TOSHIBA

Leading Innovation

SERVICE MANUAL

MULTIFUNCTIONAL DIGITAL SYSTEMS

e-STUDIO203S

e-STUDIO203SD

Model: DP-2031/2032
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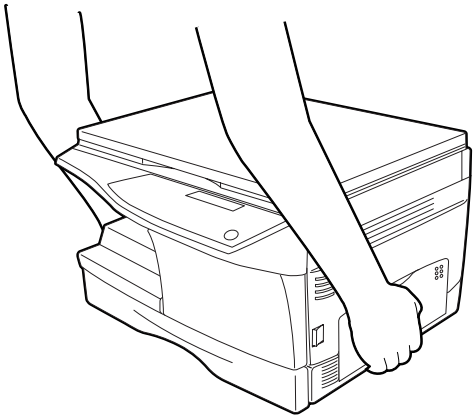
GENERAL PRECAUTIONS REGARDING THE INSTALLATION AND SERVICE FOR e-STUDIO203S/203SD

The installation and service should be done by a qualified service technician.

1. **Transportation/Installation**
   - When transporting/installing the machine, be sure to use the positions as indicated below. The machine is quite heavy and weighs approximately 16.8 kg (37 lb.), therefore pay full attention when handling it.



   - Be sure to use a dedicated outlet with AC120V/8A, 220-240V/5A, 230-240V/5A for its power source.
   - The machine must be grounded for safety.
     Never ground it to a gas pipe or a water pipe.
   - Select a suitable place for installation.
     Avoid excessive heat, high humidity, dust, vibration and direct sunlight.
   - Also provide proper ventilation as the machine emits a slight amount of ozone.
   - The socket-outlet shall be installed near the machine and shall be easily accessible.

2. **Service of Machines**
   - Basically, be sure to turn the main switch off and unplug the power cord during service.
   - Be sure not to touch high-temperature sections such as the exposure lamp, the fuser unit and their periphery.
   - Be sure not to touch high-voltage sections such as the chargers and the high-voltage transformer.
     Especially, the board of these components should not be touched since the electric charge may remain in the capacitors, etc. on them even after the power is turned OFF.
   - Be sure not to touch rotating/operating sections such as gears, belts, pulleys, fan, etc.
   - Be careful when removing the covers since there might be the parts with very sharp edges underneath.
   - When servicing the machines with the main switch turned on, be sure not to touch live sections and rotating/operating sections. Avoid exposure to laser radiation.
   - Use suitable measuring instruments and tools.
   - Avoid exposure to laser radiation during servicing.
     - Avoid direct exposure to the beam.
     - Do not insert tools, parts, etc. that are reflective into the path of the laser beam.
     - Remove all watches, rings, bracelets, etc. that are reflective.
   - Unplug the power cable and clean the area around the prongs of the plug once a year or more. A fire may occur when dust lies on this area.

3. **Main Service Parts for Safety**
   - The breaker, door switch, fuse, thermostat, thermofuse, thermistor, etc. are particularly important for safety. Be sure to handle/install them properly. If these parts are shorted circuit and/or made their functions out, they may burn down, for instance, and may result in fatal accidents. Do not allow a short circuit to occur. Do not use the parts not recommended by Toshiba TEC Corporation.

4. **Cautionary Labels**
   - During servicing, be sure to check the rating plate and the cautionary labels such as “Unplug the power cord during service”, “Hot area”, “Laser warning label” etc. to see if there is any dirt on their surface and whether they are properly stuck to the machine.

5. **Disposition of Consumable Parts, Packing Materials**
   - Regarding the recovery and disposal of the machine, supplies, consumable parts, packing materials, follow the relevant local regulations or rules.

6. **When parts are disassembled, reassembly is basically the reverse of disassembly unless otherwise noted in this manual or other related documents. Be careful not to reassemble small parts such as screws, washers, pins, E-rings, star washers in the wrong places.**

7. **Basically, the machine should not be operated with any parts removed or disassembled.**

8. **Precautions Against Static Electricity**
   - The PC board must be stored in an anti-electrostatic bag and handled carefully using a wristband, because the ICs on it may become damaged due to static electricity.
     Caution: Before using the wristband, pull out the power cord plug of the machine and make sure that there are no uninsulated charged objects in the vicinity.

CAUTION

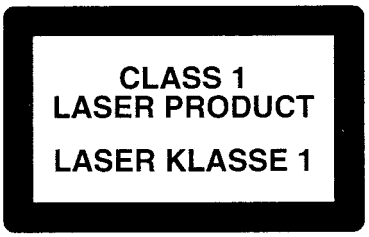
This product is a class 1 laser product that complies with 21CFR 1040 of the CDRH standard and IEC60825-1. This means that this machine does not produce hazardous laser radiation. The use of controls, adjustments or performance of procedures other than those specified herein may result in hazardous radiation 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 : 11.82μs/7mm
Out put power : 0.15mW ± 0.01mW

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

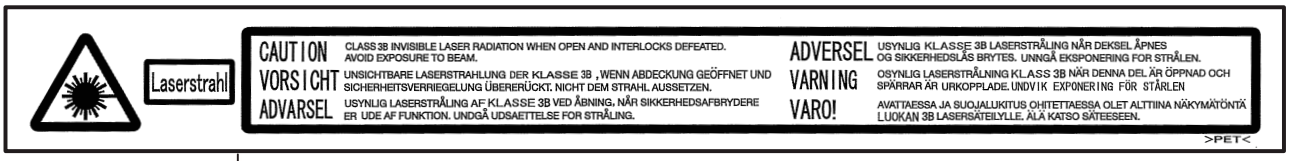
USYNLIG LASERSTRÅLNING VED ÅBNING, NÅR
SIKKERHEDSBRYDERE ER UDE AF
FUNKTION. UNDGÅ UDSAETTELSE FOR
STRÅLNING.

