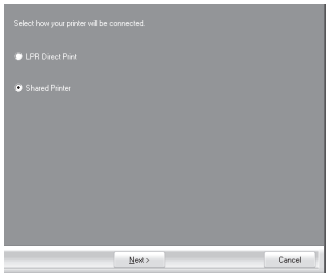
If the machine will be used as a shared printer on a network, follow these steps to install the printer driver in the client computer.

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

1) Perform steps 3) through 7) in "Using the machine as a network printer" (p.5-6).
2) Click the "Printer Driver" button.

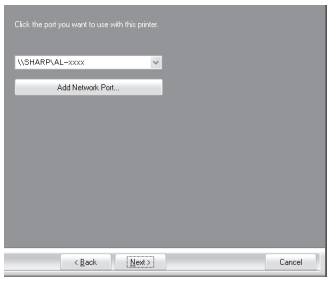


3) Select "Shared Printer" and click the "Next" button.



4) For the port to be used, select the machine set as a shared printer, and click the "Next" button.

You can also click the "Add Network Port" button and select the printer to be shared (the machine) by browsing the network in the window that appears.



Note: If the shared printer does not appear in the list, check the settings in the printer server.

5) Follow the on-screen instructions.

6) When the "Finish" screen appears, 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. Setting up Button Manager (AL-2040CS/2050CS only)

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

1) Click the "start" button, click "Control Panel", click "Printers and Other Hardware", and then click "Scanners and Cameras".

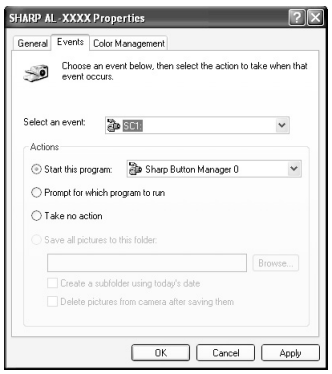
In Windows Vista, click the "Start" button, select "Control Panel" and click "Hardware and Sound", and then click "Scanners and Cameras".

2) Click the "SHARP AL-XXXX" icon and select "Properties" from the "File" menu.

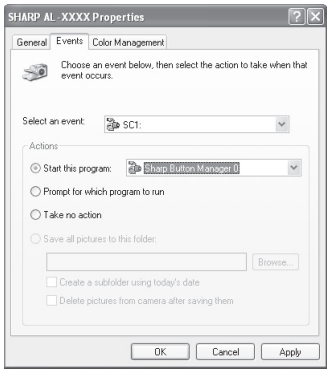
In Windows Vista, select "Properties" from the "Organize" menu.

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 O" from the pull-down menu.



6) Click the "Apply" button.

7) Repeat Steps 4) through 6) 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 O" from the pull-down menu, and then 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" in the Online Manual.

(2) Windows 98/Me/2000

1) Click the "Start" button, select "Settings", and then click "Control Panel".

2) Double-click the "Scanners and Cameras" icon.

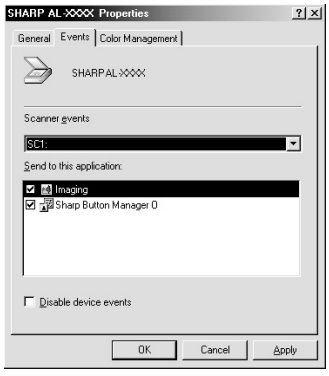
Note: If the "Scanners and Cameras" icon does not appear in Windows Me, click "view all Control Panel options".

3) Select "SHARP AL-XXXX" and click the "Properties" button.

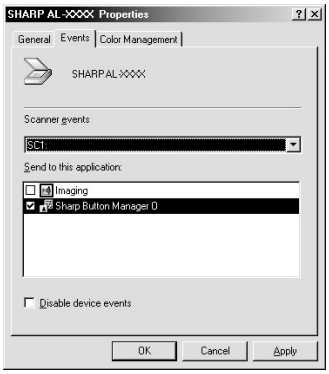
In Windows Me, right click "SHARP AL-XXXX" and click "Properties" in the pop-up menu.

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

5) Select "SC1:" from the "Scanner events" pull-down menu.



6) Select "Sharp Button Manager O" 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 O" 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 menus 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" in the Online Manual.

10. Interface

A. USB

Connector

Type-B connector

Cable

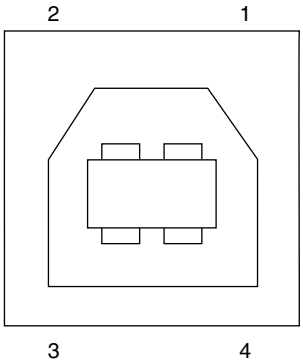
Shielded twisted pair cable

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

Pin configuration

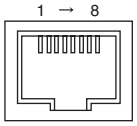
The pin numbers and signal names are listed in the following table.

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



B. RJ45

RJ-45 connector pin arrangement



Pin No.	Signal name	LAN adapter RJ-45 connector
1	TD+	Send output +
2	TD–	Send output -
3	RD+	Receive input +
6	RD–	Receive input -
4, 5, 7, 8	Not used.	Not used.

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

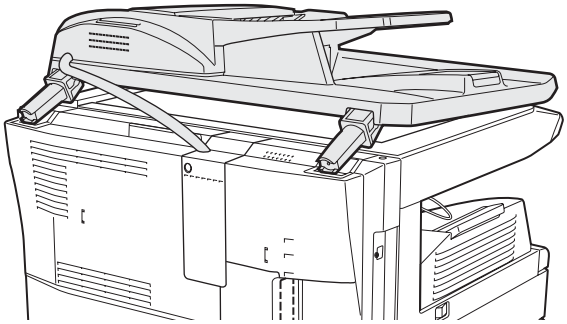
Clean the position where each cushion/mylar is attached with industrial alcohol before the work.

C. Attachment method

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

1) Detach the RSPF.

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

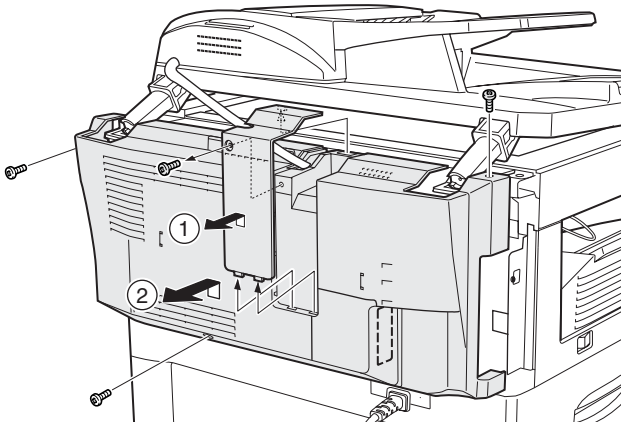


2) Remove the rear cabinet.

   <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 RSPF, and remove the RSPF from the machine.

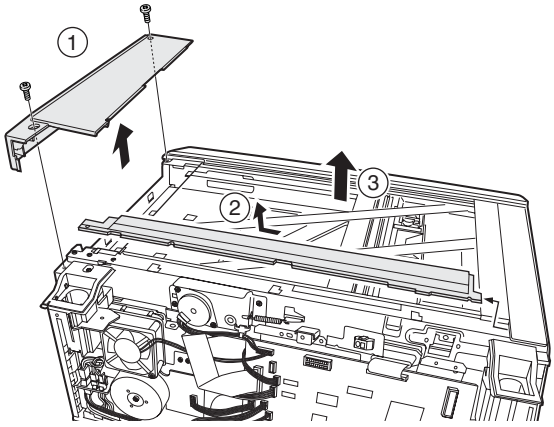


3) Remove the rear cover for the document glass.

   <1> Remove the two screws and then remove the right glass holder.

   <2> Slide the rear cover for the document glass to remove it.

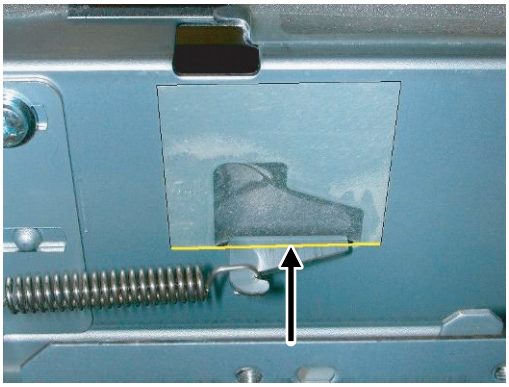
   <3> Remove the table glass.



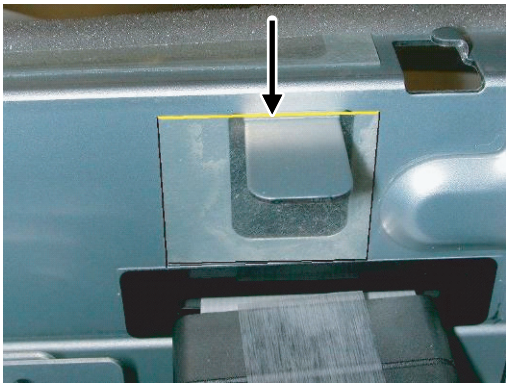
4) Attach the Scanner condensation prevention mylar at the 3 positions on the rear side of the main unit as described below.

   Note: The hole should be covered with the mylar.

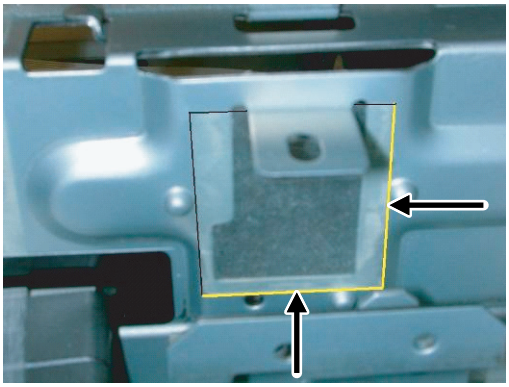
   Align the edge of the mylar to the R part (the yellow line in the diagram below) so that the hole of the metal plate is covered as much as possible.



   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).

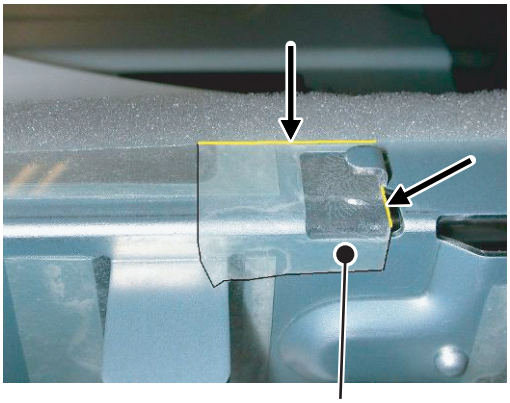


5) Attach the Optical right hole mylar B at the 2 positions shown in the diagrams below which are at the top of the rear side of the main unit.

Note: The holes should be covered with the mylar.

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

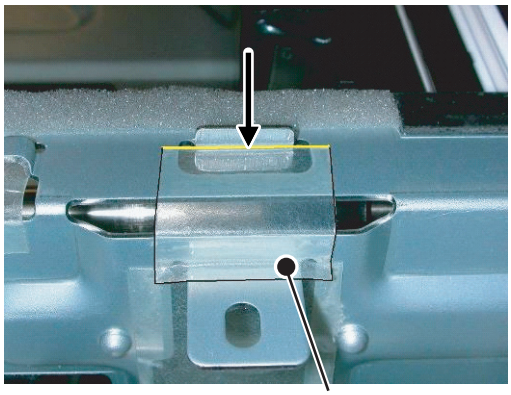
Align with the inside line of the bent part (the yellow line in the diagram below).



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.

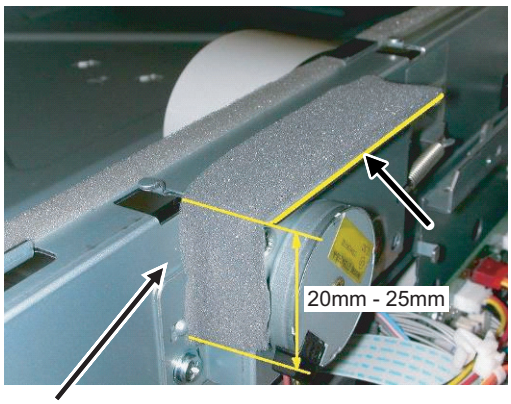


Stick the excessive part on the side.

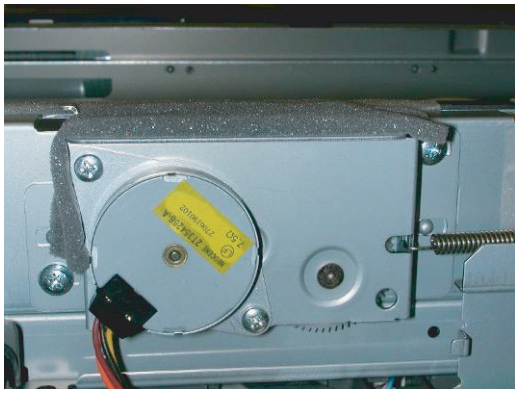
6) Attach the Scanner motor metal plate cushion at 1 position on the attachment plate of the motor on the rear side of the main unit.

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).

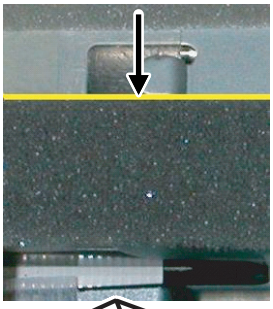


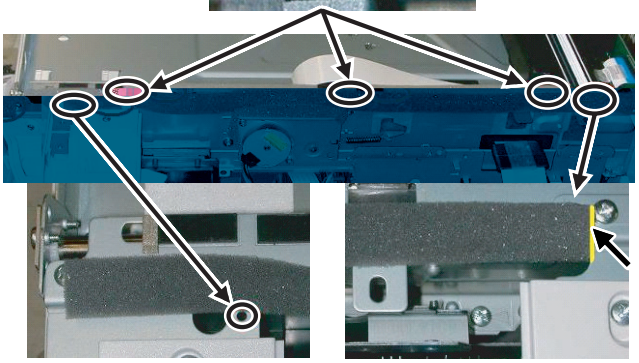
Press and attach the cushion aligning it to the metal plate so that there will be no gap between them.



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.

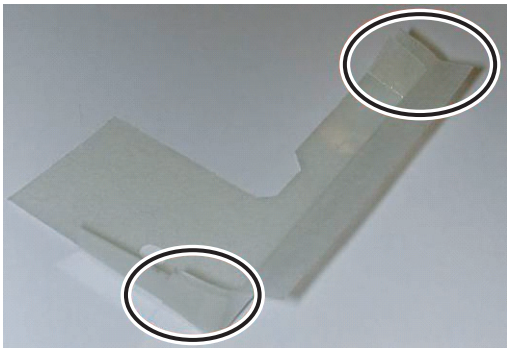
Align the edge of the cushion with the edge of the metal plate.

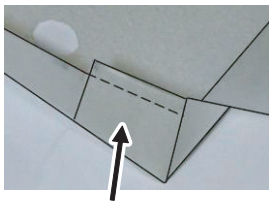
Bend the part which is sticking out to the rear side of the scanner and attach to the surface.

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

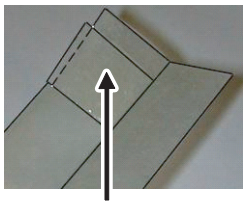
Press the cushion to make sure all the holes are covered.

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





Stick together.



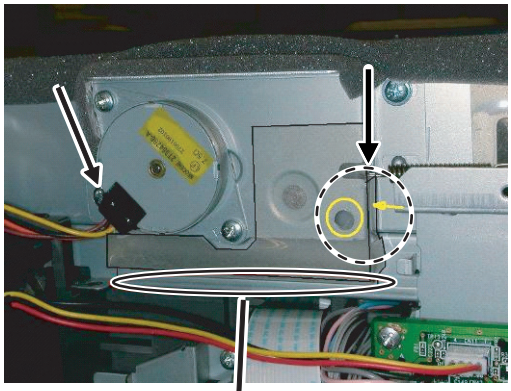
Stick together.

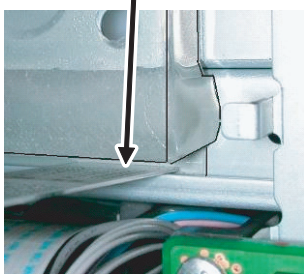
9) Attach the Scanner motor lower mylar at 1 position under the motor attachment plate on the rear side of the main unit.

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.



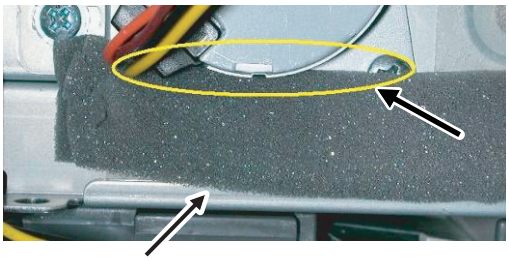


Press the mylar with a sharp-pointed stick or something so that it is stuck correctly.

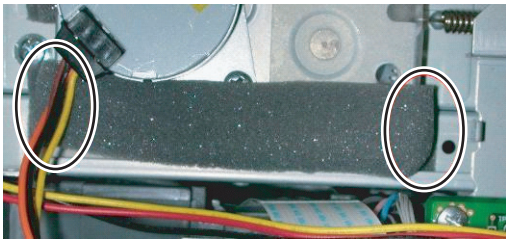
10) Attach the Scanner motor metal plate cushion covering the bottom part of the Scanner motor lower mylar.

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

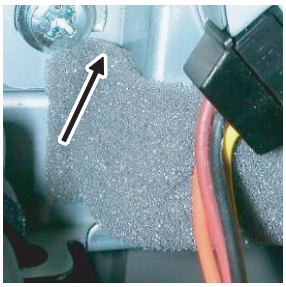
Attach the cushion to cover the gap between the mylar and the metal plate (the yellow mark).

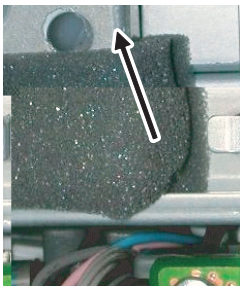


Stick the lower part of the cushion to the mylar, too.

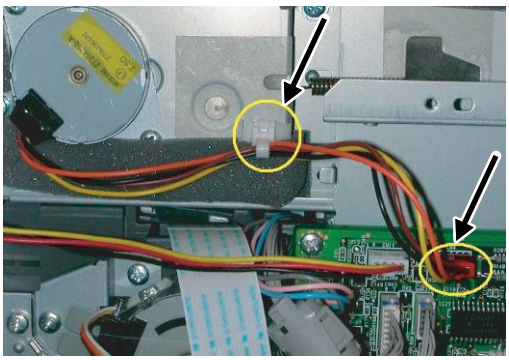


Press the cushion with a sharp-pointed stick or something to fill the gap between the mylar and the metal plate.





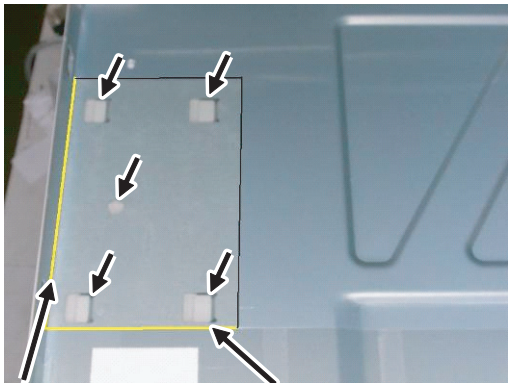
11) Attach the motor connector and the snap band to the original position.



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.

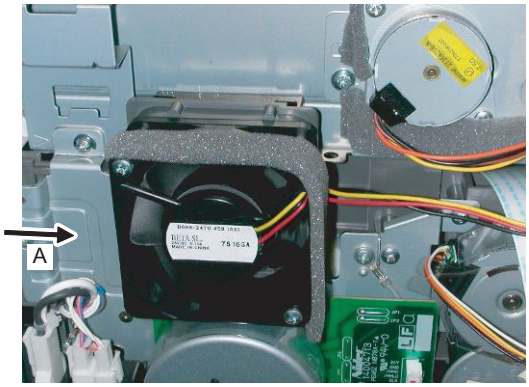
Attach along with the bent part of the metal plate and align the edge of the mylar with the line shown in the diagram (the yellow line in the diagram).

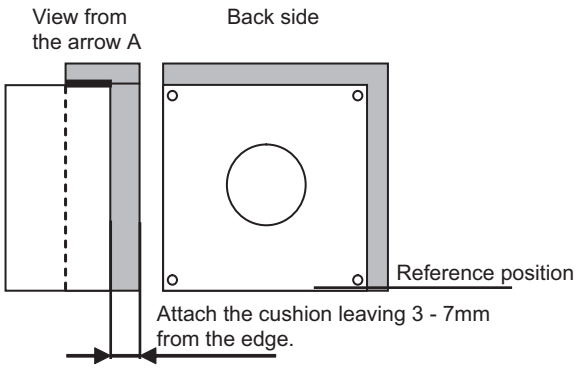


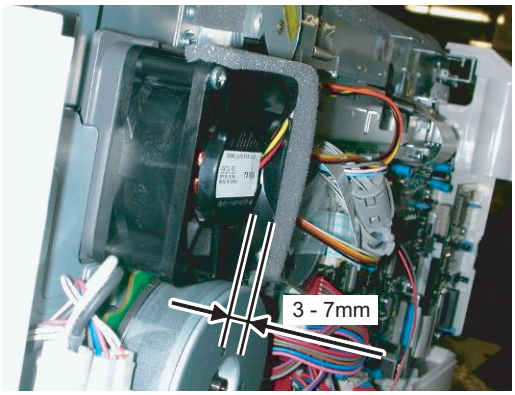
13) Attach the Fan housing cushion to the cooling fan at the position shown in the diagram below.

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.





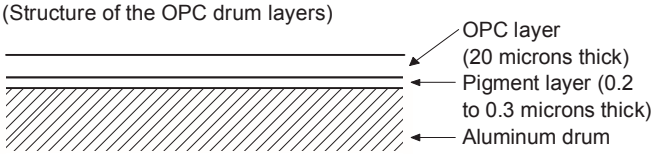


Attach the cushion leaving 3 - 7mm from the edge so that the gap between the Fan housing cushion and the filter of the rear cabinet is filled for sure.

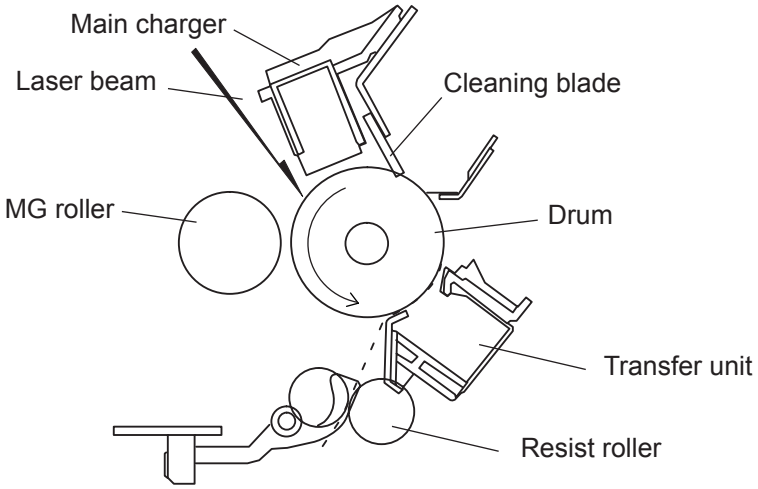
14) Attach the parts removed in the items 1), 2), and 3).

[6] COPY PROCESS

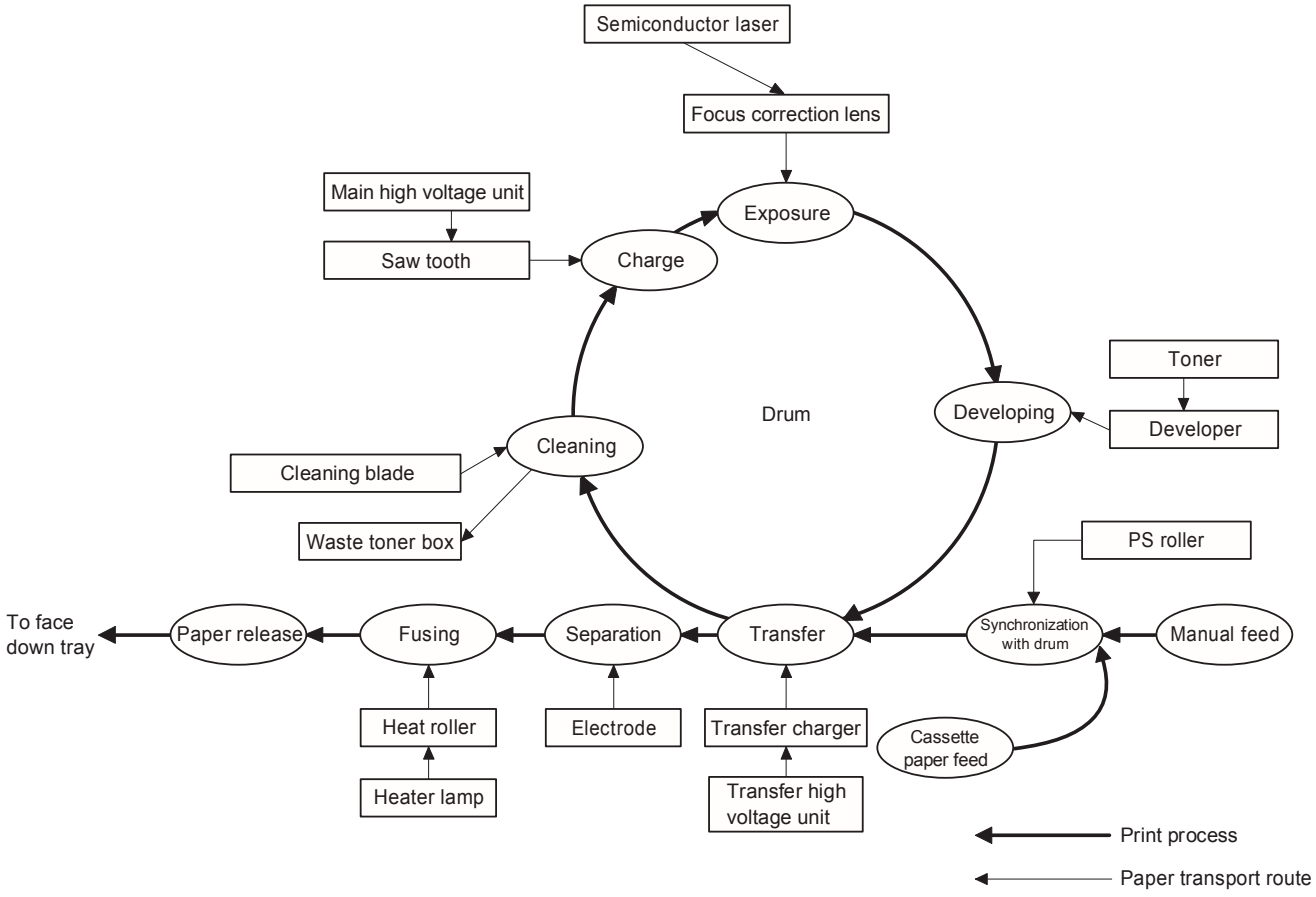
An OPC drum is used for the photoconductor.
(Structure of the OPC drum layers)



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.

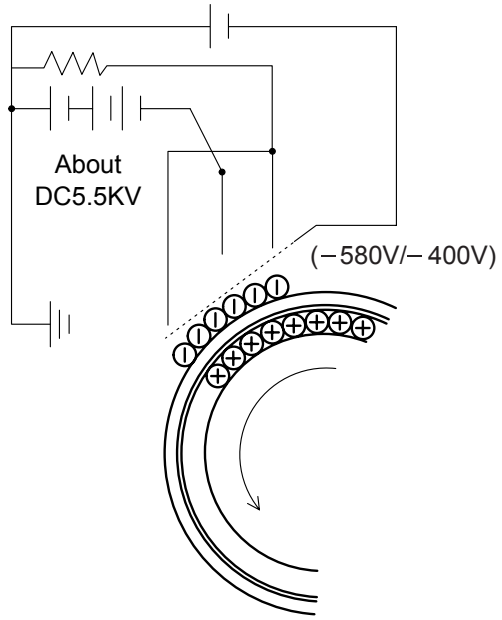
Step-6: Optical discharge
Residual charge on the drum surface is removed, by semiconductor laser beam.

3. Actual print process

Step-1: DC charge

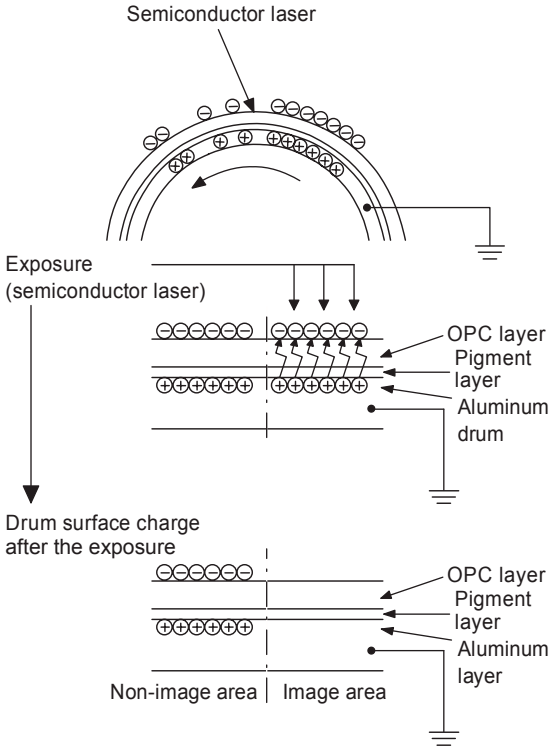
A uniform negative charge is applied over the OPC drum surface by the main charging unit. Stable potential is maintained by means of the Scorotron charger.

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.

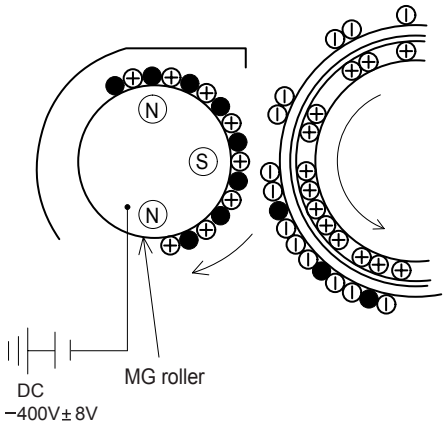


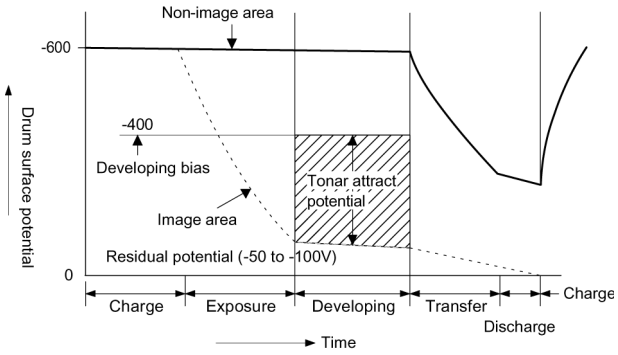
Step-3: Developing (DC bias)

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)

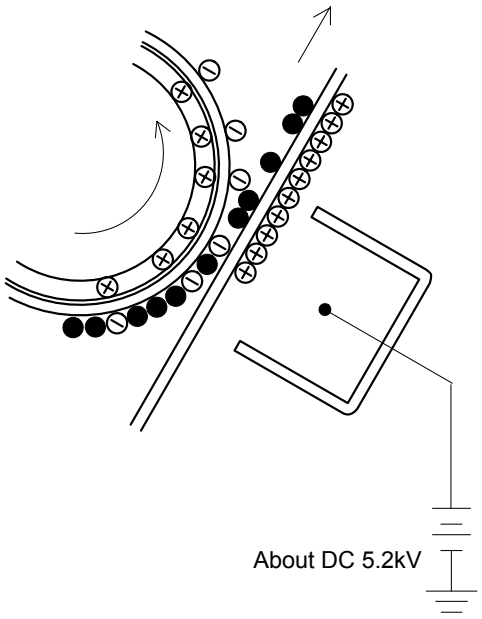




Toner is attracted over the shadowed area because of the developing bias.

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.

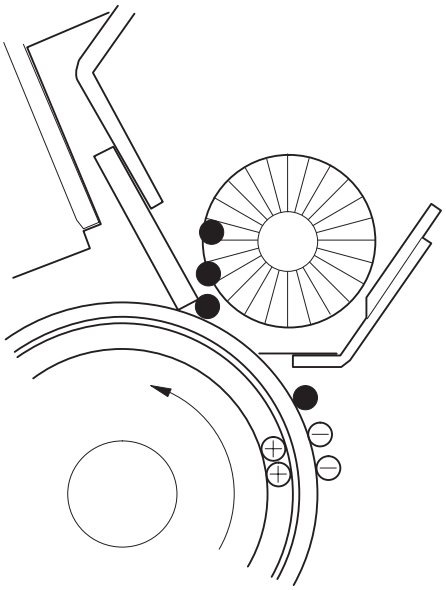


Step-5: Separation

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

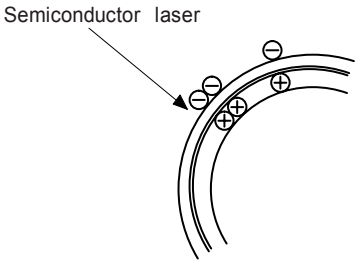
Toner remaining on the drum is removed and collected by the cleaning blade. It is transported to the waste toner collecting section in the cleaning unit by the waste toner transport roller.



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

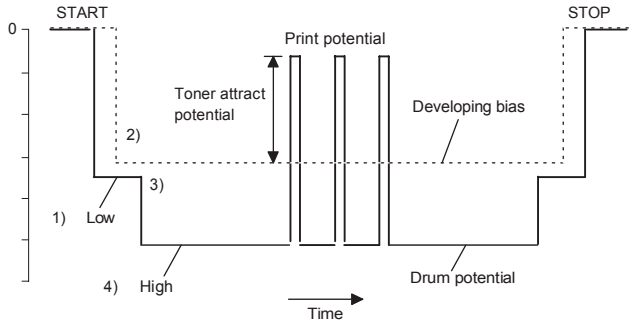
Function

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

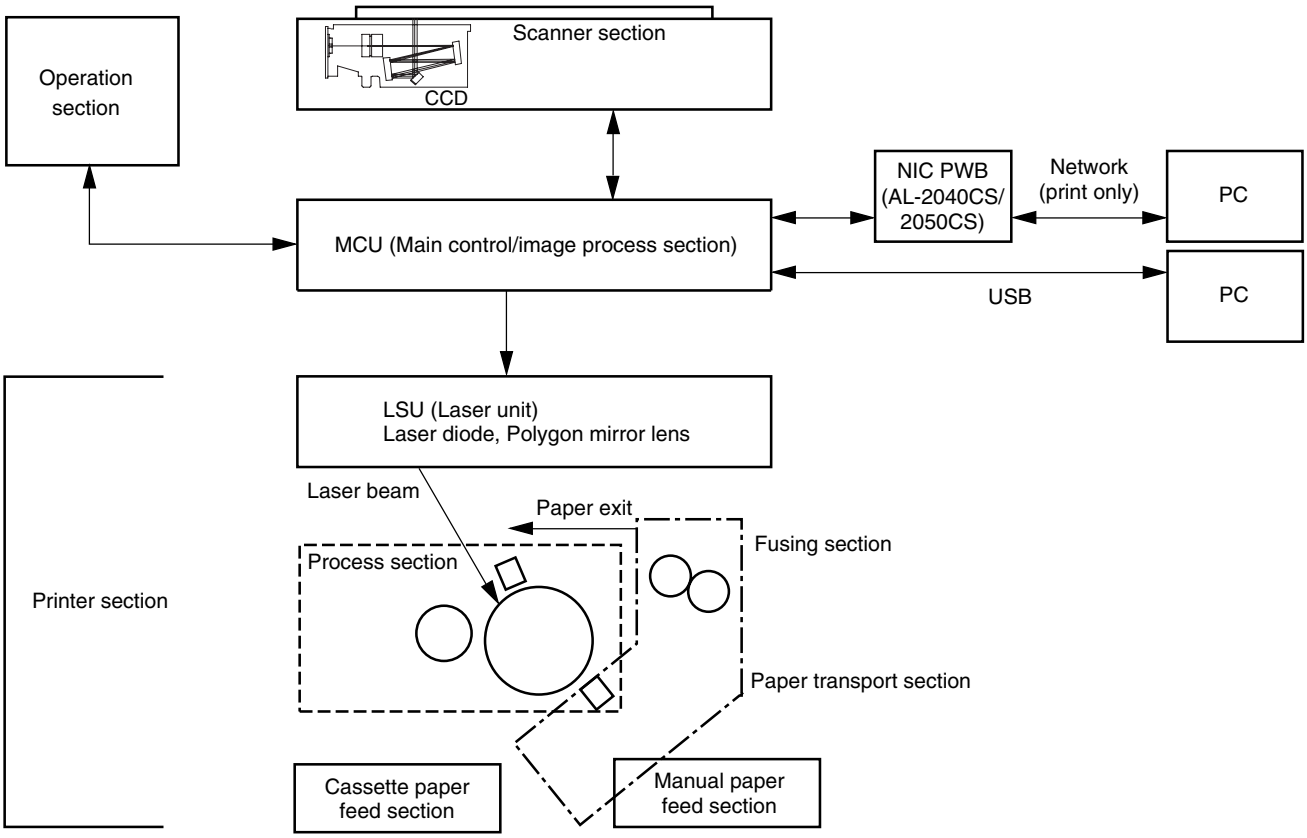
Normally, the developing bias voltage is retained for a certain time before the drum comes to a complete stop if the machine should stop before completing the normal print cycle. The developing bias can be added before resuming the operation after an abnormal interruption. Therefore, carrier will not 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 NIC PWB (in case of network connection) and the MCU to the LSU. 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.

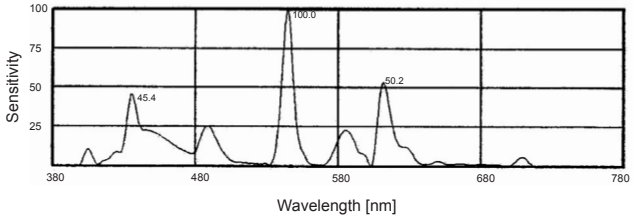
Light radiated from the light source is applied to the document on the document table. The reflected light from the document is reflected 4 times by No. 1 - No. 3 mirrors and passed through the reduction lens to form images on the light-receiving surface of 3-line CCD.

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)

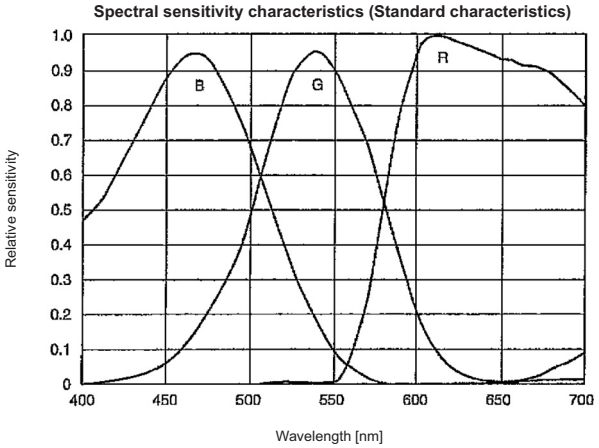
The resolution is 600dpi.

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

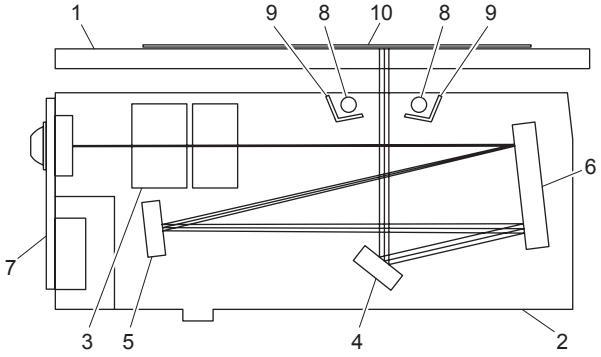
The color component for printing can be switched to red or blue by the service simulation.



(Spectrum characteristics of the lamp)



(Spectrum characteristics of the color CCD)



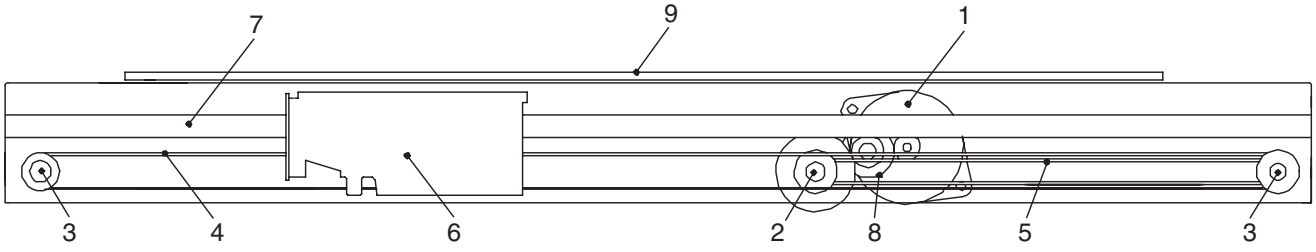
(Optical unit)

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

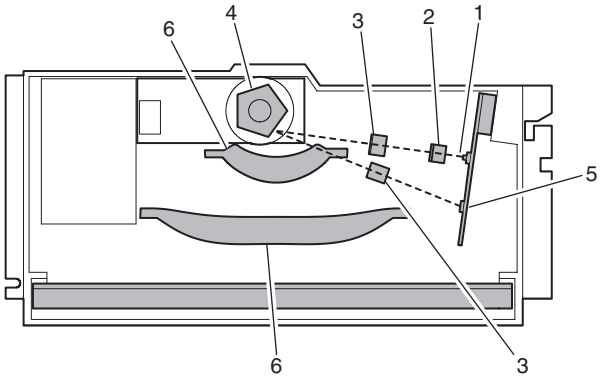
The image data sent from the MCU (image process circuit) is sent to the LSU (laser unit), where it is converted into laser beams.

A. Basic structure

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

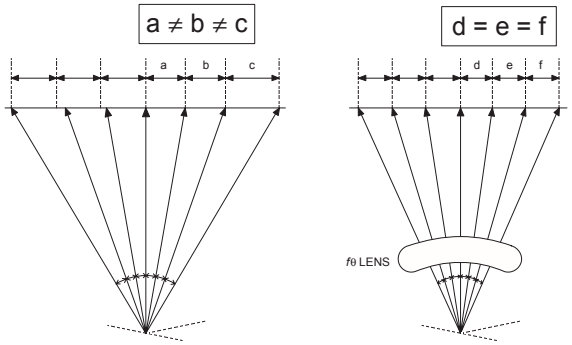
The semiconductor laser is used as the light source, and images are formed on the OPC drum by the polygon mirror and fθ lens, etc.

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.

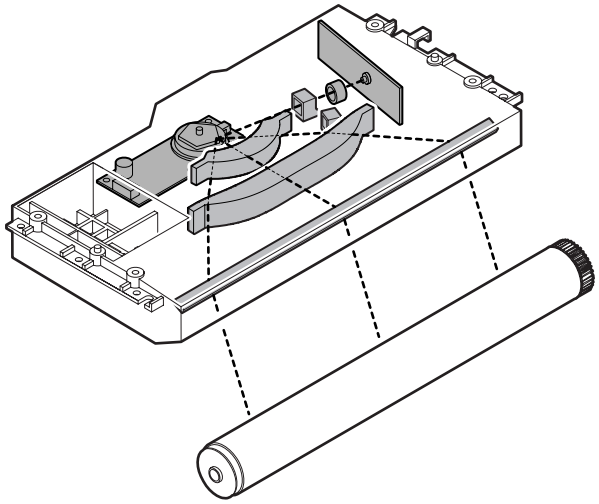


No	Component	Function
1	Semiconductor laser	Generates laser beams.
2	Collimator lens	Converges laser beams in parallel.
3	Cylinder lens	Takes the focus.
4	Polygon mirror, polygon motor	Reflects laser beams at a constant rpm.
5	BD (Lens, PWB)	Detects start timing of laser scanning.
6	fθ lens	Converges 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.)

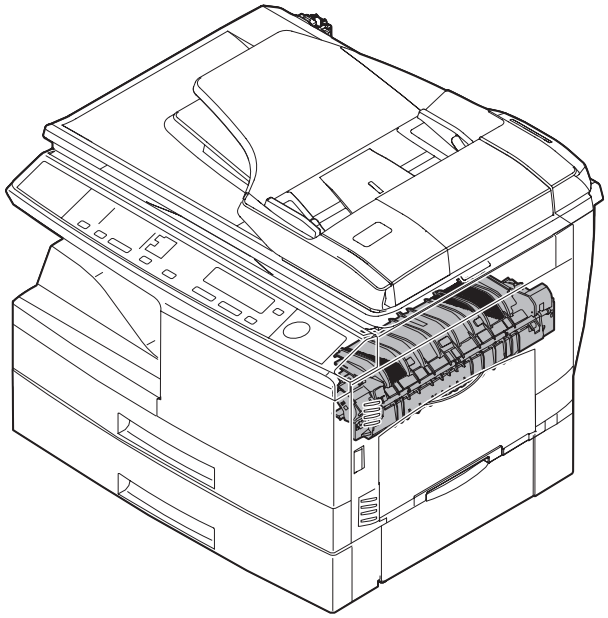
Resolution: 600dpi

Beam diameter: 75um in the main scanning direction, 80um in the sub scanning direction

Image surface power: 0.18 ± 0.01mW (Laser wavelength 770 - 795nm)

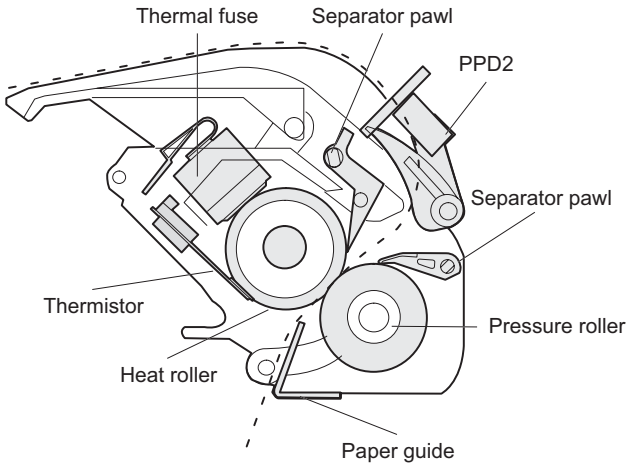
Polygon motor section: Brushless motor 20.787rpm
No. of mirror surfaces: 5 surfaces

4. Fuser section

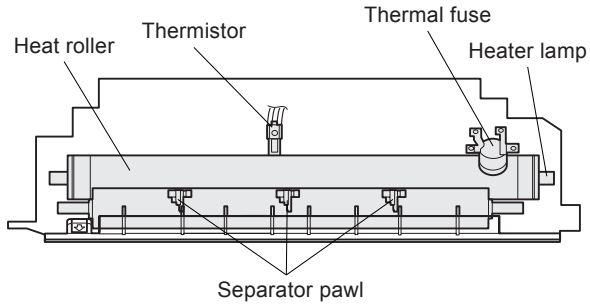


A. General description

General block diagram (cross section)



Top view



(1) Heat roller

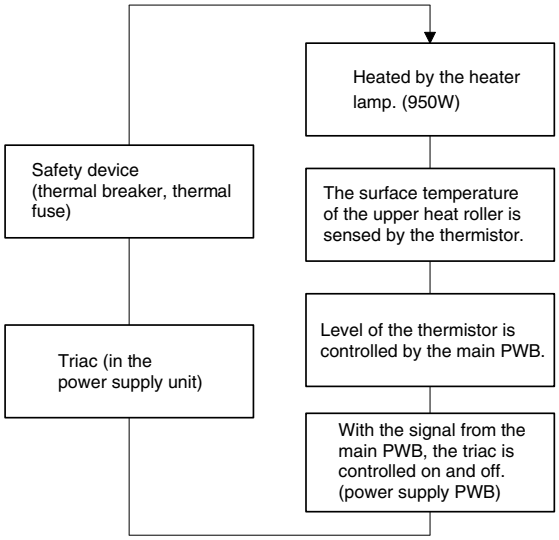
A Teflon roller is used for the heat roller and a silicone rubber roller is used for the lower heat roller for better toner fusing performance and paper separation.

(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.

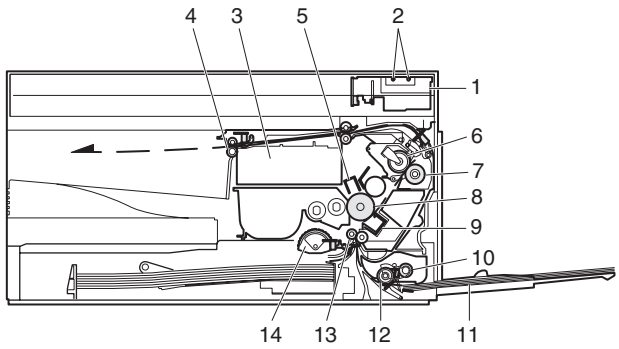
(4) Fusing resistor

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

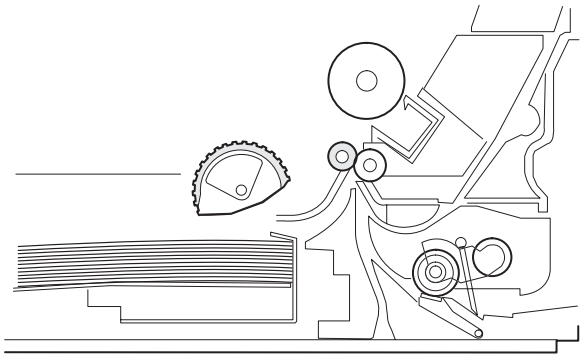
Paper feed is made in two ways; the tray paper feed and the manual paper feed. The tray is of universal-type, and has the capacity of 250 sheets.

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

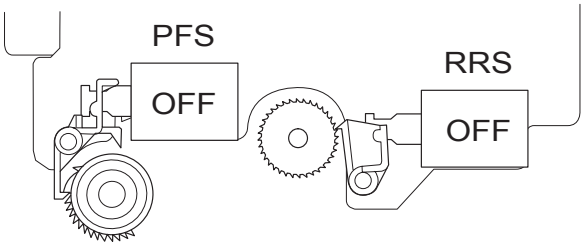
The general descriptions on the tray paper feed and the manual paper feed operation are given below.

(1) Cassette paper feed operation

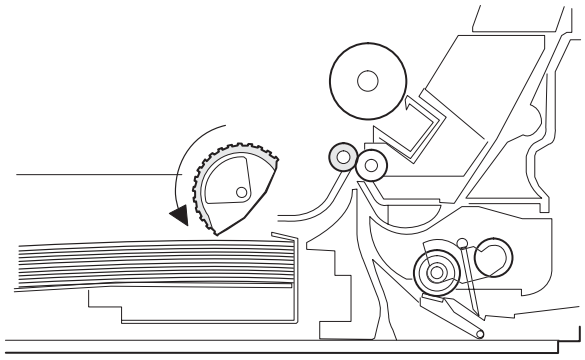
1) The figure below shows the positions of the pick-up roller, the paper feed clutch sleeve, and the paper feed latch in the initial state without pressing the Start key after lighting the ready lamp.
The paper feed latch is in contact with the projection of the clutch sleeve.

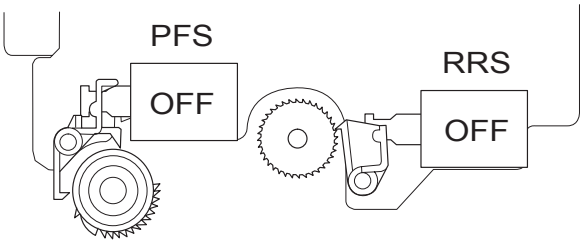


2) When the Start key is pressed, the main drive motor starts rotating to drive each drive gear.
The pick-up drive gear also is driven at that time. Since, however, the paper feed latch is in contact with the projection of the clutch sleeve, rotation of the drive gear is not transmitted to the pick-up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



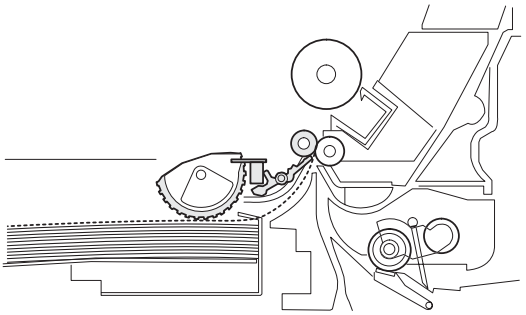
3) After about 0.1 sec from when the main motor start rotating, the tray paper feed solenoid (PFS) turns on for a moment.
This disengages the paper feed latch from the projection of the clutch sleeve, transmitting rotation of the pick-up drive gear to the paper feed roller shaft, rotating the pick-up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

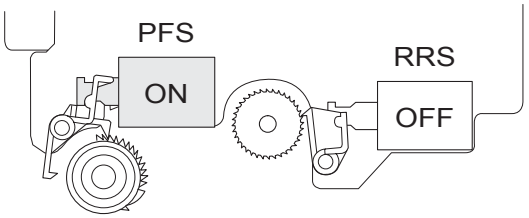




4) After more than half rotation of the pick-up roller, the paper feed latch is brought in contact with a notch on the clutch sleeve, stopping rotation of the pick-up roller.

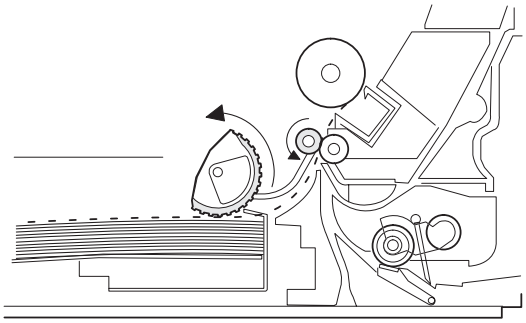
5) At this time, the paper is fed passed the paper entry detection switch (PPD1), and detected by it. After about 0.15 sec from detection of paper by PPD1, the tray paper feed solenoid (PFS) turns on so that the clutch sleeve projection comes into contact with the paper feed latch to stop the pick-up 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.

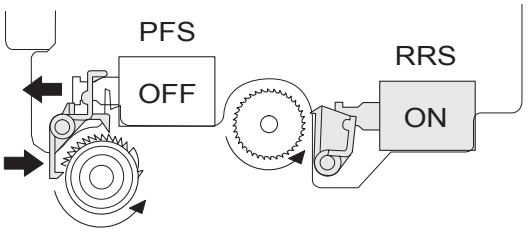




6) To release the resist roller, the tray paper feed solenoid and the resist solenoid are turned on by the paper start signal to disengage the resist start latch from the clutch sleeve, transmitting rotation of the resist drive gear to the resist roller shaft. Thus the paper is transported by the resist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

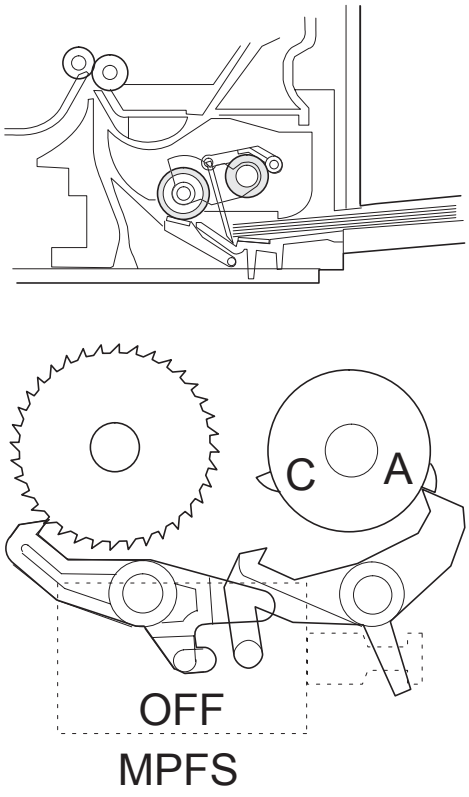




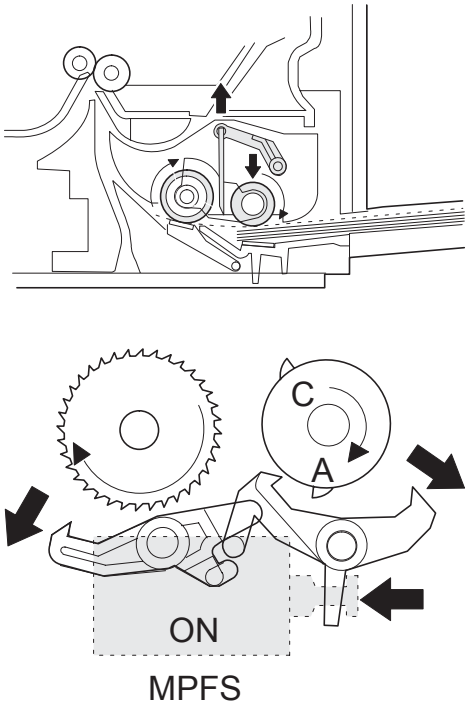
8) The paper separated from the drum is passed through the fusing paper guide, the heat roller (fusing section), POD (paper out detector) to the copy tray.