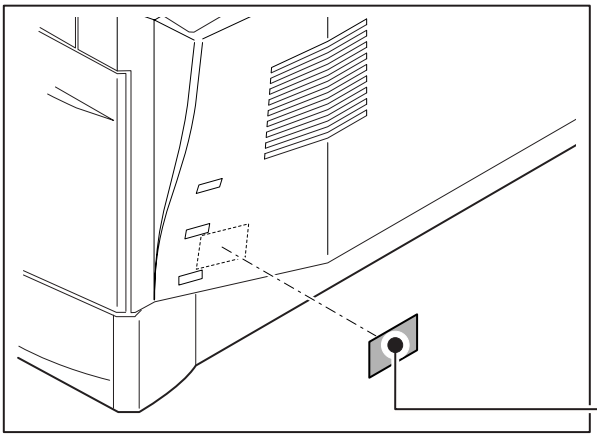
VARNING !

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

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

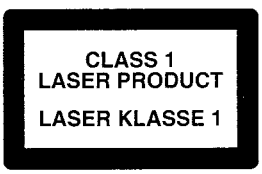




The foregoing is applicable only to the 220V model, 230V model and 240V model.

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

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



LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT

CONTENTS

[1] GENERAL

1. Major functions

Configurations

Item / Model	CPM (Letter)	SB/ MB	2 Tray	ADF	RADF	Color Scanner (push)	GDI printer	SPLC	E-SORT	Duplex	Shifter	FAX	DDM*	IEEE 1284	USB	RJ45	External NIC
e-STUDIO203S	20	MB	Opt (250)	×	Opt	❍	×	❍	❍	×	❍	Opt	❍	×	❍ (2.0Hi)	×	Opt
e-STUDIO203SD	20	MB	Opt (250)	×	Opt	❍	×	❍	❍	❍	❍	Opt	❍	×	❍ (2.0Hi)	×	Opt

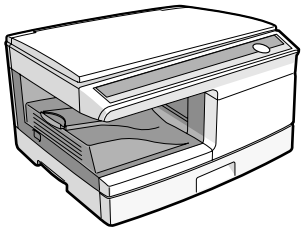
Descriptions of items

CPM:	Copy speed (Copies Per Minute)
SB/MB:	SB = Manual feed single bypass, MB = Manual feed multi bypass
2 tray:	Second cassette unit
ADF:	Original feed unit
R-ADF:	Duplex original feed unit
Color scanner:	Color scanner function
GDI printer:	GDI printer function with USB
SPLC:	SPLC printer function
E-SORT:	Electrical sort
Duplex:	Auto duplex copy function
Shifter:	Job separator function
FAX:	FAX function
DDM*:	Scanner utilities
IEEE1284:	Interface port (parallel)
USB:	Interface port (USB)
RJ45:	Interface port (Network)
External NIC:	GA-1330

Descriptions of table

❍: Standard provision
×: No function or no option available
Opt: Option

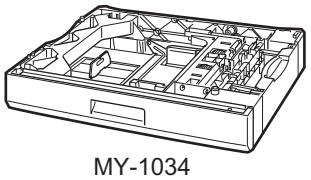
*DDM: Desktop Document Feeder



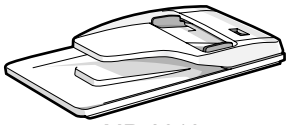
e-STUDIO203S/203SD

(Options)

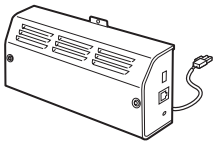
MR-2019



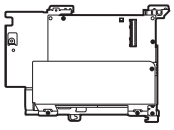
MY-1034

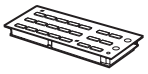


MR-2018



GA-1330





GD-1300

2. Note for servicing and handling

When the main unit power is repeatedly turned OFF/ON rapidly (for about 1sec), the IC (OA982) on the MCU PWB may malfunction to cause an error (E1-00 Communication error), which does not boot the machine. In case of this error, the blank display is kept for several tens seconds and then "E1-00" is displayed on the panel display.

<Countermeasure>

Turn off the power and keep it for more than 10sec. Then turn on the power.

When the machine is booted.: There is no problem in the MCU PWB.

When the machine is not booted.: The MCU PWB trouble

[2] SPECIFICATIONS

1. Basic specifications

Item			
Type		Desktop	
Copy system		Dry, electrostatic	
Segment (class)		Digital personal copier	
Copier dimensions	e-STUDIO203S	20-1/2” (W) x 17-5/8” (D) x 14-5/8” (H) (518mm (W) x 445mm (D) x 371mm (H))	
	e-STUDIO203SD	20-1/2” (W) x 17-5/8” (D) x 14-5/8” (H) (518mm (W) x 445mm (D) x 371mm (H))	
Weight (Approximately)	e-STUDIO203S	43.9lbs.(19.9kg)	DV unit is not included.
	e-STUDIO203SD	45.4lbs.(20.6kg)	

2. Operation specifications

Section, item			Details	
Paper feed section	Paper feed system			1 tray (250 sheets) + multi-bypass (50 sheets)
	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
			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
			Paper feed capacity	50 sheets
			Kinds	Standard paper, specified paper, recycled paper, OHP, Label, Envelop (Single copy)
			Remark	User adjustment of paper guide available
Paper exit section		Exit way		Face down
		Capacity of output tray		200 sheets
Originals		Original set		Center Registration (left edge)
		Max. original size		A4 (8-1/2" x 14")
		Original kinds		sheet, book
		Original size detection		None
Optical section	Scanning section	Scanning system		3 CCDs (RGB) sensor scanning by lighting white lamp
		CCD sensor	Resolution	600 dpi
		Lighting lamp	Type	CCFL
			Voltage	560Vrms
			Power consumption	2.8W
		Output data		Output: R, G, B 1 or 8 bits/pixel / Input: A/D 16 bits (12 bits actual)
	Writing section	Writing system		Writing to OPC drum by the semiconductor laser
		Laser unit	Resolution	600 dpi
Image forming		Photoconductor	Type	OPC (30ø)
			Life	25K
		Charger	Charging system	Saw-tooth charging with a grid, / (-) scorotron discharge
			Transfer system	(+) DC corotron system
			Separation system	(-) DC corotron system
		Developing	Developing system	Dry, 2-component magnetic brush development system
		Cleaning	Cleaning system	Counter blade system (Counter to rotation)

Section, item		Details	
Fusing section	Fusing system		Heat roller system
	Upper heat roller	Type	Teflon roller
	Lower heat roller	Type	Silicon rubber roller
	Heater lamp	Type	Halogen lamp
		Voltage	120V
		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)	380Wh/H
		Average (stand-by)	80Wh/H
		Pre-heat mode	28Wh/H
		Auto power shut-off mode	12.5W or less

3. Copy performance

Section, item		Details	
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 RADF (151 steps in 1% increments)
Manual steps (manual, photo)			5 steps
Copy speed (CPM)	First-copy time *1 (Approximately)		8.0 seconds (When user program 24 is set to OFF) 10.7 seconds (When user program 24 is set to ON) (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 (RADF) Enlarge: 1.5mm or less (OC) / 3mm or less (RADF) Reduction (50%): 6.0mm or less (OC) / 8mm or less (RADF)
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. SPLC printer

Print speed	Max. 20ppm (Paper size: A4, excluding manual paper feed) * Varies depending on the PC performance.
First print time	8 sec. (without data transfer time)
Duplex	Yes (e-STUDIO203SD only)
ROPM	Yes
CPU	None
Memory	64MB
Interface	USB2.0 (Hi Speed)
Network	Option: Network expansion kit the GA-1330
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

5. Scan function

Type	Flat Bed Color Scanner
Scanning system	Document glass / RADF
Light source	3 CCDs (RGB) sensor scanning by lighting white lamp (1 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 / A/D 16bit
Scan range	OC / RADF: 8.5" (297mm) (L) x 14" (431mm) (W) Original position: Platen: Left center / RADF: Right center
Scan speed	OC / RADF: Max. 2.88ms/line(Color/Gray scale)
Protocol	TWAIN / WIA (Only XP Vista) / STI
Support file format	RAW / JPEG
Interface	USB2.0 (Hi Speed data transmission)
Scanner utility	Button Manager / Desktop Document Manager / Composer
Scan key/lamp	Yes
Duplex scan	Yes (e-STUDIO203SD only)
Supported OS	Windows 98/Me, 2000 Professional, XP Home Edition / Professional, Vista
Void area	No
WHQL supported	Yes *1

*1: Running change

6. RADF

Original capacity		50 sheets (56 - 90g/m^2) or 6.5mm, 1/4" or less.	
Original size		A4, B5, A5 / 8-1/2" x 14", 8-1/2" x 11", 8-1/2" x 5-1/2"	
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 RADF.

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

[3] CONSUMABLE PARTS

1. Supply list

A. North America/Central and South America/Europe

No.	Name	Content		Life	Product name	Packing form
1	Toner cartridge (Black)	Toner (Toner: Net Weight 243g) Polyethylene bag	× 10 × 10	80K (8K x 10Pcs)	PS-ZT2021 (A4 6% document)	One carton of the PS-ZT2021 includes 10 toner cartridges.
2	Developer	Developer (Developer: Net Weight 170g)	× 10	250K (25K x 10Pcs)	D-2021	One carton of the D-2021 includes 10 developers.
3	Drum kit	Drum Drum fixing plate	× 1 × 1	25K	OD-1200	One carton of the collective package includes 10 units of the OD-1200.