(2) Manual multi paper feed operation

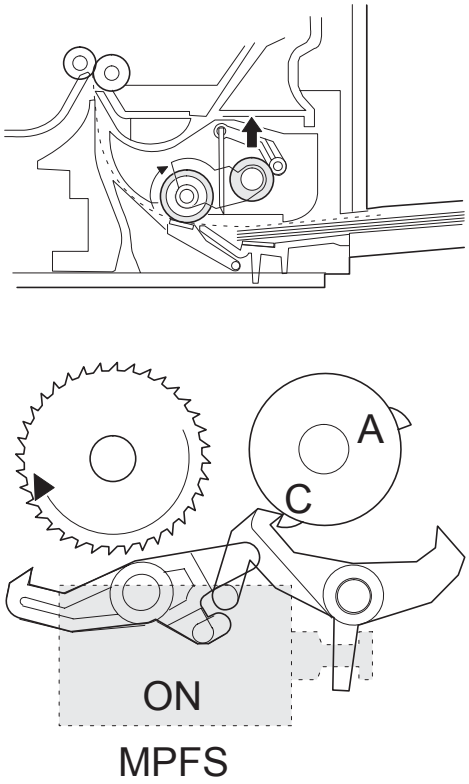
1) Before paper feed operation, the manual paper feed solenoid (MPFS) is turned OFF as shown in the figure below.



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.

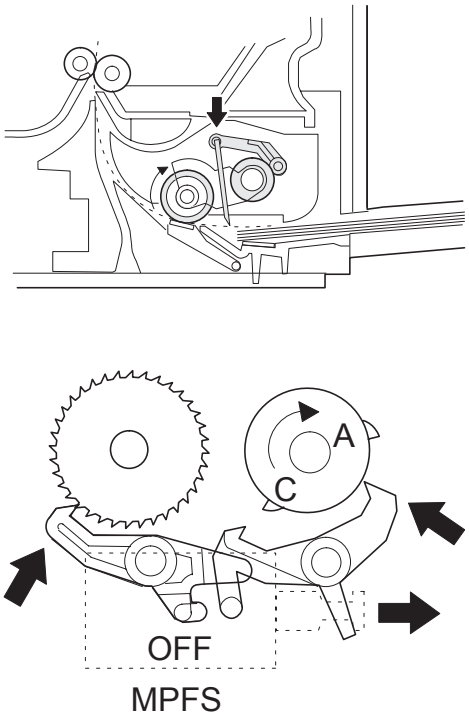


3) When pawl C of the manual paper feed clutch sleeve is engaged with the manual feed latch, the manual feed stopper falls and the manual take-up roller rises. At that time, the manual paper feed roller is rotating.



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

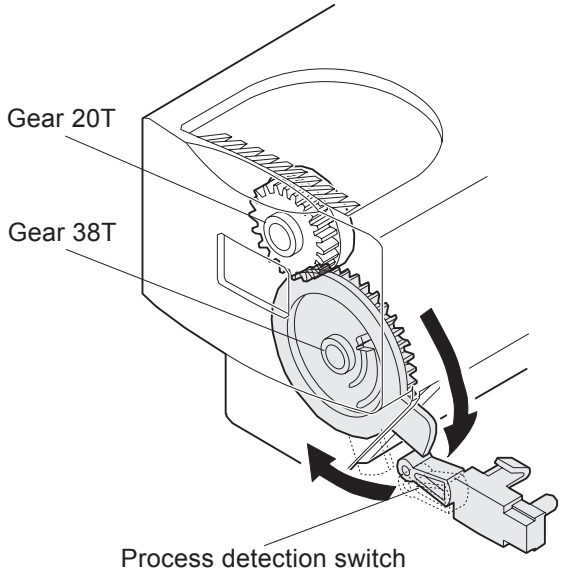
a. When the power is turned on:
PPD or POD is ON when the power is turned on.

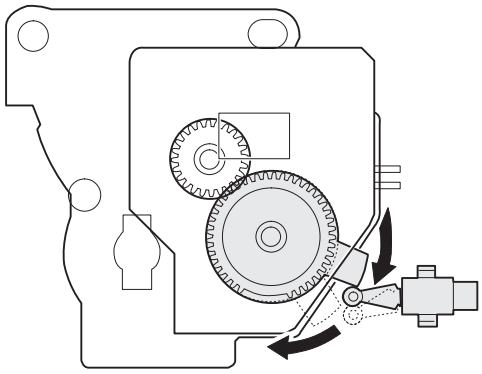
b. Copy operation

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

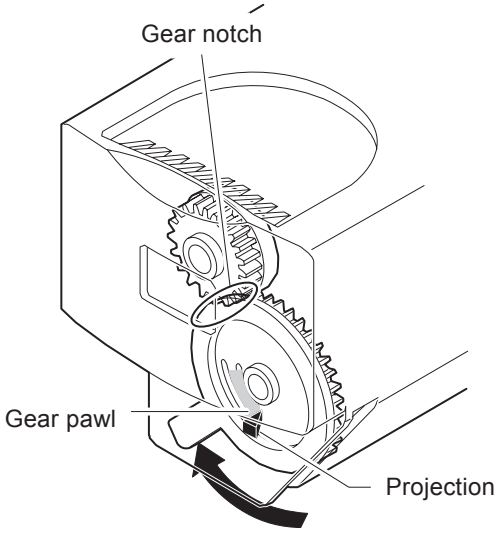
1) When the power is turned on, the detection gear 38T is rotated in the arrow direction by the detection gear 20T to push the micro-switch (process detection switch) installed to the machine sensor cover, making a judgement as a new drum.

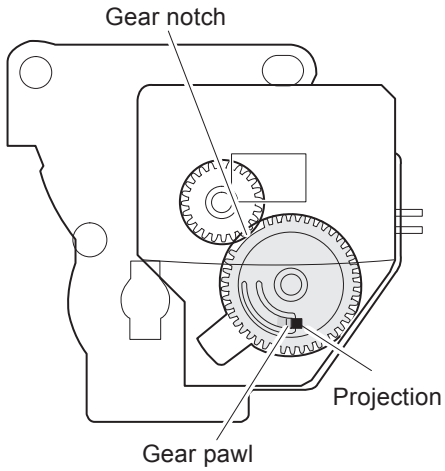




2) When the detection gear 38T turns one rotation, there is no gear any more and it stops.

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





7. SPF/RSPF section

A. Outline

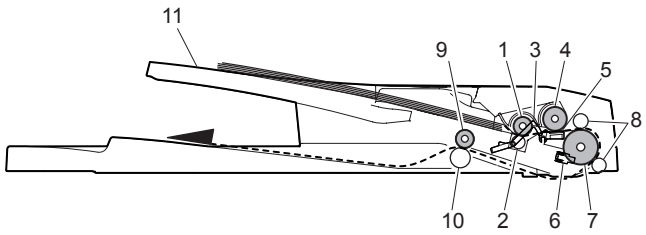
The SPF (Single Path Feeder) is installed to the AL-2030/2040CS as a standard provision.

The RSPF (Reverse Single Path Feeder) is installed to the AL-2050CS as a standard provision.

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

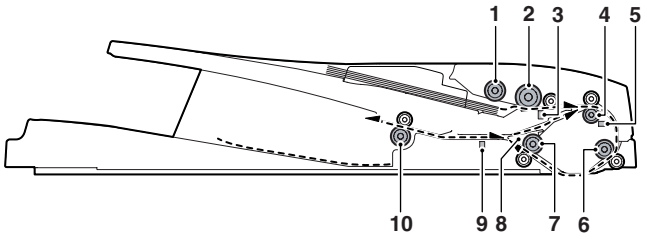
B. Document transport path and basic composition

AL-2030/2040CS



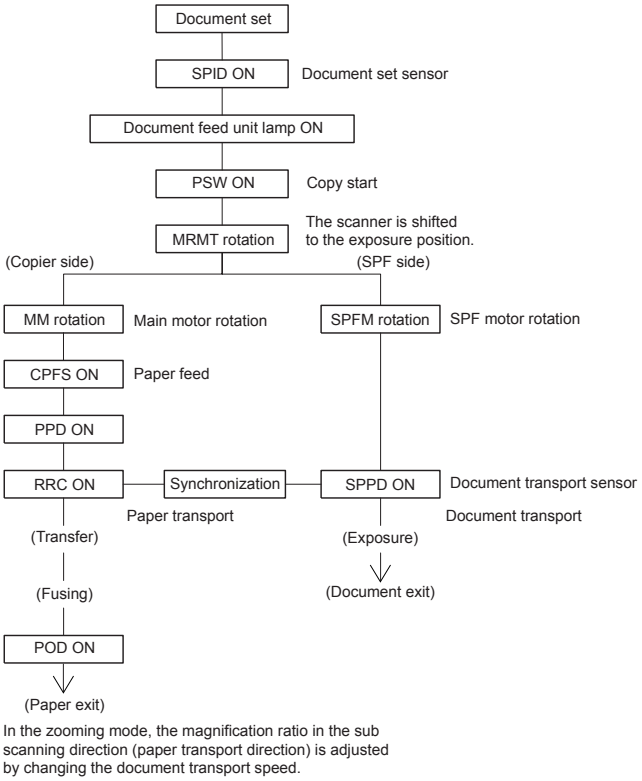
1	Pickup roller	2	Sheet of document for paper feed
3	Set detection ACT	4	Document feed roller
5	Separation sheet	6	Paper entry sensor
7	PS roller D	8	Transport follower roller
9	Paper exit roller	10	Paper exit follower roller
11	Document tray		

AL-2050CS



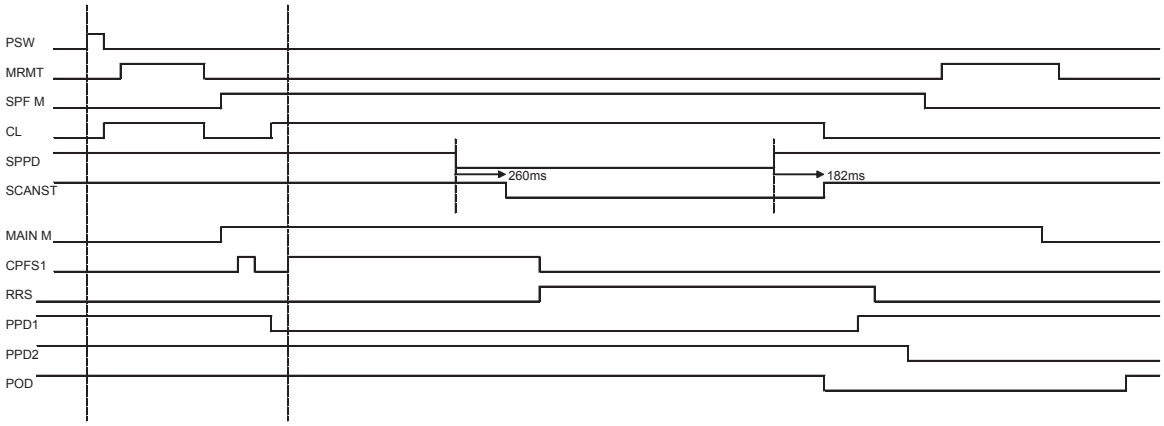
1	Pickup roller	2	Separation roller
3	Paper empty sensor	4	Upper transport roller
5	Paper sensor	6	PS roller
7	Lower transport roller	8	Reverse self-weight gate
9	Paper exit sensor	10	Paper exit roller

C. Operational descriptions



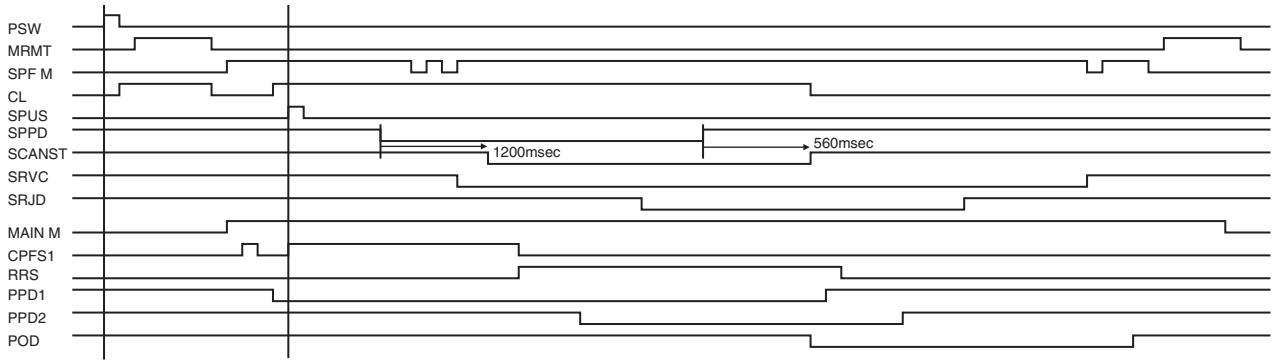
In the zooming mode, the magnification ratio in the sub scanning direction (paper transport direction) is adjusted by changing the document transport speed.

AL-2030/2040CS



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.)

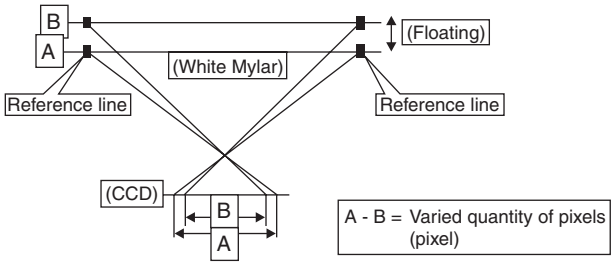


RSPF JAM generation condition

1) The SPPD is ON when turning ON the power.
2) The SPPD does not turn ON for 4.0sec from starting document feed. (in 100% copy)
3) The SPPD does not turn OFF for 4.7sec after detecting turning ON of the SPPD. (100% copy)
4) The RSPF cover or the OC cover is opened during document transportation.
5) The SRJD is ON when the power is turned ON.
6) The SRJD is not turned ON for 2.4sec from release of PS in paper feed from the document set position. (100% copy)
7) The SRJD is not turned OFF for 1.6sec from completion of document scan in the case of complete document exit. (100% copy)

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

SPF/RSPF 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. D-D (Duplex to Duplex) mode paper/ document transport (Duplex model) (AL-2050CS only)

A. Initial state

Set duplex documents on the document tray.

Set paper on the cassette. (In the duplex mode, the manual feed tray cannot be selected.)

B. Front copy

Document transport:

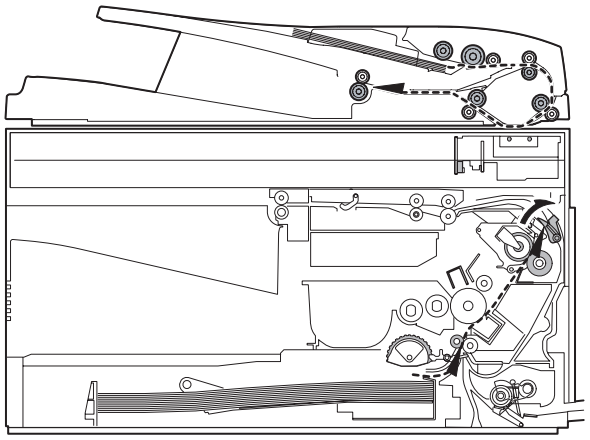
The document feed roller feeds the document from the paper feed roller to the PS roller.

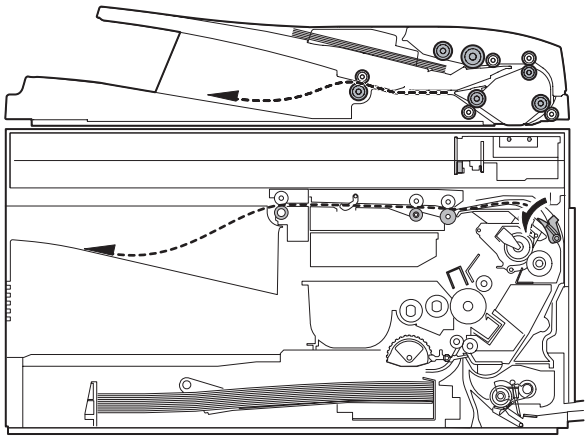
- The document is exposed in the exposure section, and transported to the document exit section by the lower transport roller and the paper exit roller.
- The document is transported to the paper exit tray. (However, it is not discharged completely.)
- The document is stopped once, and then switchback operation is performed. (To the back copy)

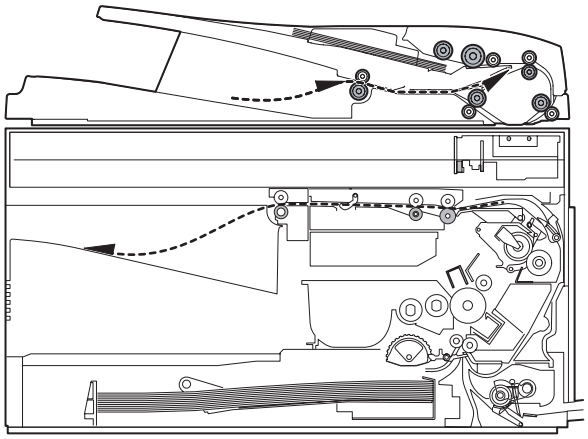
Paper transport:

The paper is passed through the paper feed roller and the PS roller, and the images on the front surface are transferred.

- The paper is passed through the fusing section and the lower side of the gate section to the paper exit tray side. (However, it is not discharged completely.)
- The paper is stopped once, and switchback operation is performed. (To the back copy)







C. Back copy

Document transport:

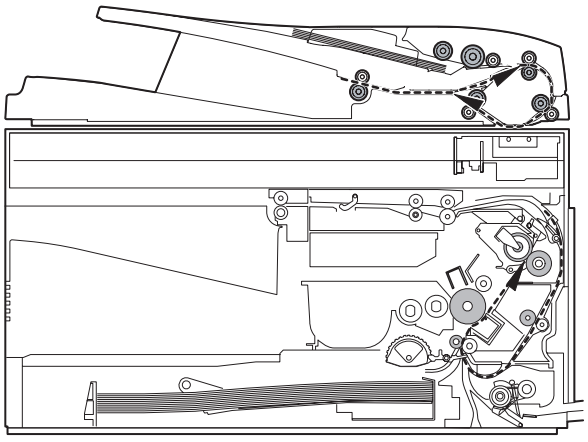
By switchback operation, the document is sent through the upper transport roller and the PS roller to the exposure section, where the back surface of the document is exposed.

- The document is sent to the document exit section by the lower transport roller and the paper exit roller.
- The document is sent to the intermediate tray. (However, it is not discharged completely.)
- The document is stopped once, and switchback operation is performed.
- The document is sent through the upper transport roller and the PS roller and the exposure section (without being exposed) to the document exit section.
- The document is discharged to the document exit tray.

Paper transport:

Switchback operation is performed.

- The paper is sent through the upper side of the gate section and the duplex transport section and the PS roller, and the images on the back surface are transferred.
- The paper is sent through the fusing section and discharged to the paper exit tray.



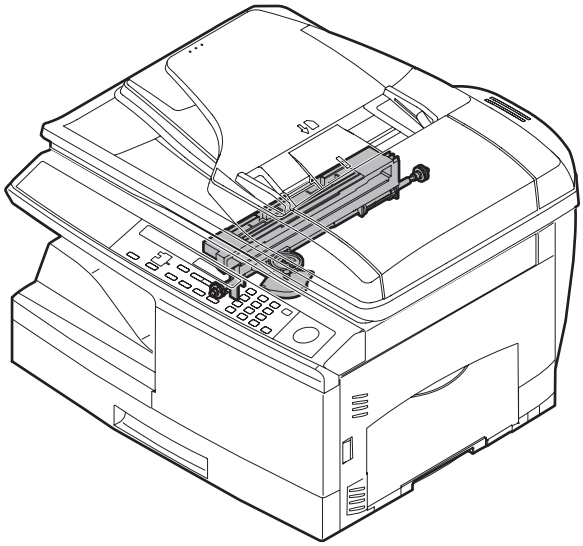
Rotation copy mode:

The front and the back are in upside down each other.

Copy mode without rotation:

The front and the back are not in upside down.

9. Shifter (AL-2050CS only)



Shift width: 2.5cm

The offset function by the shifter is turned ON/OFF by the user program.

According to the setting, offset operation is performed for every job. (Default: ON)

[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: CN42) 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-2040CS/2050CS only)
10. Reverse roller section (AL-2040CS/2050CS only)
11. RSPF section (AL-2050CS only)
12. SPF section (AL-2030/2040CS only)
13. 2nd cassette section (AL-2040CS/2050CS only)

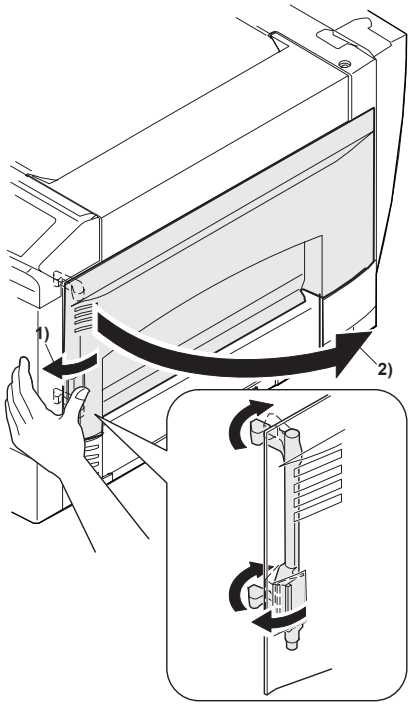
1. High voltage section

A. List

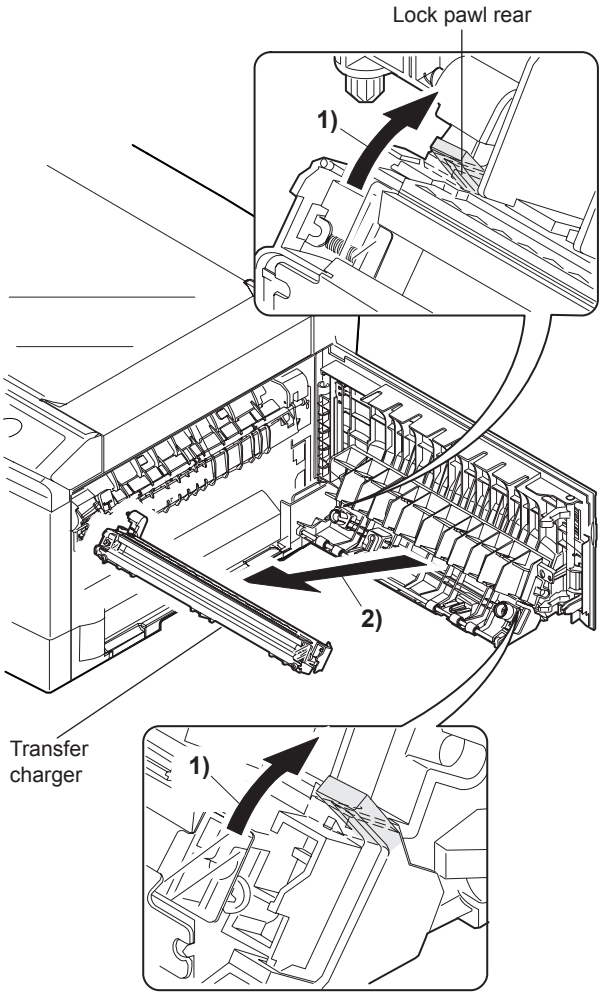
No.	Part name Ref.
1	Transfer charger unit
2	Charger wire

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.

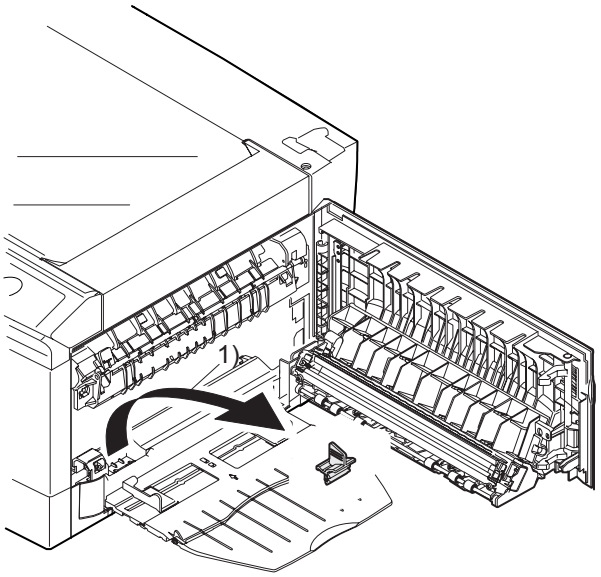


C. Assembly procedure

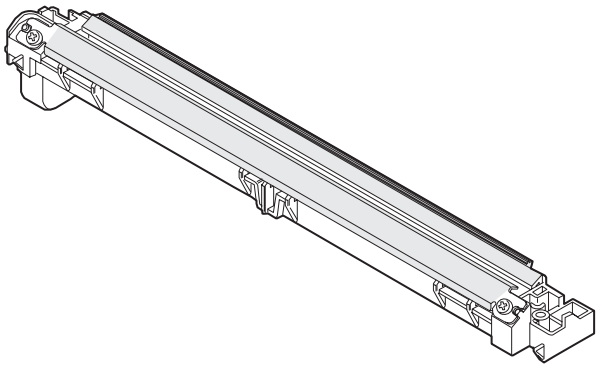
For assembly, reverse the disassembly procedure.

D. Charger wire cleaning

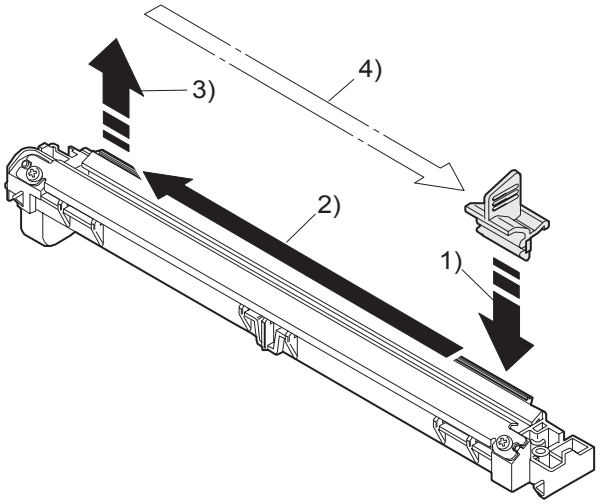
1) Remove the charger cleaner from the manual paper feed unit.



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.

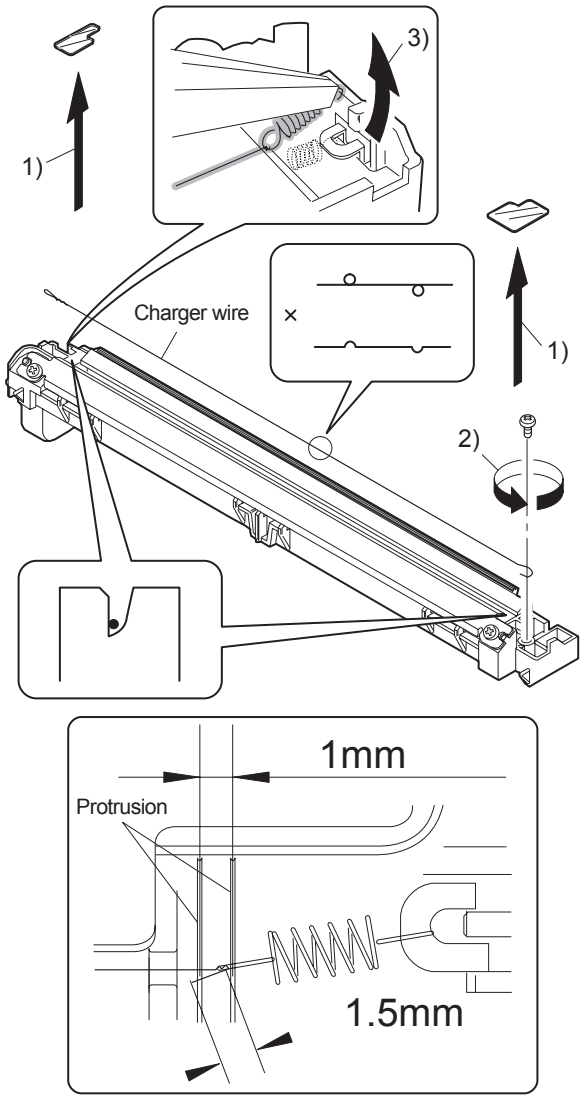


Fig.1

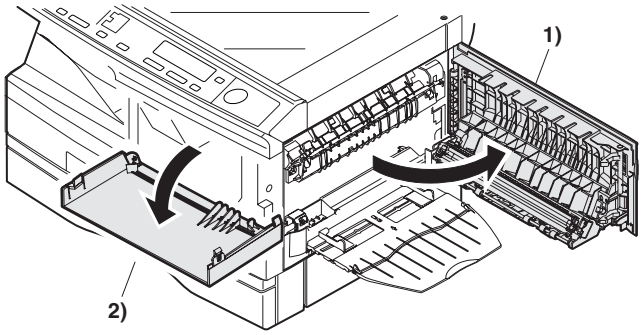
2. Operation panel section

A. List

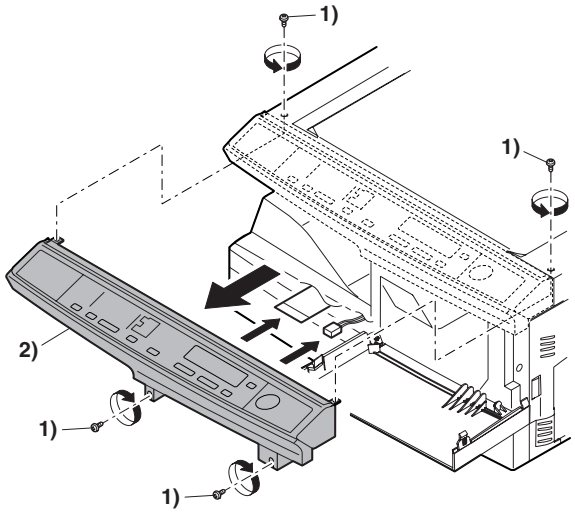
No.	Part name Ref.
1	Operation panel unit
2	Operation PWB

B. Disassembly procedure

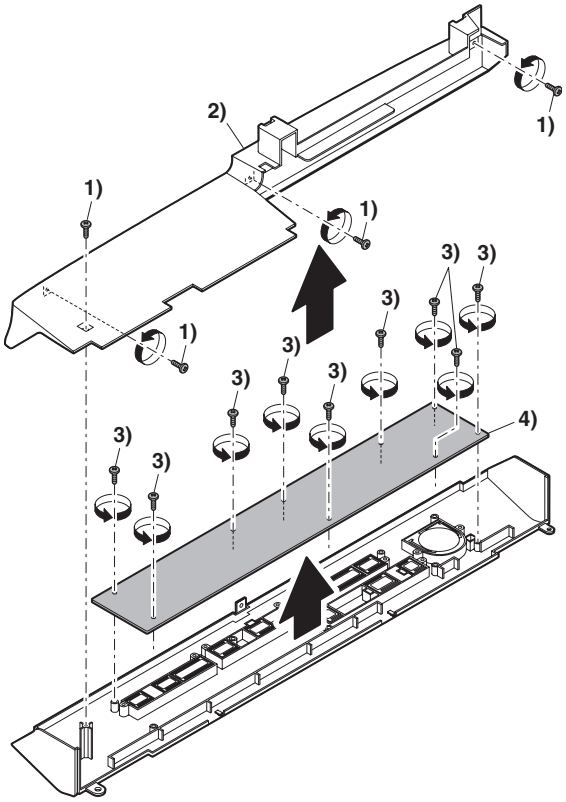
1) Open the side door, and Open the front cover.



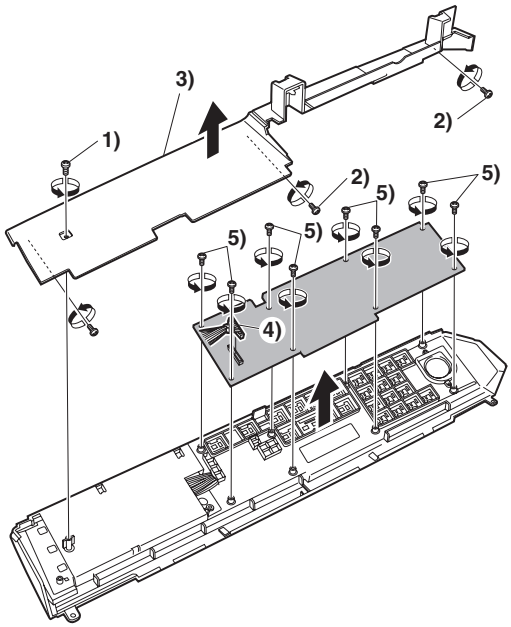
2) Remove the screws (4 pcs.), the harness, and the operation panel unit.



3) Remove four screws, and remove the operation cabinet.
4) Remove four screws, and remove the operation PWB.
(AL-2030/2040CS)



(AL-2050CS)



C. Assembly procedure

For assembly, reverse the disassembly procedure

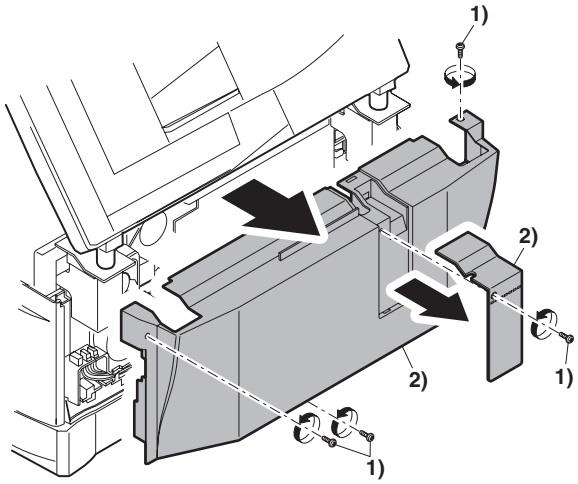
3. Optical section

A. List

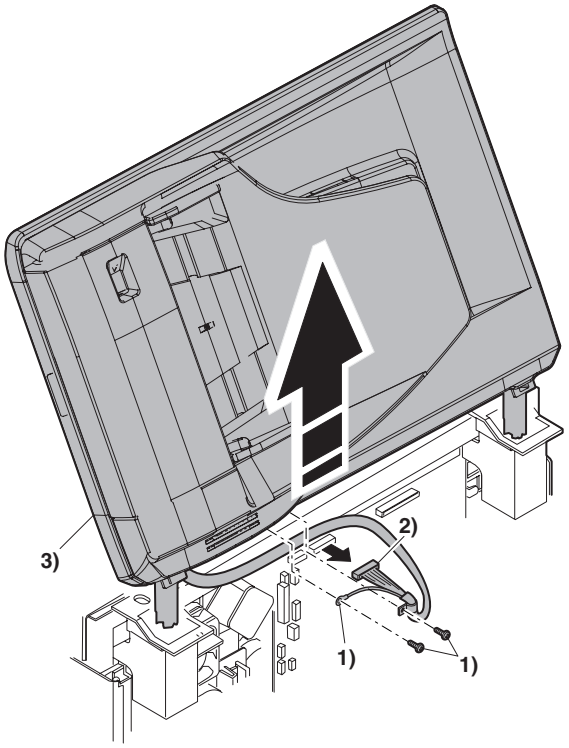
NO.	Part name Ref.
1	Copy lamp unit
2	Copy lamp
3	Lens unit

B. Disassembly procedure

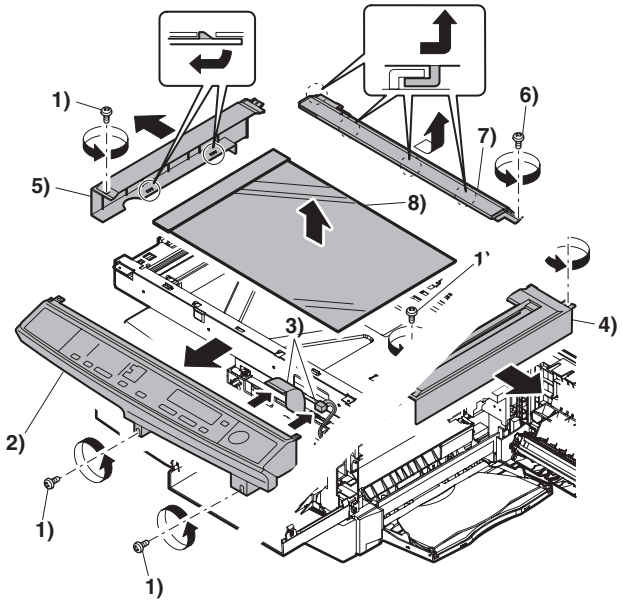
1) Remove four screws, and remove the rear cabinet and the rear cabinet cover.



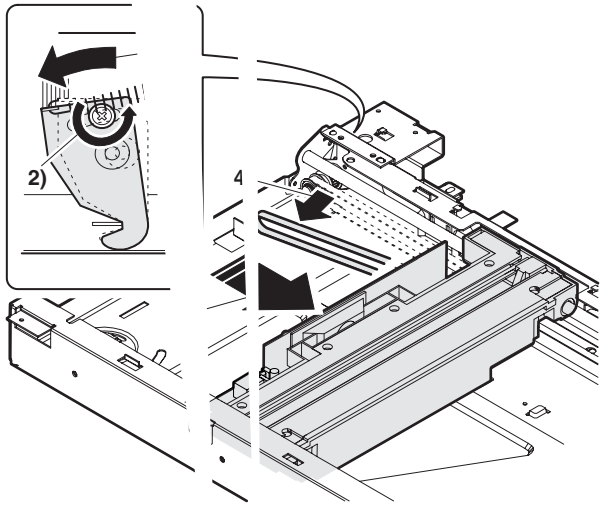
2) Remove two screws, and remove the earth wire.
3) Disconnect the connector.
4) Remove the SPF/RSPF unit.



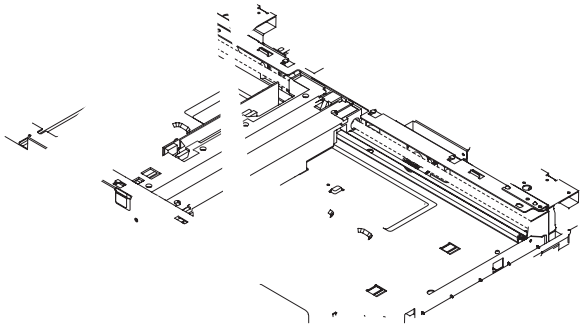
5) Remove five screws. Remove the operation unit, and disconnect the connector.
6) Remove the right cabinet.
7) Remove the left cabinet.
8) Remove the screw, and remove the rear cover.
9) Remove the table glass.



10) Move the to tl position indicated on the figure.
11) Loosen the whic is fixing the tension plate.
12) Move the t plate the arrow direction to release the tension, and re he b t.



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

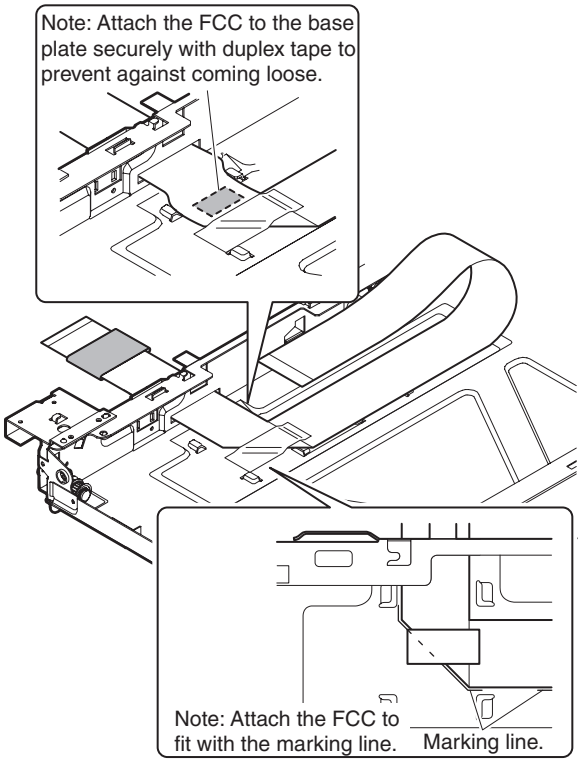


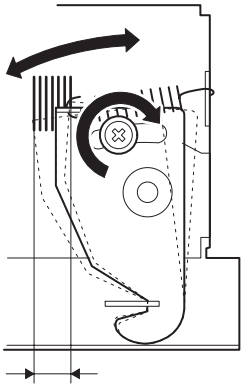
15) Lift the rear side of the carriage, remove the belt and the connector, and remove the carriage.

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.





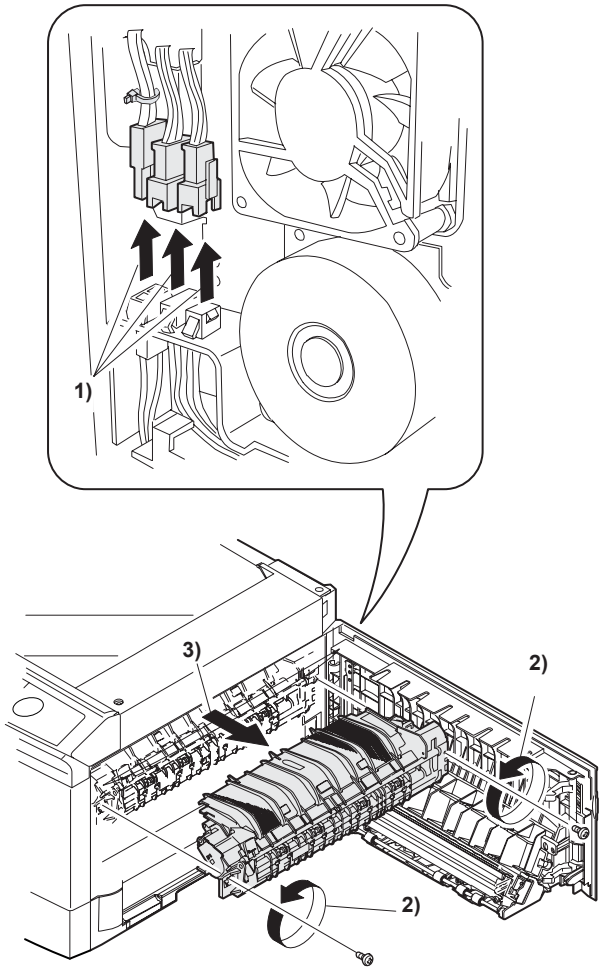
4. Fusing section

A. List

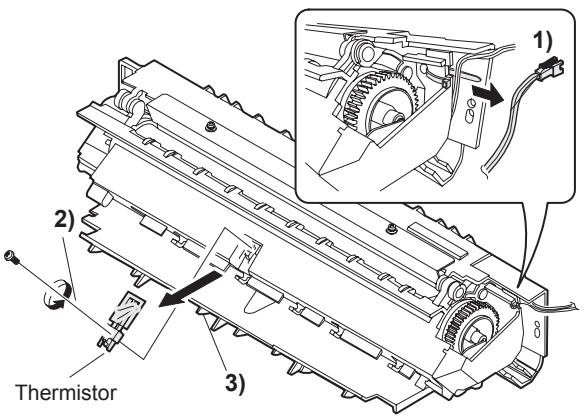
No.	Part name Ref.
1	Thermistor
2	PPD2 sensor
3	Heater lamp
4	Pressure roller
5	Heat roller

B. Disassembly procedure

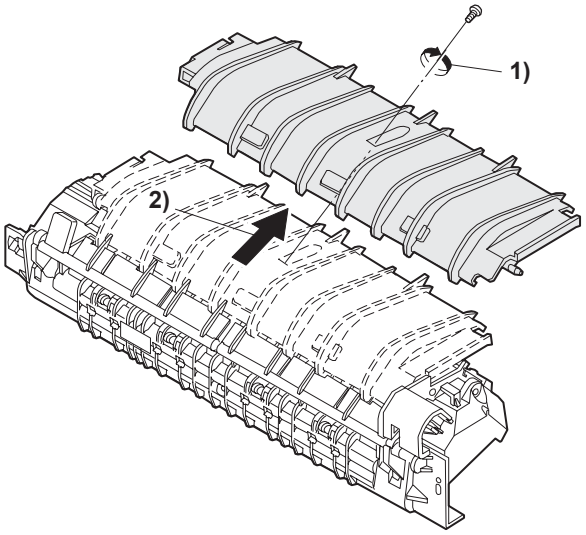
1) Remove the connectors (3 pcs.) of the rear cabinet.
2) Open the side cover, remove two screws, and remove the fusing unit.



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

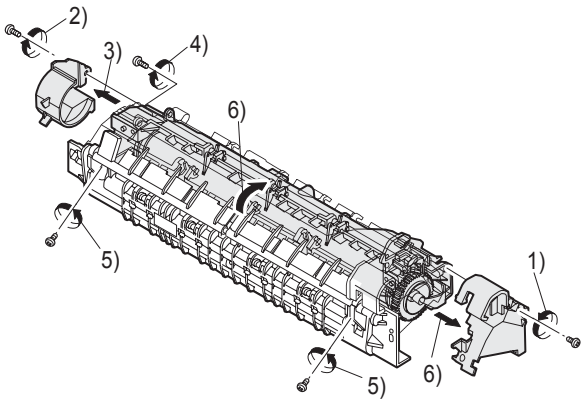


4) Remove the screw and remove the U-turn guide.

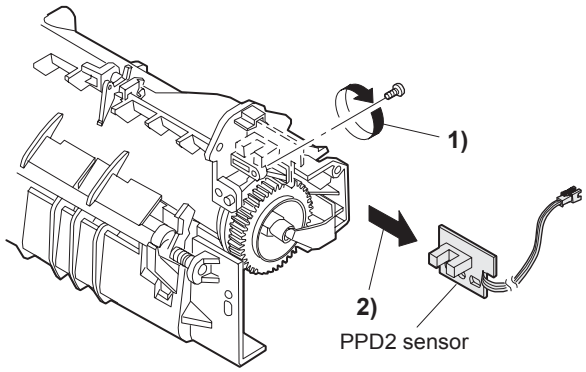


Pressure roller section disassembly

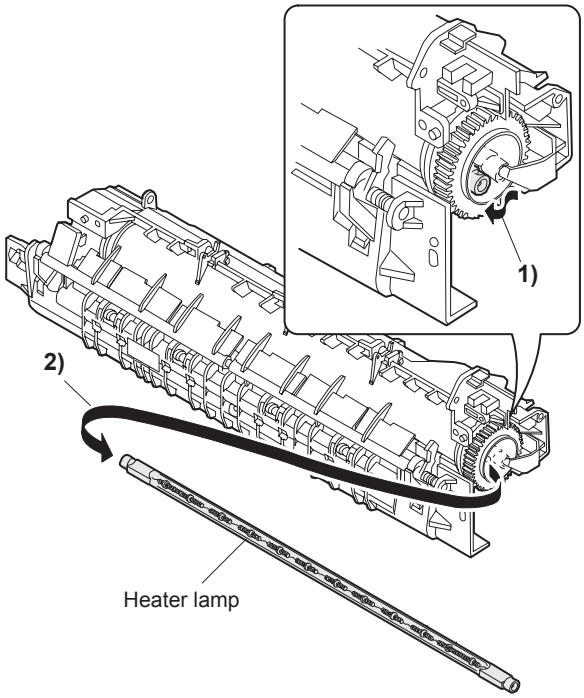
5) Remove the three screws, remove the fusing cover lower on the right side, and open the heat roller section.



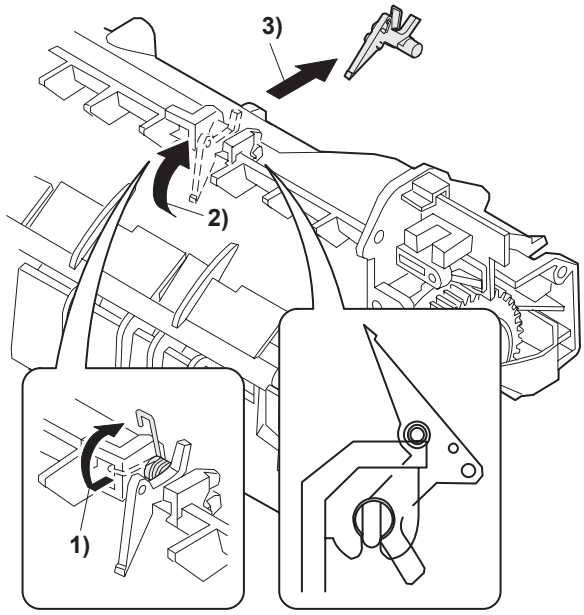
6) Remove the screw and remove the PPD2 sensor.



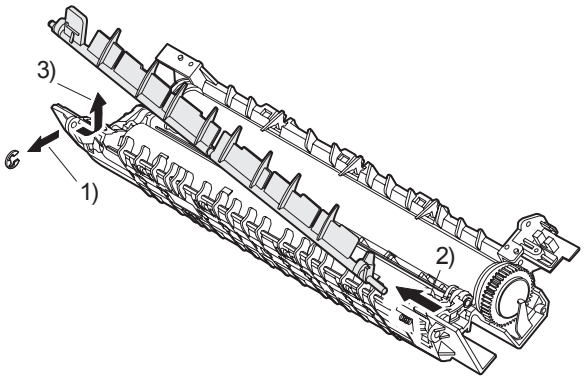
7) Remove the plate spring on the right and remove the heater lamp.



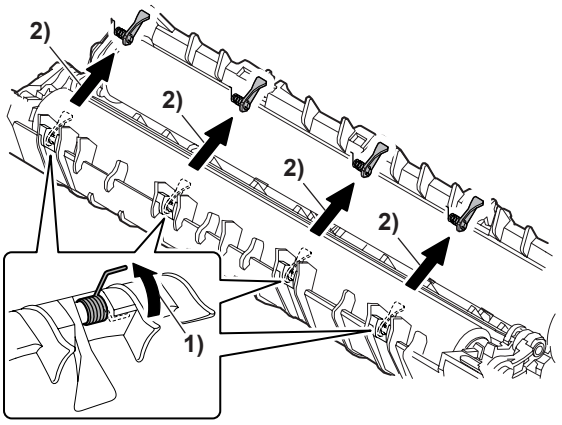
8) Remove the spring, and remove the upper separation pawls (3 pcs.).



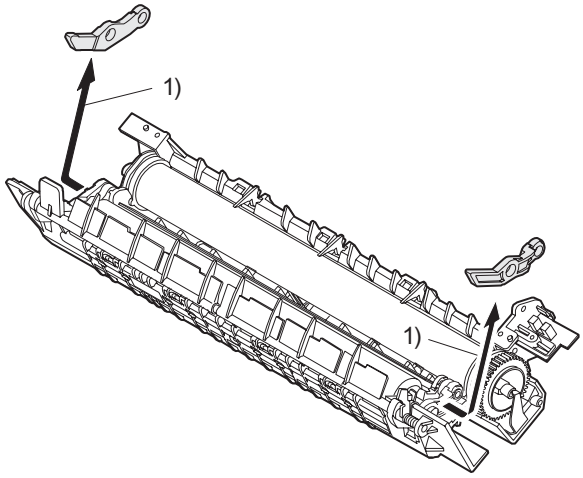
9) Remove the E-ring and remove the reverse gate.



10) Remove the spring, and remove the lower separation pawls (4 pcs.).

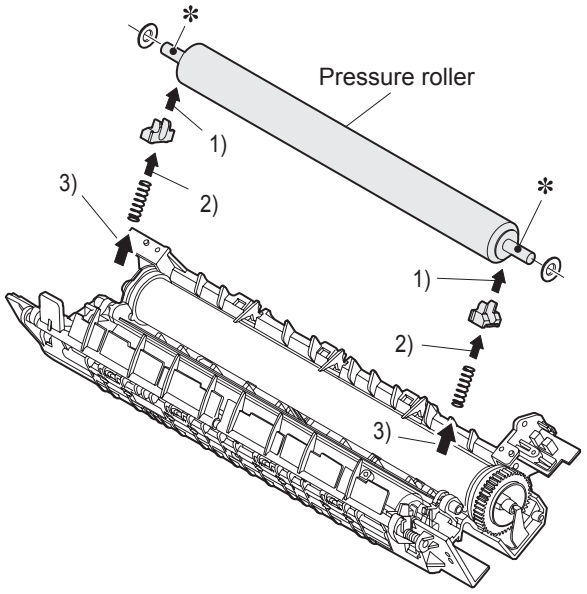


11) Remove the pressure release levers on the right and the left sides.



12) Remove the pressure roller, the pressure bearing, and the spring.

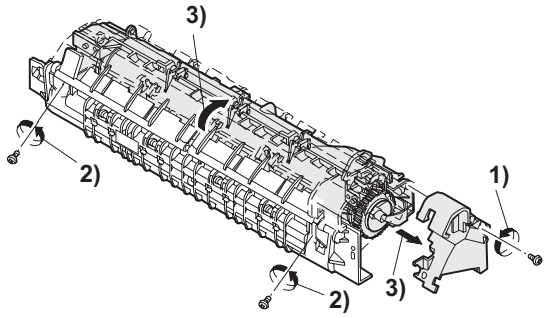
Note: Apply grease to the sections specified with an asterisk (∗).
Grease: "JFE552" UKOG-0235FCZZ



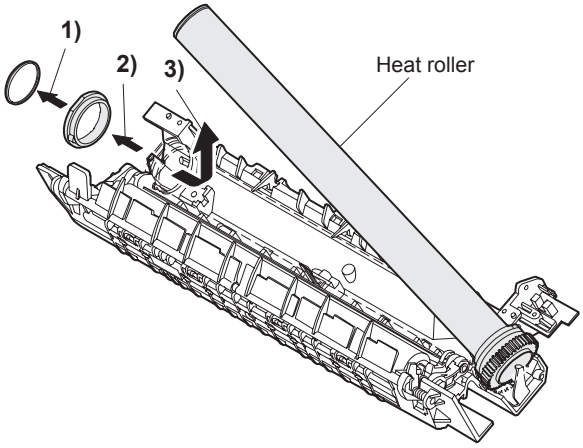
Heat roller disassembly

(Continued from procedure (4).)

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

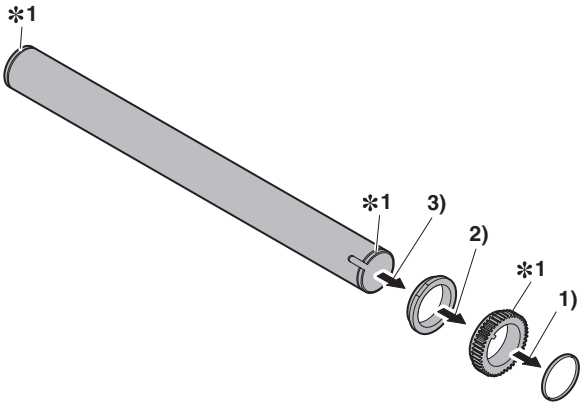


6) Remove the C-ring and the fusing bearing, and remove the heat roller.



7) Remove the parts from the heat roller.

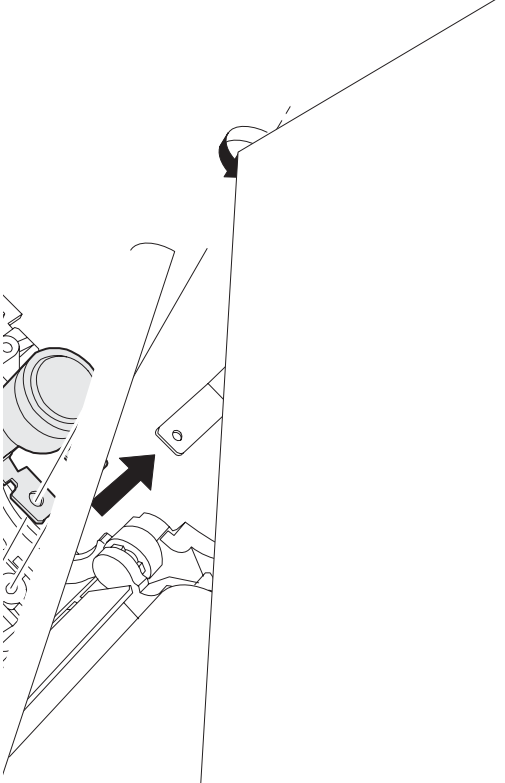
Note: Apply grease to the sections specified with ∗1.
Grease: "JFE552" UKOG-0235FCZZ



8) Remove two screws and remove the thermo unit.

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

	Temperature
Current model	210°C
AL-2030/2040CS/2050CS	230°C



C.