Note: Printing of the master/individual cartons is made in 2 languages, English/French.
Packed together with the machine: DR 25K/Developer UN/Process UN

2. Environmental

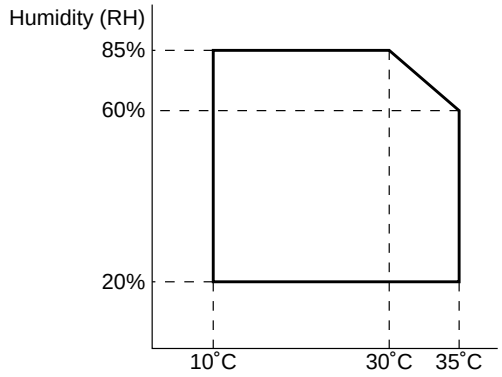
The environmental conditions for assuring the copy quality and the machine operations are as follows:

(1) Normal operating condition

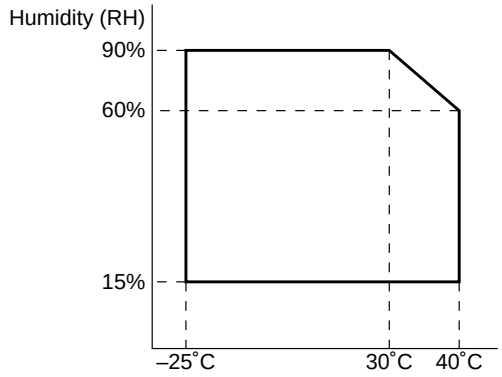
Temperature: 20°C to 25°C

Humidity: 65 ± 5%RH

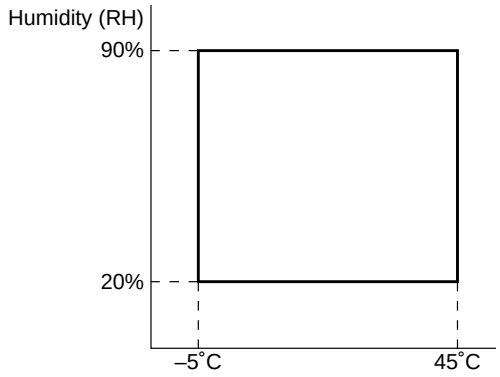
(2) Acceptable operating condition



(3) Transportation condition

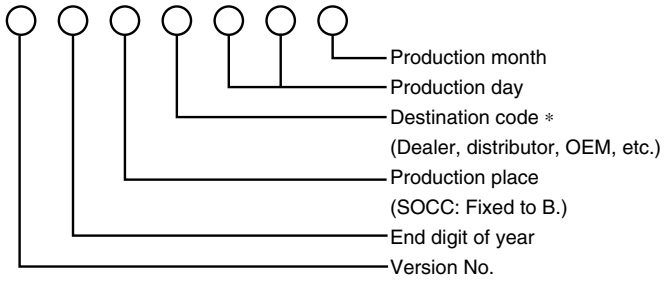


(4) Supply storage condition



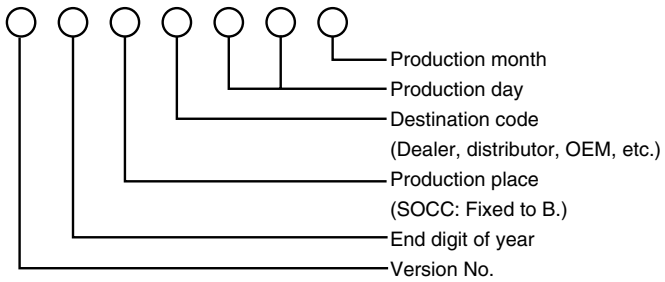
3. Production control number (lot No.) identification