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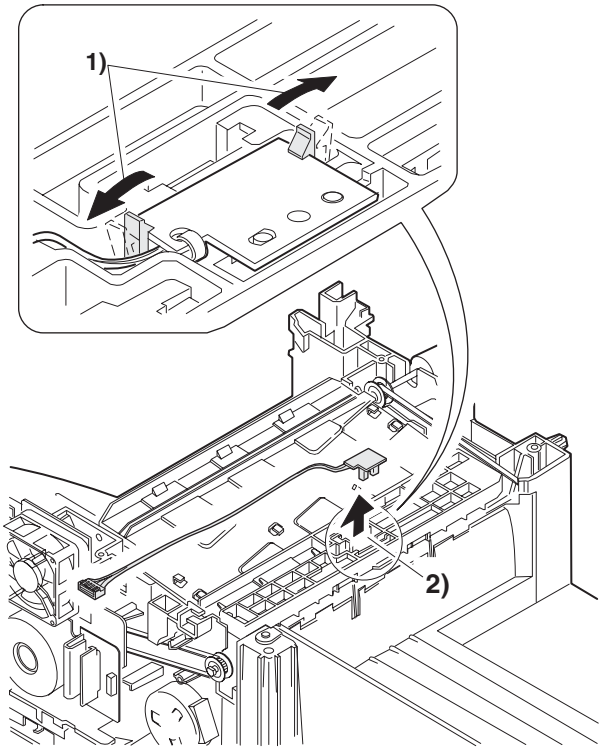
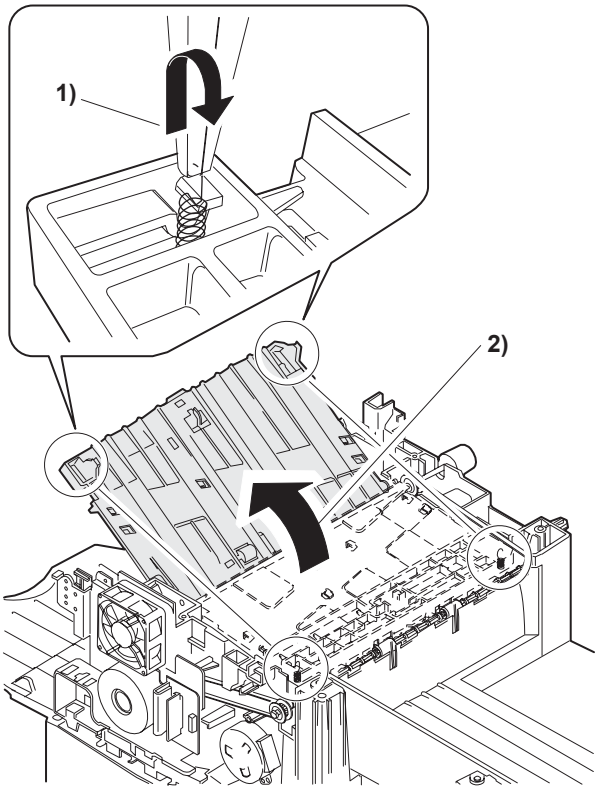
om the main unit

50CS only)

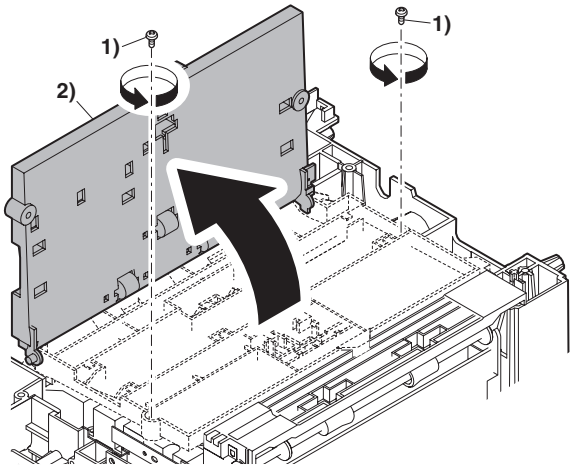
7) Remove the PWB insulation mylar and remove the paper transport detection sensor (POD).



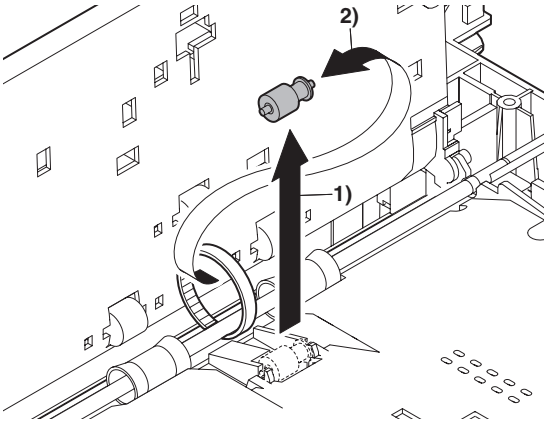
8) Remove two springs and open the intermediate frame unit. (AL-2030/2040CS only)



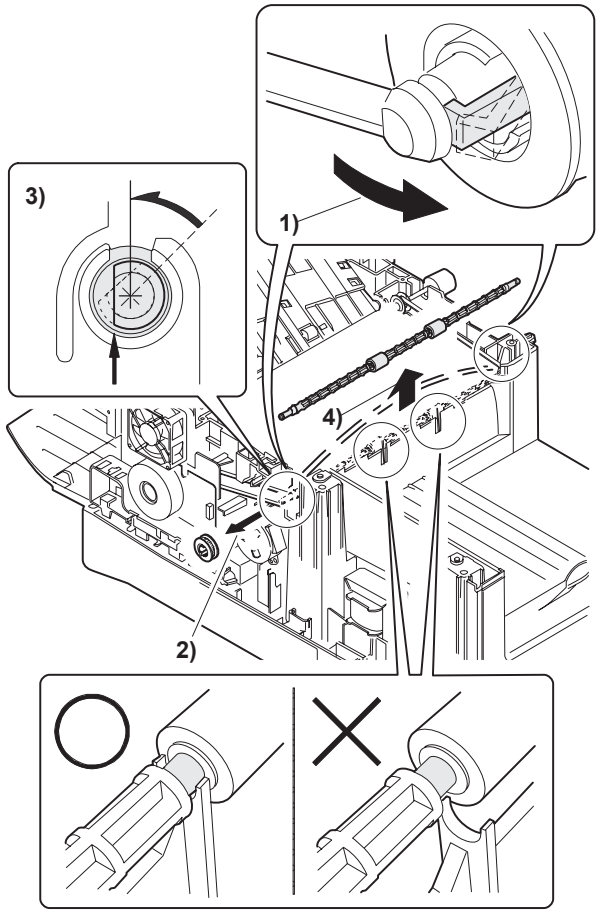
9) Remove the screw, and open the upper paper guide. (AL-2050CS only)



10) Remove the roller, and remove the belt. (AL-2050CS only)

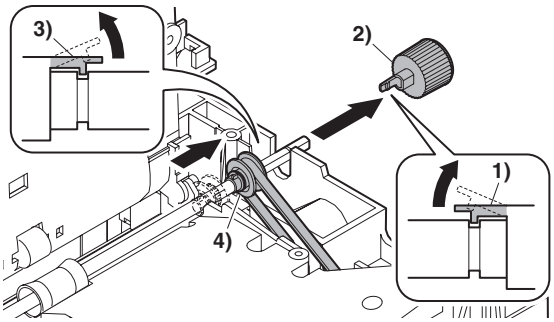


11) Remove the pulleys on the both sides and remove the paper exit roller. (AL-2030/2040CS only)

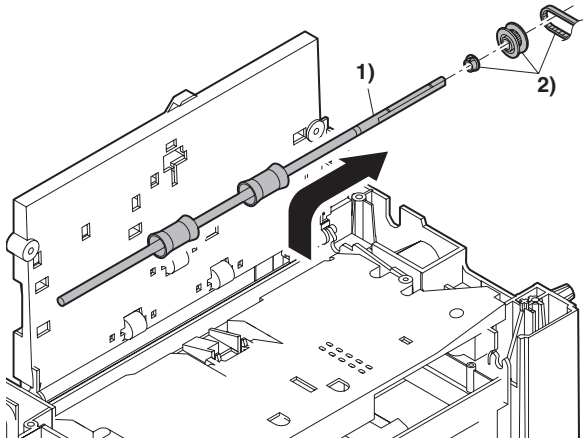


12) Disengage the pawl, and remove the roller knob.

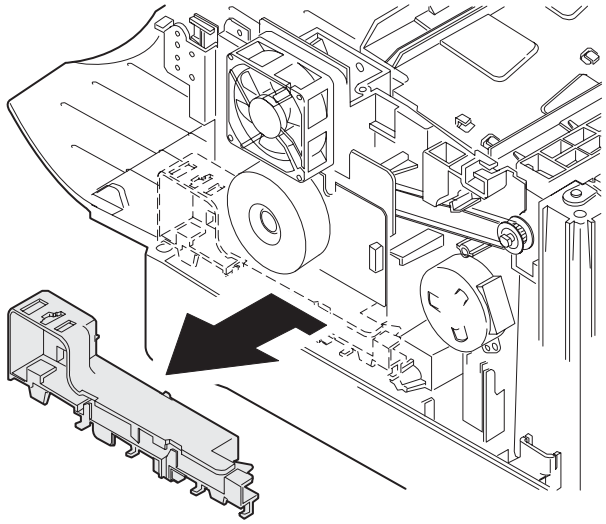
13) Disengage the pawl, and shift the pulley and the bearing.



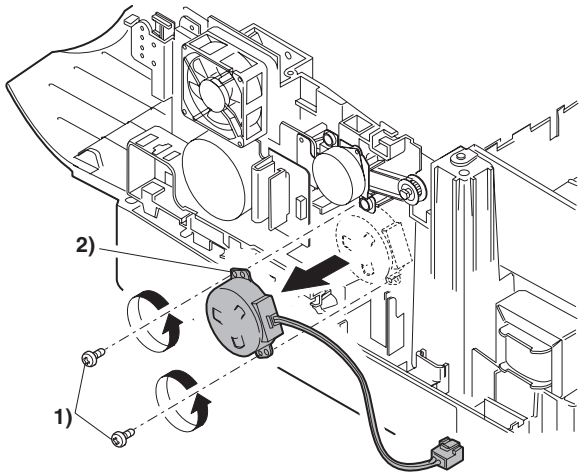
14) Remove the paper exit roller, and remove the belt, the pulley, and the bearing.



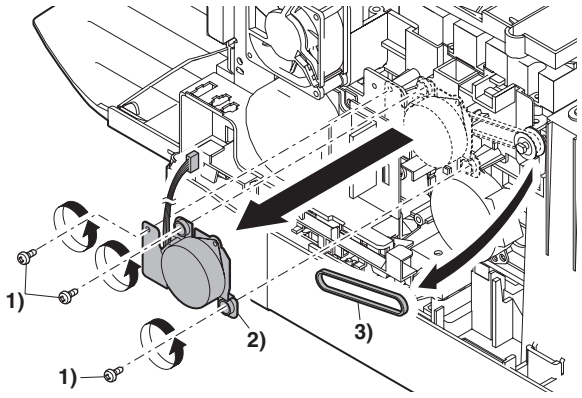
15) Remove the harness guide.



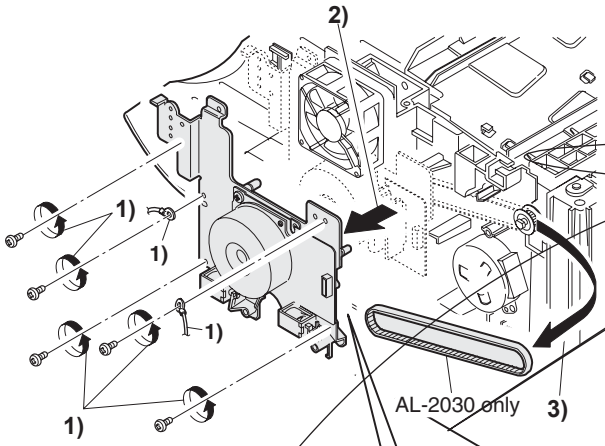
16) Remove two screws and remove the toner motor.

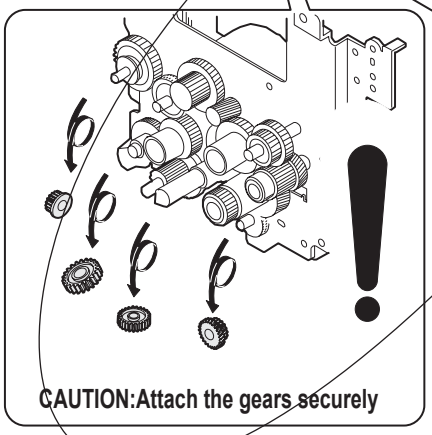


17) Remove three screws, and remove the DUP motor unit and the belt. (AL-2040CS/2050CS)

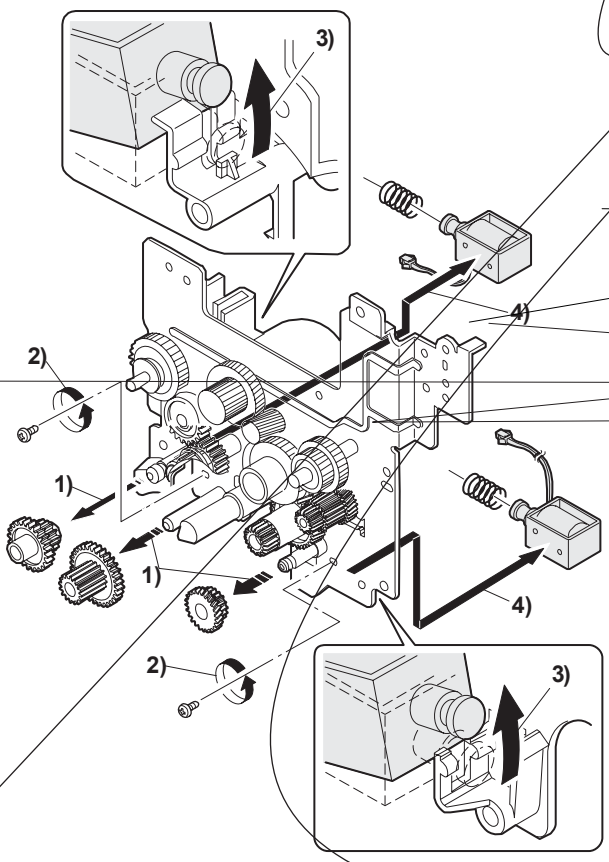


18) Remove five screws and the grounding wire.
For the AL-2030, remove the main drive plate and the belt.
For the AL-2040CS/2050CS, remove the main drive plate.

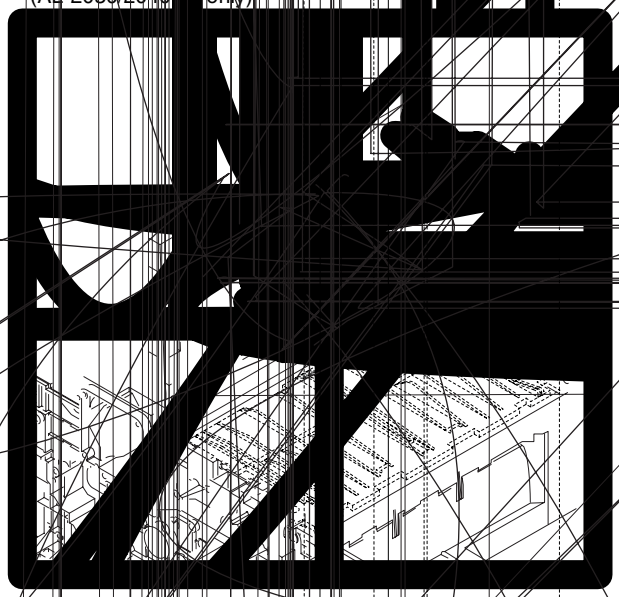




19) Remove the parts as shown below, and remove the pressure release solenoid and the paper feed solenoid.



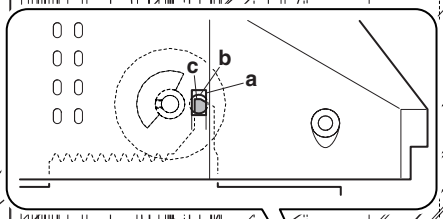
20) Remove four screws, and remove the paper guide unit. (AL-2030/2040CS only)

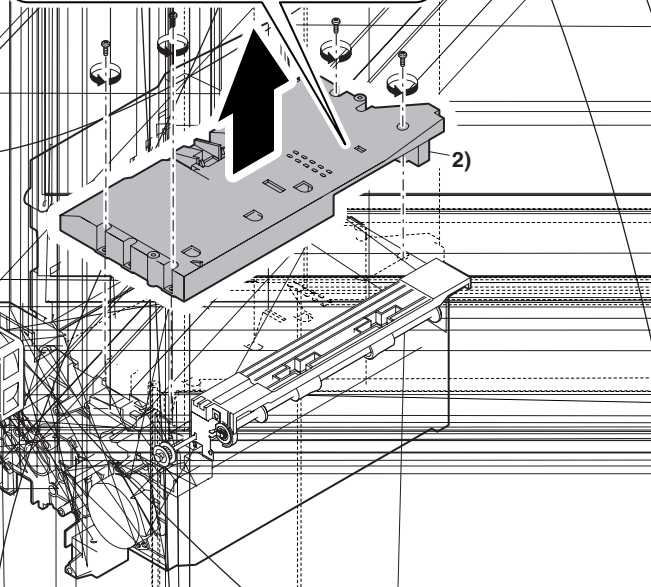


21) Remove four screws, and remove the lower paper guide unit. (AL-2050CS only)

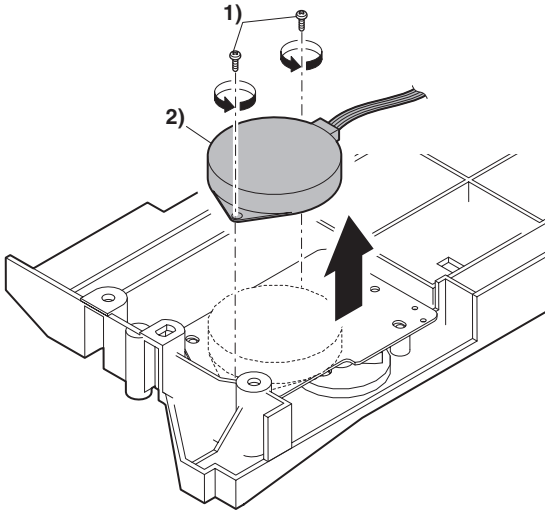
[Note for installation]

Fit the lower paper guide hole (a) with the shifter gear hole (b) so that the black resin (c) of the shifter unit can be checked.



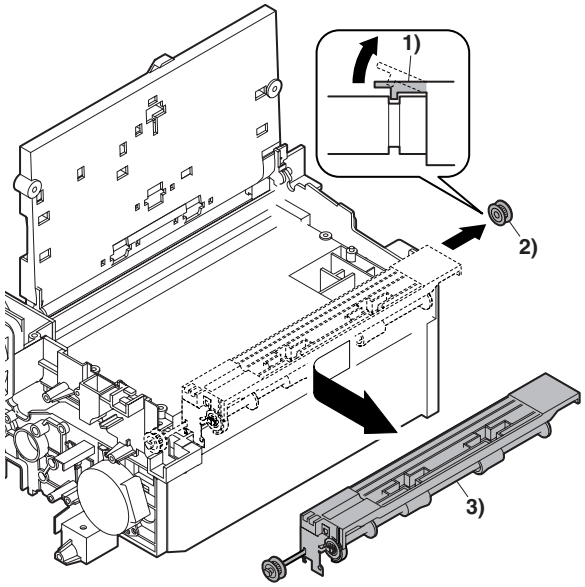


22) Put the lower paper guide unit upside down, remove two screws, and remove the shifter motor. (AL-2050CS only)



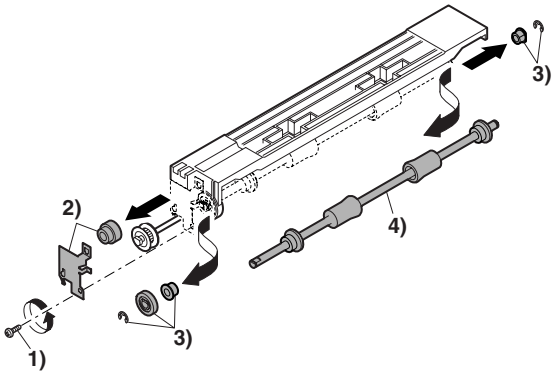
23) Remove the screw, and remove the grounding plate and the gear. (AL-2050CS only)

24) Remove the E-ring, the gear, and the bearing, and remove the shifter roller. (AL-2050CS only)

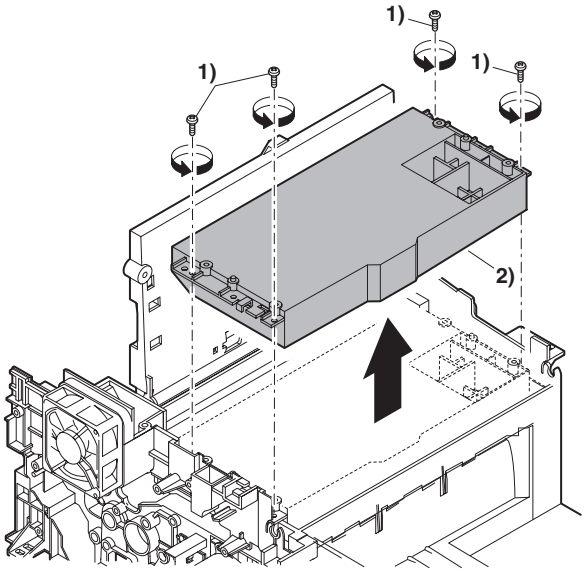


25) Disengage the pawl, and remove the pulley.

26) Shift and remove the shifter unit. (AL-2050CS only)



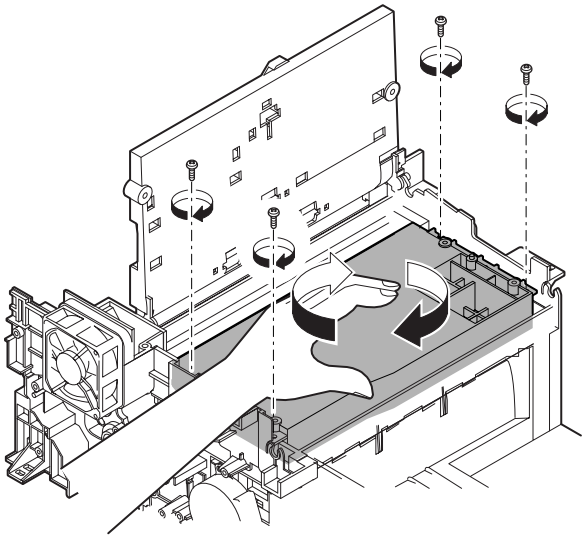
27) Remove four screws, and remove the LSU unit.



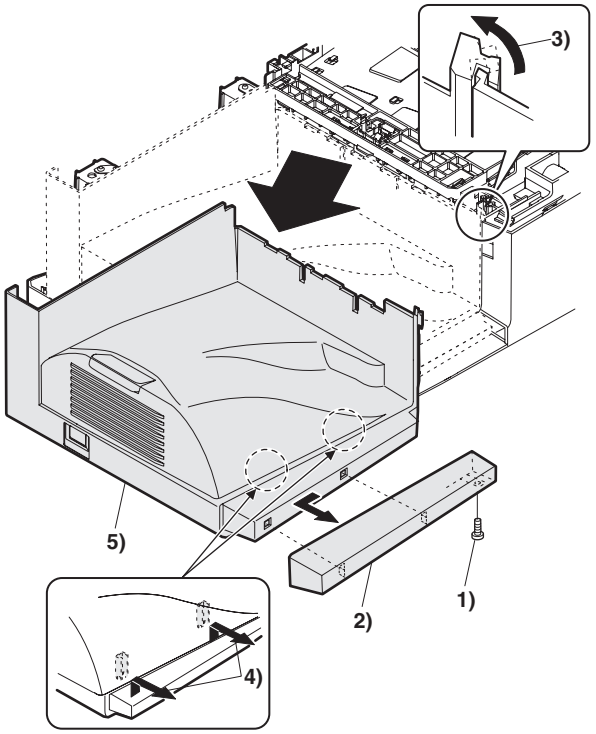
[Note for assembling the LSU]

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.

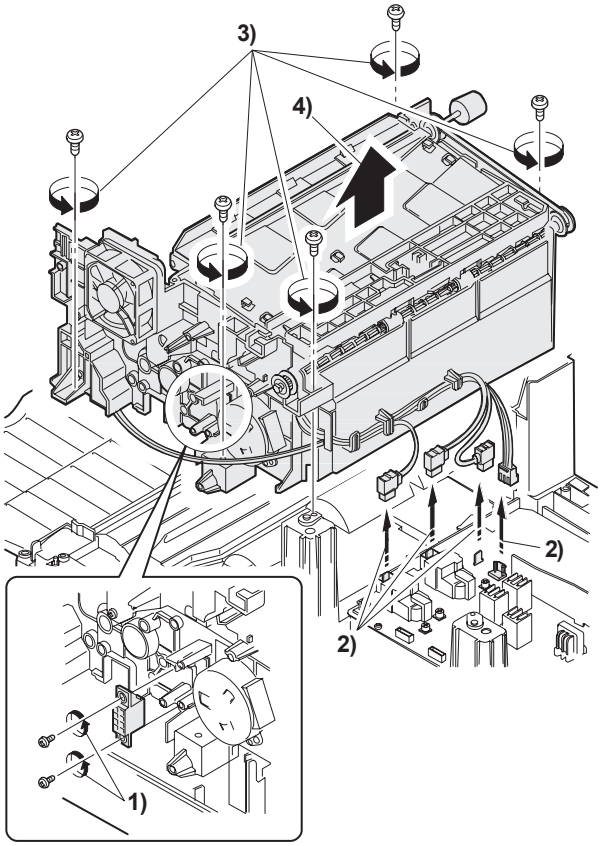


28) Remove the screw, slide the left cabinet to the left to detach it. Remove each pawl, and remove the paper exit tray.



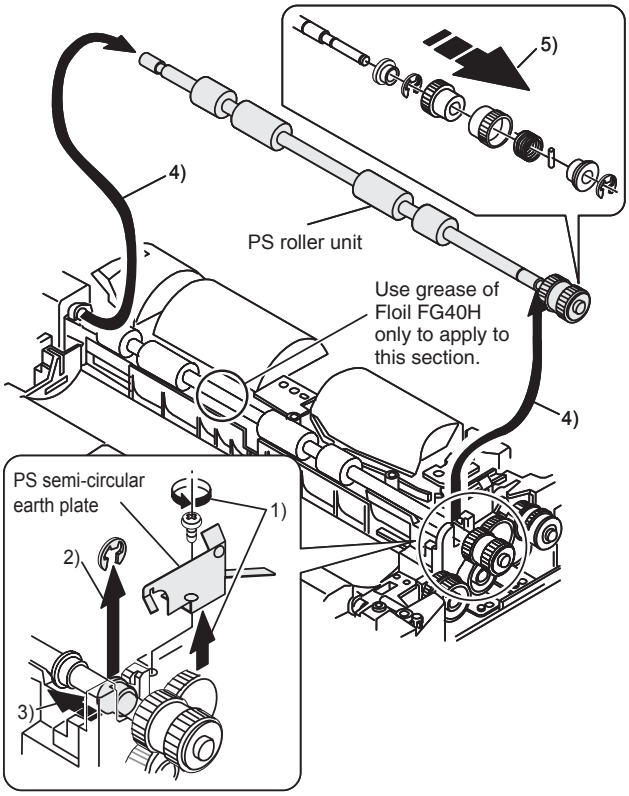
29) Remove two screws and remove the fusing connector.

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

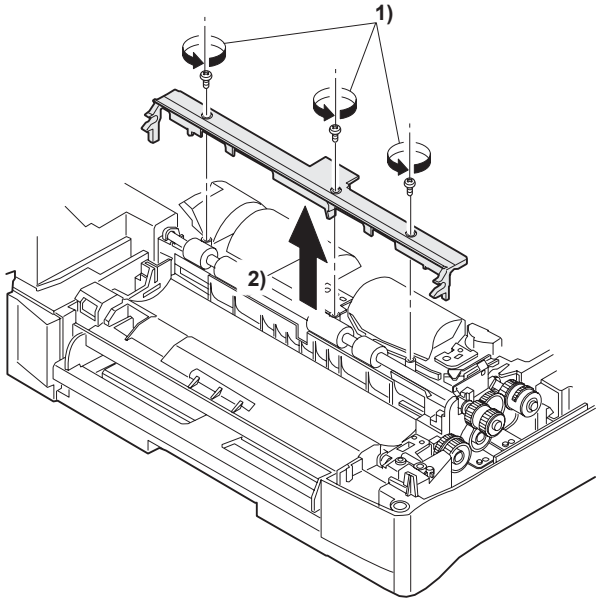


31) Remove the screw and the E-ring, and remove the PS semi-circular earth plate and the PS roller unit.

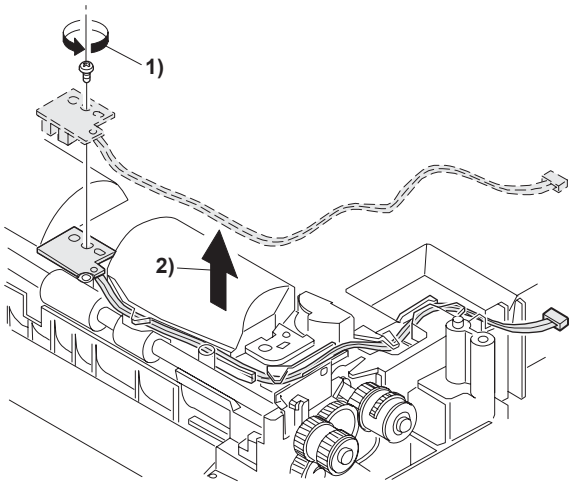
32) Remove the E-ring and remove the spring clutch from the PS roller unit.



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

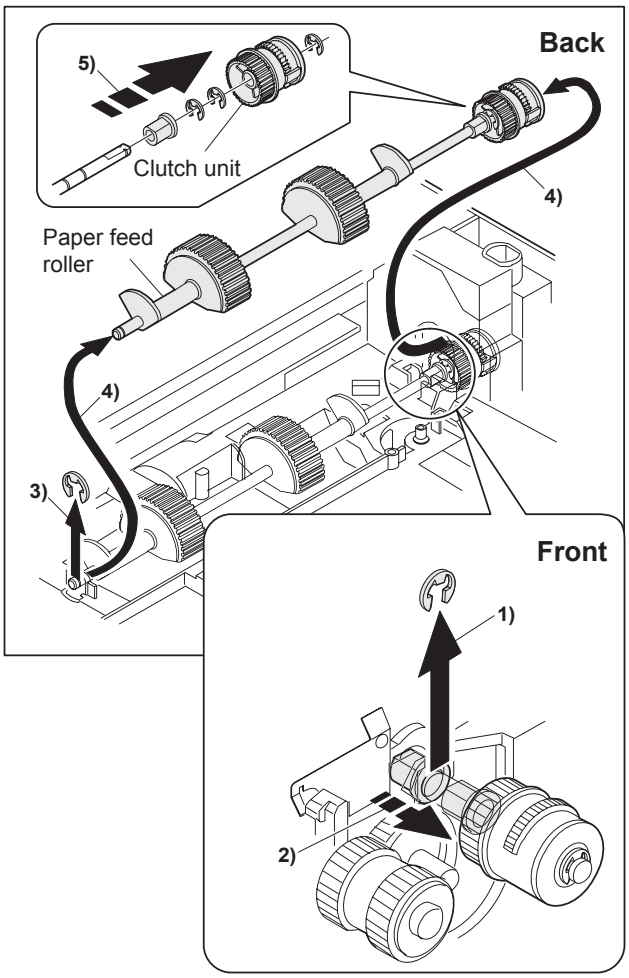


34) Remove the screw and the connector, and remove the PPD1 sensor PWB.



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

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



C. Assembly procedure

For assembly, reverse the disassembly procedure.

6. Manual paper feed section

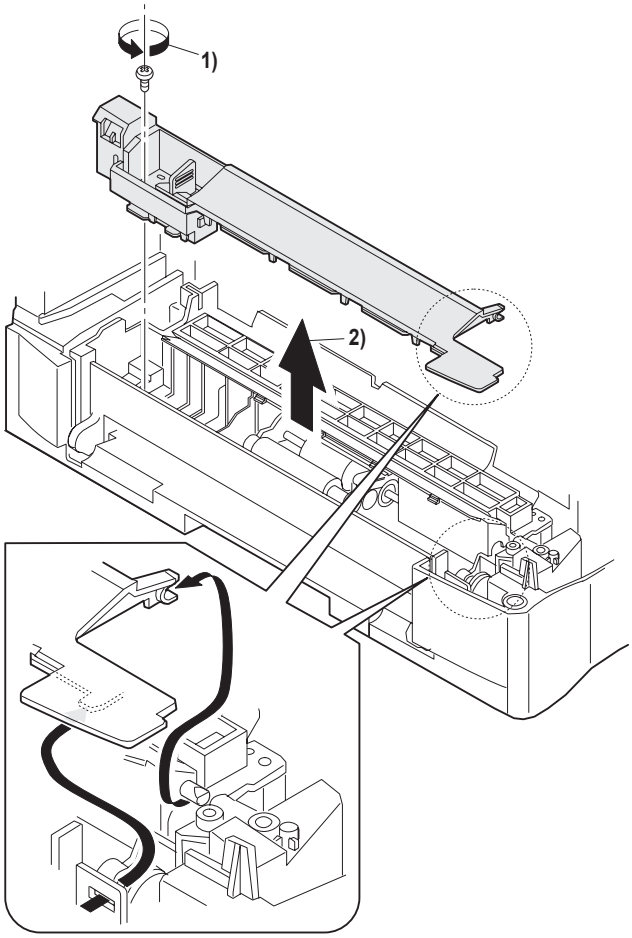
A. List

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

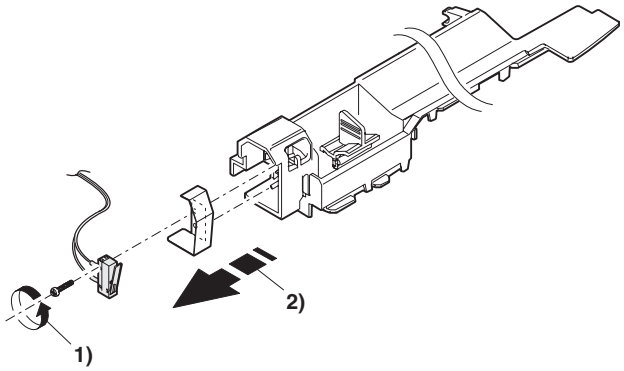
B. Disassembly procedure

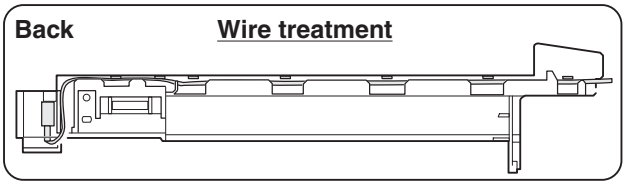
Multi unit

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



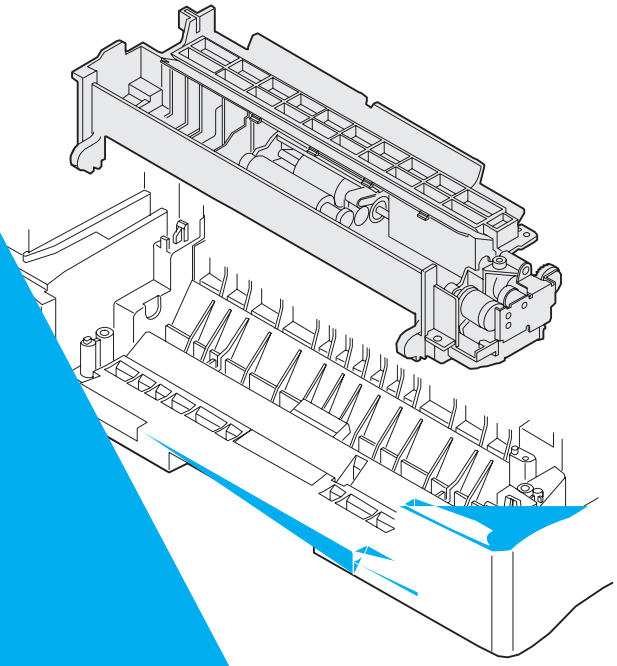
2) Remove the screw and remove the side door detection unit.





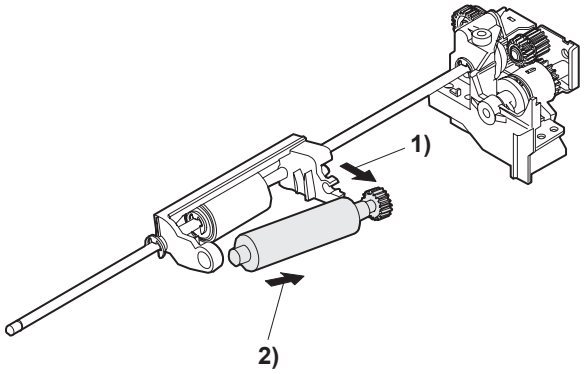
3) Remove three screws and remove the multi paper feed upper frame.

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

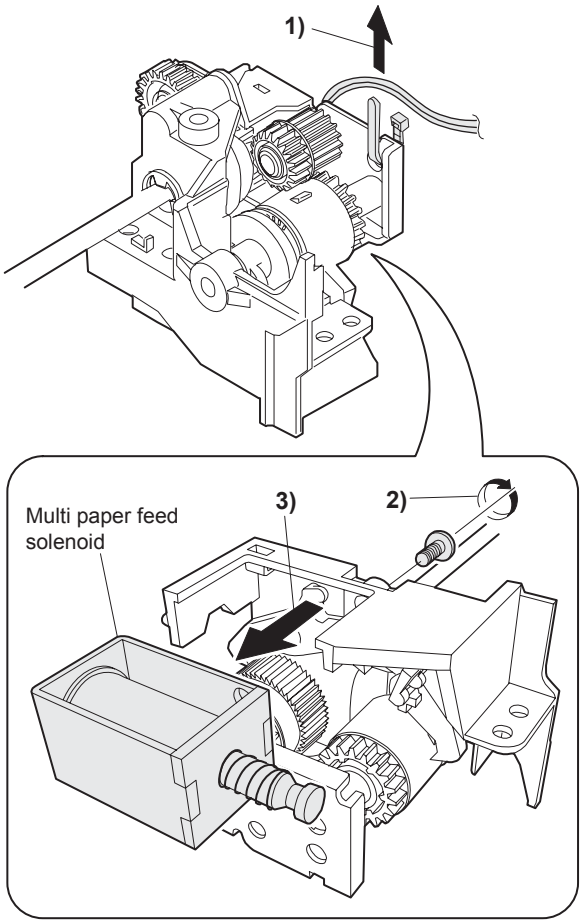


5) Remove three E-rings and remove the manual paper feed roller B9.

6) Remove the pick-up roller.



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

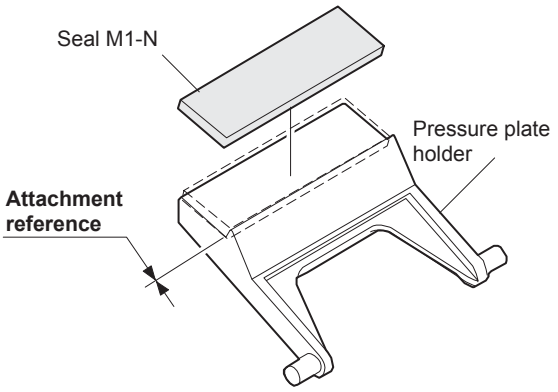


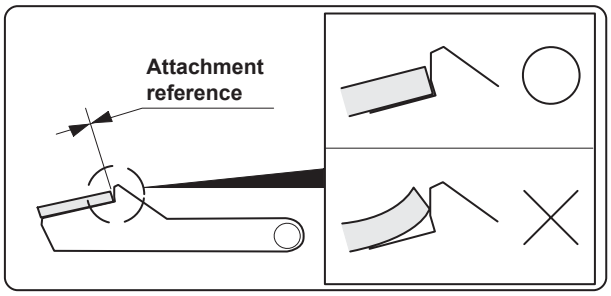
C. Assembly procedure

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.





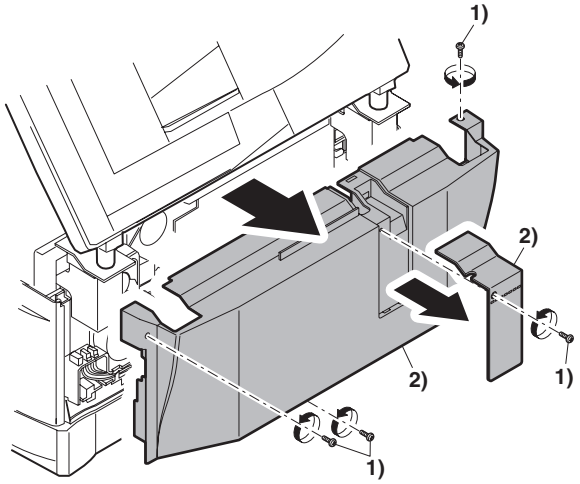
7. Rear frame section

A. List

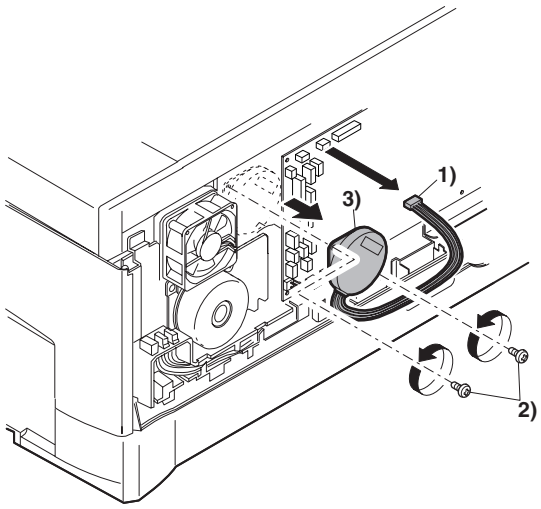
No.	Part name Ref.
1	Scanner motor
2	Main motor
3	Exhaust fan motor
4	NIC PWB
5	Main PWB

B. Disassembly procedure

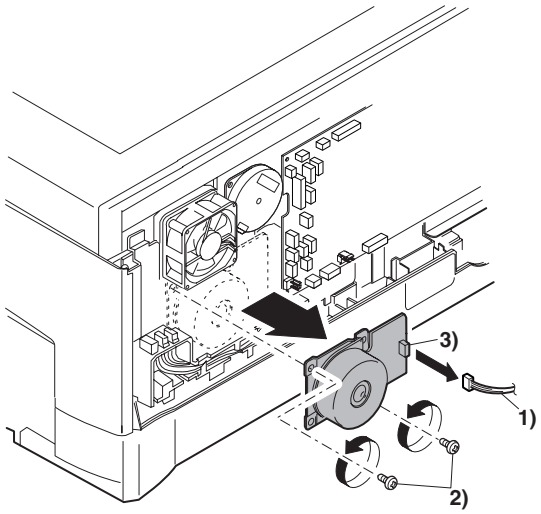
1) Remove four screws, and remove the rear cabinet and the rear cabinet cover.



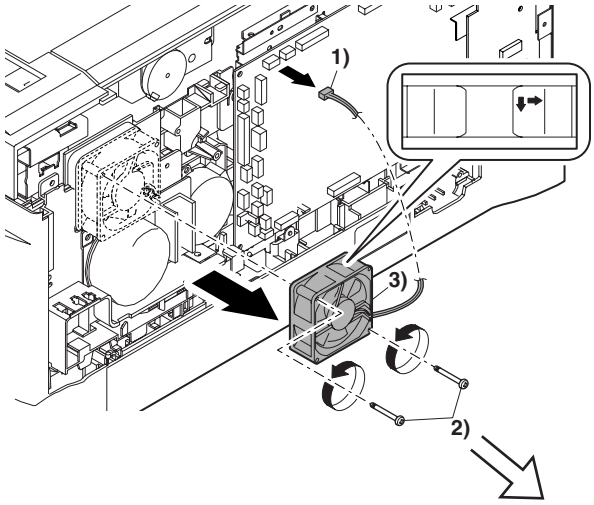
2) Disconnect the connector.
3) Remove two screws, and remove the scanner motor.



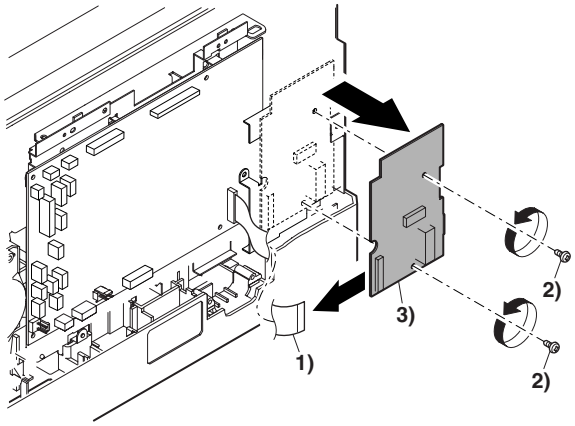
4) Remove two screws and one harness, and remove the main motor.



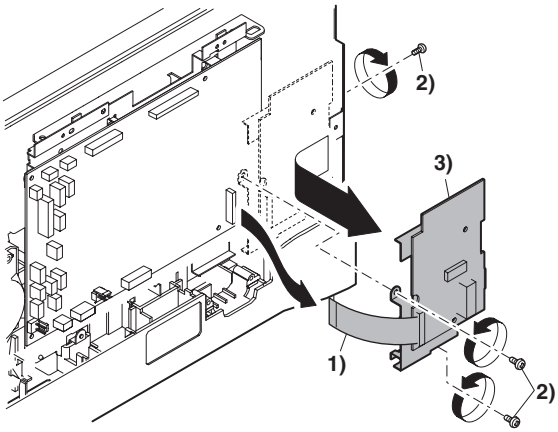
5) Remove two screws and one connector, and remove the exhaust fan motor.



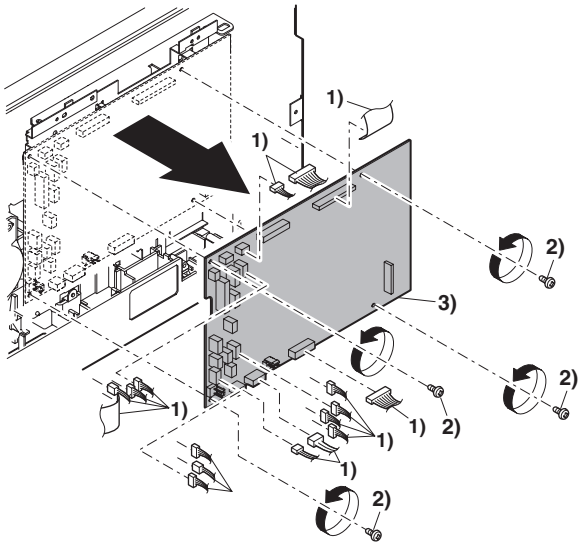
6) Disconnect the connector.
7) Remove the two screws, and remove the NIC PWB. (AL-2040CS/2050CS only)



8) Disconnect the connector.
9) Remove the three screws, and remove the NIC PWB unit. (AL-2040CS/2050CS only)



10) Disconnect the connectors.
11) 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.

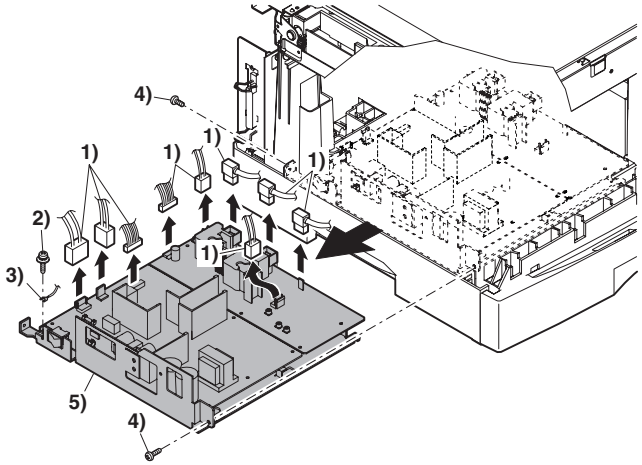
8 Power section

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.

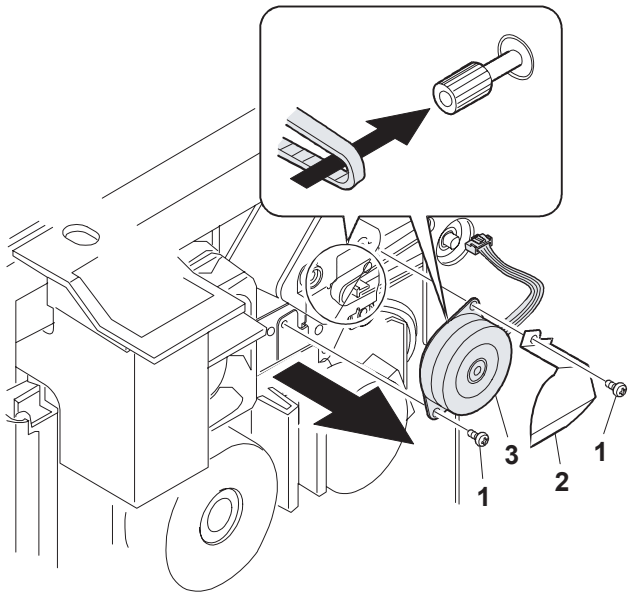
9. Duplex motor section (AL-2040CS/2050CS only)

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.

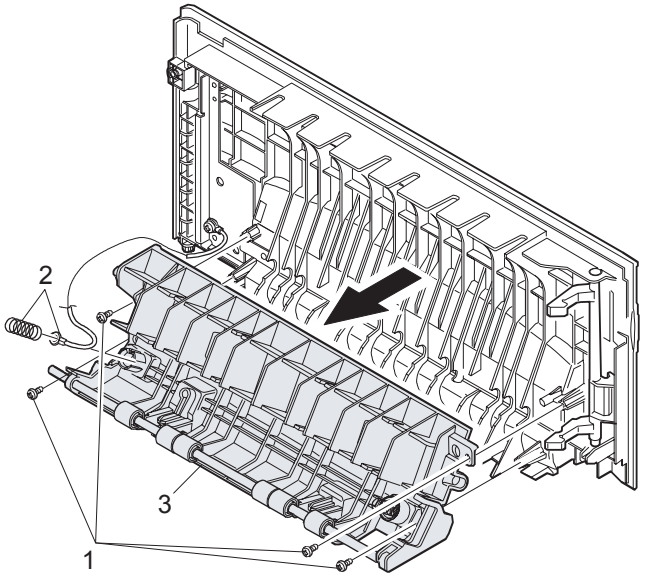
10. Reverse roller section (AL-2040CS/2050CS only)

A. List

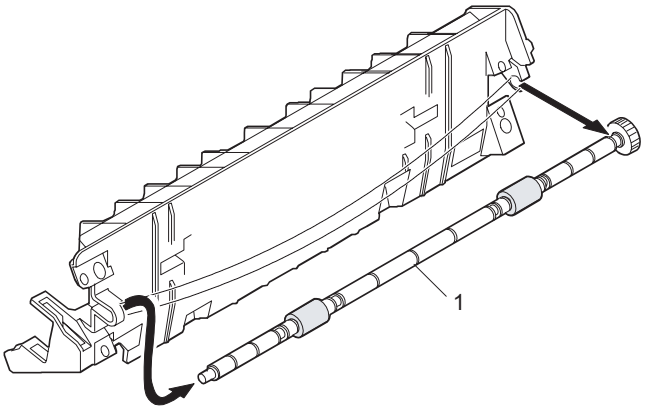
No.	Part name Ref.
1	Reverse roller

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.



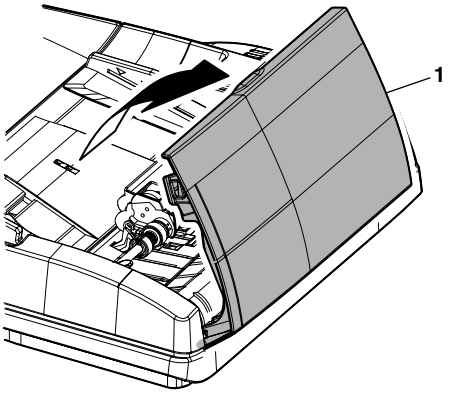
C. Assembly procedure

For assembly, reverse the disassembly procedure.

11. RSPF section (AL-2050CS only)

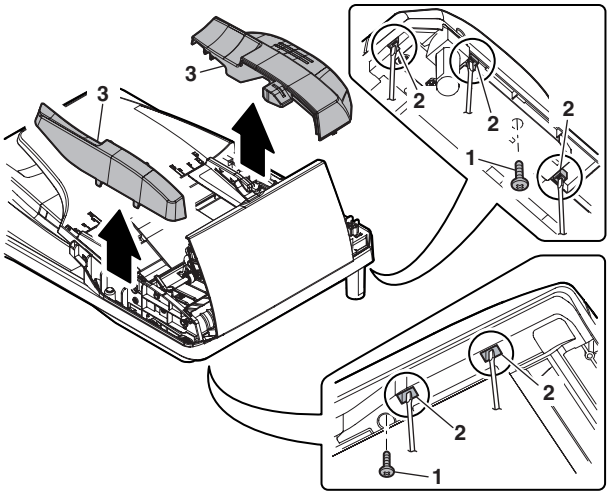
A. Front cabinet, rear cabinet

(1) Open the upper door unit.



(2) Front cabinet and rear cabinet removal

1) Remove two screws.
2) Disengage the five pawls.
3) Remove the front cabinet and the rear cabinet.



B. Upper door unit

1) Release the shaft on the front side.
2) Remove the upper door unit.

C. Document tray unit

1) Release the shaft on the front side.
2) Remove the tray unit.

■ **Note for reassembly**

Use care so that the paper exit Mylar in not pinched between the paper exit roller and the follower roller.

D. Upper door open/close sensor

1) Disconnect one connector.
2) Remove the upper door open/close sensor.

E. Reverse clutch, paper exit roller

(1) Reverse clutch removal

1) Disconnect one connector.
2) Remove the resin E-ring.
3) Remove the reverse clutch.

■ **Note for reassembly**

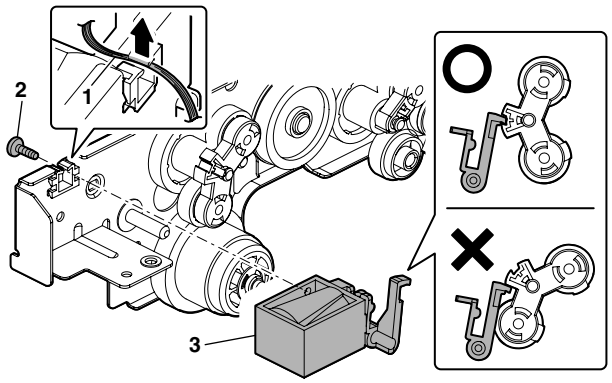
Attach the stopper of the reverse clutch along with the rib on the motor mounting plate.


1

G. Shutter solenoid

(1) Shutter solenoid unit removal

1) Remove the harness from the edge saddle.
2) Remove one screw.
3) Remove the shutter solenoid unit.

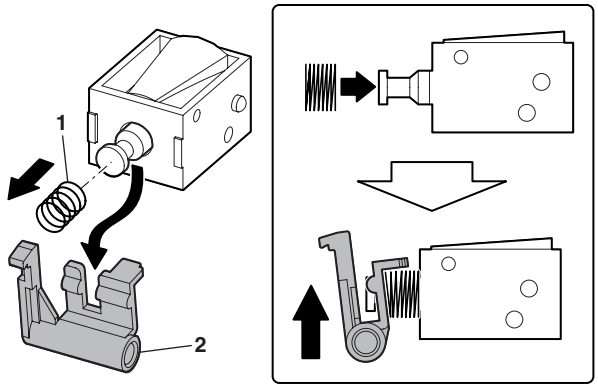


■ **Note for reassembly**

Install the paper feed solenoid under the state where the projection of the paper feed planet arm is lower than the paper feed solenoid lever.

(2) Shutter solenoid removal

1) Remove the paper feed solenoid spring from the shutter solenoid.
2) Remove the paper feed solenoid lever.



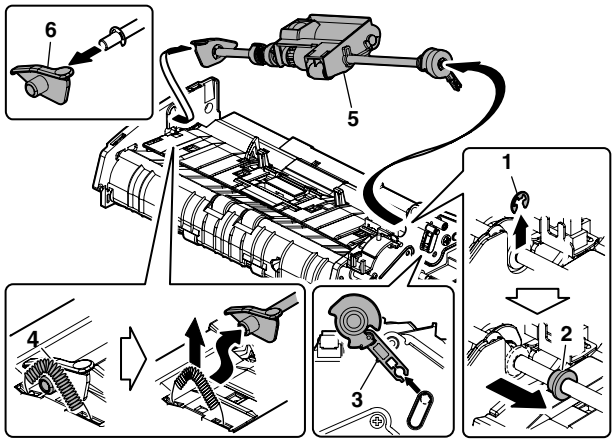
■ **Note for reassembly**

When assembling, use care so that the paper feed solenoid spring does not extend out of the paper feed solenoid lever.

H. Pickup roller, take-up roller

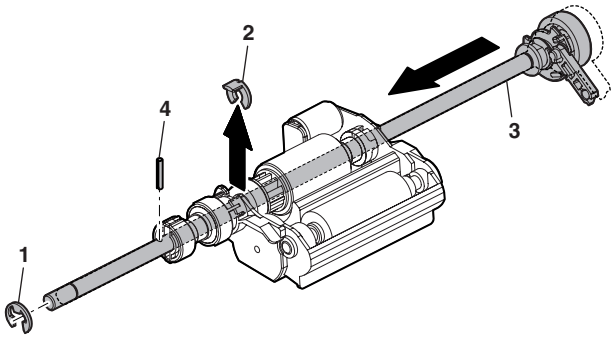
(1) Paper feed unit removal

1) Remove the E-ring.
2) Slide the bearing.
3) Remove the stopper arm.
4) Release the paper feed shaft pressure release spring.
5) Remove the paper feed unit.
6) Remove the paper feed shaft release arm.



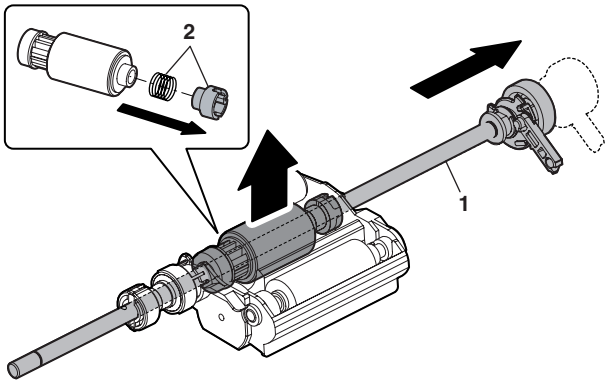
(2) Parts removal

1) Remove the E-ring.
2) Remove the resin E-ring.
3) Slide the shaft.
4) Remove the spring pin.