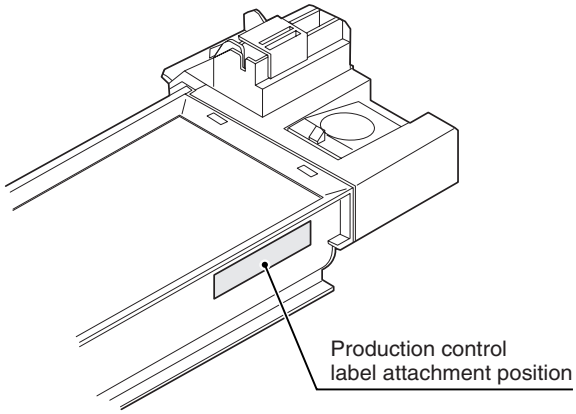
<Toner cartridge>

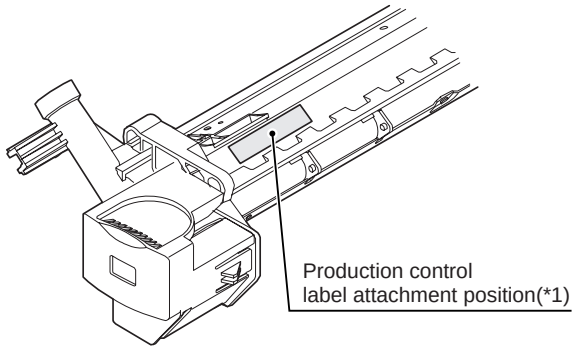


<Drum cartridge>

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

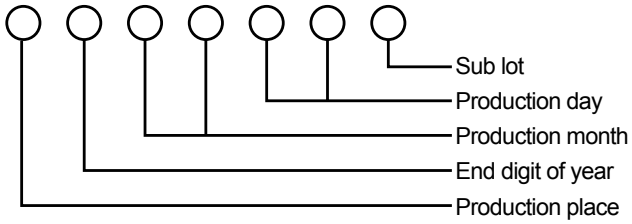






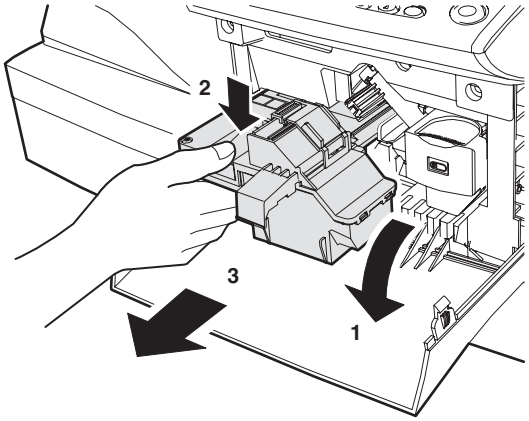
*1 The production control label is not attached to the cartridge of a China product.

<Developer>

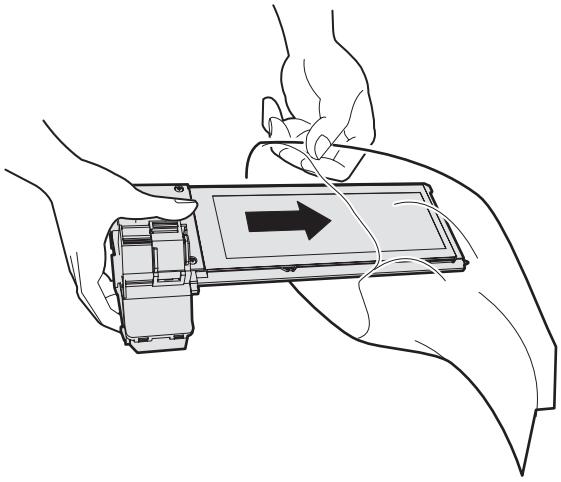


4. Toner cartridge replacement

1) Open the front and side cabinets of the copier.
2) Keep holding Toner lover, and
3) Carefully pull out Toner unit from the copier.



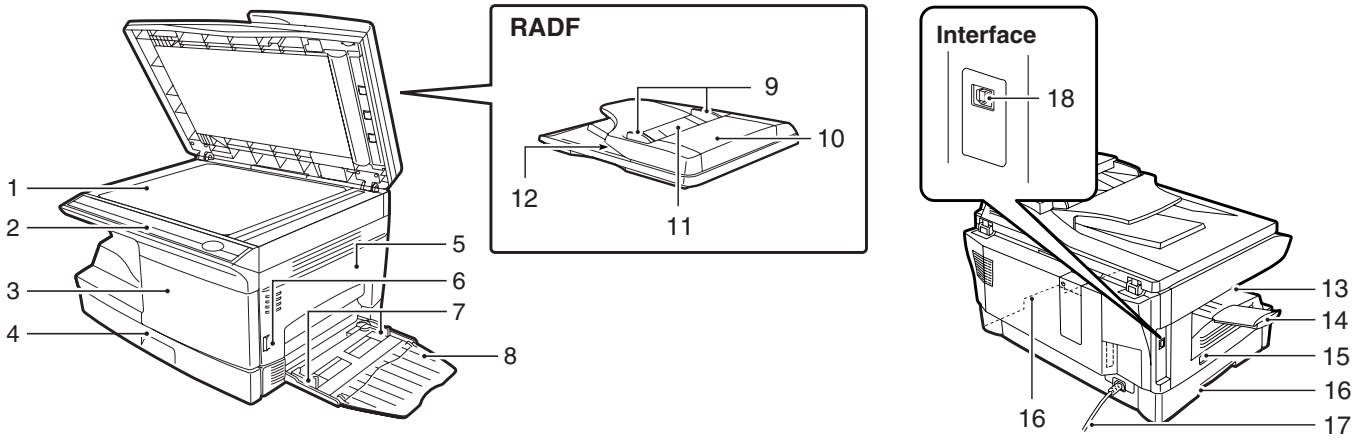
4) Put Toner unit in a collection bag immediately after removing it from the copier



Note: Never carry exposed Toner unit. Be sure to put it in the collection bag.

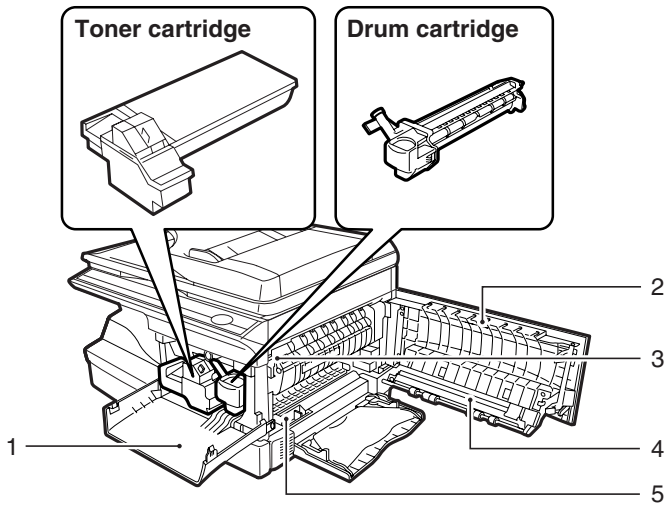
[4] EXTERNAL VIEWS AND INTERNAL STRUCTURES