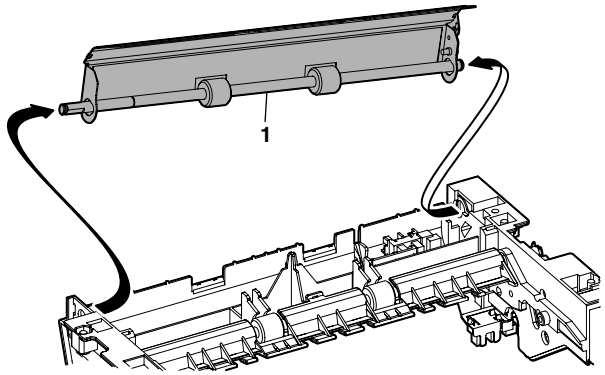
(3) Paper feed roller removal

1) Pull out the shaft.
2) Remove the clutch boss and the clutch spring from the pickup roller.



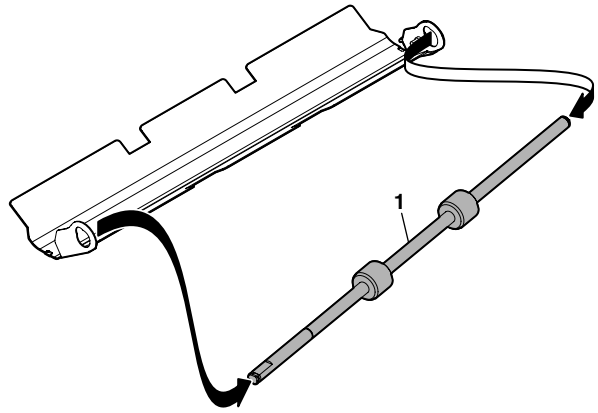
(3) Scan plate removal

1) Remove the scan plate.



(4) PS roller removal

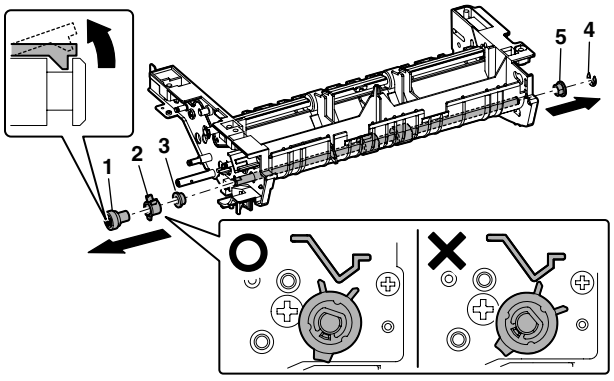
1) Remove the PS roller.



K. Upper transport roller

(1) Parts removal

1) Remove the gear.
2) Remove the upper transport release arm.
3) Remove the bearing.
4) Remove the E-ring.
5) Remove the bearing.

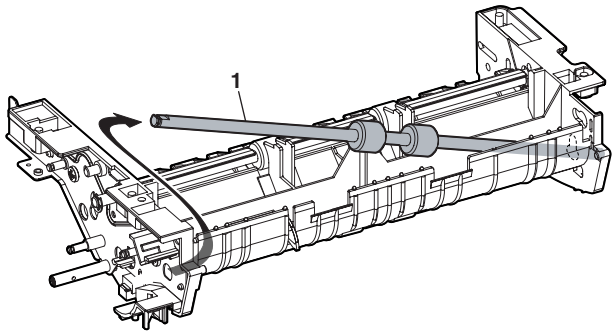


■ **Note for reassembly**

Use care so that the rib on the upper transport release arm catches the guide.

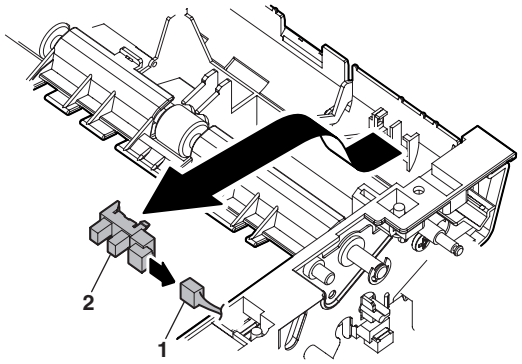
(2) Upper transport roller removal

1) Remove the upper transport roller.



L. Paper sensor

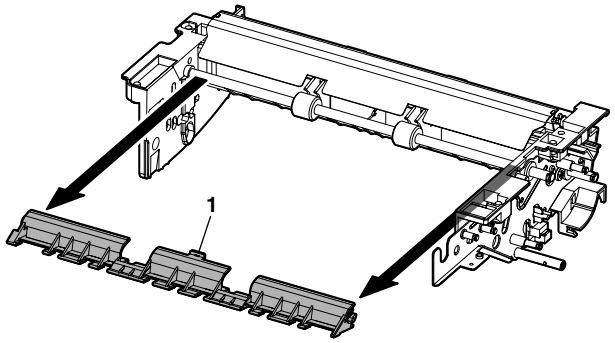
1) Disconnect one connector.
2) Remove the paper sensor.



M. Lower transport roller

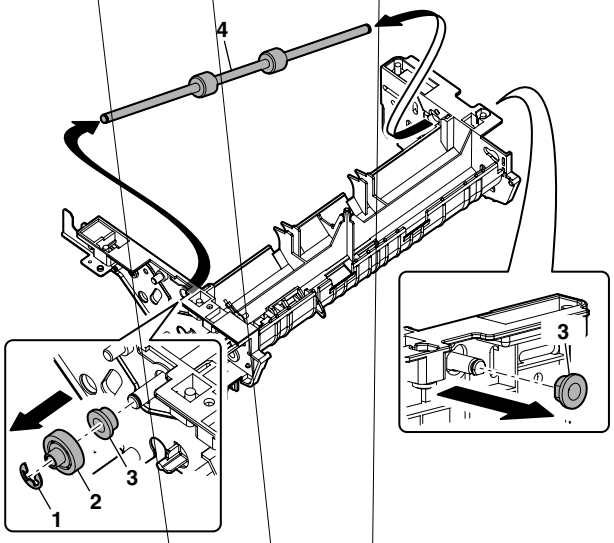
(1) Reverse self-weight gate removal

1) Remove the reverse self-weight gate.



(2) Lower transport roller removal

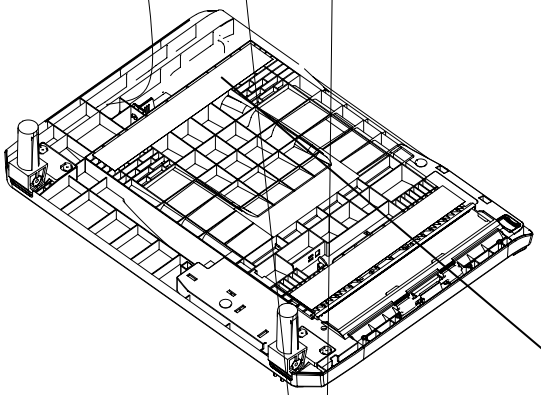
1) Remove the E-ring.
2) Remove the gear.
3) Remove the bearing.
4) Remove the lower transport roller.



N. Paper exit sensor

(1) OC mat removal

1) Remove the OC mat.



(2) Paper exit sensor removal

1) Disconnect one connector.
2) Remove the paper exit sensor.

12. SPF section (AL-2030/2040CS only)

(1) Rear cabinet disassembly

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

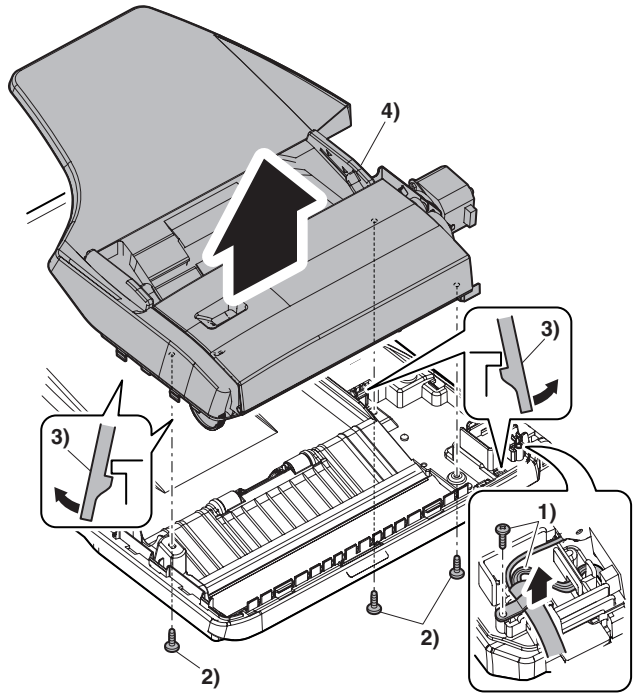
(2) Remove the SPF.

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

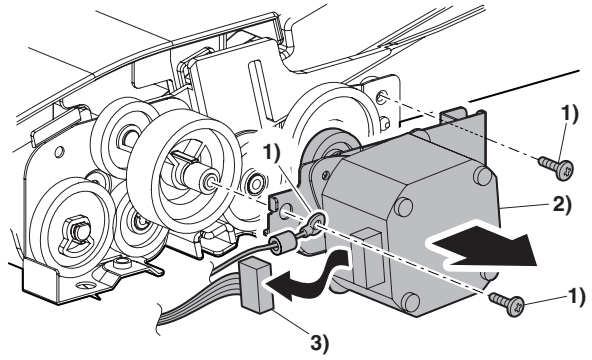
A. SPF motor

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

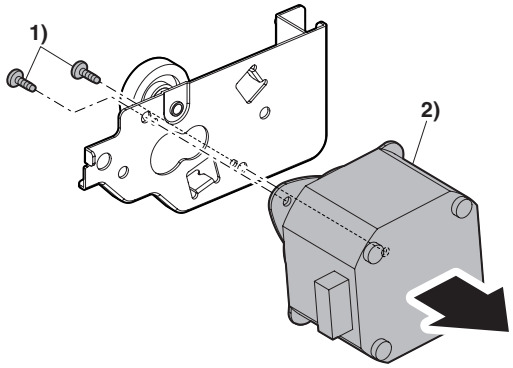
1) Remove the screw, and remove the harness.
2) Remove three screws.
3) Disengage the pawl (4 positions).
4) Remove the transport unit.



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

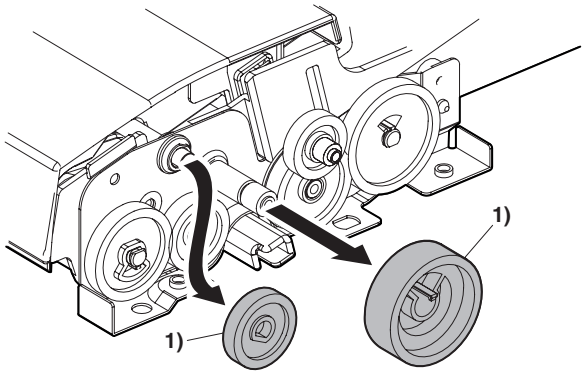


1) Remove two screws.
2) Remove the SPF motor.

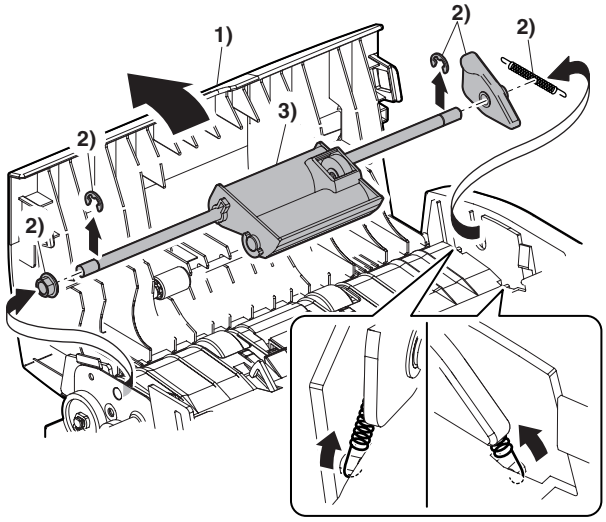


B. Pick-up roller, paper feed roller

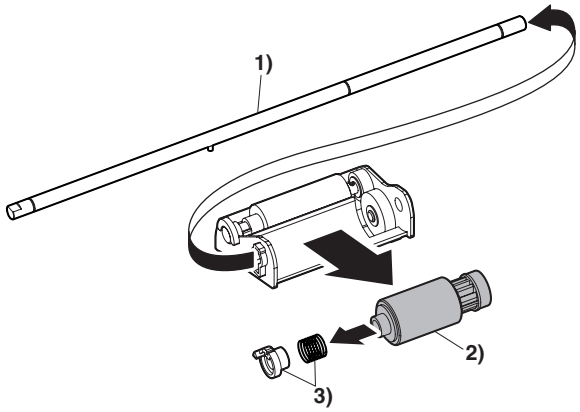
1) Remove two gears.

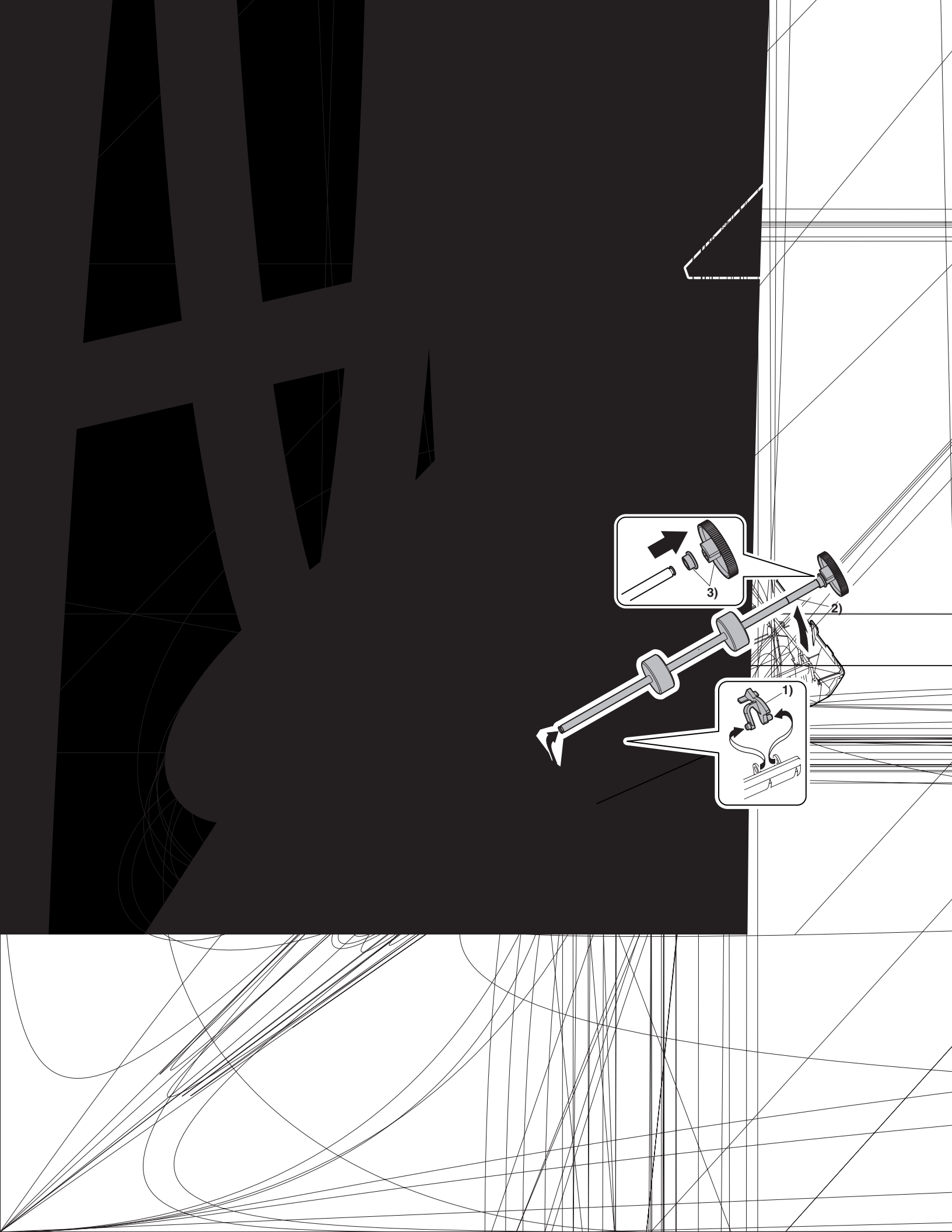


1) Open the upper door.
2) Remove two E-rings, and remove the spring, the arm, and the bearing.
3) Remove the pick-up roller unit.



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

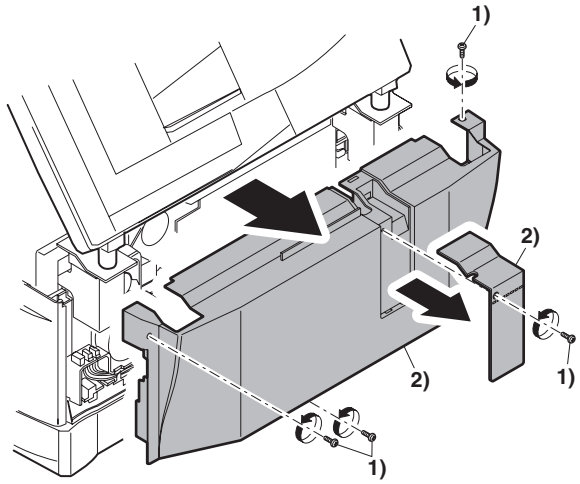



3)
2)
1)

13. 2nd cassette section (AL-2040CS/2050CS only)

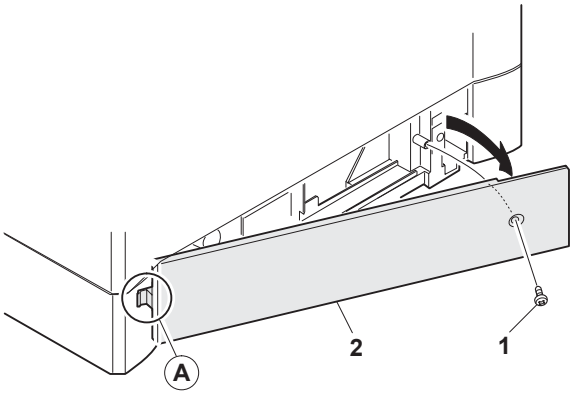
No.	Part name Ref.
A	Paper sensor
B	Cassette detection SW
C	Paper feed solenoid
D	Transport roller
E	Paper feed clutch
F	2nd paper feed roller

Paper feed unit removal

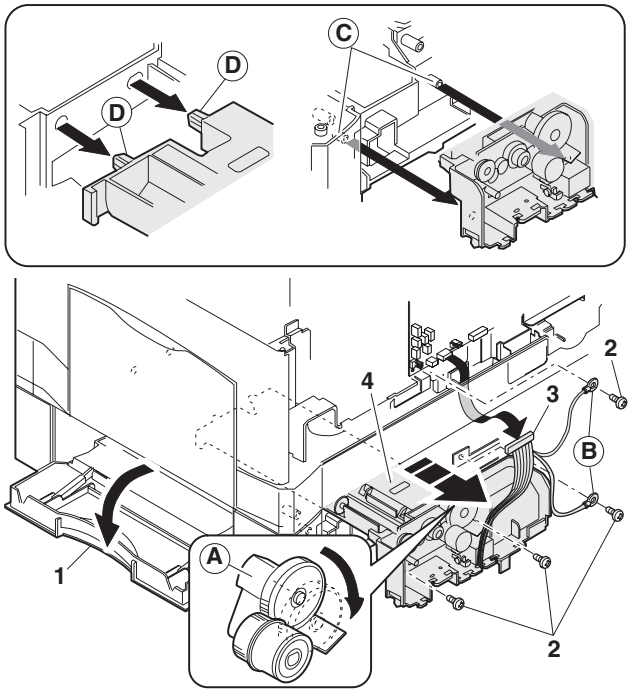


1) Remove the screw.
2) Remove the rear cover.

∗ When installing, engage the pawl and install the unit.



1) Open the right cabinet.
2) Remove three screws.
3) Remove one connector from MCU.
4) While tilting down the 2nd connection arm A, pull and remove the paper feed unit toward you.

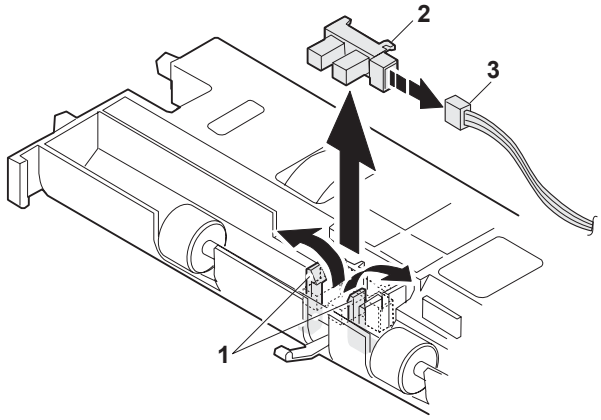


∗ When installing, securely insert two bosses C on the machine side and two bosses D on the paper feed unit side. Be sure to secure the ground wire B.

∗ Insert the 2nd page feed.

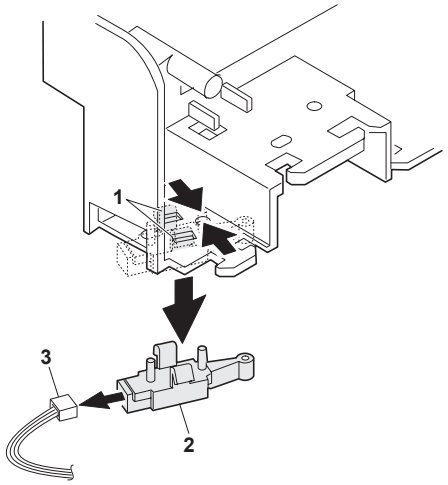
A. Paper sensor

1) Remove the pawl.
2) Remove the paper sensor.
3) Remove the harness.



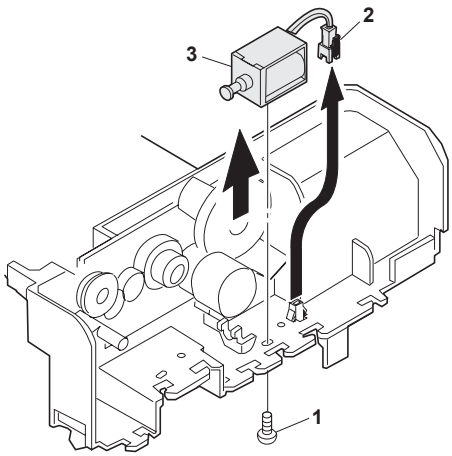
B. Cassette detection switch

1) Remove the pawl.
2) Remove the cassette detection switch.
3) Remove the harness.



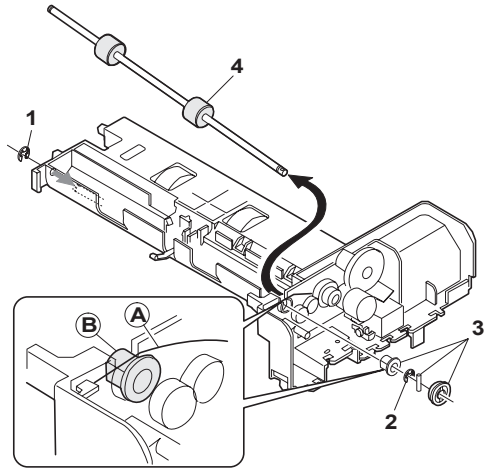
C. Paper feed solenoid

1) Remove the screw.
2) Remove the connector.
3) Remove the paper feed solenoid.



D. Transport roller

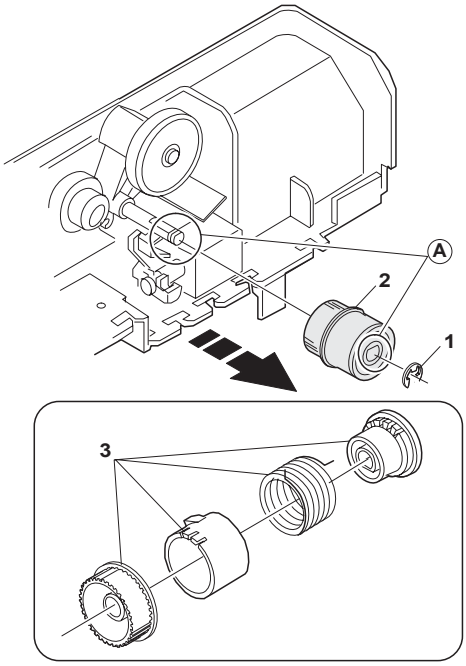
1) Remove two E-rings.
2) Remove the transport roller.



* Install so that the earth spring A is brought into contact over bearing B.

E. Paper feed clutch

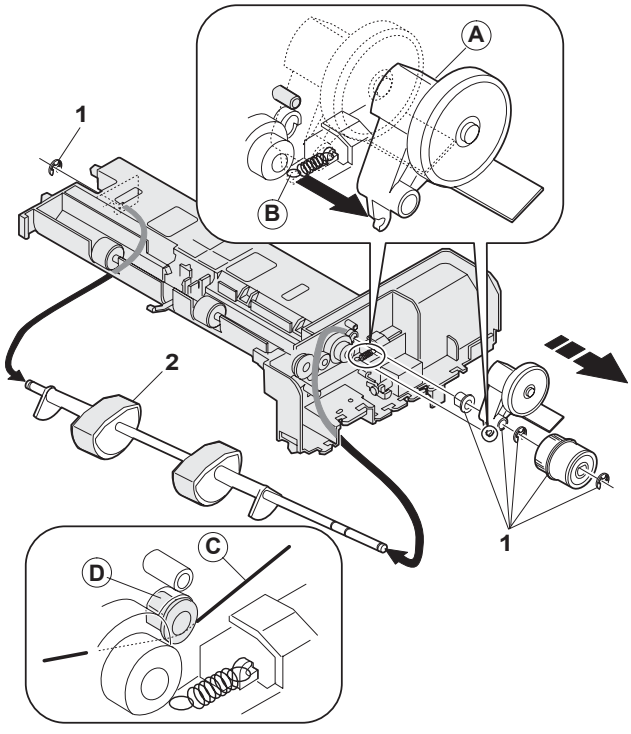
1) Remove the E-ring.
2) Remove the paper feed clutch.
3) Remove the parts.



* When installing, fit the cut surface A.

F. 2nd paper feed roller

1) Remove the E-ring and the parts.
2) Remove the 2nd paper feed roller.



* When installing, hang the 2nd connection arm on the 2nd connection arm Spring B. Be sure to install so that the earth spring C is in contact under the bearing D.

[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 (or [Numeric] keys for the AL-2050CS) 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

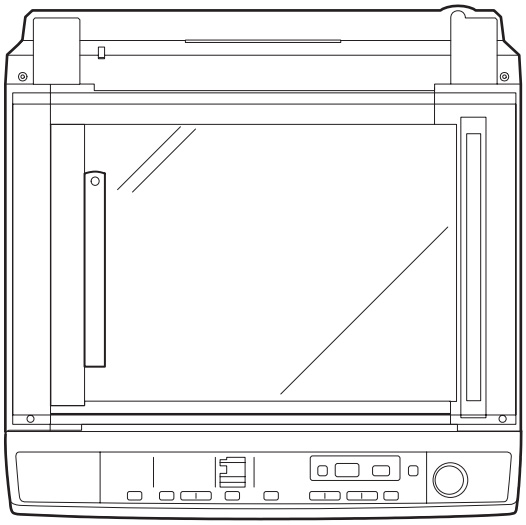
1) When the main PWB is replaced.
2) When the EEPROM in the main PWB is replaced.
3) When "U2" trouble occurs.
4) When repairing or replacing the optical section.

b. Necessary tools

- Screwdriver (+)
- Scale

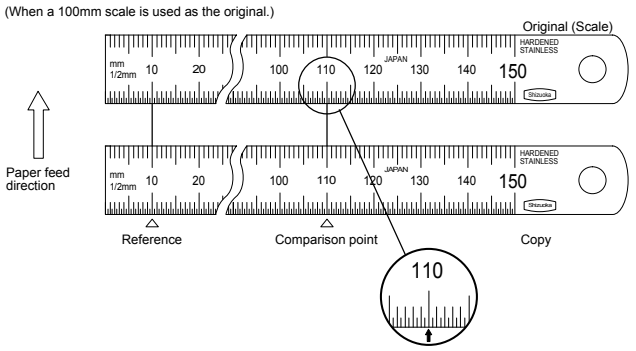
c. Adjustment procedure

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

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



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 (or [◄] [►] key for the AL-2050CS).

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.

(AL-2030/2040CS)

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

(AL-2050CS)

Adjustment mode	Display item	LED	Default
Main scan direction magnification ratio	F-R	PRINT mode lamp	50
OC mode sub scan direction magnification ratio	SCAN	SCAN mode lamp	50

8) Enter the new set value of main scanning direction copy magnification ratio with the copy quantity key (or [Numeric] key for the AL-2050CS), 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

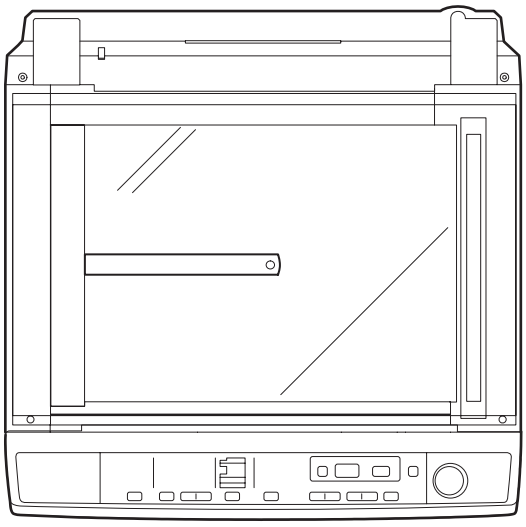
1) When the scanner unit drive section is disassembled or the part is replaced.
2) When the main PWB is replaced.
3) When the EEPROM in the main PWB is replaced.
4) When "U2" trouble occurs.

b. Necessary tools

- Scale

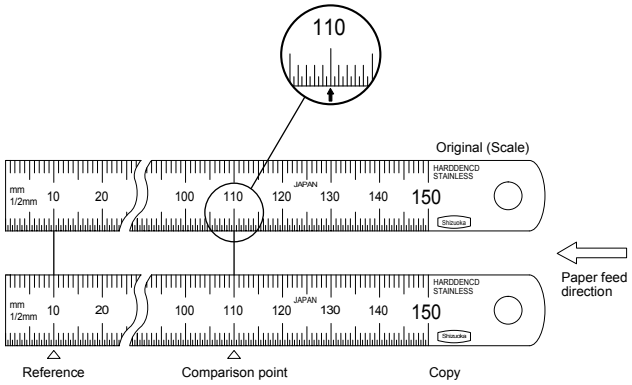
c. Adjustment procedure

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 (or [◄] [►] key for the AL-2050CS). (PHOTO lamp ON (or SCAN mode lamp ON for the AL-2050CS))
8) Enter the new set value of sub scanning direction copy magnification ratio with the [Copy quantity] keys (or [Numeric] keys for the AL-2050CS), 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 (2nd cassette paper feed)	50-01	AL-2040CS AL-2050CS
3	Print start position (Manual paper feed)	50-01	
4	Image lead edge void amount	50-01	
5	Image scan start position	50-01	
6	Image rear edge void amount (Cassette paper feed)	50-01	
7	Image rear edge void amount (Manual paper feed)	50-01	AL-2050CS
8	Print center offset (Main cassette paper feed)	50-10	
9	Print center offset (2nd cassette paper feed)	50-10	AL-2040CS AL-2050CS
10	Print center offset (Manual paper feed)	50-10	
11	2nd print center offset (Main cassette paper feed)	50-10	AL-2040CS AL-2050CS

(AL-2030/2040CS)

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 (2nd cassette paper feed)	AE, 2nd 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

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

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 (2nd cassette)	AE, 2nd 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.

(AL-2050CS)

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

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

Adjustment mode	Display item	Lamp ON
Print start position (Main cassette paper feed)	TRAY1	COPY mode lamp Main cassette lamp
(*) Print start position (2nd cassette paper feed)	TRAY2	COPY mode lamp 2nd cassette lamp
Print start position (Manual paper feed)	MFT	COPY mode lamp Manual paper feed lamp
Image lead edge void amount	DEN-A	PRINT mode lamp Main cassette lamp
Image scan start position	RRC-A	SCAN mode lamp Main cassette lamp
Image rear edge void amount (Cassette paper feed)	DEN-B	COPY mode lamp PRINT mode lamp SCAN mode lamp Main cassette lamp
Image rear edge void amount (Manual paper feed)	RRC-B	COPY mode lamp PRINT mode lamp Manual paper feed lamp

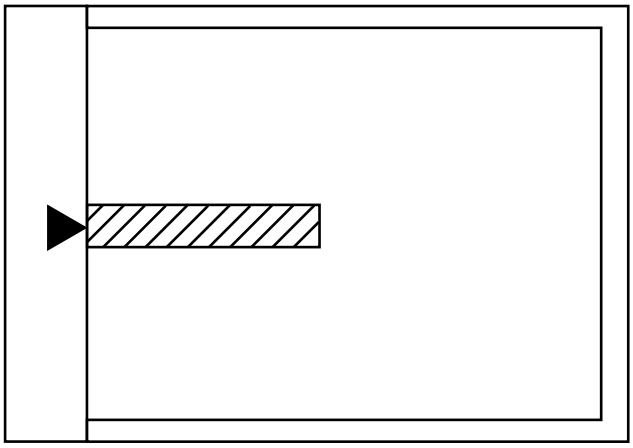
To select the adjustment mode with SIM 50-10, use the [◄] [►] key.

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

Adjustment mode	Display item	Lamp ON
Print center offset (Main cassette paper feed)	TRAY1	COPY mode lamp Main cassette lamp
Print center offset (2nd cassette paper feed)	TRAY2	COPY mode lamp 2nd cassette lamp
Print center offset (Manual paper feed)	MFT	COPY mode lamp Manual paper feed lamp
2nd print center offset (Main cassette paper feed)	SIDE2	PRINT mode lamp Main cassette lamp

(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.

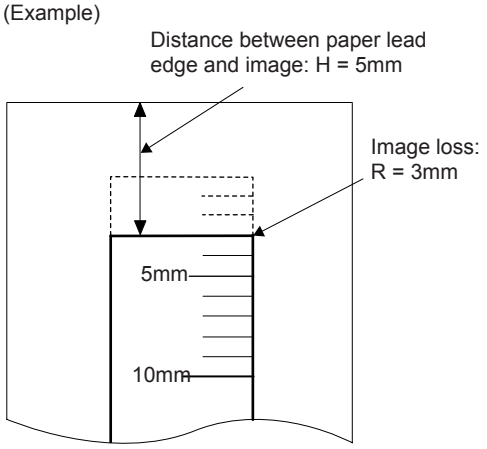


2) Execute SIM 50-01
3) Set the print start position (AE lamp ON) (A), the lead edge void amount (TEXT lamp ON) (B), and the scan start position (PHOTO lamp ON) (C) to 0, and make a copy of a scale at 100%. (AL-2030/2040CS)

   For the AL-2050CS, the following LED's are lighted:

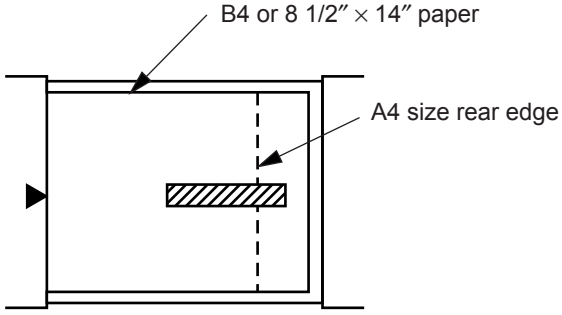
   - AE lamp/COPY mode lamp: (A)
   - TEXT lamp/PRINT mode lamp: (B)
   - PHOTO lamp/SCAN mode lamp: (C)
4) Measure the image loss amount (R mm) of the scale image.
   Set C = 10 X R (mm). (Example: Set the value of C to 30.)
   When the value of C is increased by 10, the image loss is decreased by 1mm. (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)



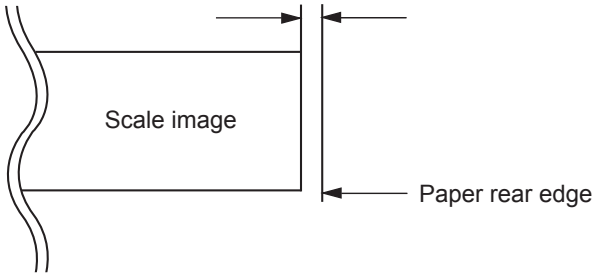
(2) Image rear edge void amount adjustment

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)



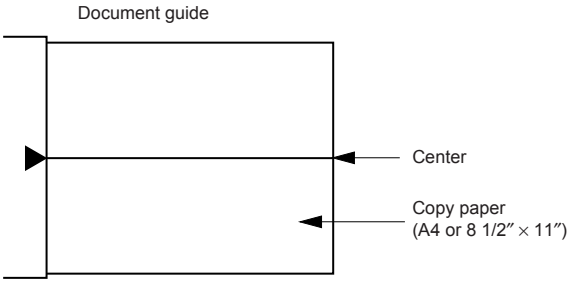
4) If the measurement value is out of the specified range, change the set value and repeat the adjustment procedure.
The default value is 50.

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

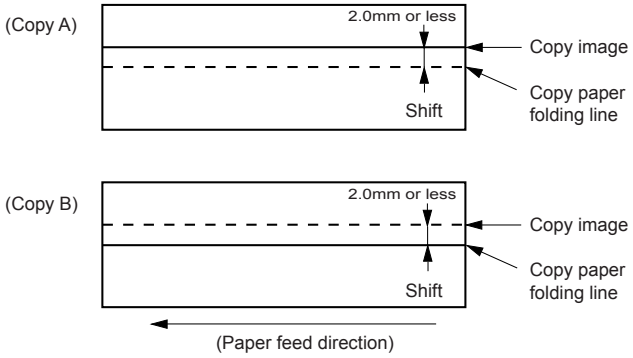
1) Set the self-made test chart for the center position adjustment so that its center line is aligned with the center mark of the document guide.

- 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.

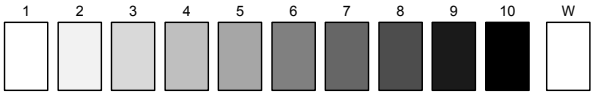
B. Note for copy density adjustment

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

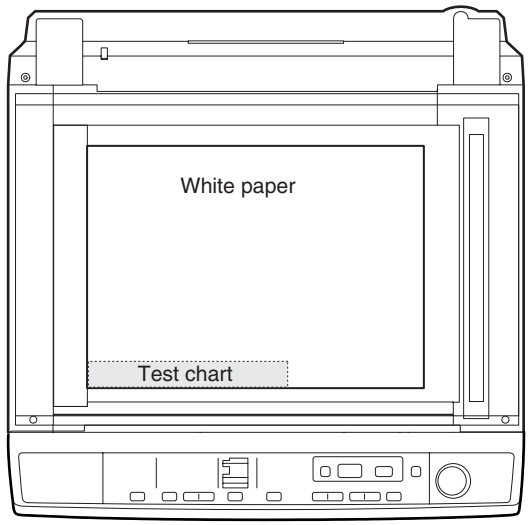
E. Copy density adjustment procedure

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

For selection of modes, use the [Exposure mode selector] key (or [◄] [►] key for the AL-2050CS).

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

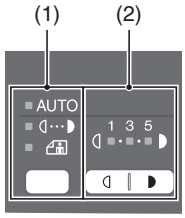
1) Place the test chart so that its edge is aligned with the A4 (Letter) reference line on the document table. Then place a A4 (14" x 8 1/2") white paper on the test chart and close the document cover.



(2) Perform the adjustment in each mode.

1) Execute SIM 46-01 (300dpi). To adjust in 600dpi, execute SIM 46-02.
2) AL-2030/2040CS

   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.)

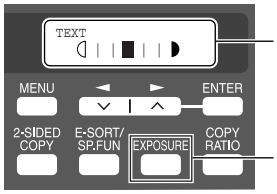


(1) Exposure mode select key/display lamp
(2) [Exposure mode selector] key/ display lamp

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.

2) AL-2050CS

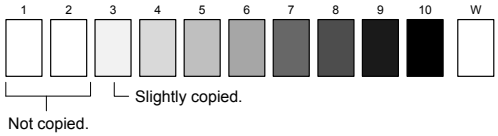
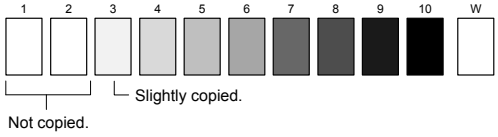
   Select the mode to be adjusted with the exposure key. Set the exposure level to 3 (center) for all adjustment. (Except for the auto mode.)



(1) Exposure mode, level display
(2) Exposure key

Adjustment mode	Display item	LED	Sharp gray chart adjustment level
Auto mode	AE	COPY mode lamp	"3" is slightly copied.
Text mode	TEXT	PRINT mode lamp	"3" is slightly copied.
Photo mode	PHOTO	SCAN mode lamp	"3" is slightly copied.
Text T/S mode	TSTXT	PRINT mode lamp SCAN mode lamp	"3" is slightly copied.
Auto T/S mode	TSAE	COPY mode lamp SCAN mode lamp	"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

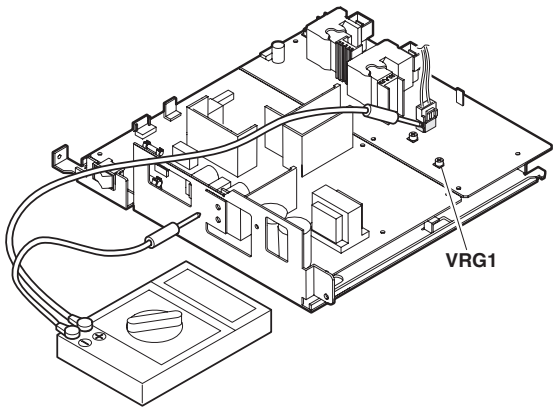
A. Main charger (Grid bias)

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.

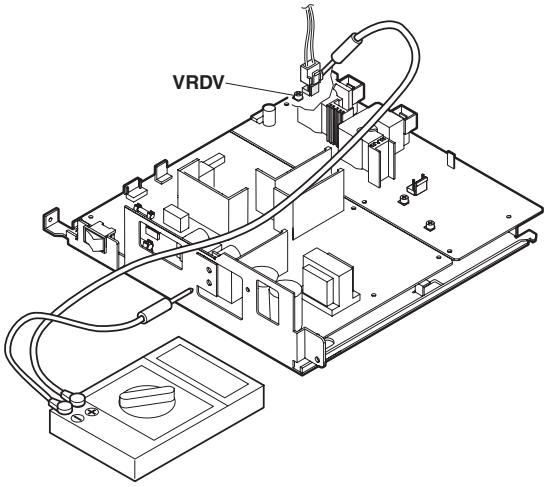


B. DV bias check

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.

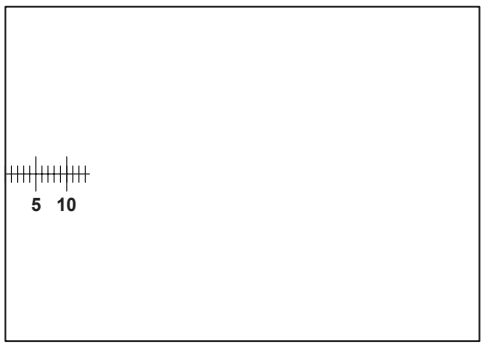
The image data is read, starting from its front end in the document delivery direction (Reference direction of document setting in the OC mode)and stored in memory.

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

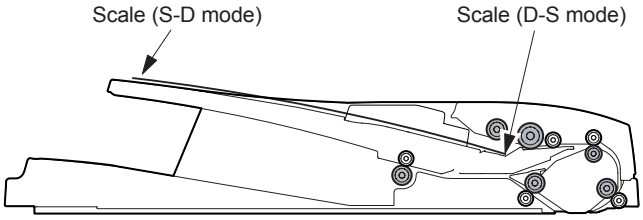
In other words, the front edge image loss of the image can be adjusted by changing the document read end position.

(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.

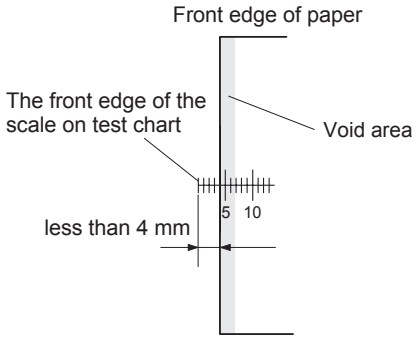


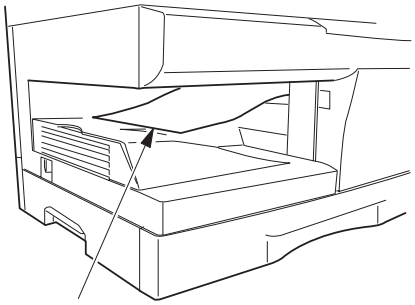
3) Execute simulation 50-18.

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

Select the SPF/RSPF 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/RSPF 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.

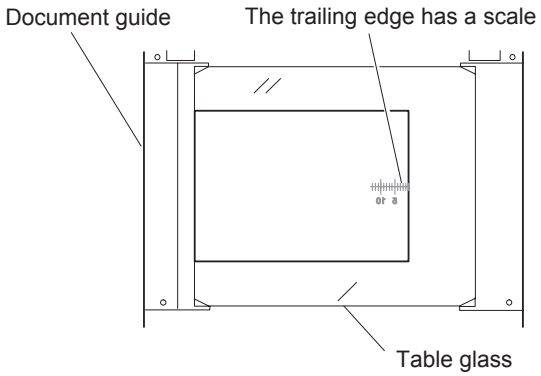
2) Print start position (Duplex back surface) (SPF/RSPF) 50-19 (PHOTO)
The size (length) of a document read from the SPF/RSPF is detected, the image at the trailing edge of the first printing surface is cut to make a void area. (The adjustment of void quantity at the time when the cassette paper size is not recognized.)

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

(Adjustment procedure)

(1) Paper trailing edge void quantity

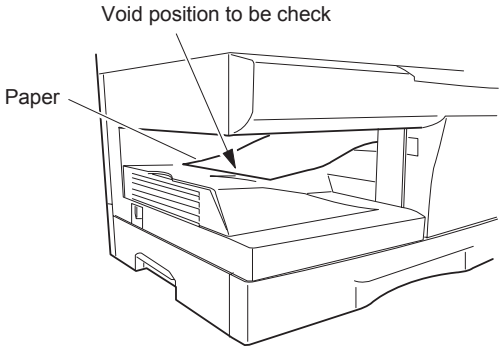
1) Preparing test chart (Draw a scale at the rear end of one side of a sheet of A/4 white paper or letter paper)
2) Set the test chart on the document glass as shown below.



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 (or PRINT mode lamp for the AL-2050CS) 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.

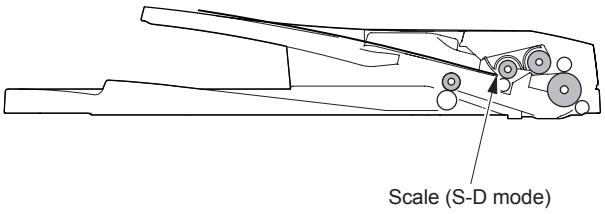


The trailing edge void on the first printing surface is shown above.

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 (or SCAN mode lamp for the AL-2050CS) 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/RSPF 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/RSPF.

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/RSPF 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/RSPF 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/RSPF scan position auto adjustment	AUTO	1	AE mode lamp (AL-2030/2040CS) COPY mode lamp (AL-2050CS)
SPF/RSPF scan position manual adjustment	MANU	1	TEXT mode lamp (AL-2030/2040CS) PRINT mode lamp (AL-2050CS)

Operation

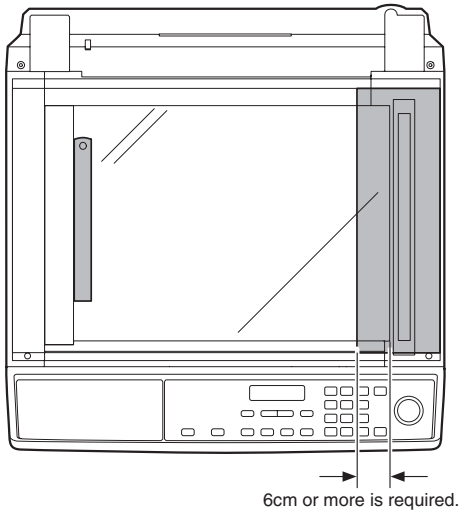
The operation is similar to simulation 46-01. (In MANUAL)
OK/ERR display in AUTO (AL-2050CS only)

<When OK>

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

<When ERR>

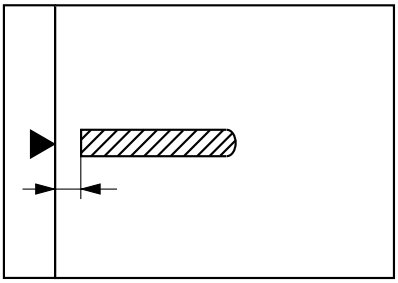
```
53-08 SPF AUTO
AUTO  100% **    ERR
```



6. SPF/RSPF 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-2030/2040CS)

   Set the test chart on the RSPF and make a duplex copy (D-D or D-S) in the normal ratio (100%). (AL-2050CS)

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.

   When adjusting the RSPF, use [2-SIDED COPY] key to select single/duplex after entering the one page print mode, performing 2-page single copy.

Mode	Display item (AL-2050CS)	Default	LED
Sub scan magnification ratio adjustment on the surface of SPF/RSPF document	SIDE1	50	AE mode lamp (AL-2030/ 2040CS) COPY mode lamp (AL-2050CS)
Sub scan magnification ratio adjustment on the surface of RSPF document (AL-2050CS only)	SIDE2	50	PRINT mode lamp

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

<Adjustment specification>

Adjustment mode	Spec value	SIM	Set value	Setting range
Sub scanning direction magnification ratio (SPF/RSPF 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

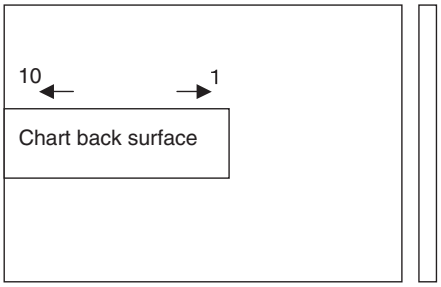
1) When the main PWB is replaced.
2) When the EEPROM in the main PWB is replaced.
3) When "U2" trouble occurs.
4) When repairing or replacing the optical section.

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.

AL-2050CS only

c. Operation

1) Initial display

```
63-02 BLACK LEVEL
                0
```

2) [ENTER]/[START] key: Correction start

```
63-02 BLACK LEVEL
EXECUTING...
```

<During canceling - When [Clear]/[Clear All] key is pressed->

After canceling, the machine goes into the sub code entry standby mode.

```
THE JOB IS BEING
CANCELED.
```

3) After execution

```
63-02 BLACK LEVEL
             *** OK
```

3) In case of an error

```
63-02 BLACK LEVEL
             *** ERR
```

[10] SIMULATION, TROUBLE CODES

1. Entering the simulation mode

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

AL-2030/AL-2040CS

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

AL-2050CS

[#] key → [*] key → [Clear] key → [*] key

To cancel the simulation mode, press the [Clear All] key.

2. Key rule

AL-2030/AL-2040CS

[▲] [▲] 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
[Exposure mode selector] key:	Selection of an item
[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).

AL-2050CS

[Numeric] key:	Entry of MAIN CODE/SUB CODE Selection of an item Setup of an adjustment value in case of simulations for adjustment
[◄] [►] key:	Selection of MAIN CODE/SUB CODE Selection of an item
[ENTER]/[START] key:	Settlement <In case of simulations for print> [ENTER] key: Settlement (Without print) [START] key: Settlement / Print
[Clear] key:	(Interrupting operation check) Returns to the upper hierarchy. In case of simulation of operation check, terminates the operations.
[Clear All] key:	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
01	01	Mirror scan operation
	02	Mirror home position sensor (MHPS) status display
	06	Aging of mirror scanning
02	01	SPF/RSPF aging operation
	02	SPF/RSPF sensor status display
	03	SPF/RSPF Motor ON
	06	Resist clutch ON (SPF) (AL-2030/2040CS only)
	08	RSPF paper feed solenoid operation check (AL-2050CS only)
	09	RSPF reverse solenoid operation check (AL-2050CS only)
03	03	Shifter operation check (AL-2050CS only)
05	01	Operation panel display check
	02	Fusing lamp, cooling fan operation check
	03	Copy lamp ON
06	01	Paper feed solenoid ON
	02	Resist solenoid ON
07	01	Warm-up display and aging with jam
	06	Intermittent aging
	08	Shift to copy with the warm-up display
08	01	Developing bias
	02	Main charger (Grid high)
	03	Grid voltage (Low)
	06	Transfer charger
09	01	Duplex motor normal rotation operation check (AL-2040CS/2050CS only)
	02	Duplex motor reverse operation check (AL-2040CS/2050CS only)
	04	Duplex motor rotation speed adjustment (AL-2040CS/2050CS 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/RSPF counter display
	12	Drum counter display
	14	ROM version display
	16	Duplex counter display (AL-2040CS/2050CS only)
	17	Copy counter display
	18	Printer counter display
	19	Scanner mode counter display (AL-2040CS/2050CS only)
	21	Scanner counter display
	22	SPF/RSPF JAM counter display
24	01	JAM total counter clear
	04	SPF/RSPF counter clear
	05	Duplex counter clear (AL-2040CS/2050CS only)
	07	Drum counter clear
	08	Copy counter clear
	09	Printer counter clear
	13	Scanner counter clear
	14	SPF/RSPF JAM total counter clear
	15	Scanner mode counter clear (AL-2040CS/2050CS only)
25	01	Main motor operation check (Cooling fan motor rotation check)
	10	Polygon motor ON

Sim No.	Sub code	Operation
26	02	SPF/RSPF setup
	03	Second cassette setup
	04	Machine duplex setup
	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
30	01	Paper sensor status display
41	06	OC cover float detection level adjustment
	07	OC cover float detection margin setting
43	01	Fusing temperature setting (Normal copy)
	04	Fusing temperature setting in multi copy
	05	Fusing temperature setup in duplex copy (AL-2040CS/2050CS only)
	14	Fusing start temperature setting
46	01	Copy density adjustment (300dpi)
	02	Copy density adjustment (600dpi)
	18	Image contrast adjustment (300dpi)
	19	Exposure mode setup
	20	SPF/RSPF exposure correction

Sim No.	Sub code	Operation
46	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/RSPF mode sub scan direction magnification ratio in copying
49	01	Flash ROM program writing mode
50	01	Lead edge image position
	06	Copy lead edge position adjustment (SPF/RSPF)
	10	Center offset adjustment
	12	Document off-center adjustment
	18	Memory reverse position adjustment in duplex copy (AL-2040CS/2050CS only)
	19	Duplex copy rear edge void adjustment (AL-2040CS/2050CS only)
51	02	Resist quantity adjustment
53	08	SPF/RSPF scan position automatic adjustment
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
67	50	USB receive speed adjustment (USB1.1) (AL-2030/2040CS only)

4. Descriptions of various simulations

Main code	Sub code	Contents	Details of function/operation

1	01	Mirror scan operation	**[Function]**
			When [ENTER]/[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 (or the copy mode indicator for the AL-2050CS)". (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.
			[Operation] (AL-2050CS only)
			1) Initial display
			`01-01 SCAN CHK`
			`- 100% +`
			2) [ZOOM] key
			`01-01 SCAN CHK`
			`- 78% +`
			3) [ENTER]/[START] key
			`01-01 SCAN CHK`
			`EXECUTING... - 78% +`
			2) [◄] key
			`01-01 SCAN CHK`
			`- 99% +`
			2) [►] key
			`01-01 SCAN CHK`
			`- 101% +`

	02	Mirror home position sensor (MHPS) status display	**[Function]**
			Monitors the mirror home position sensor, and makes the "Drum replacement required lamp (or the copy mode indicator for the AL-2050CS)" turn on during the sensor ON status.
			[Operation] (AL-2050CS only)
			1) Initial display
			`01-02 MHP-SENSOR`
			`EXECUTING...`

<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>1</td><td>06</td><td>Aging of mirror scanning</td><td>[Function]
When [ENTER]/[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 [ENTER]/[START] key is pressed once, the ready lamp remains OFF.
The mirror home position sensor status is displayed on the "Drum replacement required lamp (or the copy mode indicator for the AL-2050CS)." (The lamp is ON when the mirror is in the home position.)
During aging, the copy lamp is ON.
[Operation] (AL-2050CS only)
The operation is similar to simulation 1-01.</td></tr>
<tr><td>2</td><td>01</td><td>SPF/RSPF aging operation</td><td>[Function]
When [ENTER]/[START] key is pressed, the set magnification ratio is obtained. For the SPF, the single-face document transport is performed. For the RSPF, the duplex document transport is performed.
However, the operating conditions don't matter and the operation is not stopped even in case of a jam. Also the magnification ratio is displayed on the LCD/display.
[Operation] (AL-2050CS only)
The operation is similar to simulation 1-01.</td></tr>
<tr><td></td><td>02</td><td>SPF/RSPF sensor status display</td><td>[Function]
The ON/OFF status of the SPF/RSPF sensors can be checked with the LCD/LED.
When a sensor is ON, the sensor name is displayed on the LCD/LED.
<table>
<tr><th>Sensor</th><th>Display item AL-2050CS</th><th>Display item AL-2030/2040CS</th></tr>
<tr><td>Document set sensor</td><td>SPID</td><td>TD cartridge replacement required lamp</td></tr>
<tr><td>RSPF document transport sensor</td><td>SPPD</td><td>Misfeed lamp</td></tr>
<tr><td>RSPF paper feed cover open/close sensor</td><td>SDSW</td><td>—</td></tr>
<tr><td>RSPF paper exit sensor</td><td>SPOD</td><td>—</td></tr>
</table>
[Operation] (AL-2050CS only)
1) Initial display
02-02 SPF SENSOR
2) When the sensor is ON:
02-02 SPF SENSOR
SPID SPPD SDSW SPOD</td></tr>
<tr><td></td><td>03</td><td>SPF/RSPF Motor ON</td><td>[Function]
When [ENTER]/[START] key is pressed, the motor rotates for 10sec at the speed corresponding to the set magnification ratio.
[Operation] (AL-2050CS only)
The operation is similar to simulation 1-01.</td></tr>
<tr><td></td><td>06</td><td>Resist clutch ON (SPF) (AL-2030/2040CS only)</td><td>When the [START] key is pressed, the SPF resist clutch (SRRC) repeats ON (500 ms) and OFF (500 ms) 20 times.</td></tr>
<tr><td></td><td>08</td><td>RSPF paper feed solenoid operation check (AL-2050CS only)</td><td>[Function]
The RSPF paper feed solenoid (SPUS) repeats ON for 500ms and OFF for 500ms 20 times by the use of the solenoid drive control Bios.
[Operation] (AL-2050CS only)
1) Initial display
02-08 SPF SPUS CHK
EXECUTING...</td></tr>
<tr><td></td><td>09</td><td>RSPF reverse solenoid operation check (AL-2050CS only)</td><td>[Function]
The RSPF reverse solenoid (SPFS) repeats ON for 500ms and OFF for 500ms 20 times by the use of the solenoid drive control Bios.
[Operation] (AL-2050CS only)
1) Initial display
02-09 RSPF SPFS CHK
EXECUTING...</td></tr>
</table>

Main code	Sub code	Contents	Details of function/operation

3	03	Shifter operation check (AL-2050CS only)	**[Function]**
			The shifter is moved back and forth in four reciprocations.
			[Operation] (AL-2050CS only)
			1) Initial display
			`03-03 SHIFTER CHK`
			`EXECUTING...`

5	01	Operation panel display check	**[Function]**
			<LED check mode (All ON/Individual ON)>
			When [ENTER]/[START] key is pressed, all the LCD's on the operation panel are turned ON (all pixels ON).
			After 5sec of ON, the machine goes into the sub code entry standby mode.
			When [Mode Select] key is pressed under the all ON state, the mode is shifted to the individual ON mode, where the LED's are turned on one by one from the left upper end to the left lower side then from the right upper side to the right lower side. (All the pixels of LCD are lighted simultaneously.) After lighting all the LCD's sequentially, all the LCD's are lighted simultaneously. After 5sec from lighting all the LCD's simultaneously, the machine goes into the sub code entry standby mode. (Cycle of individual ON mode: ON 300ms, OFF 20ms)
			When [Clear] key is pressed in the LED check mode, the machine goes into the sub code entry standby mode.
			When [START] key is pressed, the machine goes into the key input check mode.
			<Key input check mode>
			When the machine goes into the key input check mode, the value display section indicates "– – –" (For the AL-2050CS, 0 of the LCD is indicated).
			When any key is pressed after pressing a key on the operation panel, "+1" is added to the value.
			Once a key is pressed, it is not recounted.
			When [START] key is pressed, counting is made and the machine goes into the LED ON check mode (LED all ON status) after 3sec.
			When [Clear] key is pressed for the first time, it is counted. When it is pressed for the second time, the key check mode is retained as well as when another key is pressed.
			(Note in the key input check mode)
			• Be sure to press [START] key at the last. (If it is pressed on the way, the machine goes into the LED ON check mode.) (LED all ON status)
			• Multi key input is ignored.
			[Operation] (AL-2050CS only)
			<LED check mode (All ON/Individual ON)>
			1) Initial display
			[redacted]
			2) When [Mode Select] key is pressed, the machine goes into the individual ON mode.
			<Key input check mode>
			1) Initial display
			`05-01 LCD/LED CHK.`
			`0`
			2) [ENTER/START] key
			`05-01 LCD/LED CHK.`
			`**`

	02	Fusing lamp, cooling fan operation check	**[Function]**
			When [ENTER]/[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.
			[Operation] (AL-2050CS only)
			1) Initial display
			`05-02 HT LAMP CHK`
			`EXECUTING...`

	03	Copy lamp ON	**[Function]**
			When [ENTER]/[START] key is pressed, the copy lamp turns ON for 5sec.
			[Operation] (AL-2050CS only)
			1) Initial display
			`05-03 C-LAMP CHK`
			`EXECUTING...`

<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>6</td><td>01</td><td>Paper feed solenoid ON</td><td>
[Function]
When [ENTER]/[START] key is pressed, the selected paper feed solenoid repeats ON for 500ms and OF for 500ms 20times.
When tray select key (or [Numeric] key or [◄] [►] key for the AL-2050CS) is pressed, the paper feed solenoid setting is switched.
<table>
<tr><th>Code number</th><th>Setting</th><th>Remark</th></tr>
<tr><td>0</td><td>CPFS1</td><td></td></tr>
<tr><td>1</td><td>CPFS2</td><td>Operation is possible only when No. 2 cassette is installed.</td></tr>
<tr><td>2</td><td>MPFS</td><td></td></tr>
</table>
[Operation] (AL-2050CS only)
1) Initial display
<pre>06-01 PSOL CHK
0:CPFS1</pre>
2) [Numeric] key or [►] key
<pre>06-01 PSOL CHK
1:CPFS2</pre>
2) [Numeric] key or [◄] key
<pre>06-01 PSOL CHK
2:MPFS</pre>
3) [ENTER]/[START] key
<pre>06-01 PSOL CHK
EXECUTING...</pre>
4) Returns to the initial display.
</td></tr>
<tr><td></td><td>02</td><td>Resist solenoid ON</td><td>
[Function]
When [ENTER]/[START] key is pressed, the resist solenoid repeats ON for 500ms and OFF for 500ms 20 times.
[Operation] (AL-2050CS only)
1) Initial display
<pre>06-02 RES.R SOL CHK
EXECUTING...</pre>
</td></tr>
<tr><td>7</td><td>01</td><td>Warm-up display and aging with jam</td><td>
[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 All] key is pressed, the ready lamp lights up.
After that, enter the copy quantity with [▲] [▲] key (or [Numeric] key for the AL-2050CS) and press [ENTER]/[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.
[Operation] (AL-2050CS only)
1) Initial display
<pre>07-01 W-UP/AGING
                0</pre>
2) After 10sec
<pre>07-01 W-UP/AGING
               10</pre>
</td></tr>
<tr><td></td><td>06</td><td>Intermittent aging</td><td>
[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 (or [Numeric] key for the AL-2050CS) and press [ENTER]/[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.
[Operation] (AL-2050CS only)
1) Initial display (Basic display of copy)
<pre>READY TO COPY
  100%   A4   0</pre>
</td></tr>
</table>

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 All] 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.)
			[Operation] (AL-2050CS only)
			1) Initial display
			`07-08 W-UP C-MODE`
			`0`
			2) After 10sec
			`07-08 W-UP C-MODE`
			`10`

8	01	Developing bias	**[Function]**
			When [ENTER]/[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.
			[Operation] (AL-2050CS only)
			1) Initial display
			`08-01 DVLP BIAS SET.`
			`EXECUTING...`

	02	Main charger (Grid high)	**[Function]**
			When [ENTER]/[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.
			[Operation] (AL-2050CS only)
			1) Initial display
			`08-02 MHV(H) SET.`
			`EXECUTING...`

	03	Grid voltage (Low)	**[Function]**
			When [ENTER]/[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.
			[Operation] (AL-2050CS only)
			1) Initial display
			`08-03 MHV(L) SET.`
			`EXECUTING...`

	06	Transfer charger	**[Function]**
			When [ENTER]/[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.
			[Operation] (AL-2050CS only)
			1) Initial display
			`08-06 THV SET.`
			`EXECUTING...`

9	01	Duplex motor normal rotation operation check (AL-2040CS/2050CS 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.
			[Operation] (AL-2050CS only)
			1) Initial display
			`09-01 DPLX ROT.`
			`EXECUTING...`

	02	Duplex motor reverse operation check (AL-2040CS/2050CS 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.
			[Operation] (AL-2050CS only)
			1) Initial display
			`09-02 DPLX ROT.REV.`
			`EXECUTING...`

Main code	Sub code	Contents	Details of function/operation

9	04	Duplex motor rotation speed adjustment (AL-2040CS/2050CS only)	**[Function]**
			When this simulation is executed, the currently set value is displayed.
			Enter the adjustment value with [▲] [▲] key (or [Numeric] key for the AL-2050CS) and press [ENTER]/[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)
			[Operation]
			AL-2050CS
			1) Initial display
			`09-04 DPLX ROT.SPEED`
			`6( 1-13)`
			2) [Numeric] key
			`09-04 DPLX ROT.SPEED`
			`5( 1-13)`
			3) [ENTER/START] key
			`09-04 DPLX ROT.SPEED`
			`5( 1-13)`
			AL-2040CS
			1) Press [▲] [▲] key to change the code number.
			2) Press [START] key to fix the code number.

10		Toner motor aging	**[Function]**
			When [ENTER]/[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.
			[Operation] (AL-2050CS only)
			1) Initial display
			`10-00 TONER MOTOR`
			`EXECUTING...`

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.
			[Operation] (AL-2050CS only)
			1) Initial display
			`14-00 TRBL CANC.`
			`CLEARED`

16		Cancel of U2 trouble	**[Function]**
			Used to cancel U2 trouble.
			When [ENTER]/[START] key is pressed, check sum of the total counter in the EEPROM is rewritten and hardware reset is made.
			[Operation] (AL-2050CS only)
			1) Initial display
			`16-00 U2 TRBL CANC.`
			`CLEARED`

22	04	JAM total counter display	**[Function]**
			The JAM total counter is displayed.
			[Operation]
			AL-2050CS
			1) Initial display
			`22-04 JAM TTL CNT`
			`***,***`
			AL-2030/2040CS
			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]
			AL-2050CS
			1) Initial display
			`22-05 TTL CNT`
			`***,***`
			AL-2030/2040CS
			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>22</td><td>08</td><td>SPF/RSPF counter display</td><td>
[Function]
The SPF/RSPF counter is displayed.
[Operation]
AL-2050CS
1) Initial display
<pre>22-08 SPF CNT
,</pre>
AL-2030/2040CS
The operation is similar to simulation 22-04.
</td></tr>
<tr><td></td><td>12</td><td>Drum counter display</td><td>
[Function]
The drum counter is displayed.
[Operation]
AL-2050CS
1) Initial display
<pre>22-12 DRUM CNT
,</pre>
AL-2030/2040CS
The operation is similar to simulation 22-04.
</td></tr>
<tr><td></td><td>14</td><td>ROM version display</td><td>
[Function]
The P-ROM version is displayed.
Press [▲] [▲] key (or [Numeric] key or [◄] [►] key for the AL-2050CS) to switch the display version.
<table>
<tr><th>Code number</th><th>Version</th><th>Display item</th></tr>
<tr><td>0</td><td>Main unit Program</td><td>MAIN PROG.</td></tr>
<tr><td>1</td><td>F-IMC Program</td><td>F-IMC PROG.</td></tr>
<tr><td>2</td><td>LCD DATA</td><td>LCD DATA</td></tr>
</table>
[Operation]
AL-2050CS
1) Initial display
<pre>22-14 ROM VER.
MAIN PROG.   00.00</pre>
2) [Numeric] key or [►] key
<pre>22-14 ROM VER.
F-IMC PROG.   00.00</pre>
2) [Numeric] key or [◄] key
<pre>22-14 ROM VER.
LCD DATA   00.00</pre>
AL-2030/2040CS
The operation is similar to simulation 22-04.
</td></tr>
<tr><td></td><td>16</td><td>Duplex counter display
(AL-2040CS/2050CS only)</td><td>
[Function]
The duplex counter is displayed.
[Operation]
AL-2050CS
1) Initial display
<pre>22-16 DPLX CNT
,</pre>
AL-2040CS
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></td><td>17</td><td>Copy counter display</td><td>
[Function]
The copy counter is displayed.
[Operation]
AL-2050CS
1) Initial display
<pre>22-17 COPIES CNT
,</pre>
AL-2030/2040CS
The operation is similar to simulation 22-04.
</td></tr>
<tr><td></td><td>18</td><td>Printer counter display</td><td>
[Function]
The printer counter is displayed.
[Operation]
AL-2050CS
1) Initial display
<pre>22-18 PRT.CNT
,</pre>
AL-2030/2040CS
The operation is similar to simulation 22-04.
</td></tr>
</table>

Main code	Sub code	Contents	Details of function/operation
22	19	Scanner mode counter display (AL-2040CS/2050CS only)	**[Function]** The scanner mode counter is displayed. **[Operation]** **AL-2050CS** 1) Initial display 22-19 S-MODE CNT ***,*** **AL-2040CS** The operation is similar to simulation 22-16.
	21	Scanner counter display	**[Function]** The scanner counter is displayed. **[Operation]** **AL-2050CS** 1) Initial display 22-21 SCAN CNT ***,*** **AL-2030/2040CS** The operation is similar to simulation 22-04.
	22	SPF/RSPF JAM counter display	**[Function]** The SPF/RSPF JAM counter is displayed. **[Operation]** **AL-2050CS** 1) Initial display 22-22 S JAM CNT ***,*** **AL-2030/2040CS** The operation is similar to simulation 22-04.
24	01	JAM total counter clear	**[Function]** When [ENTER]/[START] key is pressed, the JAM total counter is cleared to 0 and "000,000" is displayed on the LCD/display. **[Operation]** **AL-2050CS** 1) Initial display 24-01 JAM TTL CLR. CLEARED 000,000 **AL-2030/2040CS** The operation is similar to simulation 22-04.
	04	SPF/RSPF counter clear	**[Function]** When [ENTER]/[START] key is pressed, the SPF/RSPF counter value is cleared to 0 and "000,000" is displayed on the LCD/display. **[Operation]** **AL-2050CS** 1) Initial display 24-04 SPF CLR. CLEARED 000,000 **AL-2030/2040CS** The operation is similar to simulation 22-04.
	05	Duplex counter clear (AL-2040CS/2050CS only)	**[Function]** When [ENTER]/[START] key is pressed, the duplex counter value is cleared to 0, and "000,000" is displayed on the LCD/display. **[Operation]** **AL-2050CS** 1) Initial display 24-05 DPLX CLR. CLEARED 000,000 **AL-2040CS** The operation is similar to simulation 22-16.
	07	Drum counter clear	**[Function]** When [ENTER]/[START] key is pressed, the drum counter value is cleared to 0, and "000,000" is displayed on the LCD/display. **[Operation]** **AL-2050CS** 1) Initial display 24-07 DRUM CLR. CLEARED 000,000 **AL-2030/2040CS** The operation is similar to simulation 22-04.

Main code	Sub code	Contents	Details of function/operation

24	08	Copy counter clear	**[Function]**
			When [ENTER]/[START] key is pressed, the copy counter value is cleared to 0, and "000,000" is displayed on the LCD/display.
			[Operation]
			AL-2050CS
			1) Initial display
			`24-08 COPIES CLR.`
			`CLEARED 000,000`
			AL-2030/2040CS
			The operation is similar to simulation 22-04.

	09	Printer counter clear	**[Function]**
			When [ENTER]/[START] key is pressed, the printer counter value is cleared to 0, and "000,000" is displayed on the LCD/display.
			[Operation]
			AL-2050CS
			1) Initial display
			`24-09 PRT.CLR.`
			`CLEARED 000,000`
			AL-2030/2040CS
			The operation is similar to simulation 22-04.

	13	Scanner counter clear	**[Function]**
			When [ENTER]/[START] key is pressed, the scanner counter value is cleared to 0, and "000,000" is displayed on the LCD/display.
			[Operation]
			AL-2050CS
			1) Initial display
			`24-13 SCAN CLR.`
			`CLEARED 000,000`
			AL-2030/2040CS
			The operation is similar to simulation 22-04.

	14	SPF/RSPF JAM total counter clear	**[Function]**
			When [ENTER]/[START] key is pressed, the SPF/RSPF JAM total counter value is cleared to 0, and "000,000" is displayed on the LCD/display.
			[Operation]
			AL-2050CS
			1) Initial display
			`24-14 S JAM TTL CLR.`
			`CLEARED 000,000`
			AL-2030/2040CS
			The operation is similar to simulation 22-04.

	15	Scanner mode counter clear (AL-2040CS/2050CS only)	**[Function]**
			When [ENTER]/[START] key is pressed, the scanner mode counter value is cleared to 0, and "000,000" is displayed on the LCD/display.
			[Operation]
			AL-2050CS
			1) Initial display
			`24-15 S-MODE CLR.`
			`CLEARED 000,000`
			AL-2040CS
			The operation is similar to simulation 22-16.

25	01	Main motor operation check (Cooling fan motor rotation check)	**[Function]**
			When [ENTER]/[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.
			[Operation] (AL-2050CS only)
			1) Initial display
			`25-01 MAIN MOTOR CHK`
			`EXECUTING...`

<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>25</td><td>10</td><td>Polygon motor ON</td><td>
[Function]
When [ENTER]/[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.
[Operation] (AL-2050CS only)
1) Initial display
<pre>25-10 LSU CHK
EXECUTING...</pre>
</td></tr>
<tr><td>26</td><td>02</td><td>SPF/RSPF setup</td><td>
[Function]
When this simulation is executed, the current set SPF/RSPF is displayed. Enter the code number corresponding to the desired SPF/RSPF and press [ENTER]/[START] key to save the setting.
<table>
<tr><th>Code number</th><th>SPF/RSPF</th><th>Display item</th></tr>
<tr><td>0</td><td>SPF NO</td><td>SPF OFF</td></tr>
<tr><td>1</td><td>SPF YES</td><td>SPF ON</td></tr>
<tr><td>2</td><td>RSPF YES</td><td>RSPF ON</td></tr>
</table>
[Operation]
AL-2050CS
1) The current set value is displayed.
<pre>26-02 SPF/RSPF
1:SPF ON   (0- 2)</pre>
2) [Numeric] key or [►] key
<pre>26-02 SPF/RSPF
0:SPF OFF (0- 2)</pre>
2) [Numeric] key or [◄] key
<pre>26-02 SPF/RSPF
2:RSPF ON   (0- 2)</pre>
3) [ENTER]/[START] key
<pre>26-02 SPF/RSPF
2:RSPF ON   (0- 2)</pre>
AL-2030/2040CS
1) Press [▲] [▲] key to change the code number.
2) Press [START] key to fix the code number.
</td></tr>
<tr><td></td><td>03</td><td>Second cassette setup</td><td>
[Function]
When this simulation is executed, the current set second cassette is displayed. Enter the code number corresponding to the desired second cassette and press [ENTER]/[START] key to save the setting.
<table>
<tr><th>Code number</th><th>Second cassette</th><th>Display item</th></tr>
<tr><td>0</td><td>Second cassette NO</td><td>OFF</td></tr>
<tr><td>1</td><td>Second cassette YES</td><td>ON</td></tr>
</table>
[Operation]
The operation is similar to simulation 26-02.
</td></tr>
<tr><td></td><td>04</td><td>Machine duplex setup</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 [ENTER]/[START] key to save the setting.
<table>
<tr><th>Code number</th><th>Duplex</th><th>Display item</th></tr>
<tr><td>0</td><td>Duplex NO</td><td>OFF</td></tr>
<tr><td>1</td><td>Duplex YES*</td><td>ON</td></tr>
</table>
* AL-2030: cannot be executed.
[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 [ENTER]/[START] key to save the setting.
<table>
<tr><th>Code number</th><th>Destination</th><th>Display item</th></tr>
<tr><td>0</td><td>Inch series</td><td>INCH</td></tr>
<tr><td>1</td><td>EX Japan AB series</td><td>AB</td></tr>
<tr><td>2</td><td>Japan AB series</td><td>–</td></tr>
</table>
* Code number 2 cannot be selected.
[Operation]
The operation is similar to simulation 26-02.
</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>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>
[Operation] (AL-2050CS only)
1) The machine setting is displayed.
<pre>
26-07 CPM
20 CPM
</pre>
</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 [ENTER]/[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>Rear edge void NO</td><td>OFF</td><td></td></tr>
<tr><td>1</td><td>Rear edge void YES</td><td>ON</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 [ENTER]/[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>CE mark support control OFF</td><td>OFF</td><td>Default (100V series)</td></tr>
<tr><td>1</td><td>CE mark support control ON</td><td>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 PRINT switch 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>8</td><td>8 MBYTE</td><td></td></tr>
<tr><td>16</td><td>16 MBYTE</td><td></td></tr>
</table>
[Operation] (AL-2050CS only)
1) Memory capacity display
<pre>
26-39 MEM.CHK
8 MBYTE
</pre>
</td></tr>
<tr><td></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 [ENTER]/[START] key to save the setting.
<table>
<tr><th rowspan="2">Code number</th><th rowspan="2">Setting</th><th colspan="2">Display item</th><th rowspan="2">Remark</th></tr>
<tr><th>AL-2050CS</th><th>AL-2030/2040CS</th></tr>
<tr><td>0</td><td>0sec</td><td>0 SEC.</td><td>0</td><td></td></tr>
<tr><td>1</td><td>30sec</td><td>30 SEC.</td><td>30</td><td>Default</td></tr>
<tr><td>2</td><td>60sec</td><td>60 SEC.</td><td>60</td><td></td></tr>
<tr><td>3</td><td>90sec</td><td>90 SEC.</td><td>90</td><td></td></tr>
</table>
[Operation]
The operation is similar to simulation 26-02.
</td></tr>
</table>

Main code	Sub code	Contents	Details of function/operation
26	42	Transfer ON timing control setup	**[Function]** **AL-2030/2040CS** When this simulation is executed, the currently set code number is displayed. Enter the code number and press the [START] key, and the setting will be changed. (For any number different from the following ones, the default time is automatically set.) <Paper lead edge adjustment table>

Code number	Setting
0	Default (236 msec)
1	–20 msec
2	–18 msec
3	–16 msec
4	–14 msec
5	–12 msec
6	–10 msec
7	–8 msec
8	–6 msec
9	–4 msec
10	–2 msec

Code number	Setting
11	Default (236 msec)
12	+2 msec
13	+4 msec
14	+6 msec
15	+8 msec
16	+10 msec
17	+12 msec
18	+14 msec
19	+16 msec
20	+18 msec
21	+20 msec

* 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.

AL-2050CS

For the AL-2050CS, the adjustment can be made individually for each of the following modes.

Mode	Display item	Default	Setting range
Front surface paper lead edge	F-REAR	11	0 - 21
Front surface paper rear edge	F-END	50	1 - 99
Back surface paper lead edge	B-REAR	11	0 - 21
Back surface paper rear edge	B-END	50	1 - 99

<Paper lead edge adjustment table> is the same as that of the AL-2030/2040CS above.

<Front/back surface of paper rear edge adjustment table>

Code	Setting	Remark
1	–98 msec	
. . .	. . .	
49	–2 msec	
50	0 msec	Default
51	+2 msec	
. . .	. . .	
99	+98 msec	

* The default "50" of the transfer OFF timing indicates "210msec passed from PPD1OFF."

* The transfer OFF timing can be adjusted to 210msec ± 2ms.

[Operation] (AL-2050CS only)

1) Initial display
<Front surface lead edge setting>

```
26-42 TC ON TIMING
F-REAR     11( 0-21 )
```

2) [◄] [►] key: Mode selection

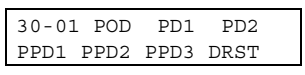
```
26-42 TC ON TIMING
F-END      50( 1-99 )
```

3) [Numeric] key: Value entry

```
26-42 TC ON TIMING
F-END      51( 1-99 )
```

4) [ENTER]/[START] key:
Settles the entered value. The display is shifted to the sub code input standby menu.

<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>5.5 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 [ENTER]/[START] key to save the setting.
(Setting range: 0 – 1, default: 1)
<table>
<tr><th>Code number</th><th>Setting</th><th>Display item</th><th>Remark</th></tr>
<tr><td>0</td><td>OFF</td><td>OFF</td><td></td></tr>
<tr><td>1</td><td>ON</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 [ENTER]/[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>Copy lamp OFF</td><td>OFF</td><td></td></tr>
<tr><td>1</td><td>Copy lamp half-ON</td><td>ON</td><td>Default</td></tr>
</table>
[Operation]
The operation is similar to simulation 26-02.
</td></tr>
<tr><td>30</td><td>01</td><td>Paper sensor status display</td><td>
[Function]
The paper sensor status is displayed on the LCD/LED.
<table>
<tr><th>Sensor</th><th>Display item (AL-2050CS)</th><th>Display lamp (AL-2030/2040CS)</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>No. 2 tray paper feed sensor</td><td>PPD3</td><td>2nd cassette lamp</td></tr>
<tr><td>New drum cartridge sensor</td><td>DRST</td><td>Zoom lamp</td></tr>
</table>
* Since the manual paper feed sensor is a single bypass sensor, its status is not displayed.
* The width sensor is available only in the FAX models.
[Operation] (AL-2050CS only)
1) Initial display

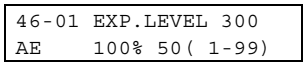

2) When sensor ON


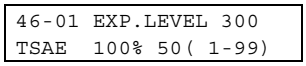
</td></tr>
</table>

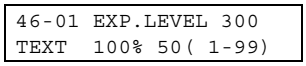
<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>41</td><td>06</td><td>OC cover float detection level adjustment</td><td>
[Function]
When this simulation is executed, the current set value is displayed. When [ENTER]/[START] key is pressed, the mirror base unit moves to the SPF/RSPF 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-2030/2040CS: Misfeed lamp lights up, and the 7seg display remains unchanged.
AL-2050CS: The LCD indicates "ERR."
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.
[Operation] (AL-2050CS only)
1) Initial display
<pre>41-06 OC FLOAT LEVEL
                0</pre>
2) [ENTER/START] key
<pre>41-06 OC FLOAT LEVEL
EXECUTING...</pre>
<Canceling - when [Clear]/[Clear All] key is pressed->
After canceling, the machine goes into the sub code entry standby mode.
<pre>THE JOB IS BEING
CANCELED.</pre>
3) When the level is acquired:
<pre>41-06 OC FLOAT LEVEL
            **** OK</pre>
3) When the level is not acquired:
<pre>41-06 OC FLOAT LEVEL
            **** ERR</pre>
</td></tr>
<tr><td></td><td>07</td><td>OC cover float detection margin setting</td><td>
[Function]
For the number of pixels between black markers on the SPF/RSFP 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 (or [Numeric] key for the AL-2050CS), 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>
</table>

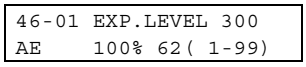
<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>43</td><td>01</td><td>Fusing temperature setting (Normal copy)</td><td>
[Function]
Used to set the fusing temperature of 3rd or later sheet. (For 1st and 2nd sheets, SIM 43-14 is used.)
When this simulation is executed, the current set code number is displayed. Press [▲] [▲] key (or [Numeric] key for the AL-2050CS) to change the setting and press [ENTER]/[START] key to save the setting into the EERPOM. The machine goes into the sub code entry standby mode.
The [Exposure mode selector] key (or [◄] [►] key for the AL-2050CS) 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 (AL-2050CS)</th><th>Display item (AL-2030/2040CS)</th></tr>
<tr><td>Main cassette paper feed & 2nd cassette paper feed</td><td>TRAY1</td><td>AE mode lamp</td></tr>
<tr><td>Manual paper feed</td><td>MFT</td><td>TEXT mode lamp</td></tr>
</table>
* The cassette feed and the manual feed are controlled similarly.
[Operation]
AL-2050CS
1) Initial display <Main cassette paper feed & 2nd cassette paper feed setting>
<pre>43-01 FU TEMP
TRAY1   6(0-8)</pre>
2) [◄] [►] key: Mode selection
<pre>43-01 FU TEMP
MFT   6(0-8)</pre>
3) [Numeric] key: Value entry
<pre>43-01 FU TEMP
MFT   6(0-8)</pre>
4) [ENTER]/[START] key
Settles the entered value. The display is shifted to the sub code input standby menu.
AL-2030/2040CS
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>
<tr><td></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 43-1 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 [ENTER]/[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>Mode</th><th>Display item (AL-2050CS)</th><th>Display lamp (AL-2030/2040CS)</th><th>Default</th></tr>
<tr><td>Main cassette paper feed & 2nd cassette paper feed</td><td>TRAY1</td><td>AE mode lamp</td><td>3</td></tr>
<tr><td>Manual paper feed</td><td>MFT</td><td>TEXT mode lamp</td><td>3</td></tr>
<tr><td>Main cassette paper feed & 2nd cassette paper feed (small-size)</td><td>TRAY1 SH</td><td>PHOTO mode lamp</td><td>1</td></tr>
<tr><td>Manual paper feed (small-size)</td><td>MFT SH</td><td>AE mode lamp
TEXT mode lamp</td><td>1</td></tr>
</table>
* The cassette feed and the manual feed are controlled similarly.
[Operation]
The operation is similar to simulation 43-01.
</td></tr>
</table>

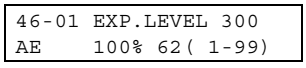
<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>43</td><td>05</td><td>Fusing temperature setup in duplex copy (AL-2040CS/2050CS only)</td><td>
[Function]
In the case of duplex copy, the shift temperature set with this simulation is applied to the fusing temperature.
When this simulation is executed, the current set code number is displayed.
Enter the desired code number and press [ENTER]/[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>14</td><td>Fusing start temperature setting</td><td>
[Function]
When this simulation is started, the currently set code number is displayed.
Press [▲] [▲] key (or [Numeric] key or [◄] [►] key for the AL-2050CS) to switch the setting, and press [ENTER]/[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>
[Operation]
The operation is similar to simulation 43-01.
</td></tr>
</table>

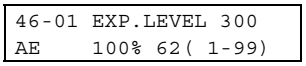
<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>46</td><td>01</td><td>Copy density adjustment (300dpi)</td><td>
[Function]
Copy density is set for each mode.
When this simulation is executed, the current se value is displayed in 2 digits (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 (or [◄] [►] key for the AL-2050CS) 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 item (AL-2050CS)</th><th>LED (AL-2050CS)</th><th>Display lamp (AL-2030/2040CS)</th><th>Default</th></tr>
<tr><td>AE mode (300dpi)</td><td>AE</td><td>COPY mode lamp</td><td>AE mode lamp</td><td>50</td></tr>
<tr><td>TEXT mode (300dpi)</td><td>TEXT</td><td>PRINT mode lamp</td><td>TEXT mode lamp</td><td>50</td></tr>
<tr><td>PHOTO mode</td><td>PHOTO</td><td>SCAN mode lamp</td><td>PHOTO mode lamp</td><td>50</td></tr>
<tr><td>TS mode (TEXT) (300dpi)</td><td>TSTXT</td><td>PRINT mode lamp
SCAN mode lamp</td><td>TEXT mode lamp
PHOTO mode lamp</td><td>50</td></tr>
<tr><td>TS mode (AE) (300dpi)</td><td>TSAE</td><td>COPY mode lamp
SCAN mode lamp</td><td>AE mode lamp
PHOTO mode lamp</td><td>50</td></tr>
</table>
[Operation]
AL-2050CS
1) Initial display


2) [◄] key: Mode selection


2) [►] key: Mode selection


3) [Numeric] key: Value entry


4) [START] key: Fixing and printing value (No change on the LCD)
* Print is started in the set mode.


4) To fix the set value without printing, press [Enter] key.


* To cancel manual feed paper empty MSG, press any key.
* When performing the AE mode exposure adjustment, place the test chart on the document table so that the center area of 10cm is not covered.
AL-2030/2040CS
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.
</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 se 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 (or [◄] [►] key for the AL-2050CS) 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 item (AL-2050CS)</th><th>LED (AL-2050CS)</th><th>Display lamp (AL-2030/2040CS)</th><th>Default</th></tr>
<tr><td>AE mode (600dpi)</td><td>AE</td><td>COPY mode lamp</td><td>AE mode lamp</td><td>50</td></tr>
<tr><td>TEXT mode (600dpi)</td><td>TEXT</td><td>PRINT mode lamp</td><td>TEXT mode lamp</td><td>50</td></tr>
<tr><td>PHOTO mode</td><td>PHOTO</td><td>SCAN mode lamp</td><td>PHOTO mode lamp</td><td>50</td></tr>
<tr><td>TS mode (TEXT) (600dpi)</td><td>TSTXT</td><td>PRINT mode lamp
SCAN mode lamp</td><td>TEXT mode lamp
PHOTO mode lamp</td><td>50</td></tr>
<tr><td>TS mode (AE) (600dpi)</td><td>TSAE</td><td>COPY mode lamp
SCAN mode lamp</td><td>AE 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 se 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 (or [◄] [►] key for the AL-2050CS) 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 item (AL-2050CS)</th><th>LED (AL-2050CS)</th><th>Display lamp (AL-2030/2040CS)</th><th>Default</th></tr>
<tr><td>AE mode (300dpi)</td><td>AE</td><td>COPY mode lamp</td><td>AE mode lamp</td><td>50</td></tr>
<tr><td>TEXT mode (300dpi)</td><td>TEXT</td><td>PRINT mode lamp</td><td>TEXT mode lamp</td><td>50</td></tr>
<tr><td>PHOTO mode</td><td>PHOTO</td><td>SCAN mode lamp</td><td>PHOTO mode lamp</td><td>50</td></tr>
<tr><td>TS mode (TEXT) (300dpi)</td><td>TSTXT</td><td>PRINT mode lamp
SCAN mode lamp</td><td>TEXT mode lamp
PHOTO mode lamp</td><td>50</td></tr>
<tr><td>TS mode (AE) (300dpi)</td><td>TSAE</td><td>COPY mode lamp
SCAN mode lamp</td><td>AE mode lamp
PHOTO mode lamp</td><td>50</td></tr>
</table>
* No density display on LCD/display.
[Operation]
The operation is similar to simulation 46-01.
</td></tr>
<tr><td></td><td>19</td><td>Exposure mode setup</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 (or [◄] [►] key for the AL-2050CS) to change the mode and write into the EEPROM.
<AE operation mode>
When setting the γ table, press [Exposure mode selector] key (or [►] key for the AL-2050CS) 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 (or [◄] [►] key for the AL-2050CS) to change the mode and write into the EEPROM.
<PHOTO image process setting>
When [Exposure mode selector] key (or [►] key for the AL-2050CS) 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 (or [◄] [►] key for the AL-2050CS) to change the mode and write into the EEPROM.
<table>
<tr><th>Mode</th><th>Display item (AL-2050CS)</th><th>Display lamp (AL-2030/2040CS)</th><th>Code number</th><th>Setting content</th><th>Remark</th></tr>
<tr><td rowspan="2">γ</td><td rowspan="2">GAMMA</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 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 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 43-01.
</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/RSPF exposure correction</td><td>
[Function]
Used to adjust the exposure correction amount in the SPF/RSPF 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-2050CS)</th><th>Display lamp (AL-2030/2040CS)</th><th>Default</th><th>Remark</th></tr>
<tr><td>RSPF/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 se 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 (or [◄] [►] key for the AL-2050CS) 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 item (AL-2050CS)</th><th>LED (AL-2050CS)</th><th>Display lamp (AL-2030/2040CS)</th><th>Default</th></tr>
<tr><td>AE mode (600dpi)</td><td>AE</td><td>COPY mode lamp</td><td>AE mode lamp</td><td>50</td></tr>
<tr><td>TEXT mode (600dpi)</td><td>TEXT</td><td>PRINT mode lamp</td><td>TEXT mode lamp</td><td>50</td></tr>
<tr><td>PHOTO mode</td><td>PHOTO</td><td>SCAN mode lamp</td><td>PHOTO mode lamp</td><td>50</td></tr>
<tr><td>TS mode (TEXT) (600dpi)</td><td>TSTXT</td><td>PRINT mode lamp
SCAN mode lamp</td><td>TEXT mode lamp
PHOTO mode lamp</td><td>50</td></tr>
<tr><td>TS mode (AE) (600dpi)</td><td>TSAE</td><td>COPY mode lamp
SCAN mode lamp</td><td>AE mode lamp
PHOTO mode lamp</td><td>50</td></tr>
</table>
* No density display on LCD/display.
[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 [ENTER]/[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 (or [◄] [►] key for the AL-2050CS), setting is changed. (Setting range: 0 – 31, Default: 0)
<table>
<tr><th>Mode</th><th>Display item (AL-2050CS)</th><th>Display lamp (AL-2030/2040CS)</th><th>Remark</th></tr>
<tr><td>Limit value for AE</td><td>AE</td><td>AE mode lamp</td><td></td></tr>
<tr><td>Limit value for AE (toner save)</td><td>TEXT</td><td>TEXT 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 (or [◄] [►] key for the AL-2050CS). The code number of the selected mode is dip0slayed on the LCD/display.

<table>
<tr><th>Mode</th><th>Display item (AL-2050CS)</th><th>LED (AL-2050CS)</th><th>Display lamp (AL-2030/2040CS)</th><th>Default setting</th></tr>
<tr><td>AE mode</td><td>AE</td><td>COPY mode lamp</td><td>AE mode lamp</td><td>1</td></tr>
<tr><td>TEXT mode</td><td>TEXT</td><td>PRINT mode lamp</td><td>TEXT mode lamp</td><td>1</td></tr>
<tr><td>PHOTO mode</td><td>PHOTO</td><td>SCAN mode lamp</td><td>PHOTO mode lamp</td><td>1</td></tr>
<tr><td>TS mode (TEXT)</td><td>TSTXT</td><td>PRINT mode lamp
SCAN mode lamp</td><td>TEXT mode lamp
PHOTO mode lamp</td><td>1</td></tr>
<tr><td>TS mode (AE)</td><td>TSAE</td><td>COPY mode lamp
SCAN mode lamp</td><td>AE 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 (or [◄] [►] key for the AL-2050CS). The code number of the selected mode is dip0slayed on the LCD/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 item (AL-2050CS)</th><th>LED (AL-2050CS)</th><th>Display lamp (AL-2030/2040CS)</th><th>Default setting</th></tr>
<tr><td>AE mode (including TS)</td><td>AE</td><td>COPY mode lamp</td><td>AE mode lamp</td><td>0</td></tr>
<tr><td>TEXT mode (including TS)</td><td>TEXT</td><td>PRINT mode lamp</td><td>TEXT mode lamp</td><td>0</td></tr>
<tr><td>PHOTO mode</td><td>PHOTO</td><td>SCAN mode lamp</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 (or [Numeric] key for the AL-2050CS). 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 (or [◄] [►] key for the AL-2050CS). (Adjustment range: 1 – 99, Default: 50)
<table>
<tr><th>Mode</th><th>Display item (AL-2050CS)</th><th>LED (AL-2050CS)</th><th>Display lamp (AL-2030/2040CS)</th><th>Default value</th></tr>
<tr><td>Main scan direction magnification ratio</td><td>F-R</td><td>PRINT mode lamp</td><td>TEXT mode lamp</td><td>50</td></tr>
<tr><td>OC mode sub scan direction magnification ratio</td><td>SCAN</td><td>SCAN mode lamp</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/RSPF mode sub scan direction magnification ratio in copying</td><td>
[Function]
Used to display the current SPF/RSPF 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 (or [◄] [►] key for the AL-2050CS). (Adjustment range: 1 – 99, Default: 50)
When adjusting the RSPF, the mode is set to "Duplex → Single," single copies of two sheets are performed.
For printing, regardless of the density mode and the density level,
Density mode = MANUAL
Density level = 3
<table>
<tr><th>Mode</th><th>Initial value of duplex setting</th><th>Display item (AL-2050CS)</th><th>LED (AL-2050CS)</th><th>Display lamp (AL-2030/2040CS)</th><th>Default</th></tr>
<tr><td>Sub scan magnification ratio adjustment on the front surface of SPF/RSPF document</td><td>S-S</td><td>SIDE1</td><td>COPY mode lamp</td><td>AE mode lamp</td><td>50</td></tr>
<tr><td>Sub scan magnification ratio adjustment on the back surface of RSPF document (AL-2050CS only)</td><td>D-S</td><td>SIDE2</td><td>PRINT mode lamp</td><td>—</td><td>50</td></tr>
</table>
* When there is no document in SPF/RSPF, copy is inhibited.
[Operation]
The operation is similar to simulation 46-01.
</td></tr>
</table>

Main code	Sub code	Contents	Details of function/operation
49	01	Flash ROM program writing mode	**[Function]** When this simulation is executed, "d" is displayed on the display (or "DOWNLOAD MODE" is displayed on the LCD for the AL-2050CS), 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.

Status	AL-2050CS	AL-2030/2040CS			Remark
	Display item	Display	Pre-heat lamp	Ready lamp	
Download data receiving	RECEIVING	"d" ON	ON	OFF	
Loader function transfer	LOADER COPYING				AL-2050CS only
Date delete start	FLASH ERASE	"d" ON	OFF	ON	
Data write (Boot section)	BOOT WRITING	"d" ON	Blink	OFF	
Data write (Program section)	PROGRAM WRITING	"d" ON	Blink	Blink	
Data write (EEPROM)	E2PROM WRITING				AL-2050CS only
Data write (LCD)	LCD DATE WRITING				AL-2050CS only
During SUM CHECK	FLASH ROM SUM CHECK	"d" ON	ON	ON	
During BOOT SUM CHECK	BOOT SUM CHECK				AL-2050CS only
During EEPROM SUM CHECK	EEPROM SUM CHECK				AL-2050CS only
Download complete	DOWNLOAD COMPLETE!	"0FF" ON	OFF	OFF	
Error state		"E ∗" ON	OFF	OFF	AL-2030/2040CS only

* "∗" in an error display indicates the error position.

1	Data reception error
2	Loader function transfer
3	FLASH ROM delete
4	FLASH ROM writing (Boot section)
5	FLASH ROM writing (Program section)

6	Sum check (Loader section)
7	Sum check (Boot section)
8	Sum check (Program section)
9	Sum check (EEPROM section)
10	Data error

In case of an error in download, the following message is displayed on the LCD.
(AL-2050CS only)

Error status	Display item
PC data receiving	E-01 PC TRANS
Loader function transfer	E-02 LOADER COPY
FLASH ROM delete	E-03 FLASH ERASE
Boot section FLASH ROM write	E-04 BOOT WRITE
Program section FLASH ROM write	E-05 PROGRAM WRITE
Loader section SUM CHECK	E-06 LOADER SUM
Boot section SUM CHECK	E-07 BOOT SUM
Program section SUM CHECK	E-08 PROGRAM SUM
E2PROM SUM CHECK	E-09 E2PROM SUM
E2PROM write	E-10 E2PROM WRITE
E2PROM read Verify	E-11 E2PROM READ
E2PROM collating Verify	E-12 E2PROM COLLATE
Boot section lens check	E-13 BOOT LENGTH
Program section lens check	E-14 PROGRAM LENGTH
E2PROM lens check	E-15 E2PROM LENGTH
Total data size check	E-16 DATE SIZE
IMC communication error	E-17 IMC TRANS
IMC FRASH ROM write	E-18 IMC FLASH WRITE
LCD section lens check	E-19 LCD DATE LENGTH
LCD section FLASH ROM write	E-20 LCD DATE WRITE
LCD section SUM CHECK	E-21 LCD DATE SUM

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 [Clear All] key + [◄] key, turn on the power.

[Operation] (AL-2050CS only)

1) Initial display

```
DOWNLOAD MODE
```

Main code	Sub code	Contents	Details of function/operation
50	01	Lead edge image position	**[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 (or [◄] [►] key for the AL-2050CS) 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.)

Mode	Display item (AL-2050CS)	LED (AL-2050CS)	Display lamp (AL-2030/2040CS)	Default
Print start position (Main cassette paper feed)	TRAY1	COPY mode lamp Main cassette lamp	AE mode lamp Main cassette lamp	50
(*) Print start position (2nd cassette paper feed)	TRAY2	COPY mode lamp 2nd cassette lamp	AE mode lamp 2nd cassette lamp	50
Print start position (Manual paper feed)	MFT	COPY mode lamp Manual paper feed lamp	AE mode lamp Manual feed lamp	50
Image lead edge void amount	DEN-A	PRINT mode lamp Main cassette lamp	TEXT mode lamp Main cassette lamp	50
Image scan start position	RRC-A	SCAN mode lamp Main cassette lamp	PHOTO mode lamp Main cassette lamp	50
Image rear edge void amount (Cassette paper feed)	DEN-B	COPY mode lamp PRINT mode lamp SCAN mode lamp Main cassette lamp	AE mode lamp TEXT mode lamp PHOTO mode lamp Main cassette lamp	50
Image rear edge void amount (Manual paper feed)	RRC-B	COPY mode lamp PRINT mode lamp Manual paper feed lamp	—	50

(*): Support for the installation models. For non-installation models, skip.

* When printing with the manual paper feed tray, use paper of the letter size.

* When paper is discharged, the shifter is operated.

[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%. (AL-2030/2040CS)

   For the AL-2050CS, the following LED's are lighted:

   - AE lamp/COPY mode lamp: (A)
   - TEXT lamp/PRINT mode lamp: (B)
   - PHOTO lamp/SCAN mode lamp: (C)

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.)

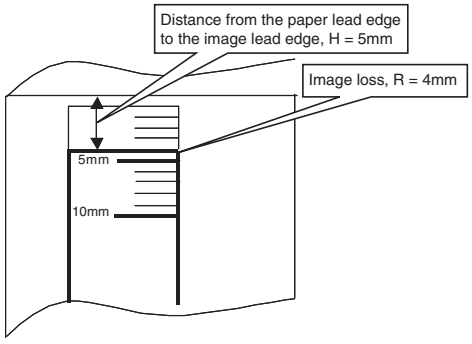
   When the value of A is increased by 10, the image lead edge is moved to the paper lead edge by 1mm. (Default: 50).

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/RSPF adjustment is made by adjusting the SPF/RSPF image scan start position after OC adjustment.

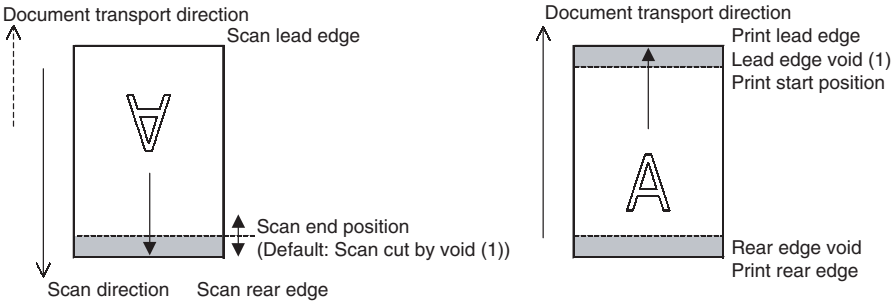
(Example)



[Operation]

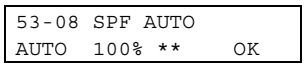
The operation is similar to simulation 46-01.

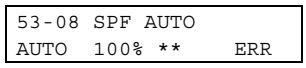
<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>50</td><td>06</td><td>Copy lead edge position adjustment (SPF/RSPF)</td><td>
[Function]
Used to adjust the SPF/RSPF copy lead edge.
When the adjustment value of the document scan position 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 (or [◄] [►] key for the AL-2050CS). (Adjustment range: 1 – 99, Default: 50)
When scanning a back surface of document, the mode must be changed to operate the SPF/RSPF by pressing [2-SIDED COPY] key.
<table>
<tr><th>Mode</th><th>Initial value of duplex setting</th><th>Display item (AL-2050CS)</th><th>LED (AL-2050CS)</th><th>Display lamp (AL-2030/2040CS)</th><th>Default</th></tr>
<tr><td>Front surface document scan position adjustment</td><td>S-S</td><td>SIDE1</td><td>COPY mode lamp</td><td>AE mode lamp</td><td>50</td></tr>
<tr><td>Back surface document scan position adjustment (AL-2050CS only)</td><td>D-S</td><td>SIDE2</td><td>PRINT mode lamp</td><td>—</td><td>50</td></tr>
<tr><td>Rear edge void adjustment (RSPF)</td><td>S-S</td><td>END</td><td>SCAN mode lamp</td><td>PHOTO mode lamp</td><td>50</td></tr>
</table>
∗ When there is no document in the SPF/RSPF, copy is inhibited.
∗ When paper is discharged, the shifter is operated.
[Operation]
The operation is similar to simulation 46-01.
</td></tr>
<tr><td></td><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 (or [◄] [►] key for the AL-2050CS).
When the set value is changed largely, the area outside the shading area may be scanned to cause black streaks on the edges. When the SPF/RSPF is used, select the mode for use of the SPF/RSPF by [2-SIDED COPY] key.
<table>
<tr><th>Mode</th><th>Display item (AL-2050CS)</th><th>LED (AL-2050CS)</th><th>Display lamp (AL-2030/2040CS)</th><th>Default</th></tr>
<tr><td>Print center offset (Main cassette paper feed)</td><td>TRAY1</td><td>COPY mode lamp
Main cassette lamp</td><td>AE mode lamp
Main cassette lamp</td><td>50</td></tr>
<tr><td>(*) Print center offset (2nd cassette paper feed)</td><td>TRAY2</td><td>COPY mode lamp
2nd cassette lamp</td><td>AE mode lamp
2nd cassette lamp</td><td>50</td></tr>
<tr><td>Print center offset (Manual paper feed)</td><td>MFT</td><td>COPY mode lamp
Manual paper feed lamp</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>SIDE2</td><td>PRINT mode lamp
Main cassette lamp</td><td>TEXT mode lamp
Main cassette lamp</td><td>50</td></tr>
</table>
(*): Support for the installation models. For non-installation models, skip.
(**): 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.
* When paper is discharged, the shifter is operated.
[Operation]
The operation is similar to simulation 46-01.
</td></tr>
</table>

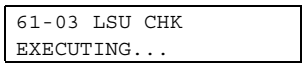
<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>50</td><td>12</td><td>Document off-center adjustment</td><td>
[Function]
Used to adjust document scan off-center adjustment.
The adjustment modes can be selected by pressing [Exposure mode selector] key (or [◄] [►] key for the AL-2050CS). (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>Initial value of duplex setting</th><th>Display item (AL-2050CS)</th><th>LED (AL-2050CS)</th><th>Display lamp (AL-2030/ 2040CS)</th><th>Default</th></tr>
<tr><td>Platen document scan</td><td>S-S</td><td>OC</td><td>COPY mode lamp</td><td>AE mode lamp</td><td>50</td></tr>
<tr><td>SPF document front scan</td><td>S-S</td><td>SPF</td><td>PRINT mode lamp</td><td>TEXT mode lamp</td><td>50</td></tr>
<tr><td>RSPF document back scan (AL-2050CS only)</td><td>D-S</td><td>RSPF</td><td>SCAN mode lamp</td><td>—</td><td>50</td></tr>
</table>
* When paper is discharged, the shifter is operated.
[Operation]
The operation is similar to simulation 46-01.
</td></tr>
<tr><td></td><td>18</td><td>Memory reverse position adjustment in duplex copy (AL-2040CS/2050CS 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 and print of even paged in D-S mode, 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 (or [◄] [►] key for the AL-2050CS)
<table>
<tr><th>Mode</th><th>Initial value of duplex setting</th><th>Display item (AL-2050CS)</th><th>LED (AL-2050CS)</th><th>Display lamp (AL-2030/ 2040CS)</th><th>Default</th></tr>
<tr><td>OC memory reverse output position</td><td>S-D</td><td>OC</td><td>COPY mode lamp</td><td>AE mode lamp</td><td>50</td></tr>
<tr><td>SPF/RSPF memory reverse output position</td><td>D-S</td><td>SPF</td><td>PRINT mode lamp</td><td>TEXT mode lamp</td><td>50</td></tr>
</table>


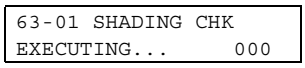
* The initial value of duplex setting is "1to2/Long Edge" for the duplex model, or "2to1" for the simplex model.
* When paper is discharged, the shifter is operated.
[Operation]
The operation is similar to simulation 46-01.
</td></tr>
</table>

<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>19</td><td>Duplex copy rear edge void adjustment
(AL-2040CS/2050CS 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 (or [◄] [►] key for the AL-2050CS). (Adjustment range; 1 – 99)
Enter the adjustment value 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 item (AL-2050CS)</th><th>LED (AL-2050CS)</th><th>Display lamp (AL-2030/2040CS)</th><th>Default</th></tr>
<tr><td>Paper rear edge void amount</td><td>DEN-B</td><td>PRINT mode lamp</td><td>TEXT mode lamp</td><td>50</td></tr>
<tr><td>Print start position (Duplex back surface)</td><td>RRC-D</td><td>SCAN mode lamp</td><td>PHOTO mode lamp</td><td>50</td></tr>
</table>
* The initial value for duplex setting is "1to2/Short Edge" for the OC setting, or "2to2" for the RSPF setting.
∗ When paper is discharged, the shifter is operated.
[Operation]
The operation is similar to simulation 46-01.
</td></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/RSPF 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 (or [◄] [►] key for the AL-2050CS).
Enter the adjustment value with [▲] [▲] key (or [Numeric] key for the AL-2050CS) and press [START] key to save the set value and make a copy.
<table>
<tr><th>Mode</th><th>Display item (AL-2050CS)</th><th>LED (AL-2050CS)</th><th>Display lamp (AL-2030/2040CS)</th><th>Default</th></tr>
<tr><td>Main cassette paper feed</td><td>TRAY1</td><td>COPY mode lamp
Main cassette lamp</td><td>AE mode lamp
Main cassette lamp</td><td>50</td></tr>
<tr><td>(*) 2nd cassette paper feed</td><td>TRAY2</td><td>COPY mode lamp
2nd cassette lamp</td><td>AE mode lamp
2nd cassette lamp</td><td>50</td></tr>
<tr><td>Manual paper feed</td><td>MFT</td><td>COPY mode lamp
Manual paper feed lamp</td><td>AE mode lamp
Manual paper feed lamp</td><td>50</td></tr>
<tr><td>RSPF document paper feed (Front surface) (AL-2050CS only)</td><td>SIDE1</td><td>COPY mode lamp
PRINT mode lamp
SCAN mode lamp
Main cassette lamp</td><td>—</td><td>50</td></tr>
<tr><td>RSPF document paper feed (Back surface) (AL-2050CS only)</td><td>SIDE2</td><td>COPY mode lamp
PRINT mode lamp
Main cassette lamp</td><td>—</td><td>50</td></tr>
<tr><td>(*) Duplex back surface</td><td>DUP-2</td><td>PRINT mode lamp
SCAN mode lamp
Main cassette lamp</td><td>TEXT mode lamp
PHOTO mode lamp
Main cassette lamp</td><td>50</td></tr>
</table>
(*): Support for the installation models. For non-installation models, skip.
[Operation] (AL-2050CS only)
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>53</td><td>08</td><td>SPF/RSPF scan position automatic adjustment</td><td>
[Function]
Place a A4 paper (white chart) so that it covers the SPF/RSPF scan glass and the OC glass together, and close the SPF/RSPF.
When this simulation 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/RSPF 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/RSPF scan position with the adjustment value displayed. The SPF/RSPF glass cover edge position is calculated from the difference between the SPF/RSPF 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.
<table>
<tr><th>Mode</th><th>Display item (AL-2050CS)</th><th>LED (AL-2050CS)</th><th>Display lamp (AL-2030/2040CS)</th><th>Default</th></tr>
<tr><td>SPF/RSPF scan position auto adjustment</td><td>AUTO</td><td>COPY mode lamp</td><td>AE mode lamp</td><td>1</td></tr>
<tr><td>SPF/RSPF scan position manual adjustment</td><td>MANU</td><td>PRINT mode lamp</td><td>TEXT mode lamp</td><td>1</td></tr>
</table>
[Operation]
The operation is similar to simulation 46-01. (In MANUAL)
OK/ERR display in AUTO
<When OK>


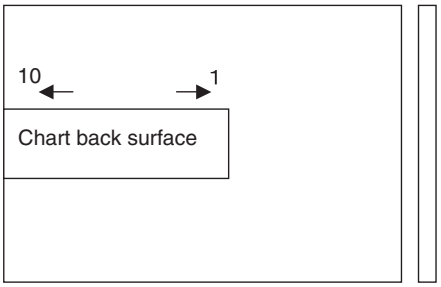
<When ERR>


</td></tr>
<tr><td>61</td><td>03</td><td>Polygon motor check (HSYNC output check)</td><td>
[Function]
When [ENTER]/[START] key is pressed, HSYNC is performed and the polygon motor is rotated for 30sec.
At that time, the ZOOM lamp (or the COPY mode lamp for the AL-2050CS) is lighted for 100msec every time when HSYNC is detected.
[Operation] (AL-2050CS only)
1) Initial display


</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 [ENTER]/[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 LCD/display. (3 digits)
[Operation] (AL-2050CS only)
1) Initial display


</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 [ENTER]/[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 LCD/display.
			* Default: 0
			* If the value is set to the default, operation is made with 0x60.
			[Operation] (AL-2050CS only)
			1) Initial display
			`63-02 BLACK LEVEL 000`
			2) [ENTER/START] key: Correction start
			`63-02 BLACK LEVEL EXECUTING...`
			<During canceling - When [Clear]/[Clear All] key is pressed->>
			After canceling, the machine goes into the sub code entry standby mode.
			`THE JOB IS BEING CANCELED.`
			3) After execution
			`63-02 BLACK LEVEL *** OK`
			3) In case of an error
			`63-02 BLACK LEVEL *** ERR`

	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 (or [Numeric] key for the AL-2050CS) 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 (or [Numeric] key for the AL-2050CS) 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 [ENTER]/[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>
<tr><td>67</td><td>50</td><td>USB receive speed adjustment (USB1.1) (AL-2030/AL-2040CS only)</td><td>Used to set the limitation on the print data receive speed of USB2.0 (Full speed) port (USB port on the machine).
→ When print images from USB2.0 (Full speed) port are disturbed, change the setting and try again.
When this simulation is executed, the currently set code number is displayed.
Enter the code number corresponding to the adjustment value, and press [START] key to change the setting.
<table>
<tr><th>Code number</th><th>Setting</th><th>Speed</th></tr>
<tr><td>1</td><td>FAST</td><td>↑ Fast</td></tr>
<tr><td>2</td><td>NORMAL1</td><td></td></tr>
<tr><td>3</td><td>NORMAL2</td><td></td></tr>
<tr><td>4</td><td>SLOW</td><td>↓ Slow</td></tr>
</table></td></tr>
</table>

5. Trouble codes

A. Trouble codes list

Main code	Sub code	Details of trouble
E1	00	IMC communication trouble
	10	IMC trouble
	13	IMC flash ROM error
	81	IMC communication interface error (Parity)
	82	IMC communication interface error (Overrun)
	84	IMC communication interface error (Framing)
E7	01	Duplex model memory setup error, memory not-detected error
	02	LSU trouble
	10	Shading trouble (Black correction)
	11	Shading trouble (White correction)
	16	Abnormal laser output
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
	32	Exhaust fan motor lock detection trouble
L6	10	Polygon motor lock detection
U2	04	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
E1	00	Content	IMC communication trouble
		Detail	An abnormality occurs in communication between the CPU and the IMC.
		Cause	IMC abnormality IMC memory defect/data abnormality
		Check and remedy	Replace the MCU PWB with new one.
	10	Content	IMC trouble
		Detail	An abnormality occurs in the IMC.
		Cause	USB chip error/CODEC error on the IMC.
		Check and remedy	Replace the MCU PWB with a new one.
	13	Content	IMC flash ROM error
		Detail	An abnormality occurs in the IMC flash ROM.
		Cause	IMC abnormality
		Check and remedy	Replace the MCU PWB with a new one. If downloading of the program is abnormally terminated, it may cause an error. Download the program again to avoid this.
	81	Content	IMC communication interface error (Parity)
		Detail	A parity error occurs in communication between the CPU and the IMC.
		Cause	IMC abnormality IMC memory defect/data abnormality
		Check and remedy	Replace the MCU PWB with new one.