1. Appearance



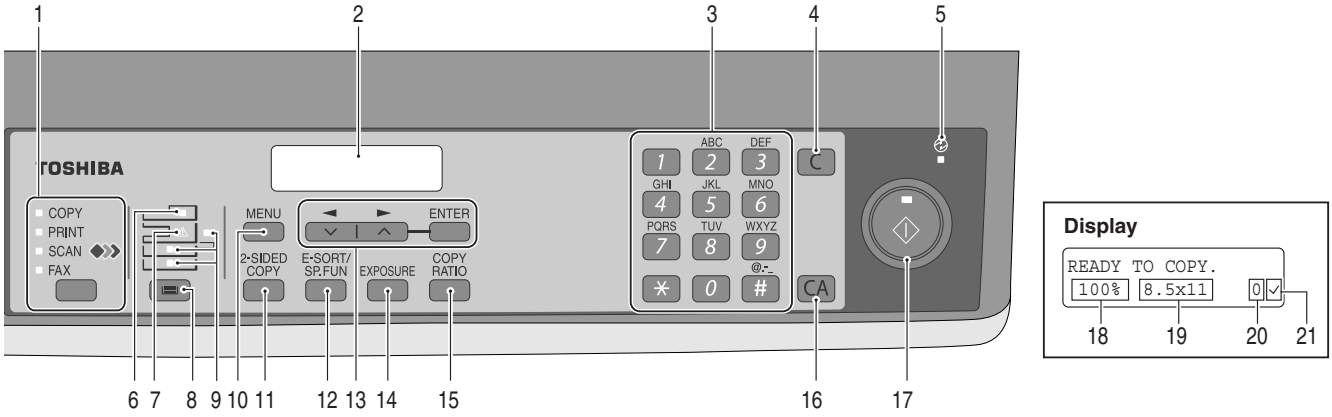
1	Document glass	2	Operation panel	3	Front cover
4	Paper tray	5	Side cover	6	Side cover open button
7	Bypass tray paper guides	8	Bypass tray	9	Original guides
10	Document feeder cover	11	Document feeder tray	12	Exit area
13	Paper output tray	14	Paper output tray extension	15	Power switch
16	Handles	17	Power cord	18	USB connector

2. Internal



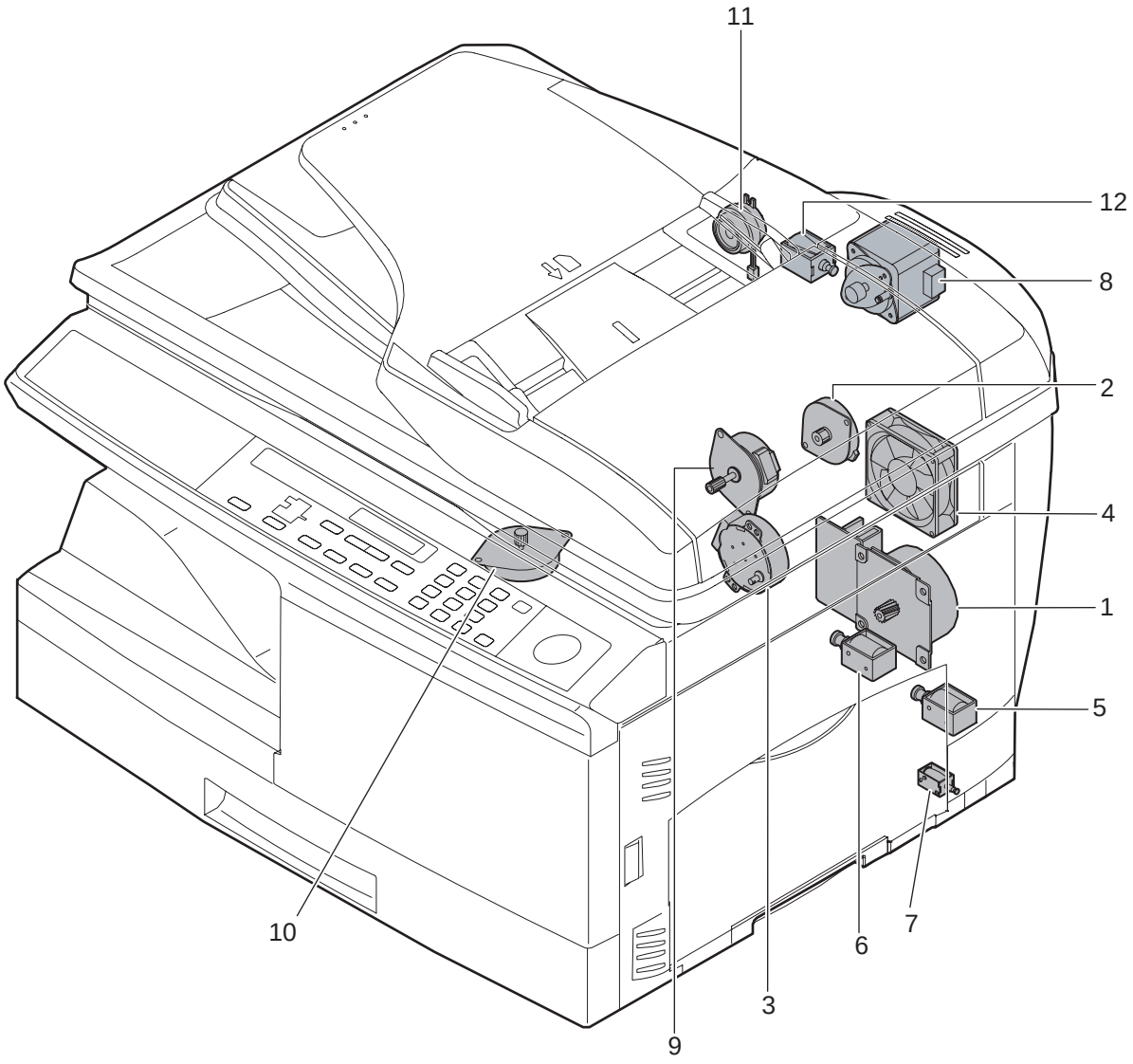
1	Front cover	2	Side cover	3	Fusing unit release lever
4	Transfer charger	5	Charger cleaner		