Main code	Sub code	Details of trouble	
E1	82	Content	IMC communication interface error (Overrun)
		Detail	An overrun error occurs in communication between the CPU and the IMC.
		Cause	IMC abnormality IMC memory defect/data abnormality.
		Check and remedy	Replace the MCU PWB with new one.
	84	Content	IMC communication interface error (Framing)
		Detail	A framing error occurs in communication between the CPU and the IMC.
		Cause	IMC abnormality IMC memory defect/data abnormality.
		Check and remedy	Replace the MCU PWB with new one.
E7	01	Content	Duplex model memory setup error, memory not-detected error
		Detail	The memory is not set properly or the memory capacity is not set to the duplex setup (6M).
		Check and remedy	Set SIM 26-39 code number to 2.
	02	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.
	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.

Main code	Sub code	Details of trouble	
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/RSPF 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.
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.

Main code	Sub code	Details of trouble	
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.
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.

Main code	Sub code	Details of trouble	
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.
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.

Main code	Sub code	Details of trouble	
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.
	32	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.
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 61-1 to check the polygon motor operations. Check connection of the polygon motor harness/connector. Replace the polygon motor. Replace the MCU PWB.
U2	04	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 conditions of factory setting can be changed according to the use conditions.

1. Functions that can be set with user programs

Toner save mode

Reduces toner consumption by approximately 10%.

Power save modes

The unit has two power save modes of operation: preheat mode and auto power shut-off mode.

Preheat mode

When the unit enters the preheat mode, the power save ( ) indicator will light up and other indicators will remain on or off as before. In this condition, the fuser in the unit is maintained at a lower heat level, thereby saving power. To copy from the preheat mode, make desired copier selections and press the start ( ) key using the normal copying procedure.

Auto power shut-off mode

When the unit enters the auto power shut-off mode, the power save ( ) indicator will light up and other indicators except the ONLINE indicator will go out. The auto power shut-off mode saves more power than the preheat mode but requires a longer time before starting copying. To copy from the auto power shut-off mode, press the start ( ) key. Then make desired copier selections and press the start ( ) key using the normal copying procedure.

Auto clear

The unit returns to the initial settings a preset amount of time after the end of job.

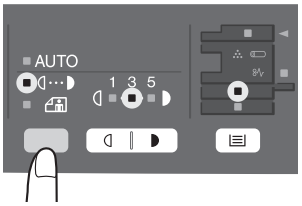
This preset amount of time (auto clear time) can be changed.

Resolution of AUTO & MANUAL mode

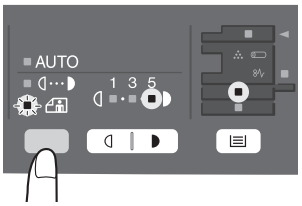
You can set the copy resolution used for AUTO and MANUAL ( ) exposure mode.

2. Toner save mode (AL-2030/2040CS)

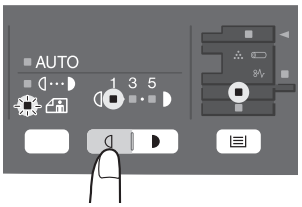
1) Press the exposure mode selector key to select the MANUAL ( ) mode.



2) Press and hold down the exposure mode selector key for approximately 5 seconds. The MANUAL ( ) indicator will go out and the PHOTO ( ) indicator will begin to blink. The light and dark indicator marked "5" will light up, indicating the standard toner mode is active.



3) To enter the toner save mode, press the light ( ) key. The light and dark indicator marked "1" will light up, indicating the toner save mode is selected.



4) Press the exposure mode selector key. The PHOTO ( ) indicator will stop blinking and light up steadily. The light and dark indicator marked "3" will light up. The toner save mode is now active.

Note: To return to the standard mode, repeat the procedure but use the dark ( ) key to select exposure level "5" in step 3).

3. User programs (AL-2030/2040CS)

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

Set the power save modes, auto clear time, preheat mode, SPF automatic original discharge time, resolution of AUTO & MANUAL mode and reset factory setting.

1) Press and hold down the light ( ) key simultaneously 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 (1: Auto clear time, 2: Preheat mode, 3: Auto power shut off mode, 4: Auto power shut off timer, 6: SPF automatic original discharge time, 10: Resolution of AUTO & MANUAL mode, 21: Reset factory, 24: Prevention of OC copies when the SPF is up function, 25: Copy effective paper width setting function (Bypass tray), 26: Copy effective paper width setting function (Tray 1), 27: Copy effective paper width setting function (Tray 2) (AL-2040CS only), 28: Selection of copy start state (Polygon rotation on/off), 29: Fusing temperature setting when the bypass tray is used). 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 → 30min., 3 → 60 min., 4 → 120 min., 5 → 240 min.
6	SPF automatic original discharge time	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
21	Reset factory	1 → YES, *2 → NO

Program No.	Mode	Parameters
24	Prevention of OC copies when the 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 (Tray 1)	*1 → Large (LETTER/A4 width), 2 → Small (INVOICE/B5R width)
27	Copy effective paper width setting function (Tray 2) (AL-2040CS only)	*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

∗ 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.

4. User programs (AL-2050CS)

1) Press the [MENU] key and then press the [ENTER] key.
   In printer mode, the user programs are accessed by simply pressing the [MENU] key.
2) Press the [◄] key ( ) or [►] key ( ) to select the item that you wish to configure in the USER PROGRAM items, and then press the [ENTER] key.
   - You can also select a program by directly entering the program number with the numeric keys.
3) Press the [◄] key ( ) or [►] key ( ) to change the setting of the selected item.

Note:

- If you mistakenly select the wrong item, press the [CLEAR] key ( ) and repeat the procedure from step 2.
- To cancel a setting for a user program, press the [MENU] key.

4) Press the [ENTER] key.
   Your selection appears briefly and then the previous screen appears.

Note: When "AE LEVEL ADJUST" is selected in the user programs and the [ENTER] key is pressed, the automatic exposure adjustment screen appears. Adjust the exposure and press the [ENTER] key.

A. Copy mode

Program number	Program name	Setting codes (factory default setting appears in bold)	Explanation
1	AUTO CLEAR	1: 10 SEC. 2: 30 SEC. **3: 60 SEC.** 4: 90 SEC. 5: 120 SEC. 6: OFF	• Auto clear time automatically returns the copy settings to the initial settings if no keys are pressed for a preset period of time following the end of a copy job. • This program is used to select the period of time. Auto clear time can also be disabled.
2	PREHEAT MODE	**1: 30 SEC.** 2: 1 MIN. 3: 5 MIN. 4: 30 MIN. 5: 60 MIN. 6: 120 MIN. 7: 240 MIN.	• This function automatically switches the machine to a low power consumption state if the set duration of time elapses without the machine being used when the power is on. The power save indicator lights up, however, the keys on the operation panel can be used. Normal operation automatically resumes when a key on the operation panel is pressed, an original is placed, a print job is received.
3	AUTO SHUT-OFF	**1: ON** 2: OFF	• Use this setting to enable or disable auto power shut-off mode.
4	AUTO SHUT-OFF TIME	**1: 5 MIN.** 2: 30 MIN. 3: 60 MIN. 4: 120 MIN. 5: 240 MIN.	• This function automatically switches the machine to a state that consumes even less power than preheat mode if the set duration of time elapses without the machine being used when the power is on. All lights except the power save indicator go off. To resume normal operation, press the [START] key ( ). Normal operation also resumes automatically when a print job is received or scanning is begun from a computer. While in auto power shut-off mode, no keys (except the [START] key ( )) can be used.
7	LAYOUT IN 2IN1	**1: PATTERN 1** 2: PATTERN 2	• Use this setting to select the layout pattern when two original pages are copied onto a single sheet of paper.
8	OFFSET FUNCTION	**1: ON** 2: OFF	• When enabled, this function offsets the position of each set of copies in the output tray in copy mode, and each print job in printer mode.
9	ROTATE ORIG. IMAGE	1: ON **2: OFF**	• When two-sided copying is performed, this function rotates the image on the back of the original. This is convenient when binding the copies at the top (tablet binding).
10	AE/TEXT RESOLUTION	**1: 300dpi** 2: 600dpi	• This setting is used to change the copy resolution in AUTO and TEXT mode from 600 x 300 dpi to 600 x 600 dpi (high-quality mode). Scanning is slower when high-quality mode is used.

Program number	Program name	Setting codes (factory default setting appears in bold)	Explanation
11	2-SIDED COPY MODE	**1: HI-SPEED** 2: NORMAL	• If the memory fills up when two-sided copying is performed, "NORMAL" can be selected to make copying possible. However, "NORMAL" results in a slower copying speed. Normally "HI-SPEED" is selected to enable fast two-sided copying.
12	MARGIN WIDTH	1: 1/4" **2: 1/2"** 3: 3/4" 4: 1"	• Use this setting to set the margin width.
13	MEM. FOR PRINTER	1: 30% 2: 40% **3: 50%** 4: 60% 5: 70%	• Use this to change the proportion of machine memory used for printer mode.
14	AUTO KEY REPEAT	**1: ON** 2: OFF	• Use this setting to select whether or not holding down a key causes repeated input of the key. For keys that normally cause a set value to decrease or increase when held down (for example, the [◄] key (▭) or [►] key (▭)), this program can be used to have the set value not change when the key is held down.
15	KEY PRESS TIME	**1: NORMAL** 2: 0.5 SEC. 3: 1.0 SEC. 4: 1.5 SEC. 5: 2.0 SEC.	• Use this setting to select how long a key must be pressed for the input to be accepted. By selecting a longer time, you can prevent settings from being changed by the accidental pressing of a key.
16	KEY TOUCH SOUND	**1: LOW** 2: HIGH 3: OFF	• This sets the volume of beep signals.
17	SOUND AT DEFAULT	1: ON **2: OFF**	• Use this to sound a beep when a base setting is selected.
18	TONER SAVE MODE	1: ON **2: OFF**	• This mode reduces toner usage by about 10% when copying. Toner save mode is effective when the exposure mode is AUTO or TEXT.
19	AE LEVEL ADJUST	1: SPF/RSPF (Adjustment to 5 levels is possible.) 2: DOCUMENT GLASS (Adjustment to 5 levels is possible.)	• This is used to adjust the exposure level. • The automatic exposure level can be adjusted separately for the document glass and the RSPF. • For the procedure for adjusting the exposure and guidelines for numeric values. The factory default setting for the exposure level is center.
20	LANGUAGE	**1: AMERICAN ENGLISH** 2: ENGLISH 3: FRENCH 4: SPANISH	• This is used to set the language used in the display.
21	RESET FACTORY	1: YES **2: NO**	• This is used to return all settings to the factory default settings.
22	SORT AUTO SELECT	**1: ON** 2: OFF	• Use this setting to enable or disable sort auto select mode.
24	CHECK RSPF OPEN	**1: ON** 2: OFF	• You can set the operation that takes place if the [START] key (◎) is pressed when the RSPF is not completely closed.
25	VALID COPY WIDTH	**1: 8.5x11** 2: 5.5x8.5	• Set the allowed paper sizes for copying from the bypass tray. When "5.5x8.5" is selected, a copy of a letter size original will only be printed up to invoice size.
28	LSU SETTING	**1: ON** 2: OFF	• Select whether copying is only allowed when the polygon motor is rotating, or also when the polygon motor is stopped.
29	PAPER TYPE	**1: PLAIN PAPER** 2: HEAVY PAPER	• Set the temperature of the fusing unit when the bypass tray is used. Normally "PLAIN PAPER" should be selected.
30	DISPLAY CONTRAST	1: LIGHTER 2: LIGHT **3: NORMAL** 4: DARK 5: DARKER	• Set the contrast of the display.

B. Print mode

Program number	Program name	Setting codes (factory default setting appears in bold)	Explanation
1	FORCED OUTPUT	1: ON **2: OFF**	• When this function is enabled, printing in printer mode will automatically continue using a different size of paper if the specified size of paper runs out in all trays. This feature does not function in copy mode.
2	USB 2.0 MODE SWITCH*	**1: FULL-SPEED** 2: HI-SPEED	• This sets the USB 2.0 data transfer speed. To obtain the fastest speed when using the USB 2.0 connector, first verify that your computer meets the system requirements (operating system and driver), and then use this program to change the USB 2.0 mode to "Hi-Speed". Note that the setting should not be changed while running a TWAIN driver.
3	AUTO TRAY SWITCH	**1: ON** 2: OFF	• If the paper runs out during printing and there is paper of the same size in another tray, this function automatically switches to that tray (excluding the bypass tray). The function can be disabled.

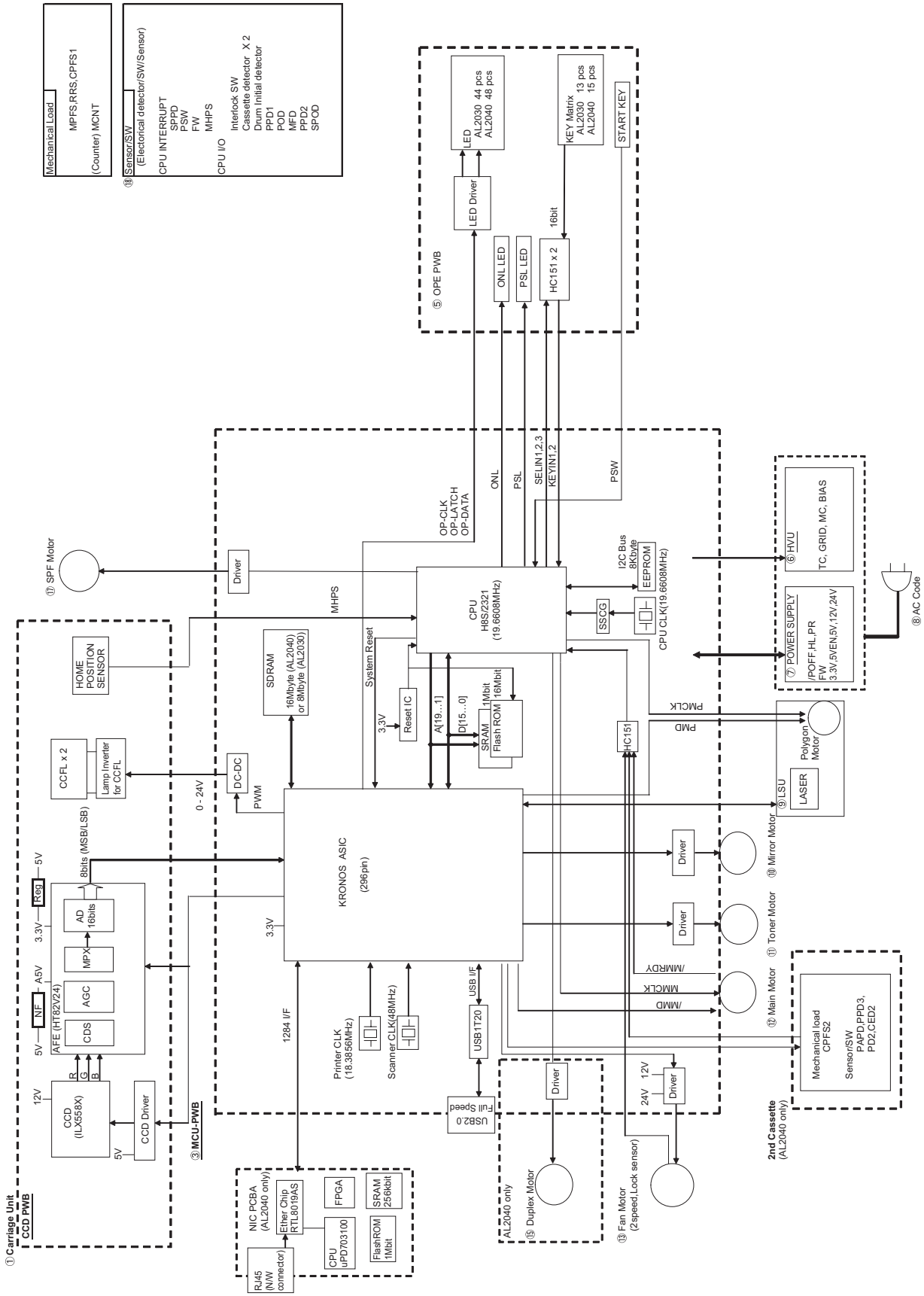
* The scanning speed increases when the USB 2.0 mode is set to "HI-SPEED", however, the printing speed does not increase considerably.

[12] ELECTRICAL SECTION

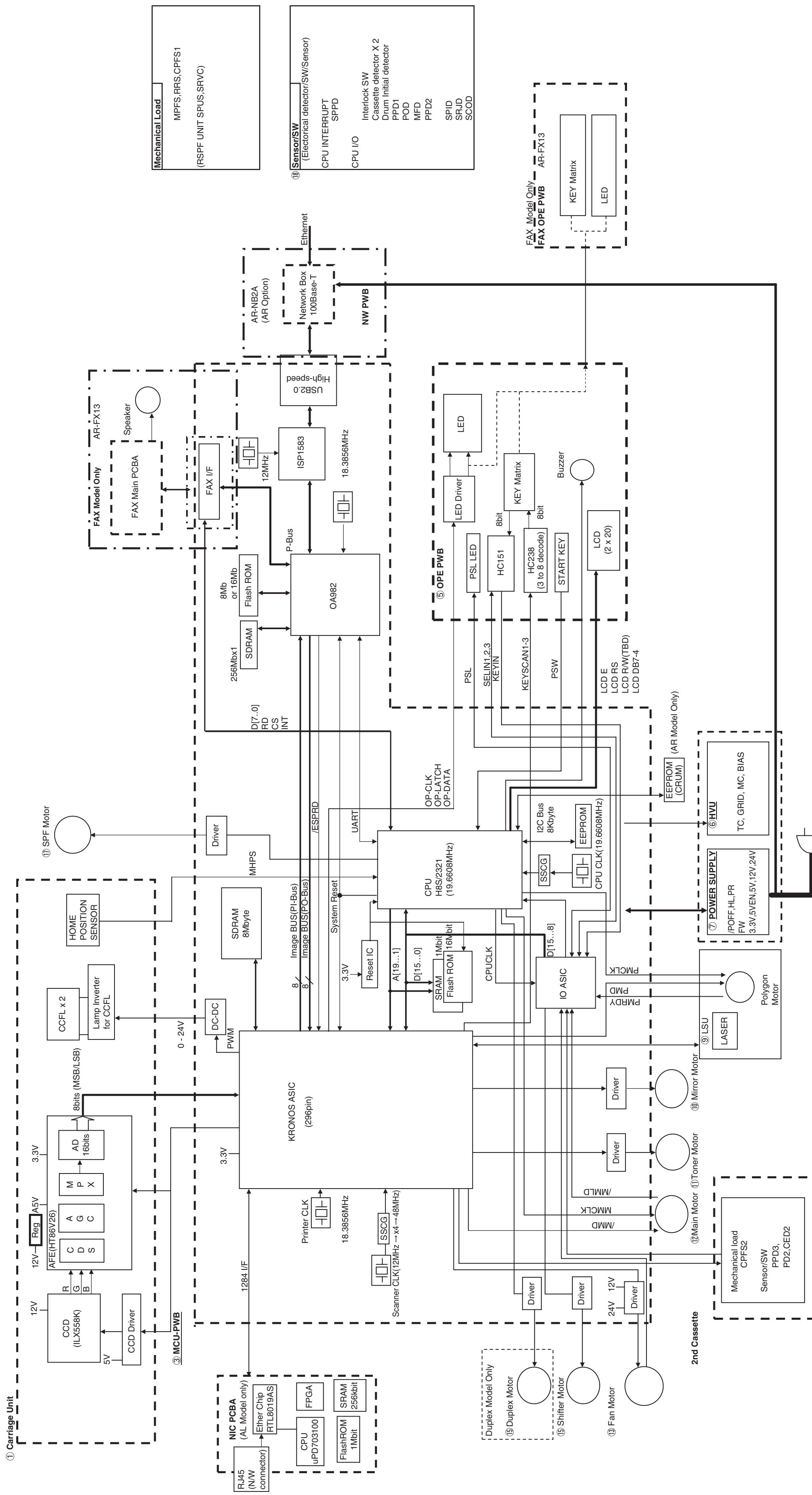
1. Block diagram

A. Overall block diagram

(1) AL-2030/2040CS



(2) AL-2050CS

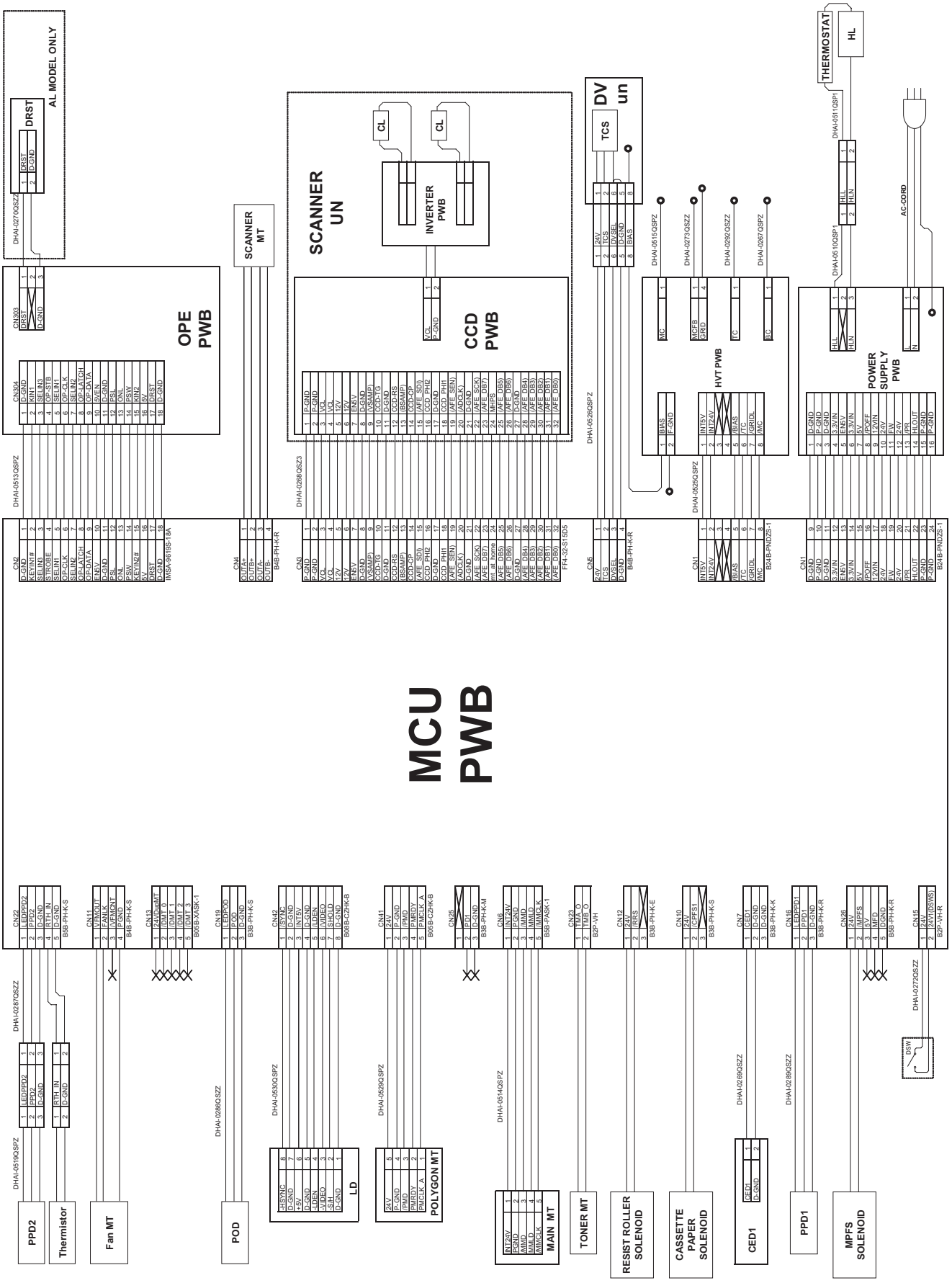


Mechanical Load
MPFS,RRS,CPFS1
(RSPF UNIT SPUS,SRVC)
⑱ Sensor/SW
(Electorical detector/SW/Sensor)
CPU INTERRUPT
SPPD
CPU I/O
Interlock SW
Cassette detector X 2
Drum Initial detector
PPD1
POD
MFD
PPD2
SPID
SRJD
SCOD
FAX Model Only
FAX OPE PWB
AR-FX13
KEY Matrix
LED
Ethernet
AR-NB2A
(AR Option)
Network Box
100Base-T
NW PWB
USB2.0
High-speed
ISP1583
12MHz
18.3856MHz
FAX Model Only
AR-FX13
Speaker
FAX Main PCBA
FAX I/F
P-Bus
OA982
8Mb
or 16Mb
Flash ROM
256Mbx1
SDRAM
D[7..0]
RD
CS
INT
⑤ OPE PWB
LED
LED Driver
KEY Matrix
Buzzer
PSL LED
HC151
HC238
(3 to 8 decode)
START KEY
LCD
(2 x 20)
8bit
PSL
SELIN1,2,3
KEYIN
KEYSCAN1-3
PSW
LCD E
LCD RS
LCD R/W(TBD)
LCD DB7-4
EEPROM
(CRUM)
(AR Model Only)
⑥ HVU
TC, GRID, MC, BIAS
⑦ POWER SUPPLY
/POFF,HL,PR
FW
3.3V,5VEN,5V,12V,24V
⑧ AC Code
⑰ SPF Motor
Driver
OP-CLK
OP-LATCH
OP-DATA
I2C Bus
8Kbyte
EEPROM
SSCG
CPU CLK(19.6608MHz)
CPU
H8S/2321
(19.6608MHz)
UART
/ESPRD
MHPS
Image BUS(PI-Bus)
Image BUS(PO-Bus)
System Reset
SDRAM
8Mbyte
Reset IC
3.3V
A[19...1]
D[15...0]
SRAM
1Mbit
Flash ROM
16Mbit
CPUCLK
D[15...8]
IO ASIC
PMCLK
PMD
PMRDY
Polygon
Motor
⑨ LSU
LASER
⑩ Mirror Motor
⑪ Toner Motor
⑫ Main Motor
/MMLD
MMCLK
/MMD
Mechanical load
CPFS2
Sensor/SW
PPD3,
PD2,CED2
2nd Cassette
HOME
POSITION
SENSOR
CCFL x 2
Lamp Inverter
for CCFL
DC-DC
PWM
0 - 24V
KRONOS ASIC
(296pin)
3.3V
8bits (MSB/LSB)
AD
16bits
M
P
X
A
G
C
C
D
S
AFE(HT86V26)
Reg
A5V
12V
R
G
B
CCD
(ILX558K)
CCD Driver
5V
③ MCU-PWB
① Carriage Unit
Printer CLK
18.3856MHz
SSCG
Scanner CLK(12MHz→x4→48MHz)
1284 I/F
Driver
24V
Duplex Model Only
⑮ Duplex Motor
⑮ Shifter Motor
⑬ Fan Motor
NIC PCBA
(AL Model only)
RJ45
(N/W
connector)
Ether Chip
RTL8019AS
CPU
uPD703100
FPGA
FlashROM
1Mbit
SRAM
256kbit

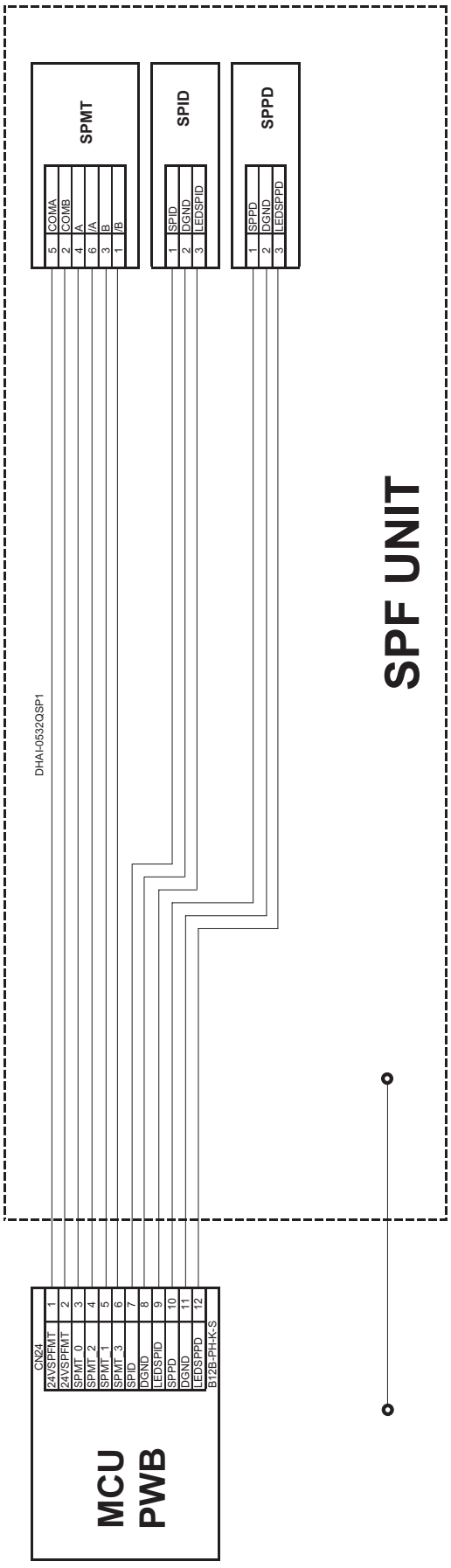
2. Actual wiring diagram

A. AL-2030

(1) MCU PWB (1/2)

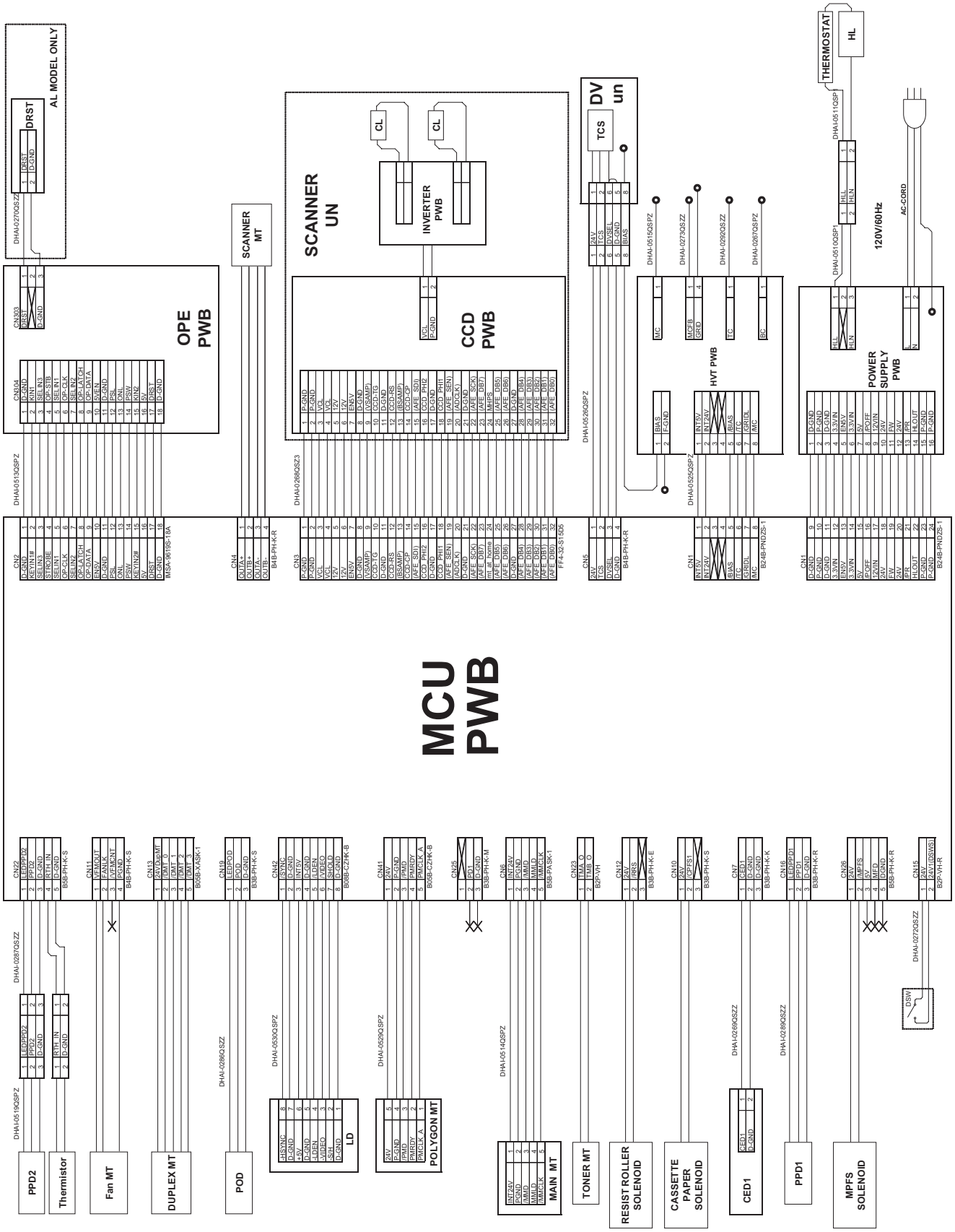


(2) SPF unit (2/2)

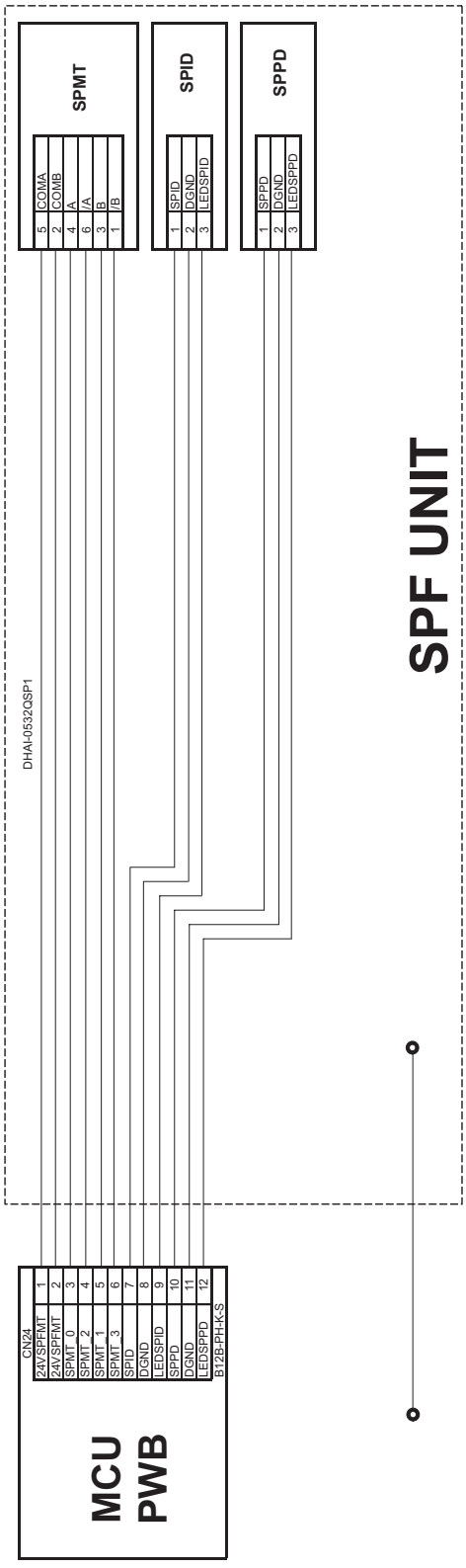

SPF UNIT
SPMT
SPID
SPPD
5 COMA
2 COMB
4 /A
6 A
3 /B
1 B
1 SPID
2 DGND
3 LEDSPID
1 SPPD
2 DGND
3 LEDSPPD
DHAI-0532QSP1
MCU PWB
CN24
1 24VSPFMT
2 24VSPFMT
3 SPMT_0
4 SPMT_2
5 SPMT_1
6 SPMT_3
7 SPID
8 DGND
9 LEDSPID
10 SPPD
11 DGND
12 LEDSPPD
B12B-PH-K-S

B. AL-2040CS

(1) MCU PWB (1/2)

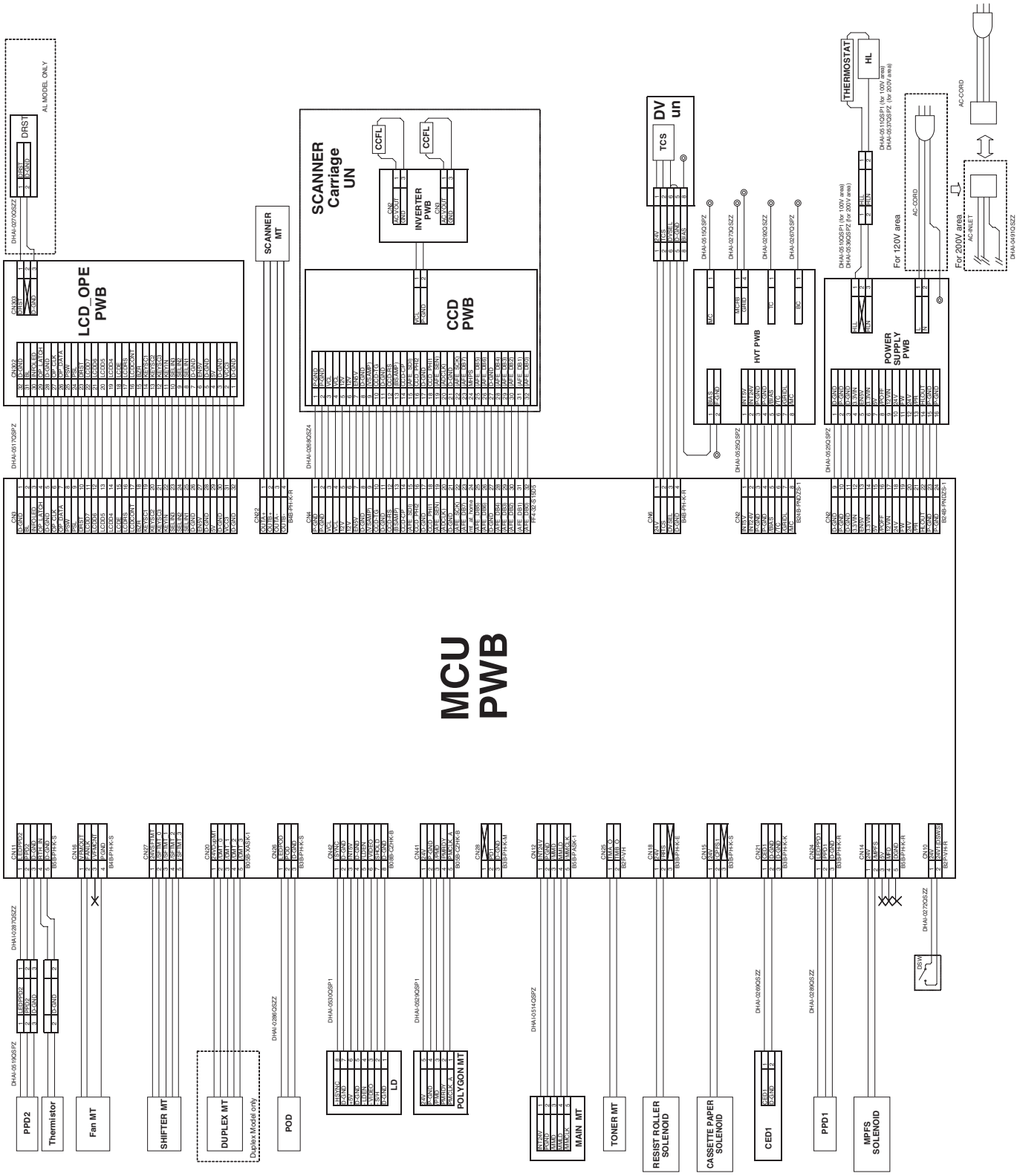


(2) SPF unit (2/2)

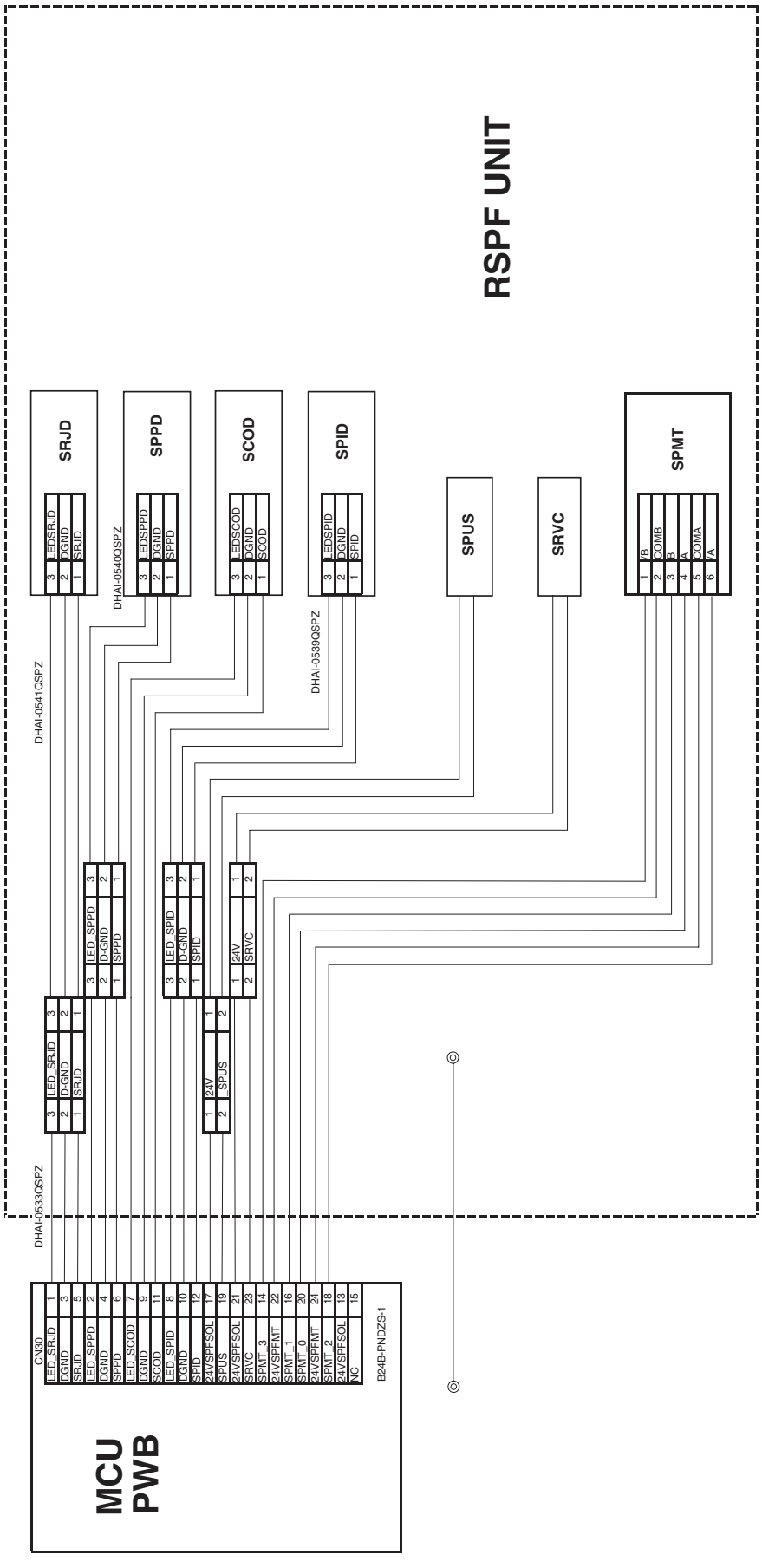

SPF UNIT
DHAI-0532QSP1
SPMT
5 COMA
2 COMB
4 /A
6 A
3 /B
1 B
SPID
1 SPID
2 DGND
3 LEDSPID
SPPD
1 SPPD
2 DGND
3 LEDSPPD
MCU PWB
CN24
24VSPFMT 1
24VSPFMT 2
SPMT_0 3
SPMT_2 4
SPMT_1 5
SPMT_3 6
SPID 7
DGND 8
LEDSPID 9
SPPD 10
DGND 11
LEDSPPD 12
B12B-PH-K-S

C. AL-2050CS

(1) MCU PWB (1/2)

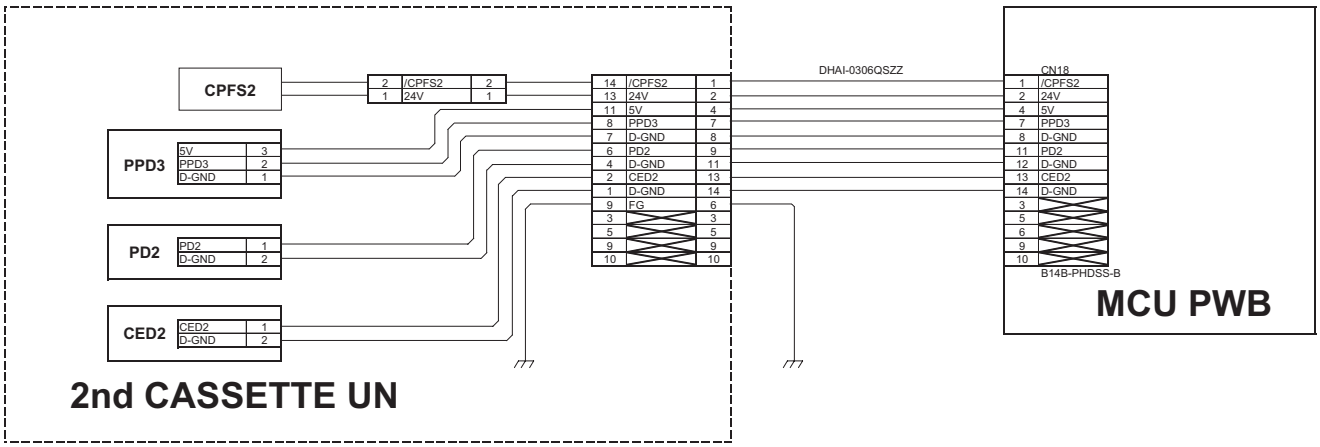


(2) RSPF section (2/2)

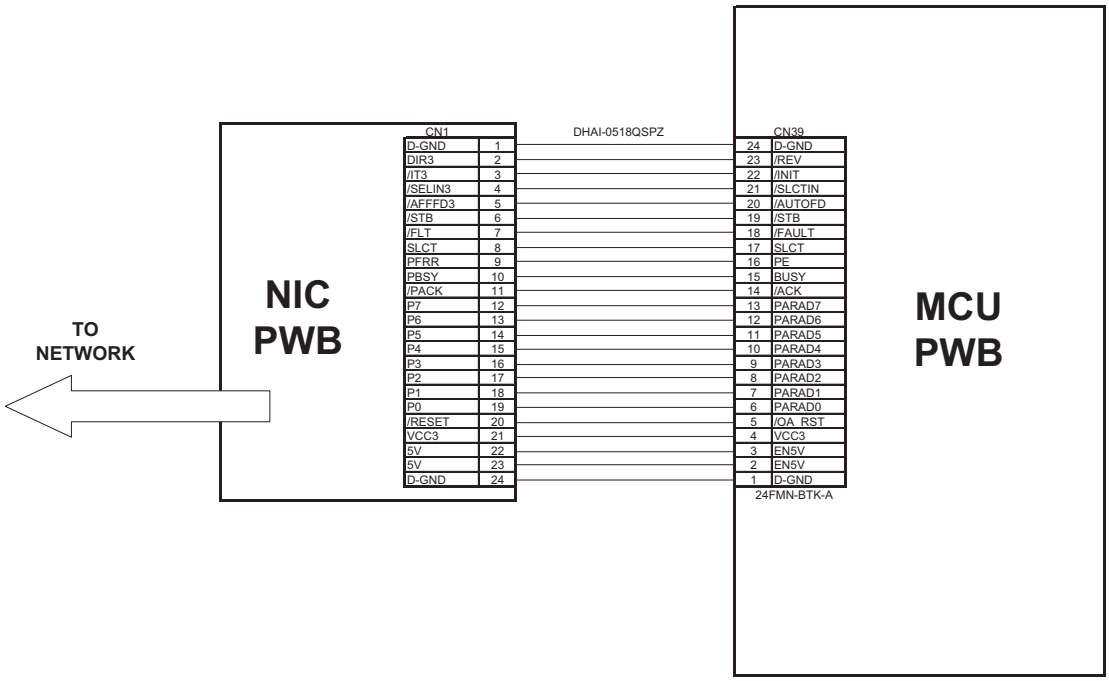


D. AL-2040CS/2050CS

(1) 2nd cassette unit (1/2)



(2) NIC PWB (2/2)



3. Signal name list

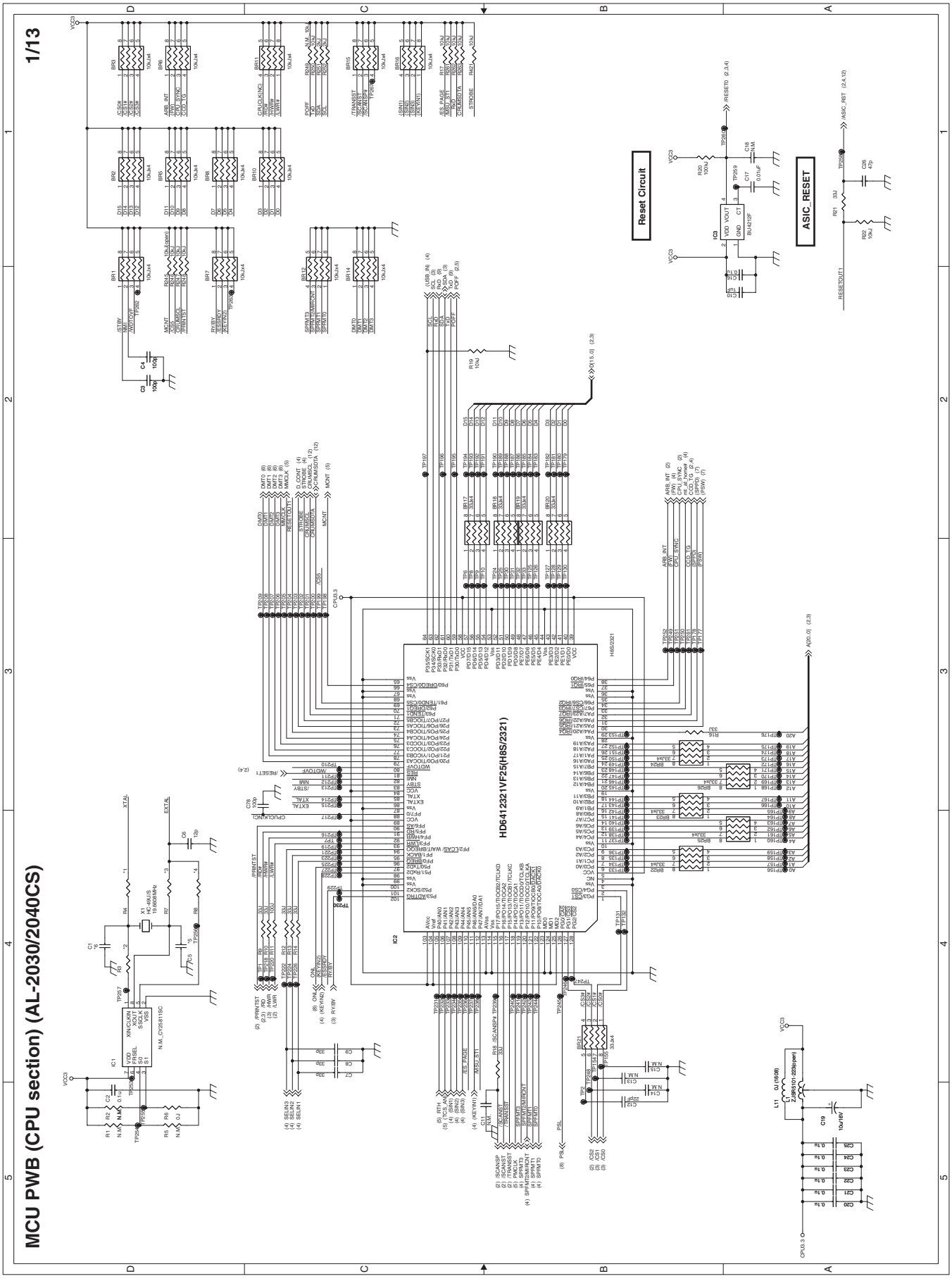
Signal name	Name	Function/Operation	Section
LEDPPD2	PPD2 sensor power		Fusing section
PPD2	PPD2 sensor	Paper transport detection	Fusing section
RTH_IN	Thermistor	Fusing section thermistor temperature detection	Fusing section
FANLK	Fusing fan	Fan lock detection signal	Optical section
MHPS	MHPS sensor	Carriage HP detection	Optical section
/MPFS	Multi bypass solenoid		Optical section
/VFMCNT	Fan speed signal	Fan rotation speed control	Optical section
VFMOUT	Fusing fan	Fan drive signal	Optical 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
LEDPOD	POD sensor power		Paper exit section
POD	POD sensor	Paper transport detection	Paper exit section
PMCLK_A	Polygon motor	Clock signal to the polygon motor	LSU
PMRDY	Polygon motor	Polygon motor ON/OFF detection signal	LSU
/PMD	Polygon motor	Polygon motor drive signal	LSU

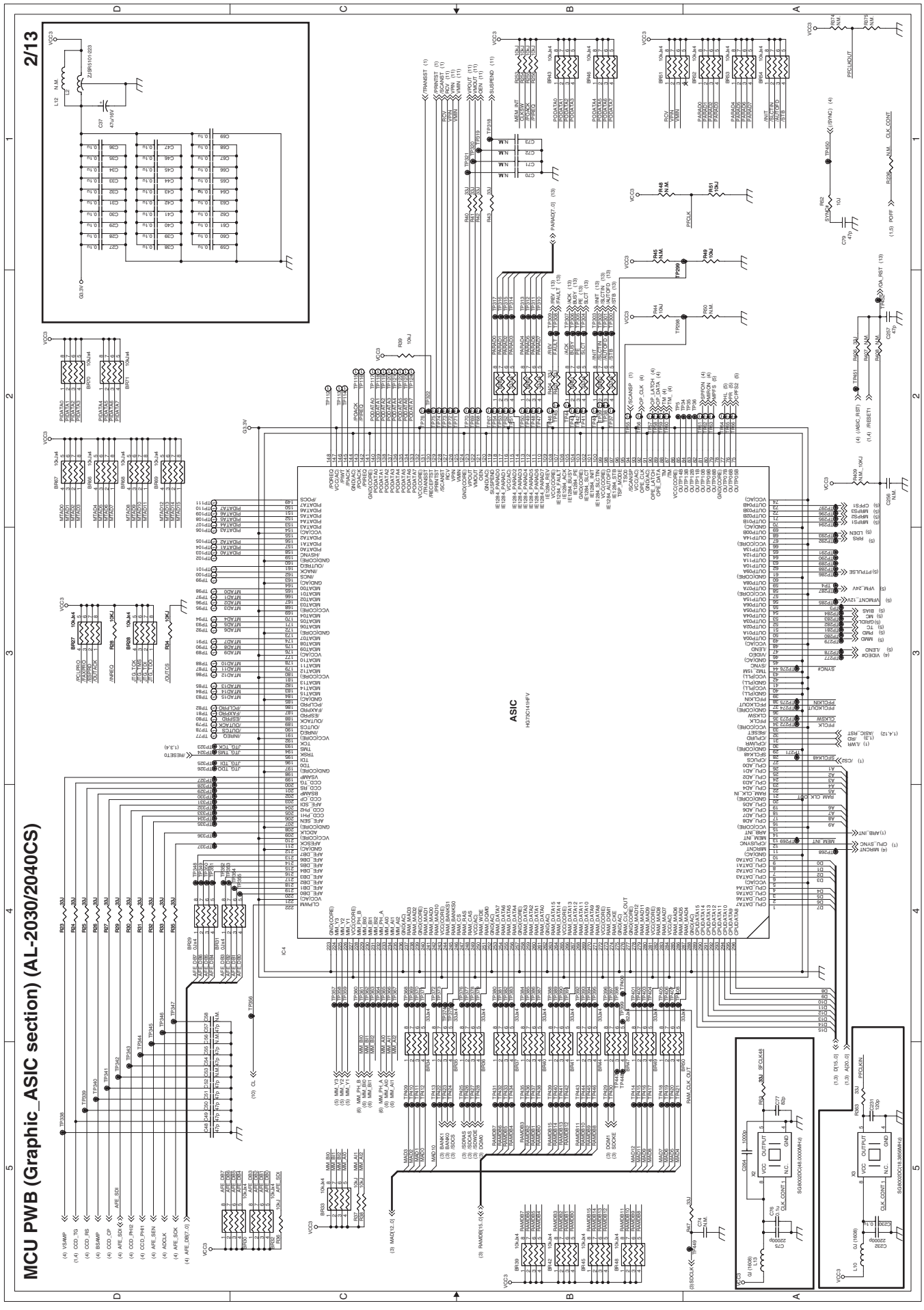
Signal name	Name	Function/Operation	Section
/LDEN	Laser	Laser circuit control signal	LSU
SHOLD	Laser	Laser APC signal	LSU
/SYNC	Laser	Horizontal sync signal from the LSU	LSU
/VIDEO	Laser	Laser drive signal	LSU
PD1	PD SW sensor	1st CS paper width sensor	Not used
/MMCLK	Main motor	Clock signal to the polygon 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
TMA_O	Toner motor	Toner motor phase control	Toner motor drive section
TMB_O	Toner motor	Toner motor phase control	Toner motor drive section
CED1	Machine cassette detection		Paper transport section
/CPFS1	1st CS pickup solenoid		Paper transport section
LEDPPD1	PPD sensor power		Paper transport section
PPD1	PPD sensor	Paper transport detection	Paper transport section
/RRS	1st transport solenoid		Paper transport section
BZR	Buzzer signal	Buzzer	Operation section
DRST	Drum reset detection	CRU initial detection	Operation section
KEYIN	Key scan input	Key detection control	Operation section
KEYIN1#	Key scan input	Key detection control	Operation section
KEYIN2#	Key scan input	Key detection control	Operation section
KEYSC1	Key scan output	Key scan output	Operation section
KEYSC2	Key scan output	Key scan output	Operation section
KEYSC3	Key scan output	Key scan output	Operation section
LCDCON	LCD control signal	Signal for LCD	Operation section
LCDDB4	LCD data signal	Signal for LCD	Operation section
LCDDB5	LCD data signal	Signal for LCD	Operation section
LCDDB6	LCD data signal	Signal for LCD	Operation section
LCDDB7	LCD data signal	Signal for LCD	Operation section
LCDE	LCD control signal	Signal for LCD	Operation section
LCDRS	LCD control signal	Signal for LCD	Operation 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
PSL	Power save LED		Operation section
PSW	Start button control		Operation 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
STROBE	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
(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
(BSAMP)	AFE	AFE control signal	Scanner unit section
(VSAMP)	AFE	AFE 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
CCD_PHI1	CCD	CCD control signal	Scanner unit section
CCD_PHI2	CCD	CCD control signal	Scanner unit section
VCL	Copy lamp	Copy lamp control	Scanner unit section

Signal name	Name	Function/Operation	Section
DVSEL	Developing tank detection		Developing section
TCS	Toner sensor	Toner quantity detection	Developing section
/BIAS	HV bias signal	HV bias drive	Process section
/GRIDL	HV grid signal	Main charger grid control	Process section
/MC	HV MC signal	Main charger control	Process section
/TC	HV TC signal	Transfer charger grid control	Process section
/POFF	Low voltage power	Output power control	Power section
FW	Low voltage power	Zero cross detection	Power section
/PR	Heater lamp	Power relay control	Power section
HLOUT	Heater lamp	Heater lamp control	Power section
LEDSCOD	SCOD sensor power		SPF/RSPF section
LEDSPID	SPID sensor power		SPF/RSPF section
LEDSPPD	SPPD sensor power		SPF/RSPF section
LEDSRJD	SRJD sensor power		SPF/RSPF section
/RSV_SOL	Reverse solenoid		SPF/RSPF section
SCOD	SCOD sensor	SPF/RSPF cover open sensor	SPF/RSPF section
SPID	SPID sensor	SPF/RSPF UN paper entry sensor	SPF/RSPF section
SPMT_0	SPF/RSPF motor	SPF/RSPF motor phase control	SPF/RSPF section
SPMT_1	SPF/RSPF motor	SPF/RSPF motor phase control	SPF/RSPF section
SPMT_2	SPF/RSPF motor	SPF/RSPF motor phase control	SPF/RSPF section
SPMT_3	SPF/RSPF motor	SPF/RSPF motor phase control	SPF/RSPF section
SPPD	SPPD sensor	SPF/RSPF transport detection	SPF/RSPF section
/SPUS	Paper feed solenoid		SPF/RSPF section
SRJD	SRJD sensor	SPF/RSPF paper exit sensor	SPF/RSPF section
/SRVC	Reverse clutch		SPF/RSPF section
CED2	2nd CS cassette detection		2nd cassette section
/CPFS2	2nd CS pickup solenoid		2nd cassette section
PD2	PD2 SW sensor	2nd CS paper width detection	2nd cassette section
PPD3	PPD3 sensor	2nd CS paper transport detection	2nd cassette section
/ACK	IEEE1284	/ACK signal	Network section
/AUTOFD	IEEE1284	/AUTOFD signal	Network section
BUSY	IEEE1284	BUSY signal	Network section
/FAULT	IEEE1284	/FAULT signal	Network section
/INIT	IEEE1284	/INIT signal	Network section
PARAD0	IEEE1284	Data bus	Network section
PARAD1	IEEE1284	Data bus	Network section
PARAD2	IEEE1284	Data bus	Network section
PARAD3	IEEE1284	Data bus	Network section
PARAD4	IEEE1284	Data bus	Network section
PARAD5	IEEE1284	Data bus	Network section
PARAD6	IEEE1284	Data bus	Network section
PARAD7	IEEE1284	Data bus	Network section
PE	IEEE1284	PE signal	Network section
/REV	IEEE1284	/REV signal	Network section
SLCT	IEEE1284	SLCT signal	Network section
/SLCTIN	IEEE1284	/SLCTIN signal	Network section
/STB	IEEE1284	/STB signal	Network section
/OA_RST	Option reset	Reset signal to the NIC PWB	Network section
USB +D	USB signal		USB section
USB -D	USB signal		USB section
/SFTMT0	Shifter motor	Shifter motor phase control	Shifter motor section
/SFTMT1	Shifter motor	Shifter motor phase control	Shifter motor section
/SFTMT2	Shifter motor	Shifter motor phase control	Shifter motor section
/SFTMT3	Shifter motor	Shifter motor phase control	Shifter motor section

[13] CIRCUIT DIAGRAM

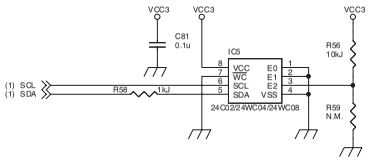
1. MCU PWB (AL-2030/2040CS)



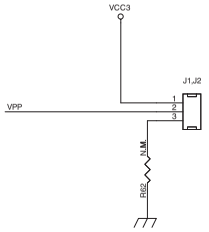

MCU PWB (Graphic_ASIC section) (AL-2030/2040CS)
2/13
ASIC
H3720-H1HFV
IC4

MCU PWB (Memory section) (AL-2030/2040CS)

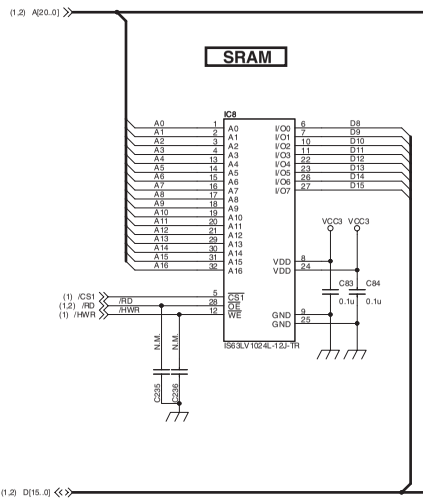
Serial EE-PROM



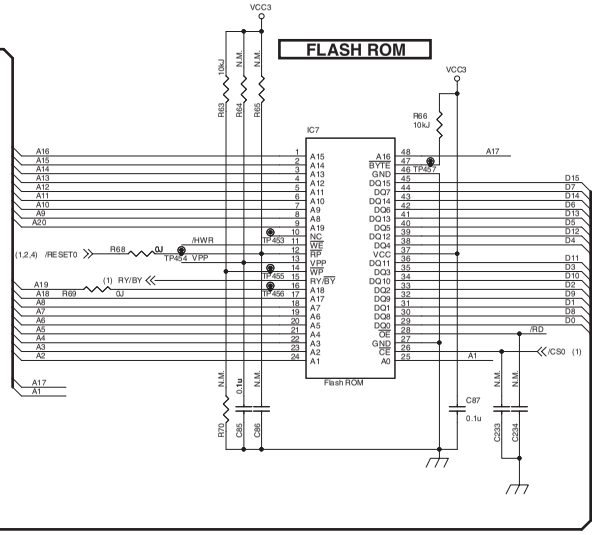
FlashROM VPP Controll



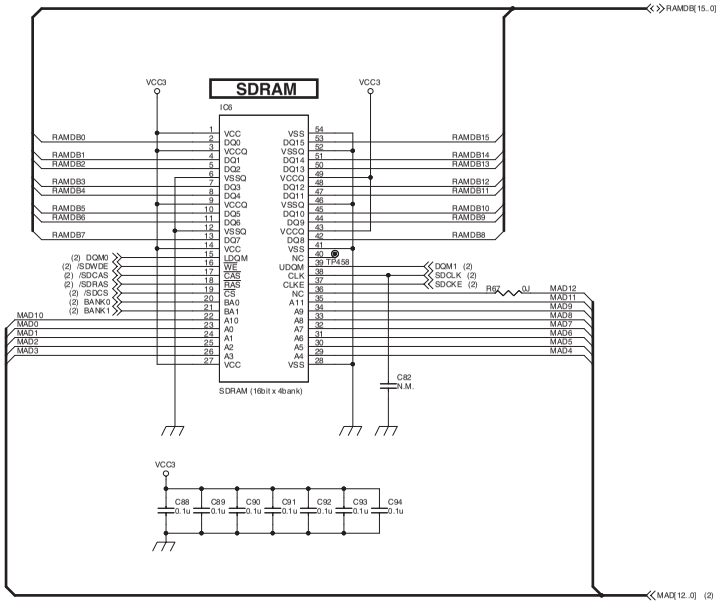
SRAM

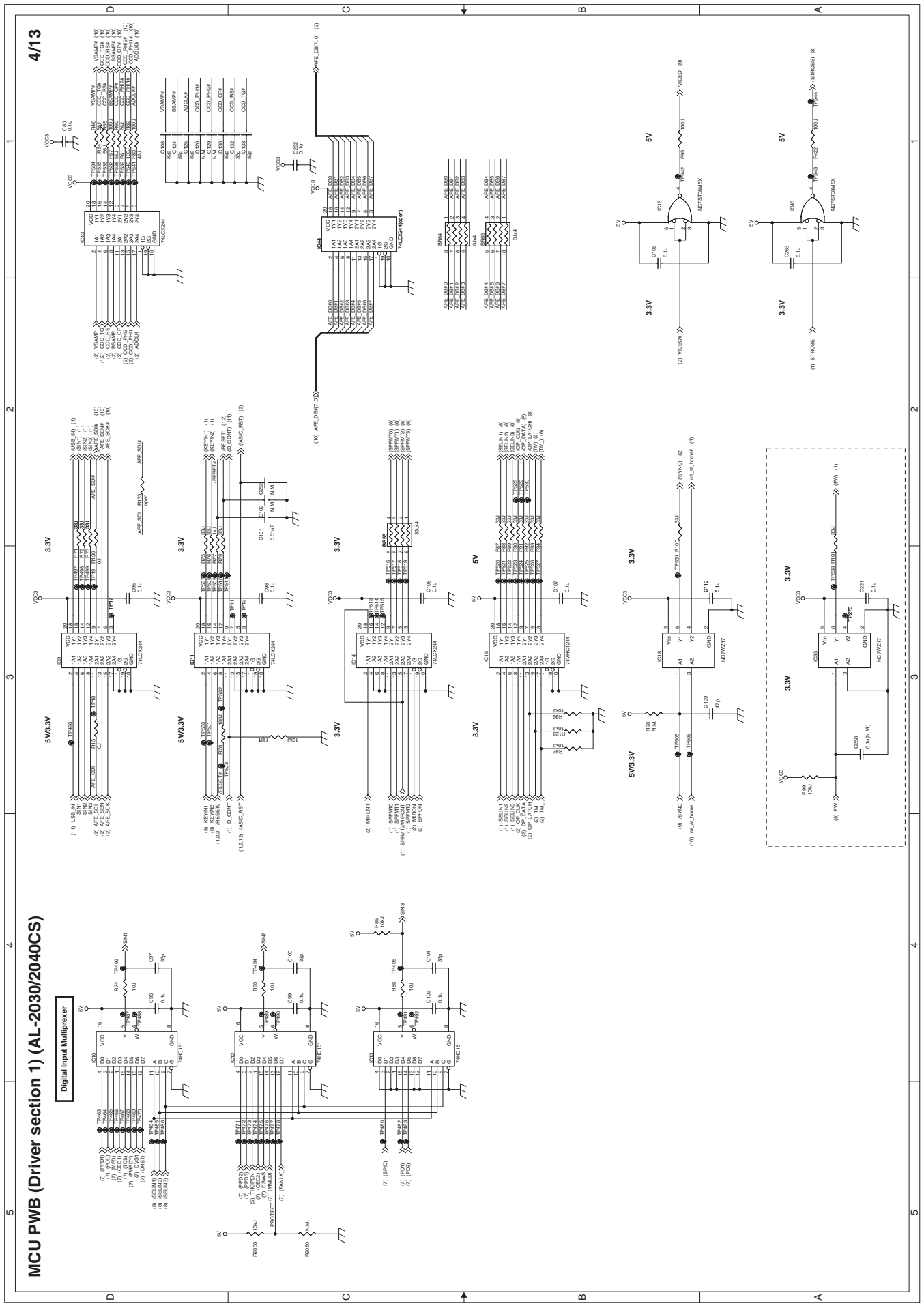


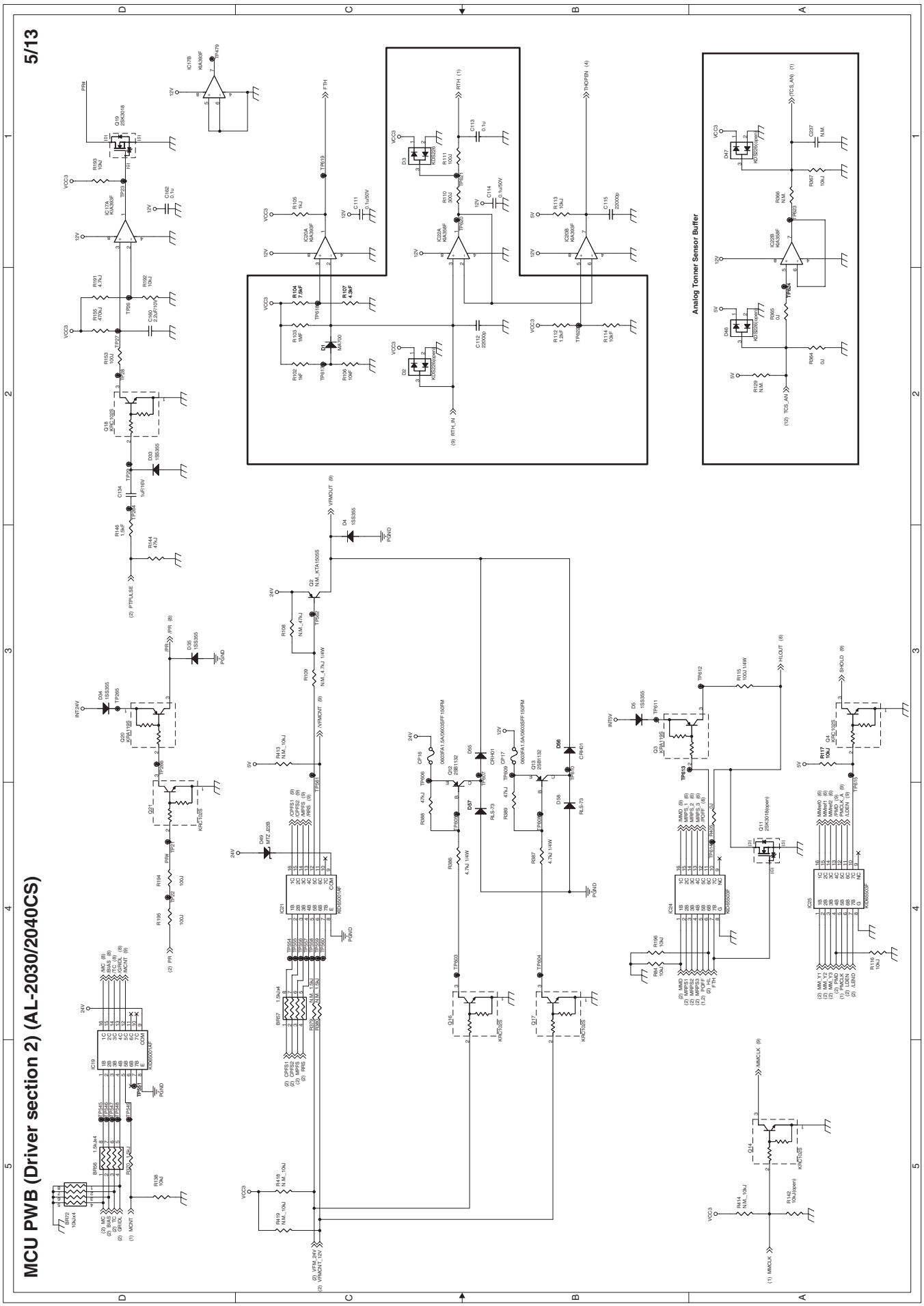
FLASH ROM



SDRAM

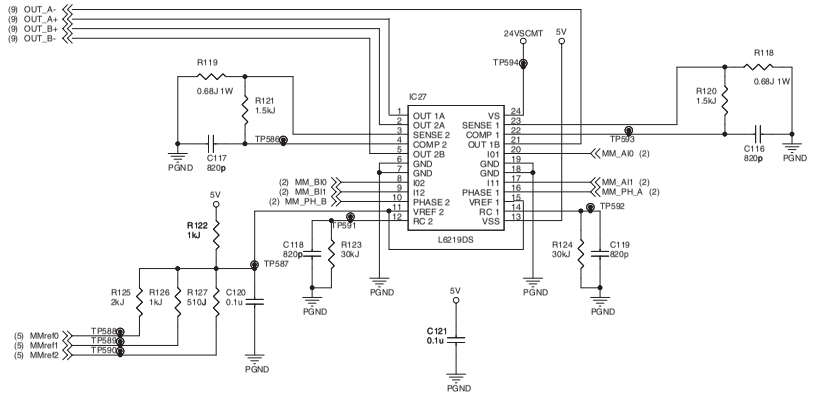



MCU PWB (Driver section 1) (AL-2030/2040CS)
4/13
Digital Input Multiplexer


MCU PWB (Driver section 2) (AL-2030/2040CS)
5/13
Analog Tonner Sensor Buffer

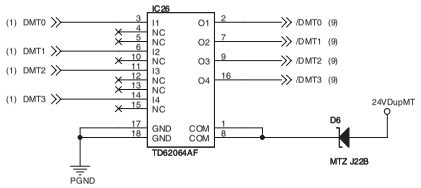
MCU PWB (Driver section 3) (AL-2030/2040CS)

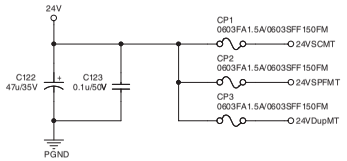
Scanner Motor Driver



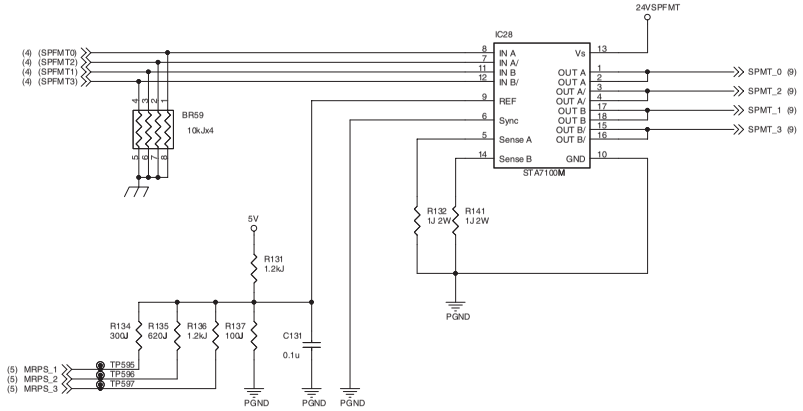
Duplex Motor Driver

For AL2040 Model Only

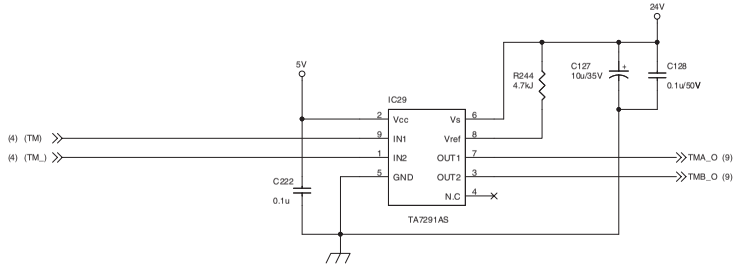




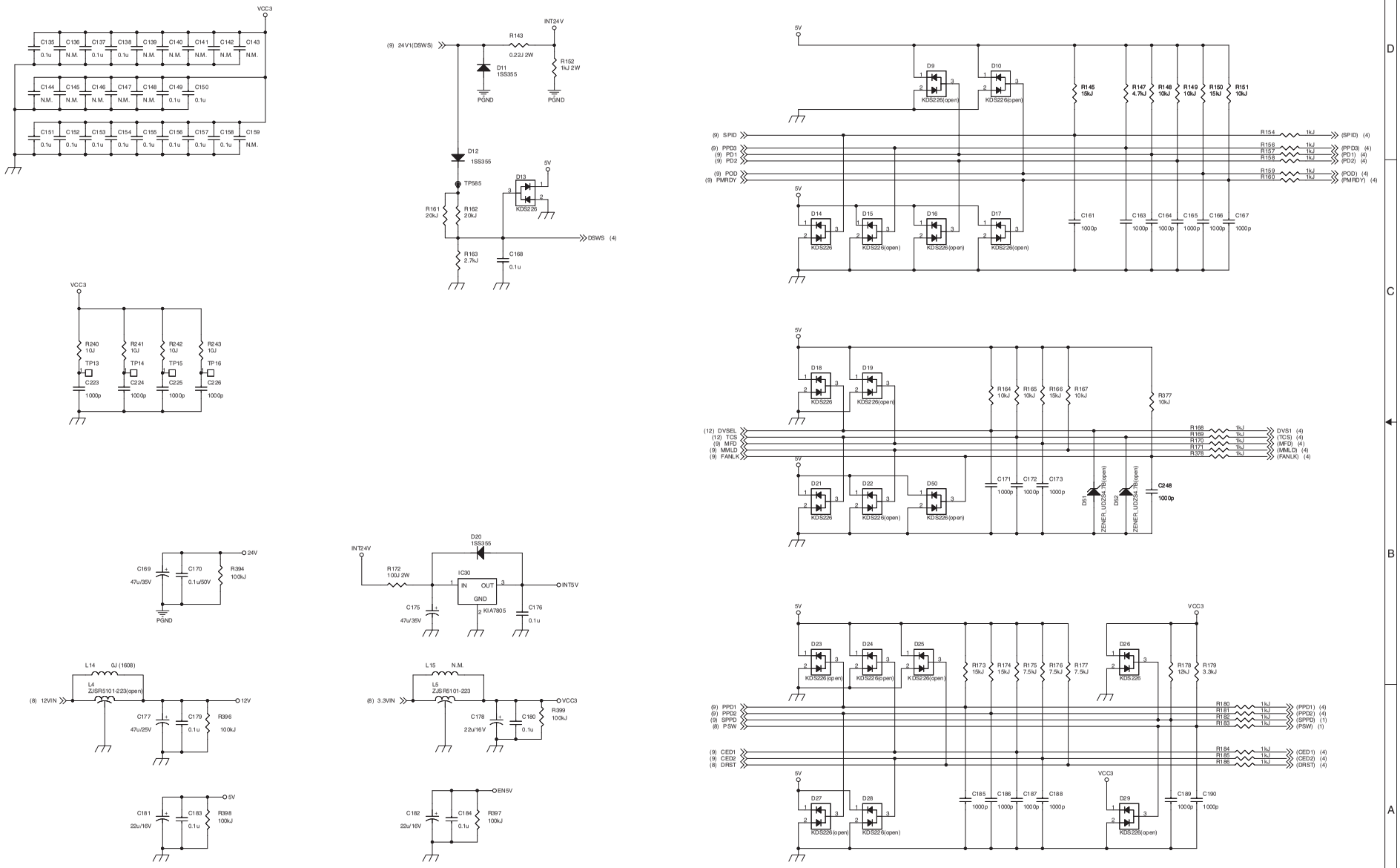
SPF Motor Driver



Tonner Motor Driver

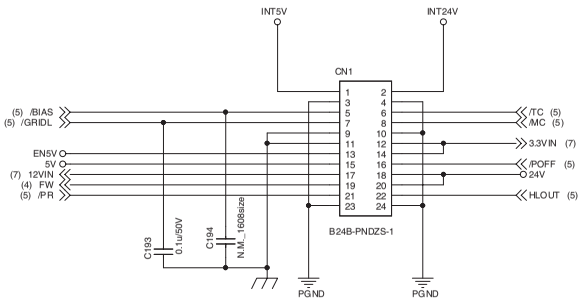


MCU PWB (Noise filter/Pull-up section) (AL-2030/2040CS)

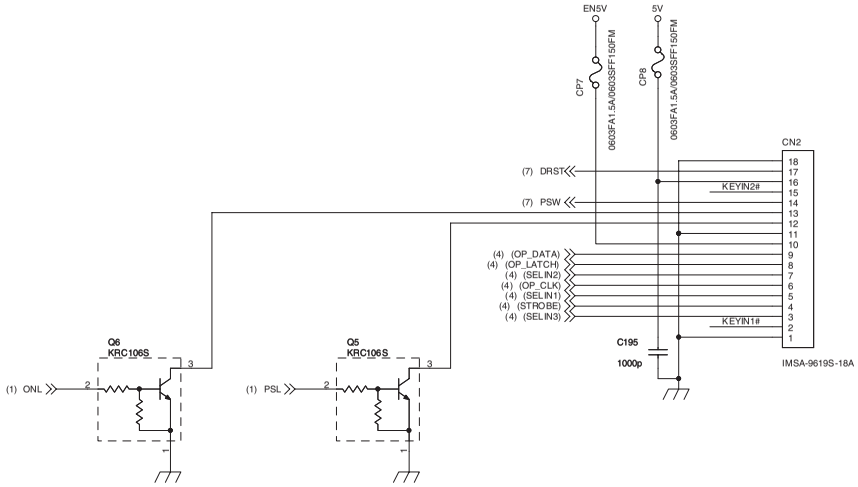


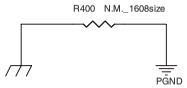
MCU PWB (Connector section 1) (AL-2030/2040CS)

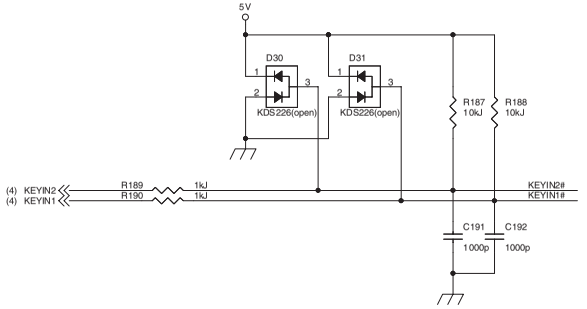
To Power unit



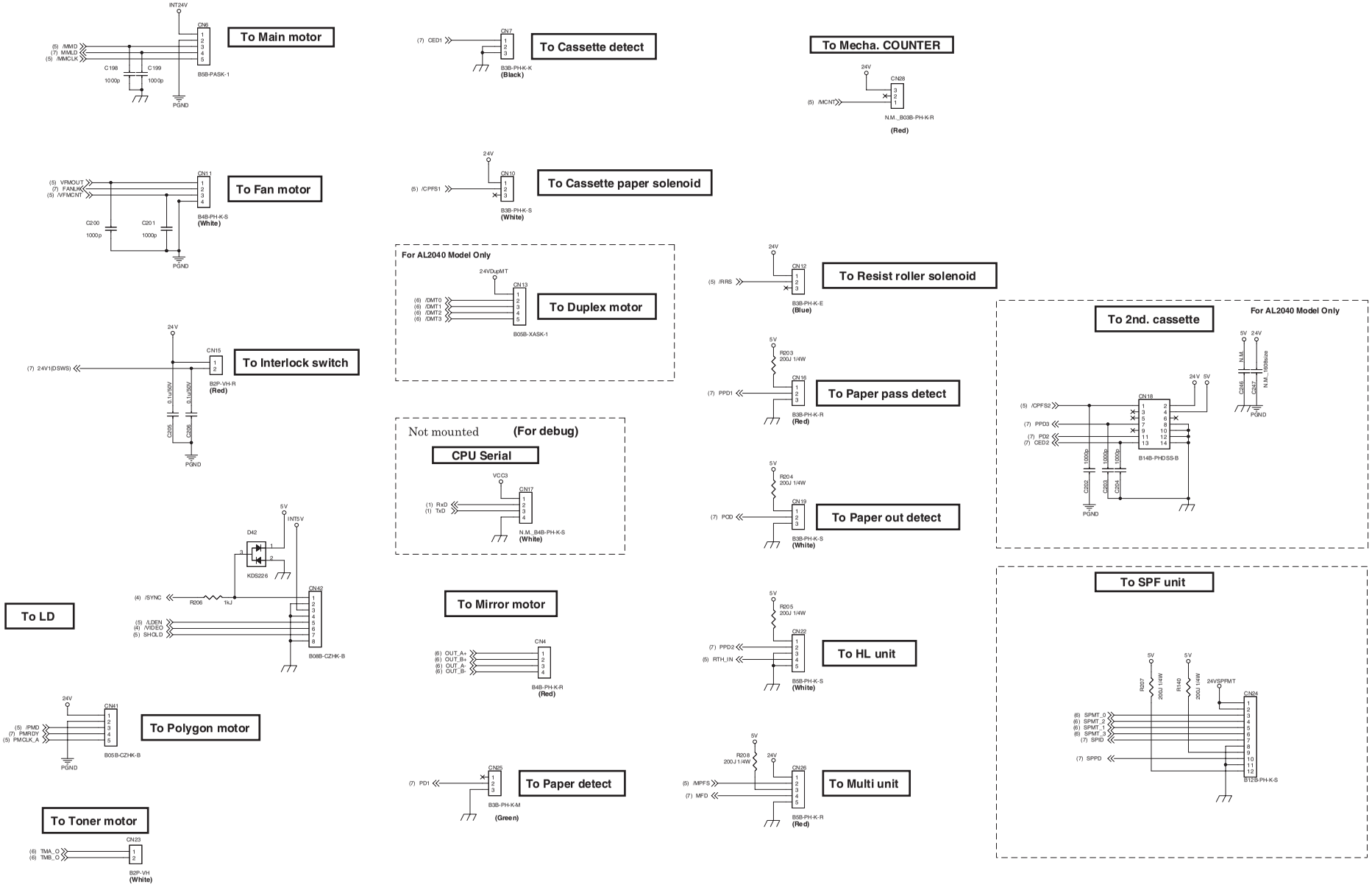
To Operational PWB





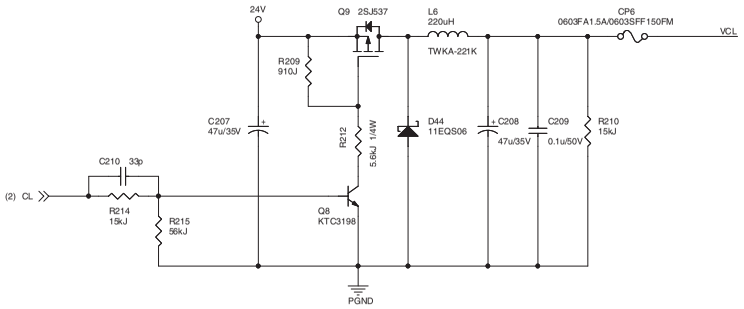


MCU PWB (Connector section 2) (AL-2030/2040CS)

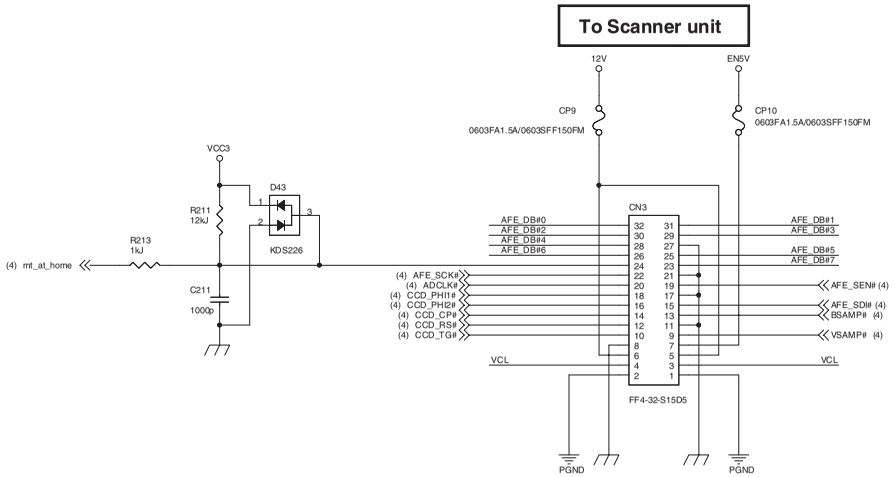


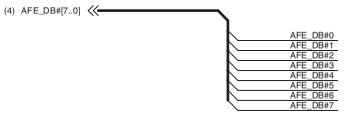
MCU PWB (Scanner I/F section) (AL-2030/2040CS)

Copy Lamp Inverter

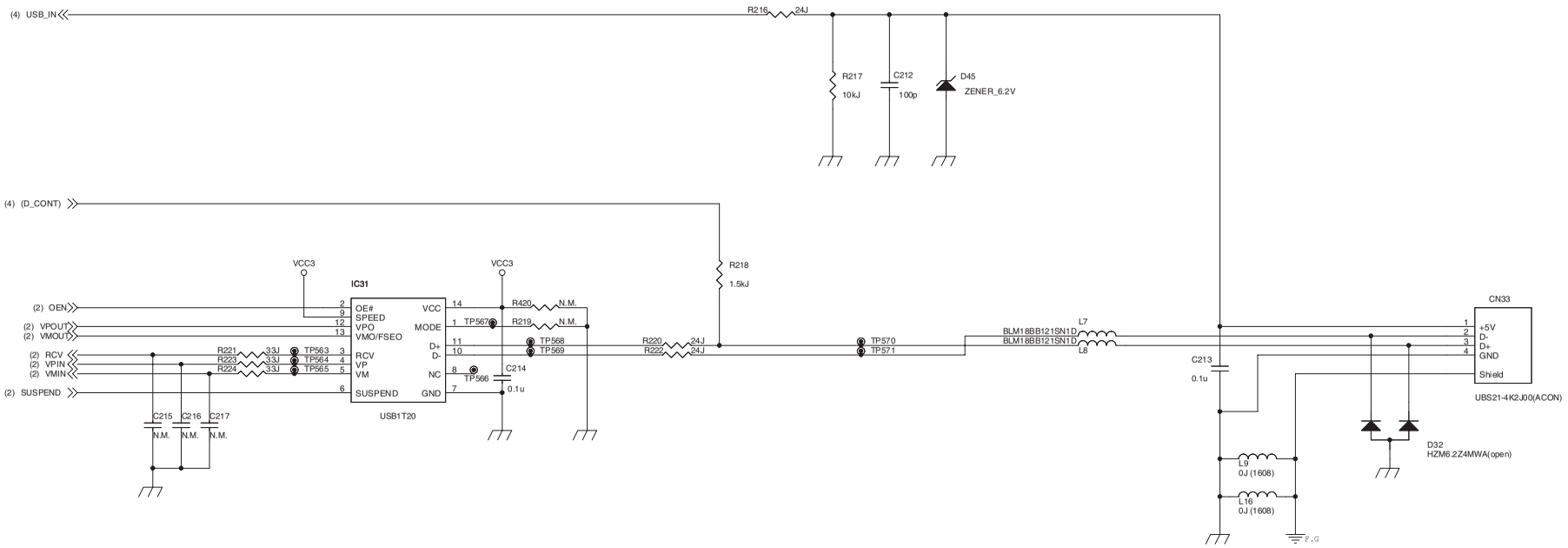


To Scanner unit

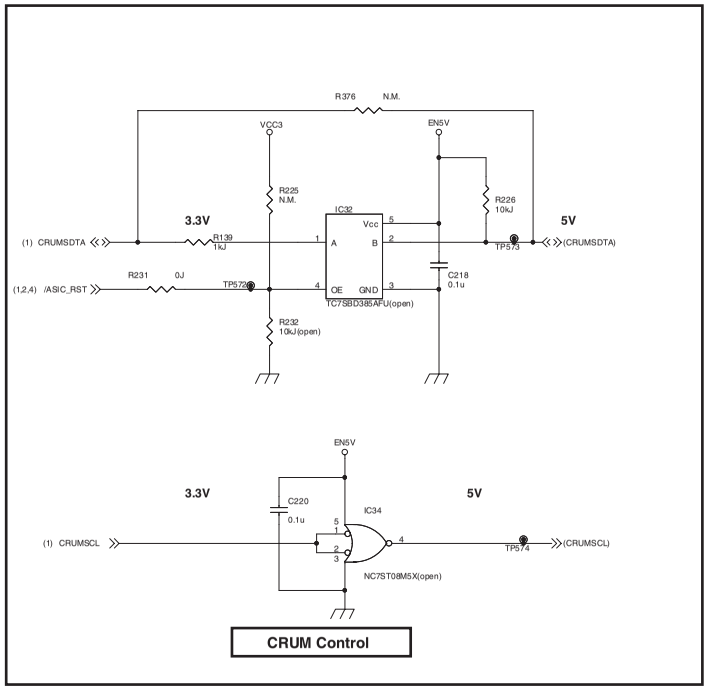


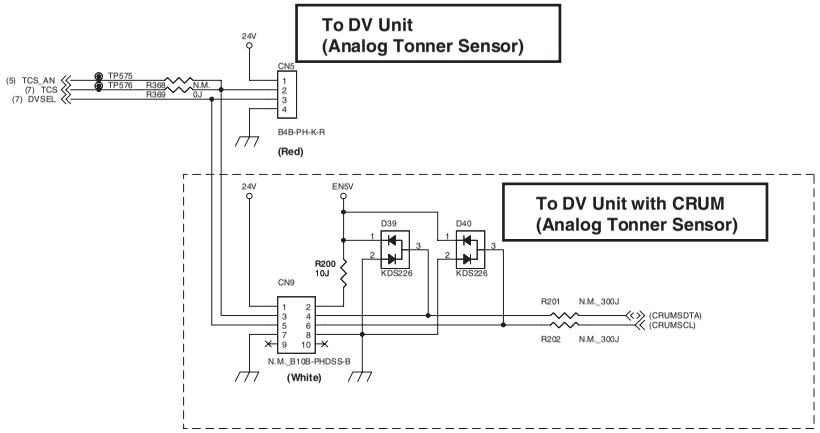


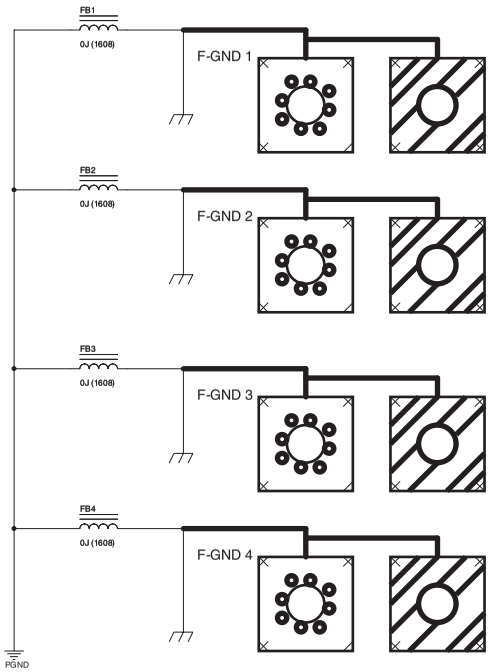
MCU PWB (USB2.0 (FULL) I/F section) (AL-2030/2040CS)



MCU PWB (CRUM I/F section) (AL-2030/2040CS)

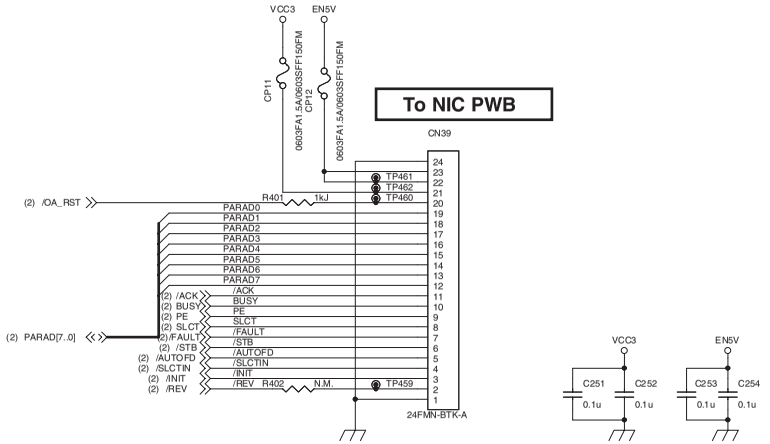




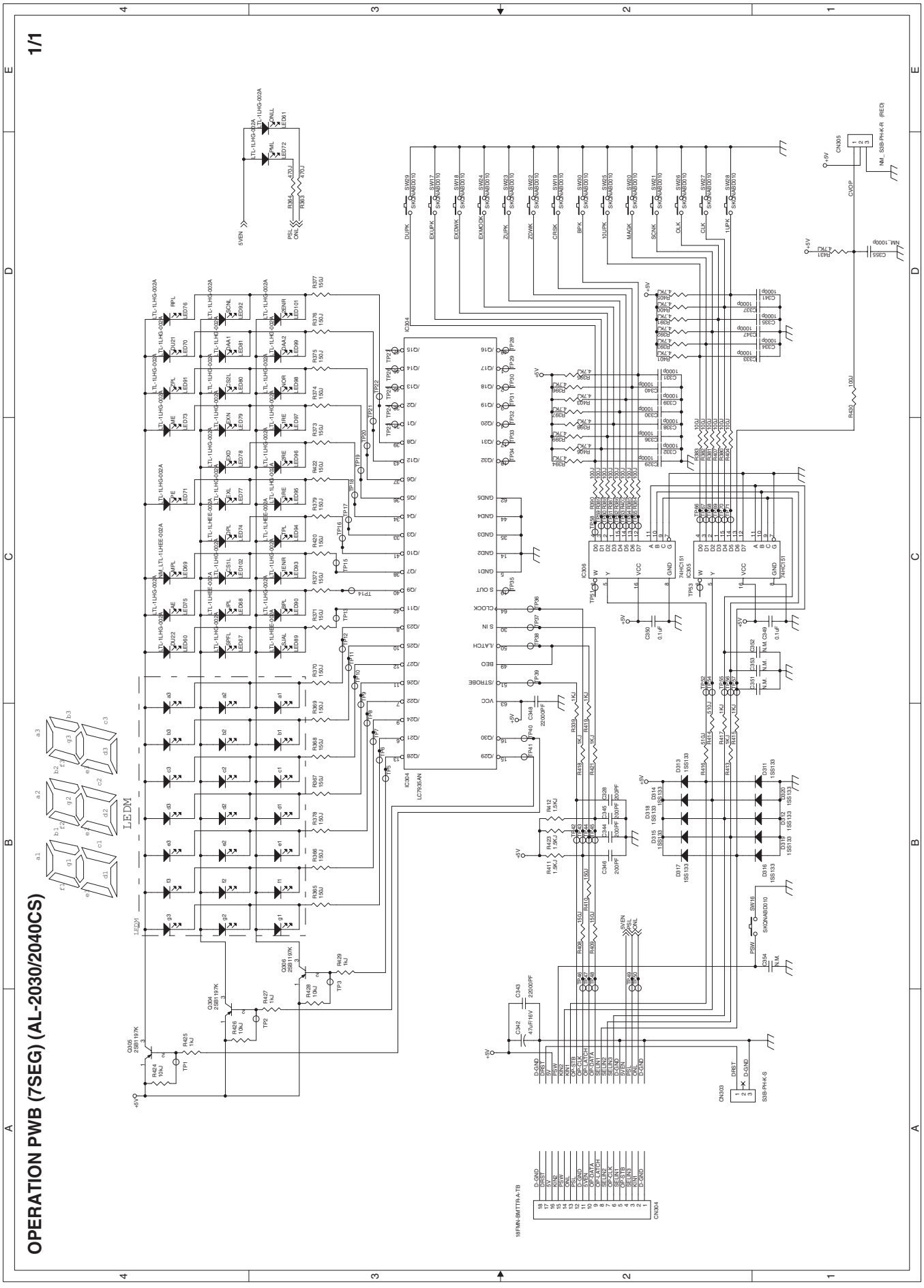


MCU PWB (NIC Interface section) (AL-2030/2040CS)

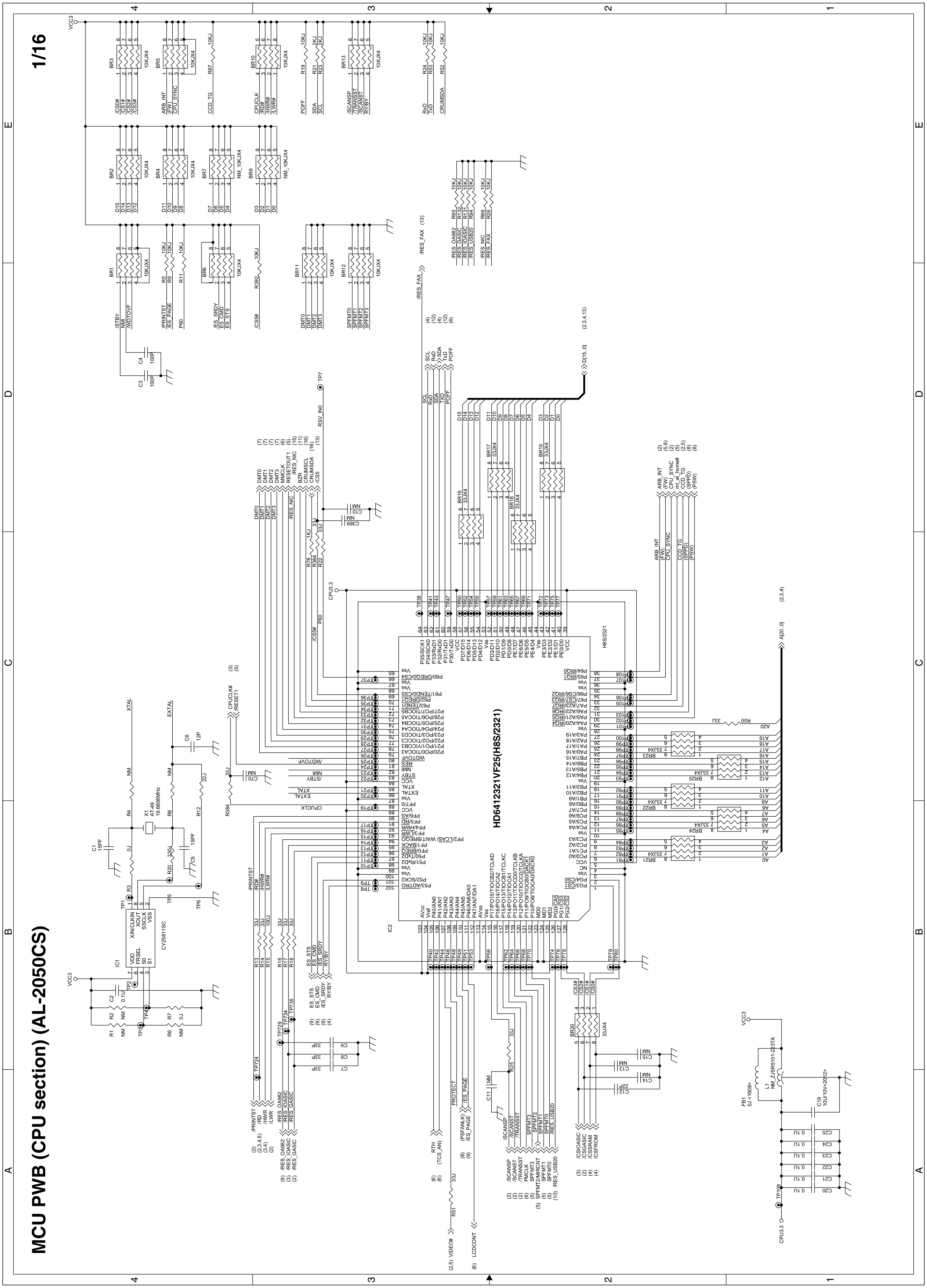
For AL2040 Model Only

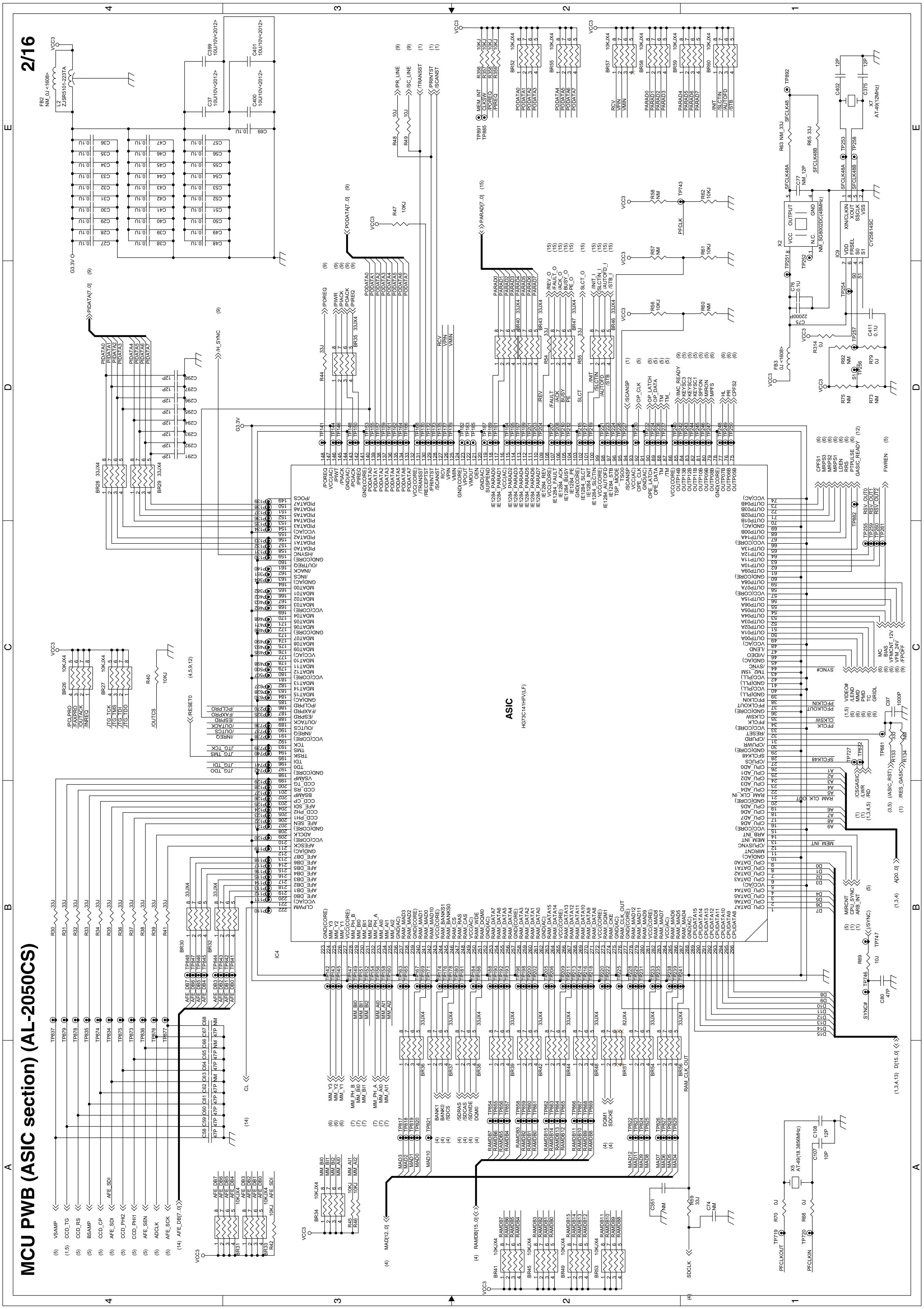


2. OPERATION PWB (AL-2030/2040CS)

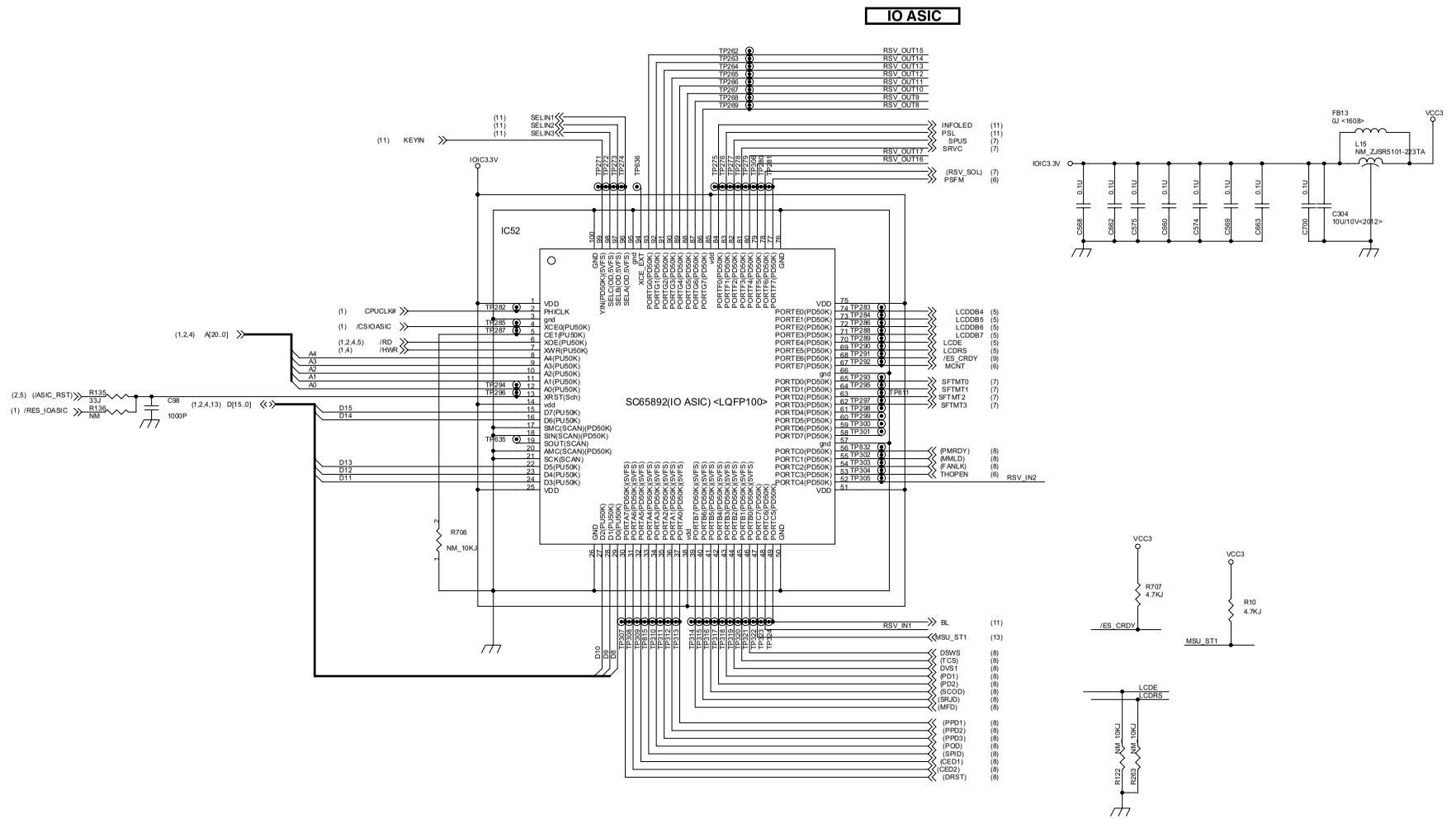


3. MCU PWB (AL-2050CS)



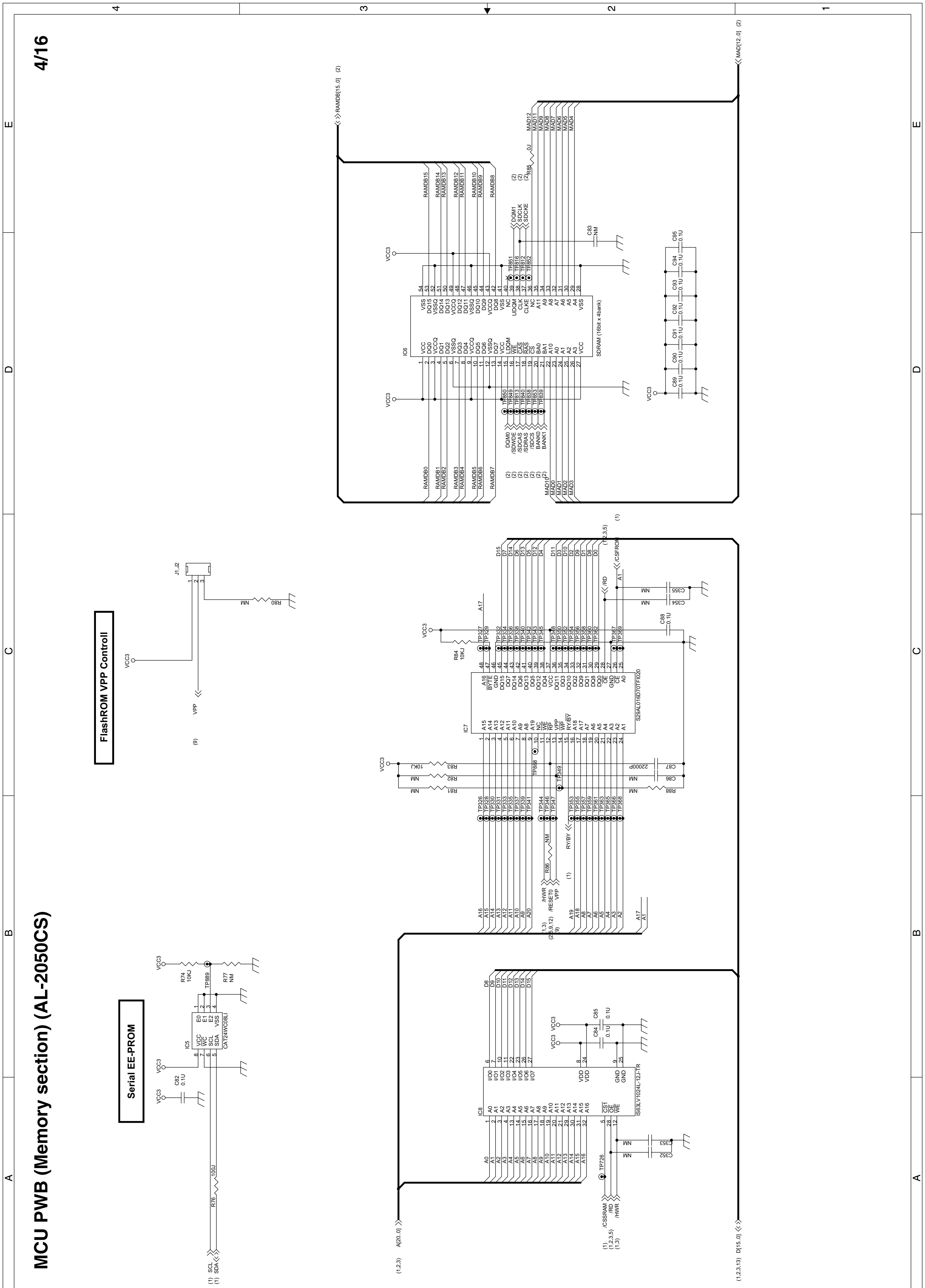

MCU PWB (ASIC section) (AL-2050CS)
2/16
ASIC

MCU PWB (I/O ASIC section) (AL-2050CS)