3. Operation panel



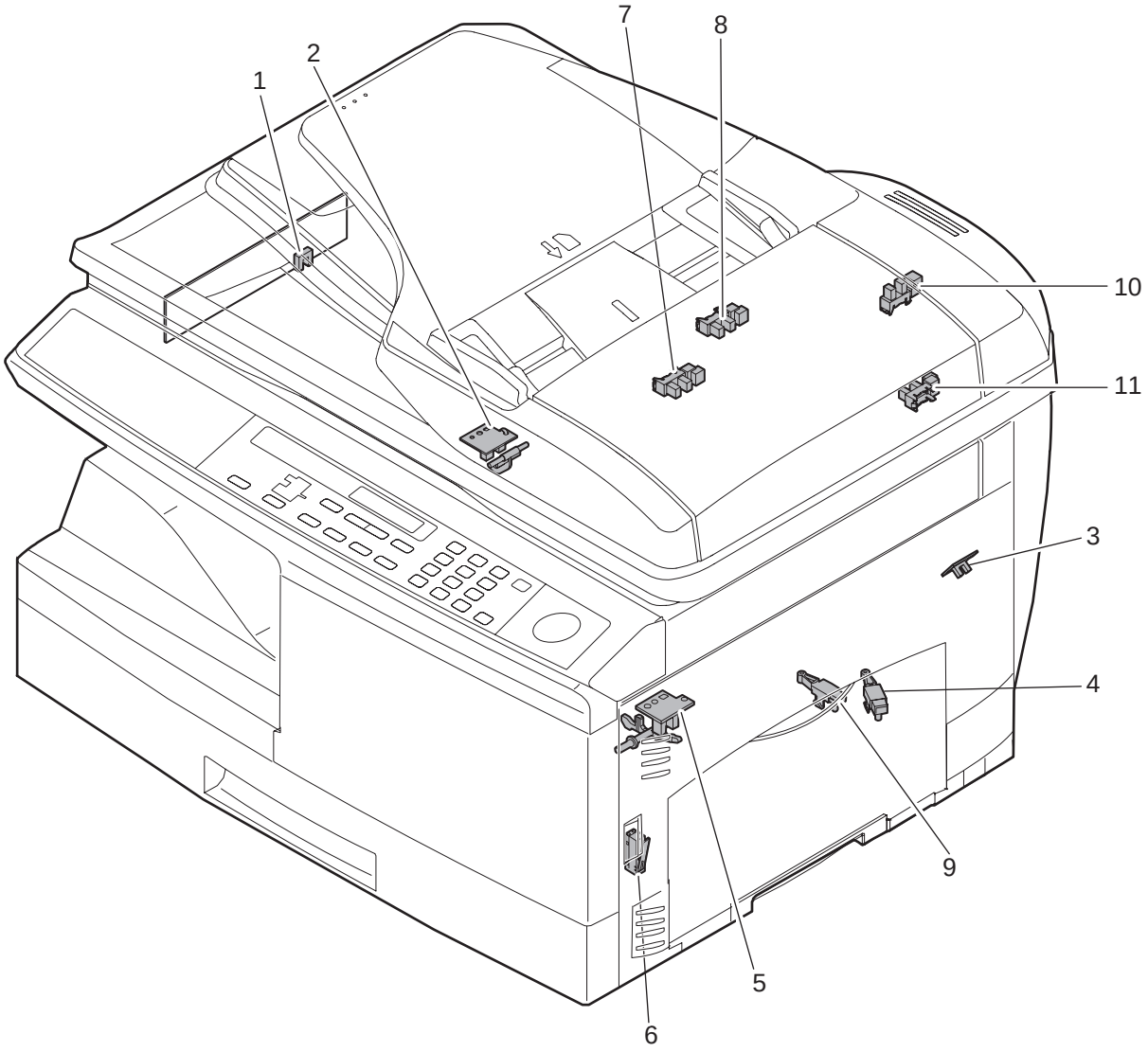
1	**[MODE SELECT] key / Mode indicators** Press this key to select the mode. The indicator of the selected mode lights (copy, printer, scanner, fax mode indicators).	2	**Display** This shows messages indicating the machine status and any problems that occur, as well as user programs and function setting 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	**RADF indicator** This lights up when an original is placed in the RADF.
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 (e-STUDIO203SD)** **[2-SIDED SCAN] key (e-STUDIO203S)** Press in copy mode to select one-sided or two-sided settings for the original and for the output.	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, solenoids and clutch