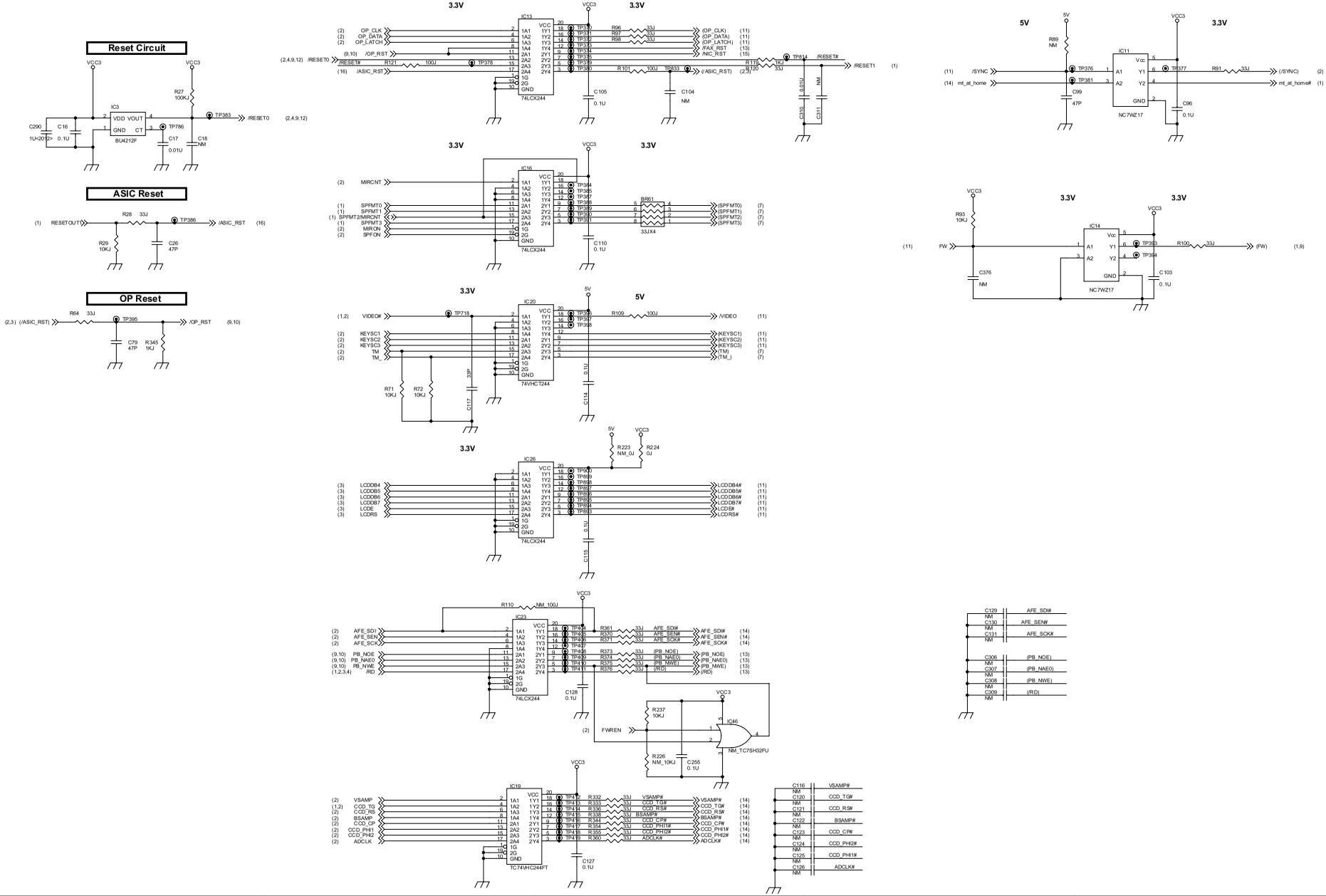


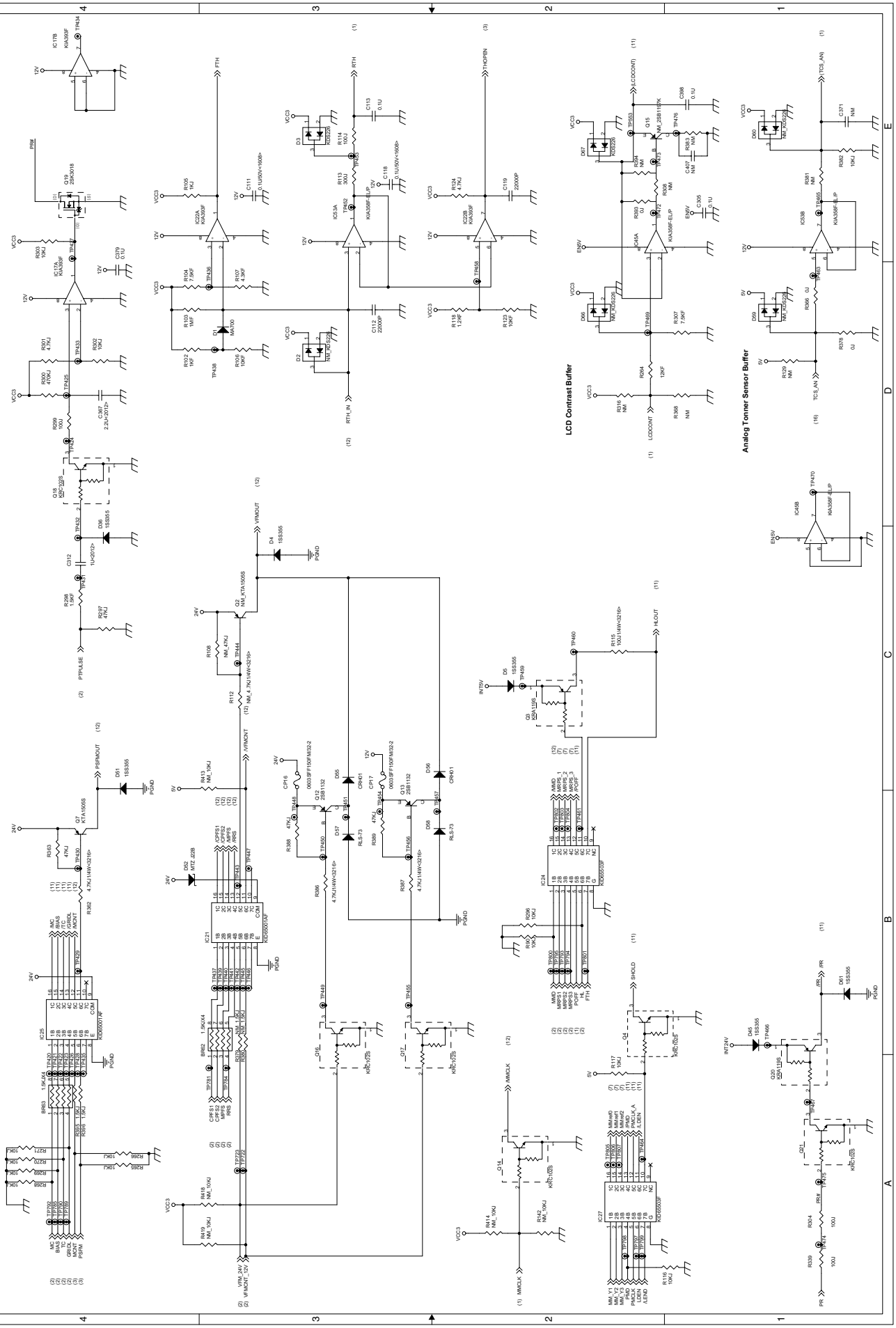
MCU PWB (Memory section) (AL-2050CS)

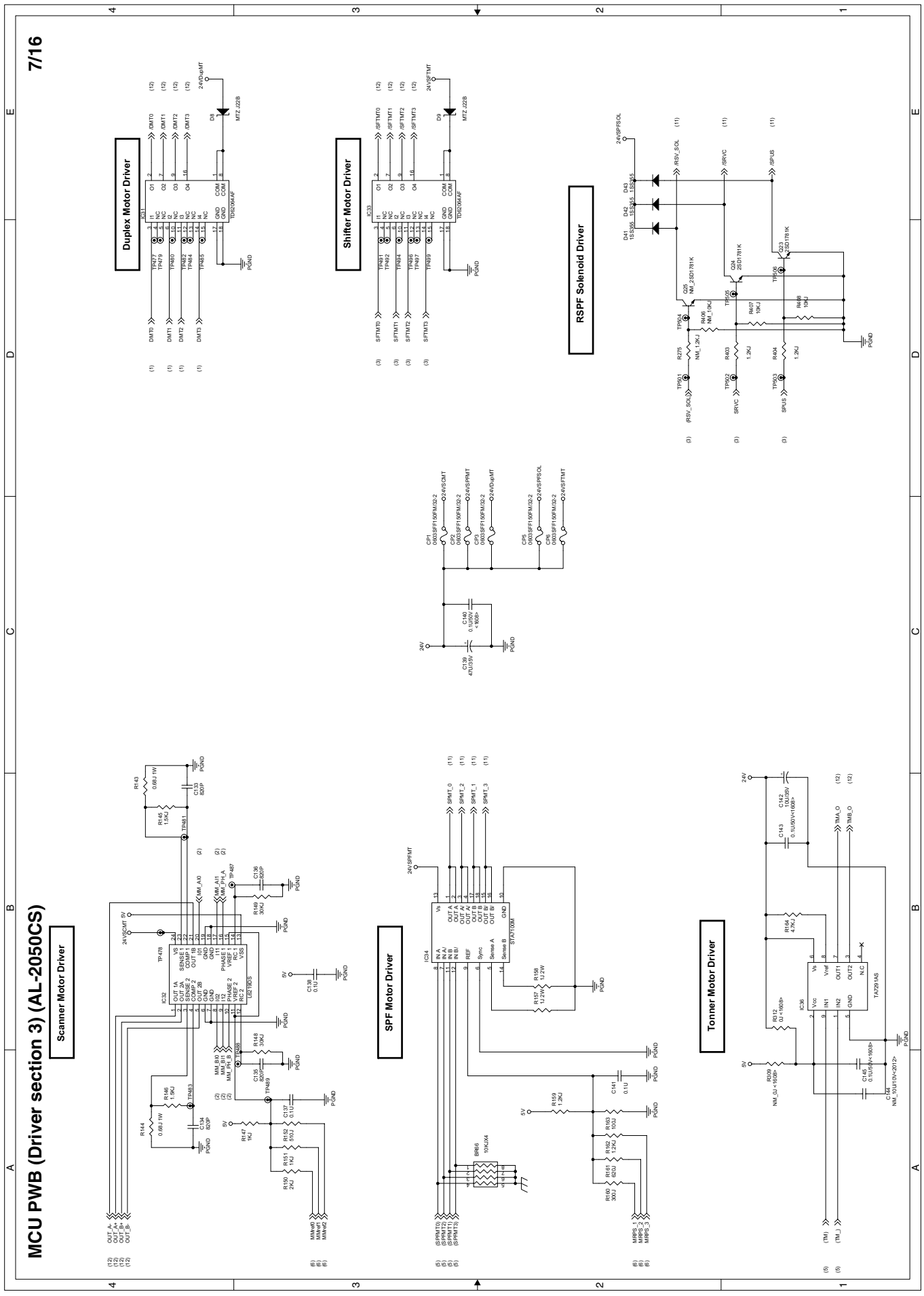
4/16



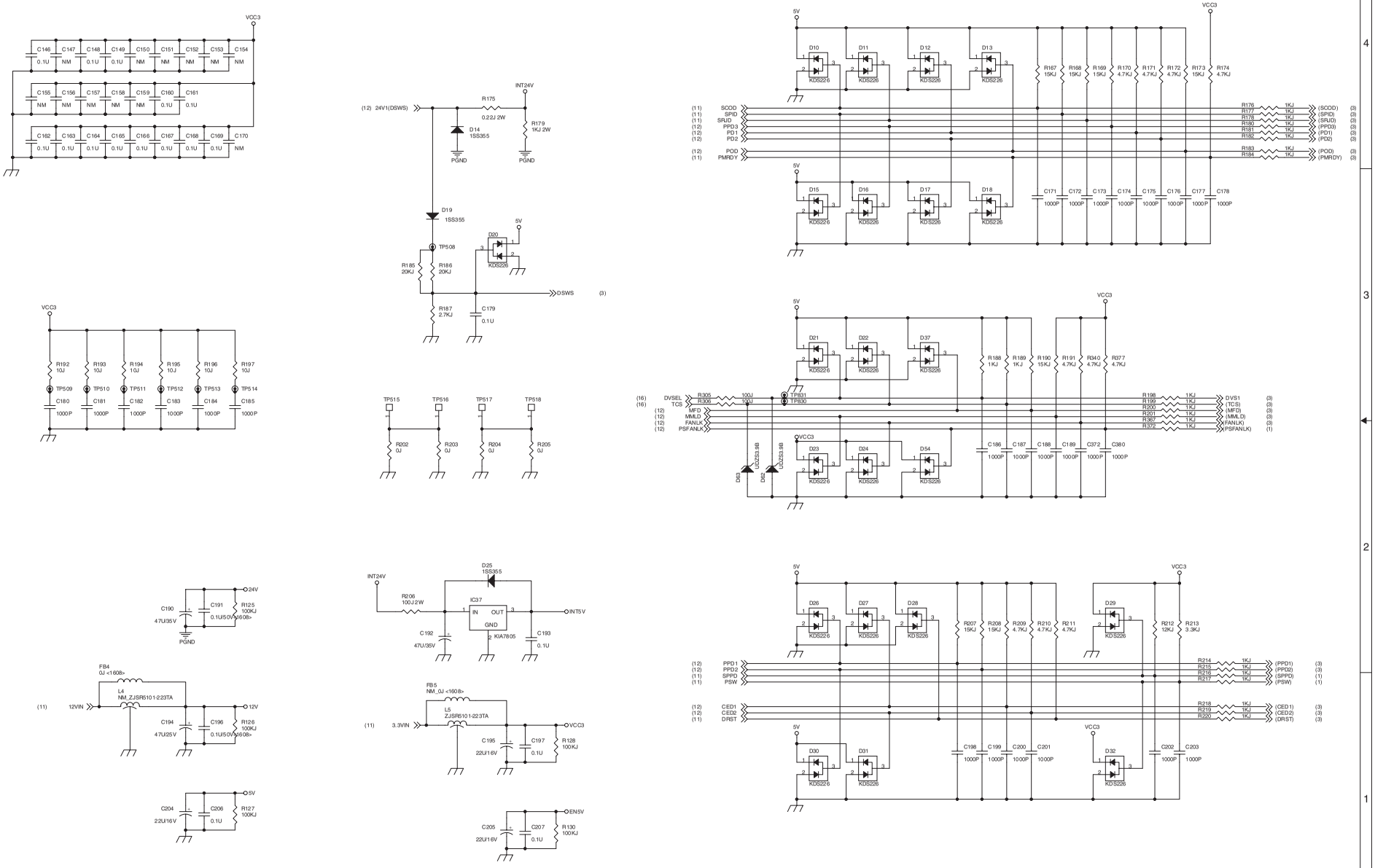
MCU PWB (Driver section 1) (AL-2050CS)



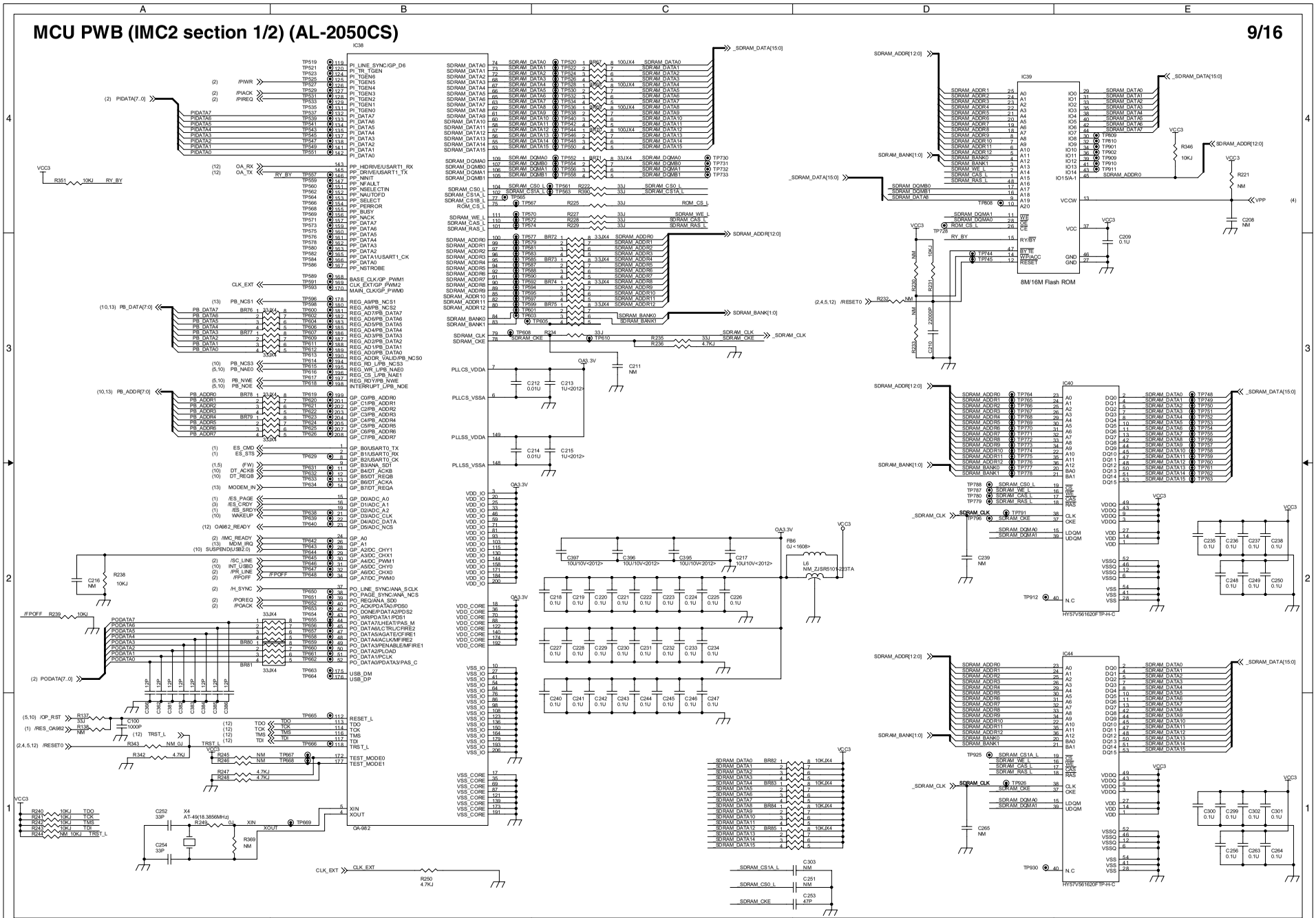

MCU PWB (Driver section 2) (AL-2050CS)
6/16
LCD Contrast Buffer
Analog Tonner Sensor Buffer


MCU PWB (Driver section 3) (AL-2050CS)
7/16
Duplex Motor Driver
Shifter Motor Driver
RSPF Solenoid Driver
Scanner Motor Driver
SPF Motor Driver
Tonner Motor Driver

MCU PWB (Noise filter/Pull-up section) (AL-2050CS)

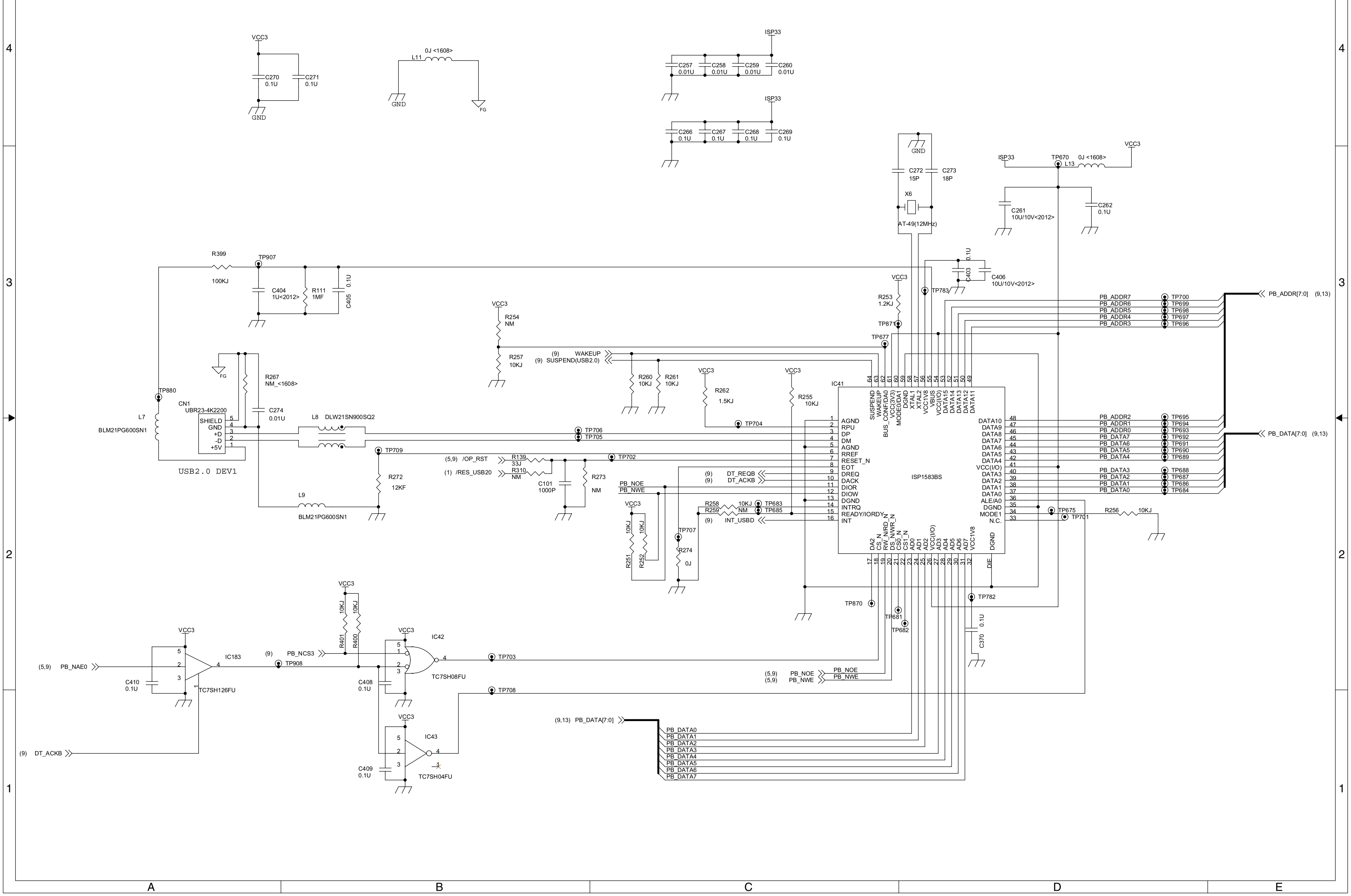


MCU PWB (IMC2 section 1/2) (AL-2050CS)



MCU PWB (IMC2 USB2.0 section 2/2) (AL-2050CS)

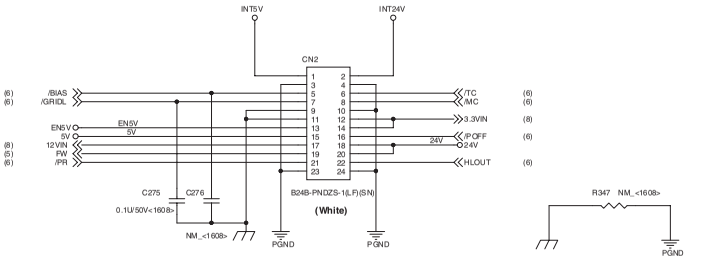
10/16



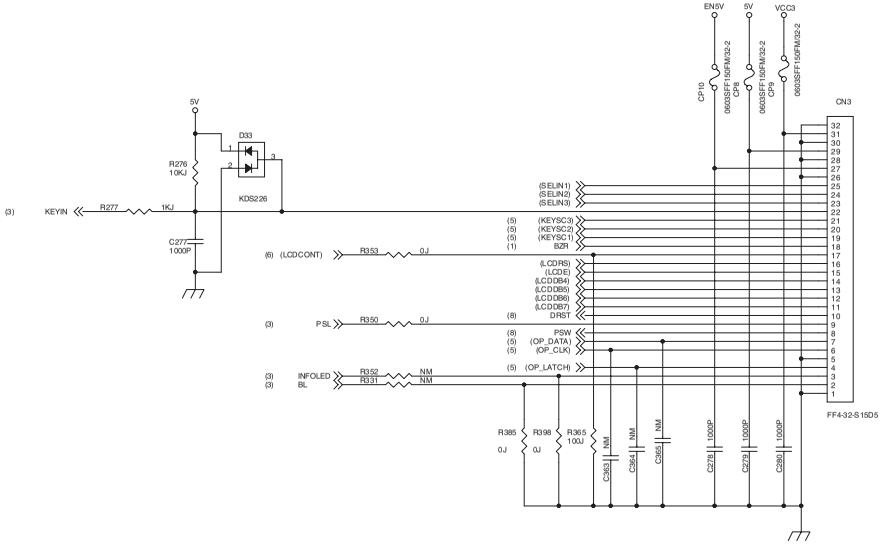
IC41
ISP1583BS
IC42
TC7SH08FU
IC43
TC7SH04FU
IC183
TC7SH126FU
CN1
UBR23-4K2200
SHIELD
GND
+D
-D
+5V
USB2.0 DEV1
L7
BLM21PG600SN1
L8 DLW21SN900SQ2
L9
BLM21PG600SN1
L11 0J <1608>
L13 0J <1608>
X6
AT-49(12MHz)
PB_ADDR[7:0] (9,13)
PB_DATA[7:0] (9,13)
(9,13) PB_DATA[7:0]
(9) WAKEUP
(9) SUSPEND(USB2.0)
(5,9) /OP_RST
(1) /RES_USB20
(9) DT_REQB
(9) DT_ACKB
(9) INT_USBD
(5,9) PB_NOE
(5,9) PB_NWE
(5,9) PB_NAE0
(9) PB_NCS3
(9) DT_ACKB
VCC3
ISP33
GND
FG

MCU PWB (Connector section 1) (AL-2050CS)

To Power unit

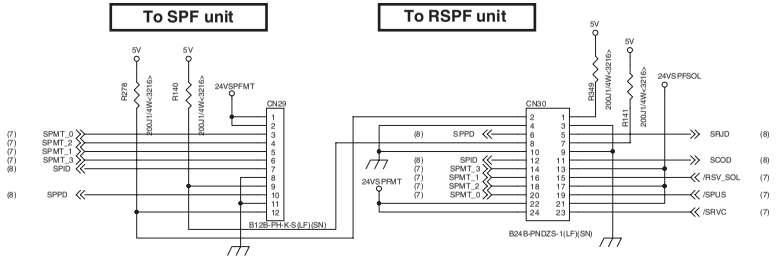


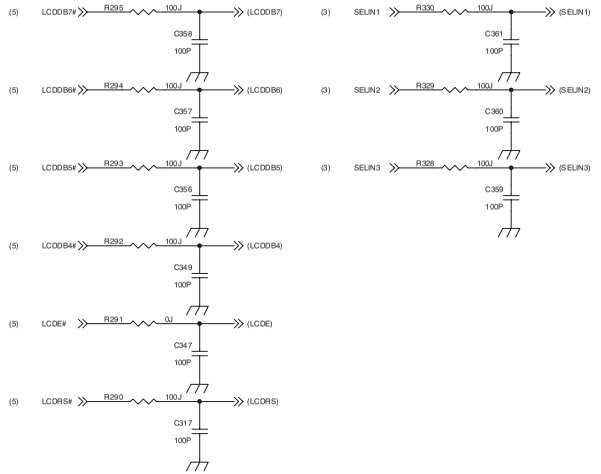
To Operational PWB



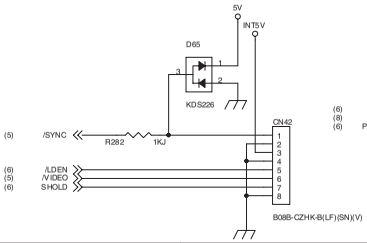
To SPF unit

To RSPF unit

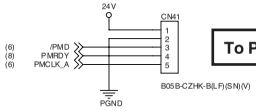




To LSU

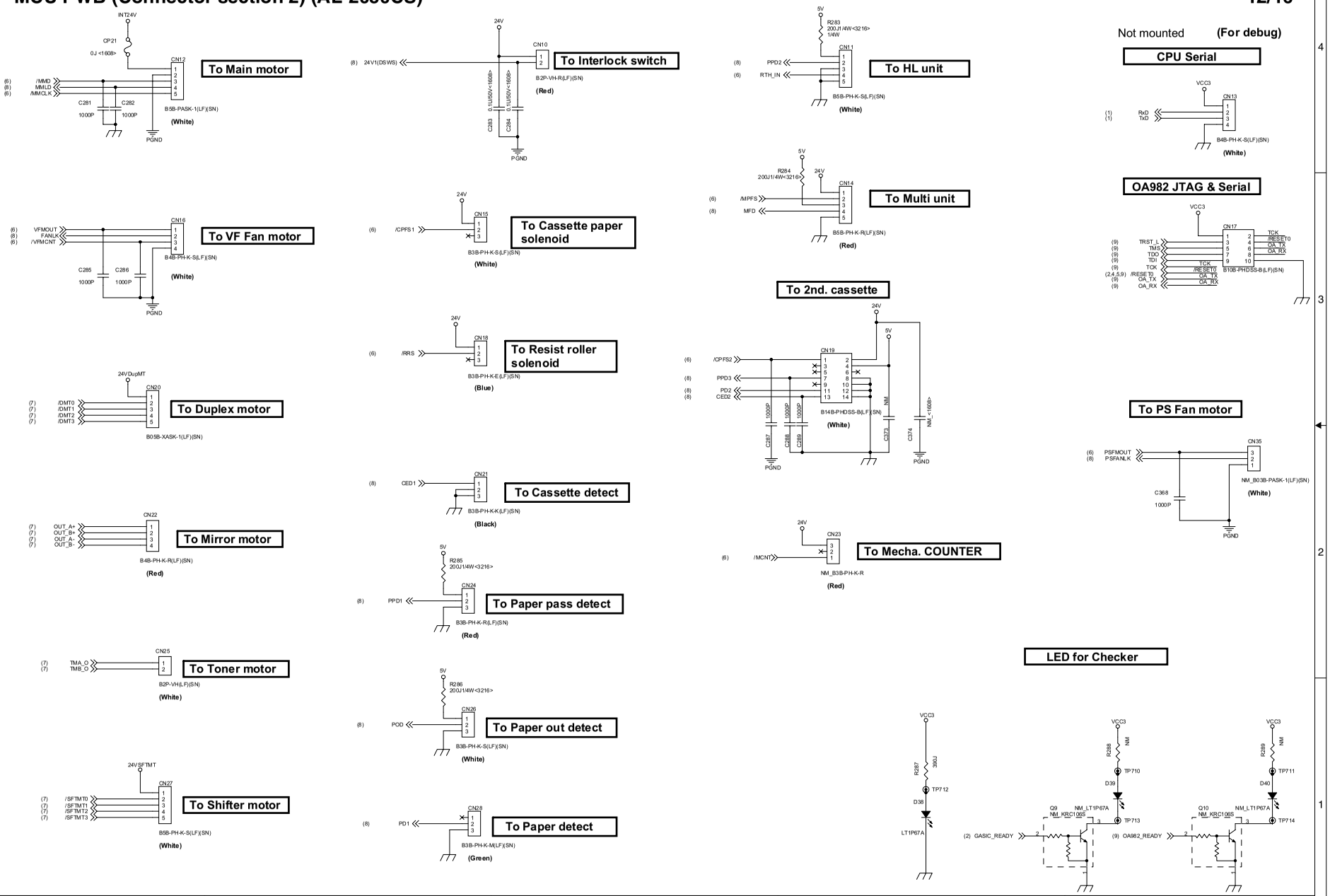


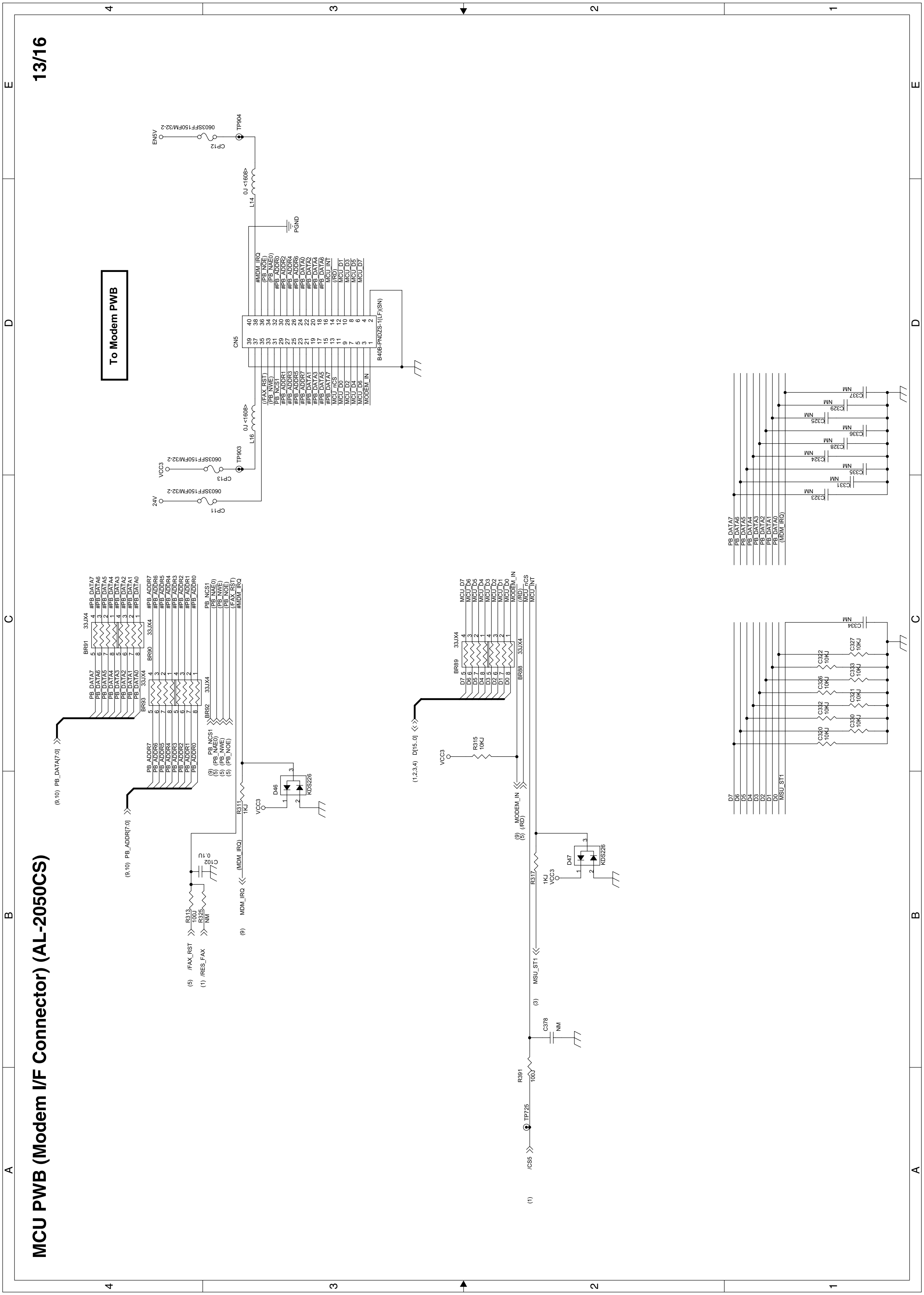
To Polygon motor



To LD

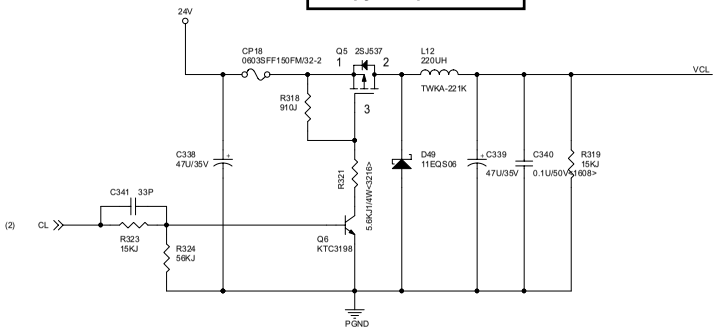
MCU PWB (Connector section 2) (AL-2050CS)



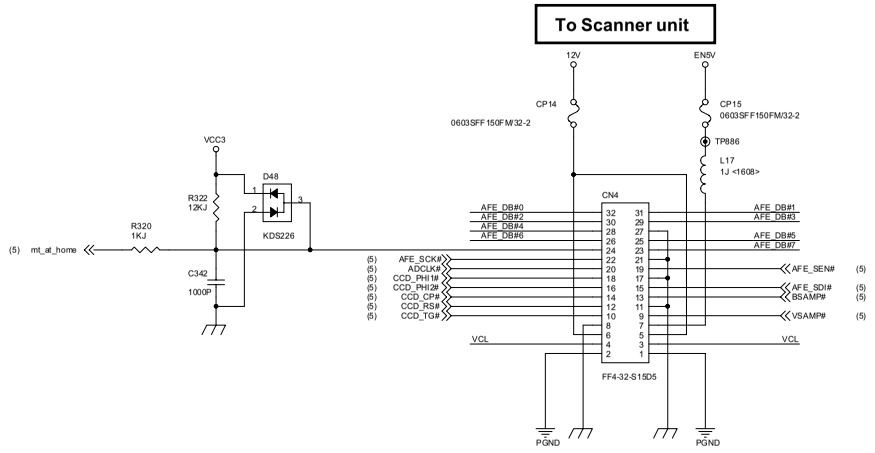

MCU PWB (Modem I/F Connector) (AL-2050CS)
13/16
To Modem PWB
CN5
B40B-PNDZS-1(LF)(SN)

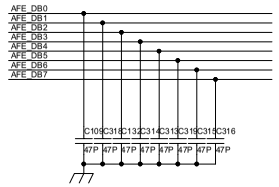
MCU PWB (Scanner I/F section) (AL-2050CS)

Copy Lamp Inverter

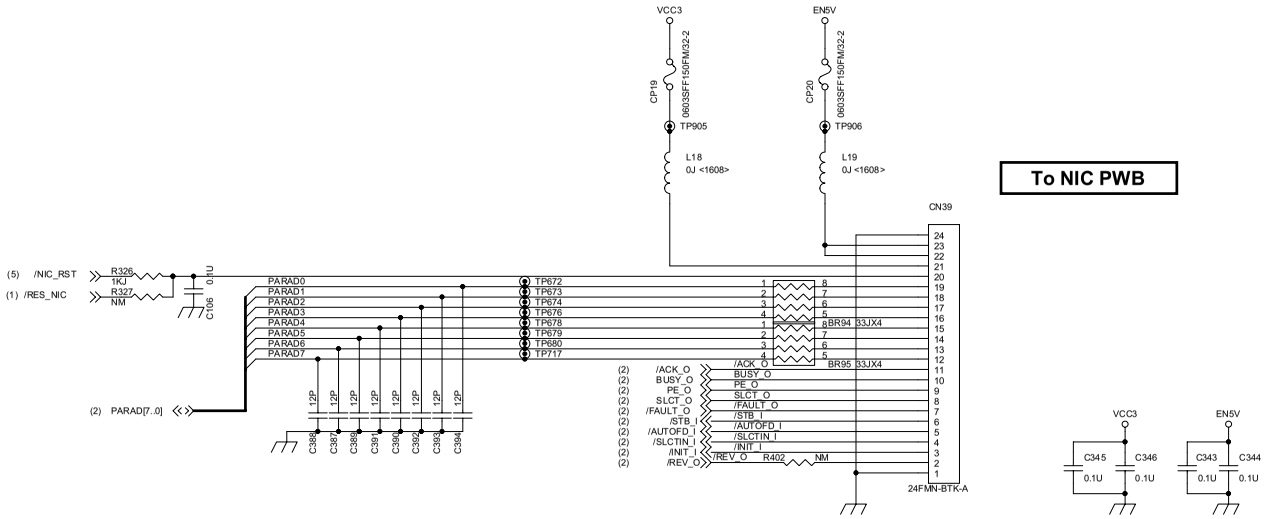


To Scanner unit

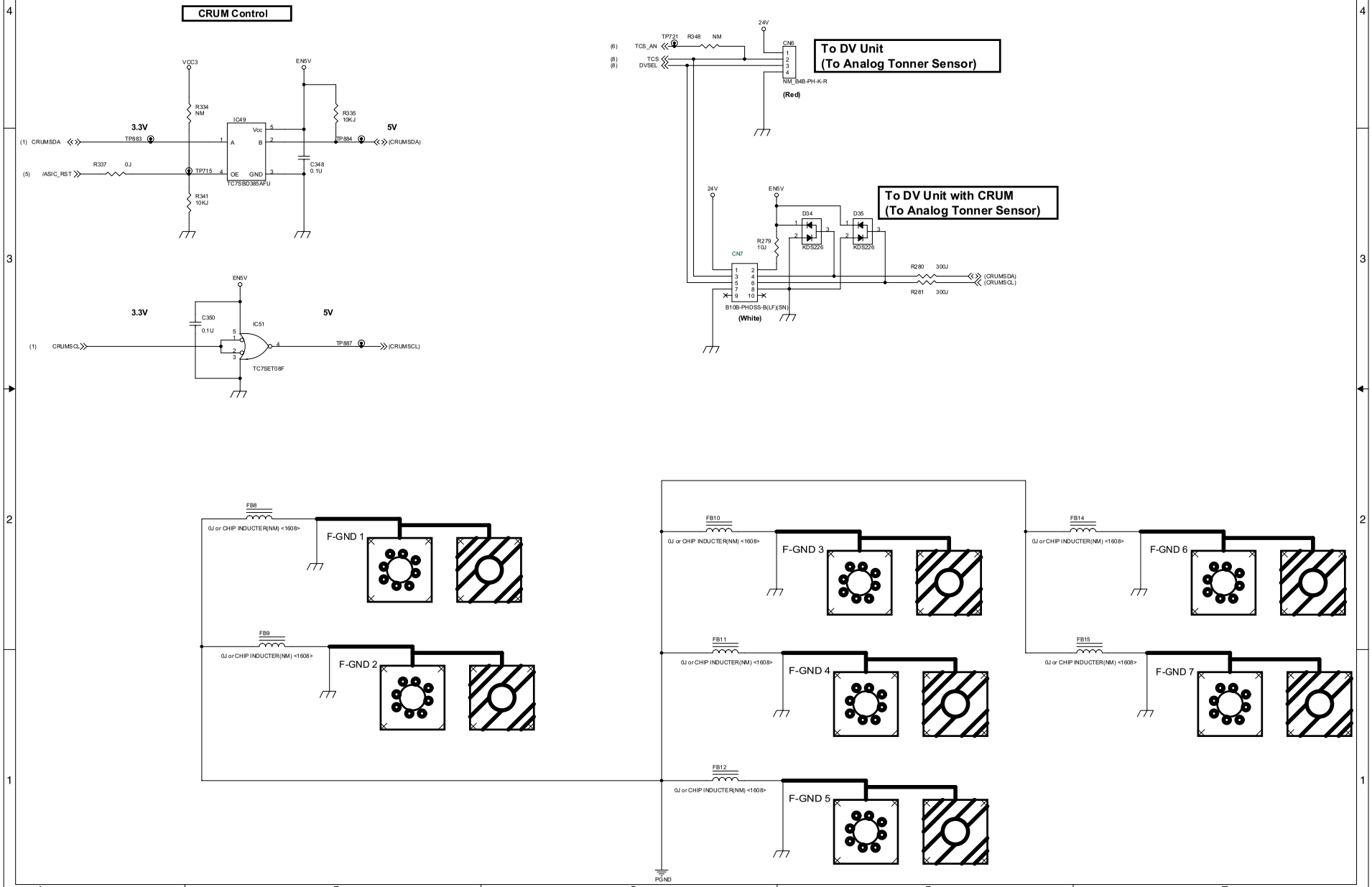




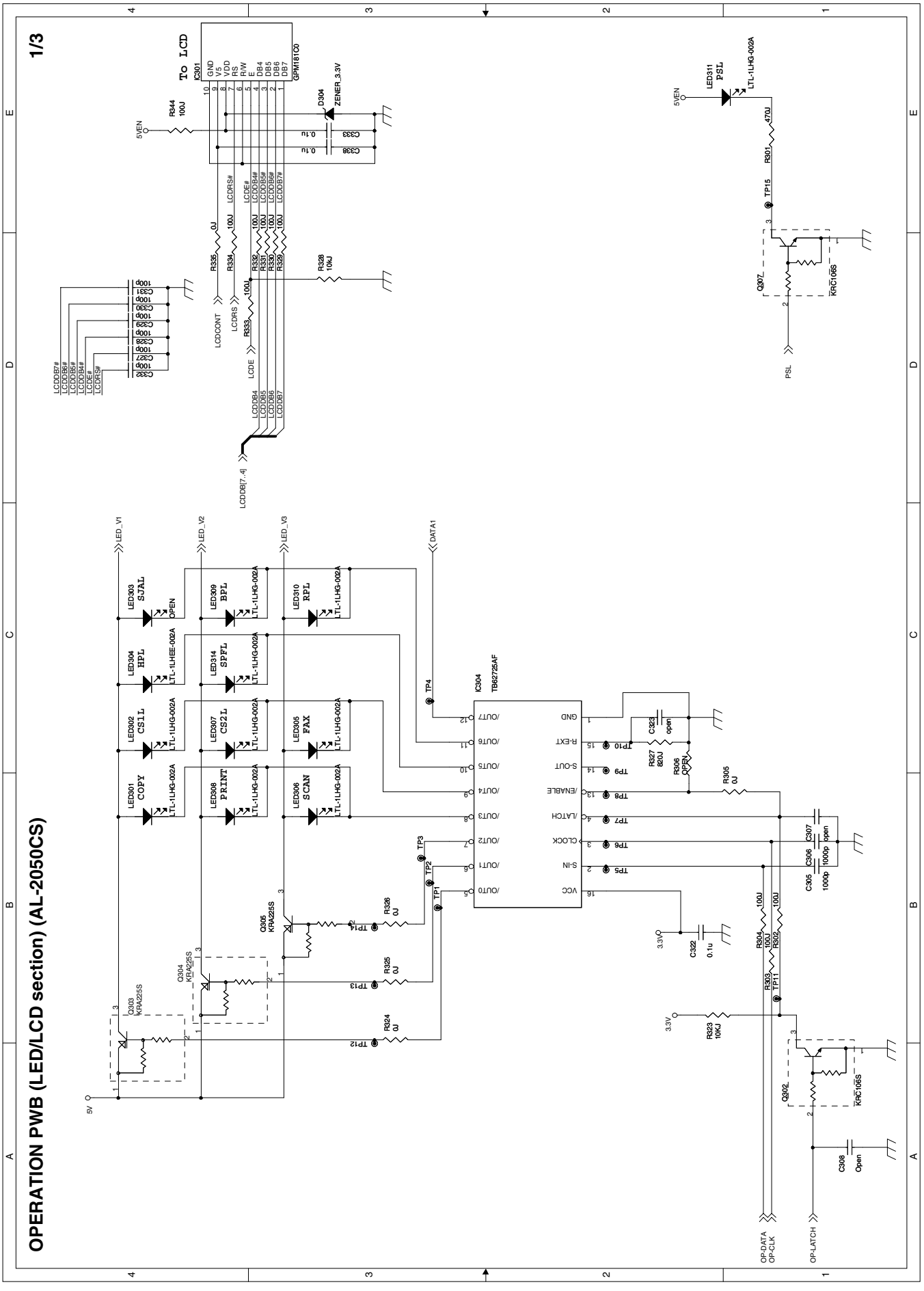
MCU PWB (NIC I/F section) (AL-2050CS)



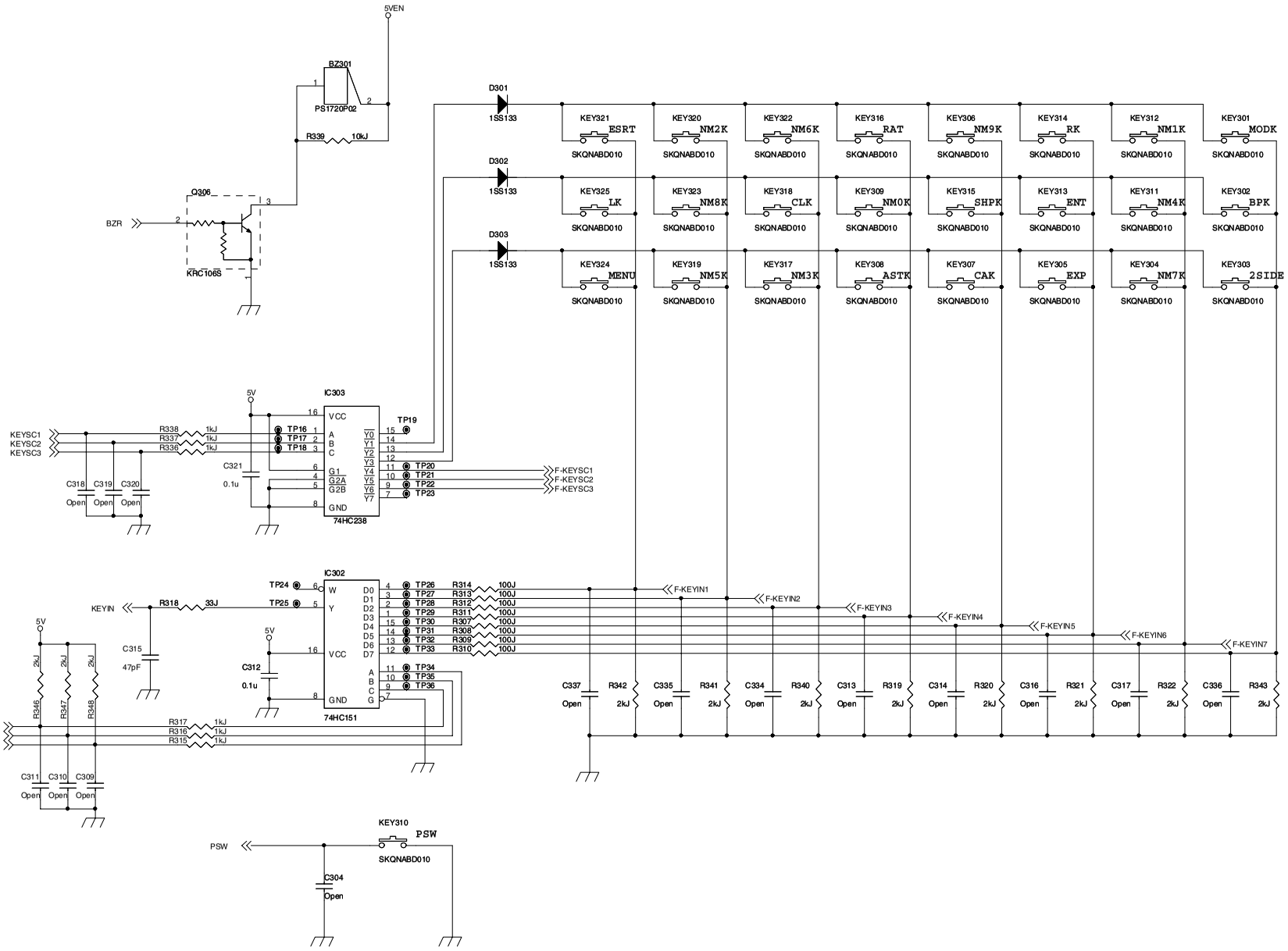
MCU PWB (CRUM I/F section) (AL-2050CS)



4. OPERATION PWB (AL-2050CS)

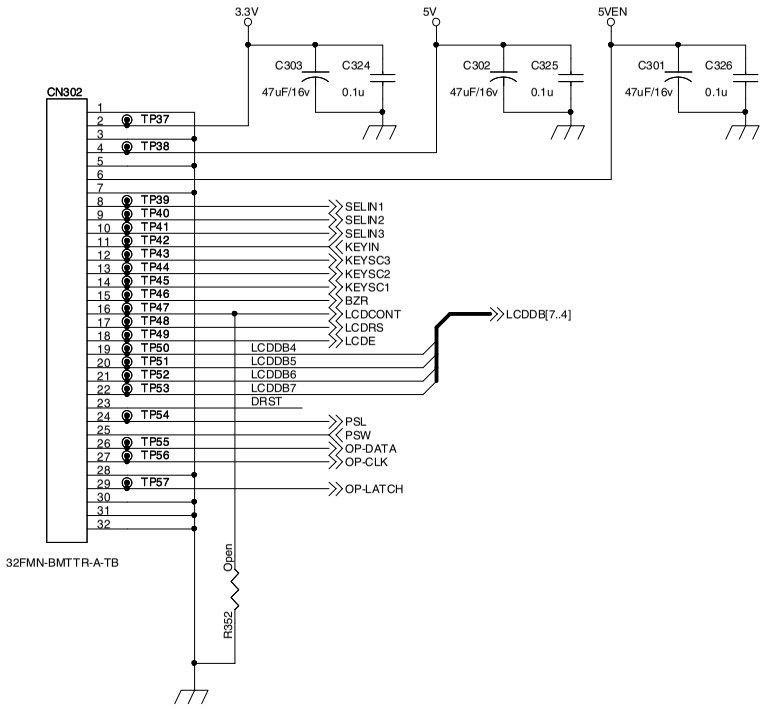


OPERATION PWB (KEY / Buzzer section) (AL-2050CS)

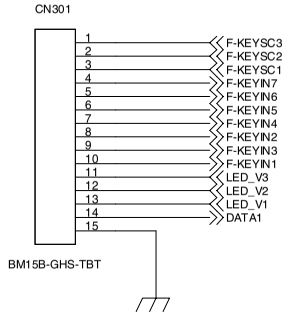


OPERATION PWB (Connector section) (AL-2050CS)

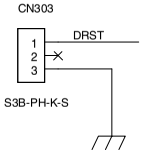
To MCU PWB



To FAX Key PWB



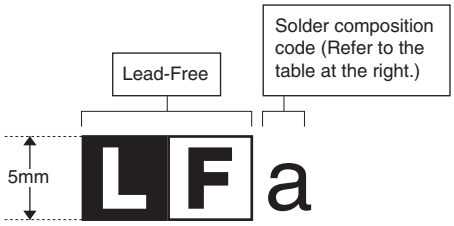
To Drum Initial Detector



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 recommendable.

(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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