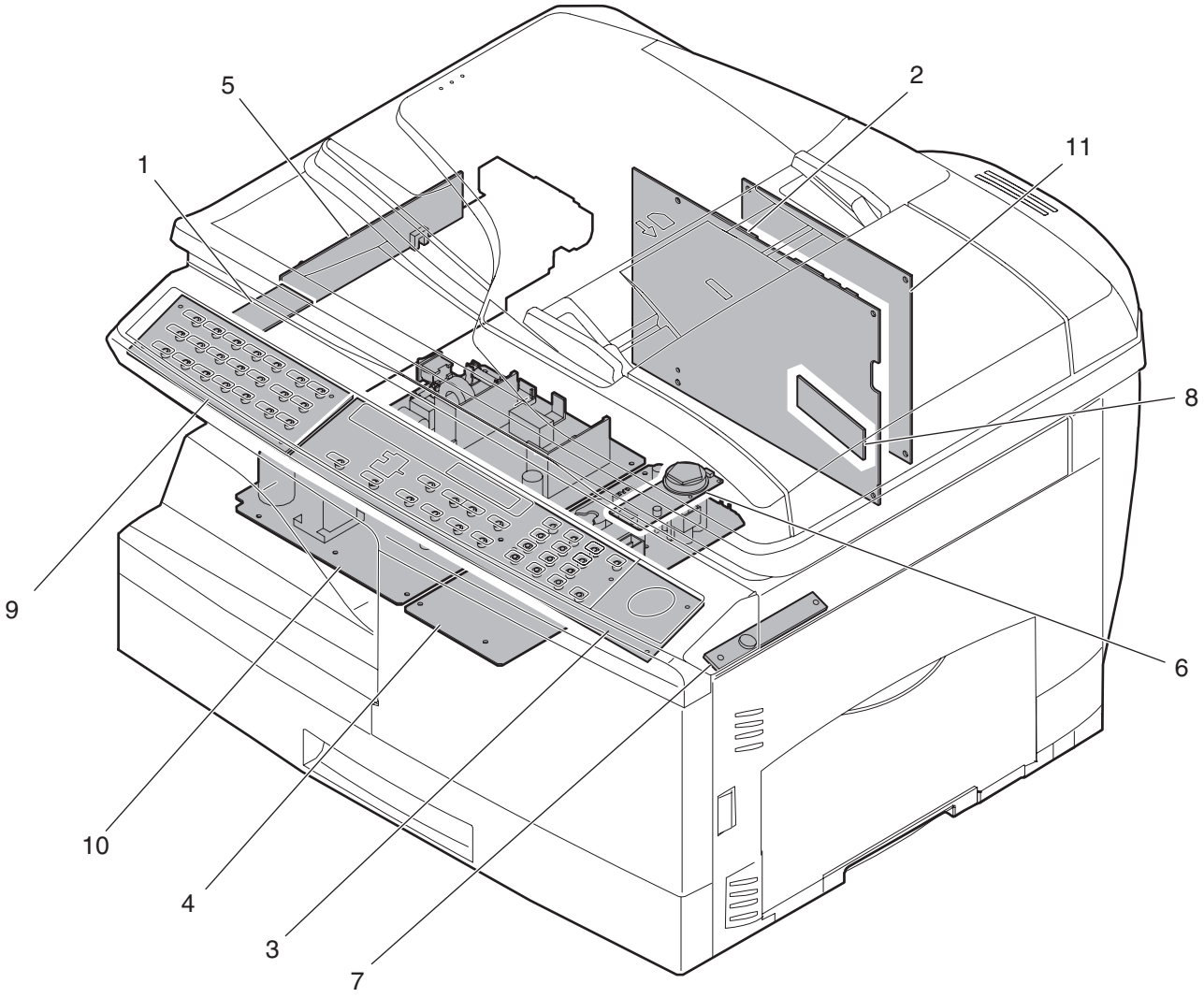
No.	Part name	Control signal	Function / Operation
1	Main motor	MM	Drives the copier.
2	Scanner motor	MRMT	Drives the optical mirror base (scanner unit).
3	Toner motor	TM	Supplies toner.
4	Cooling fan motor	VFM	Ventilate the fuser section.
5	Resist roller solenoid	RRS	Resist roller rotation control solenoid
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 RADF.
9	Duplex motor	DMT	Devices the duplex paper transport section (Duplex model only)
10	Shifter motor	SFTM	Drives the shifter.
11	Reverse clutch	SRVC	Reverses the rotating direction of the roller.
12	Paper feed solenoid (RADF)	SPUS	Feeds paper.

5. Sensors and switches



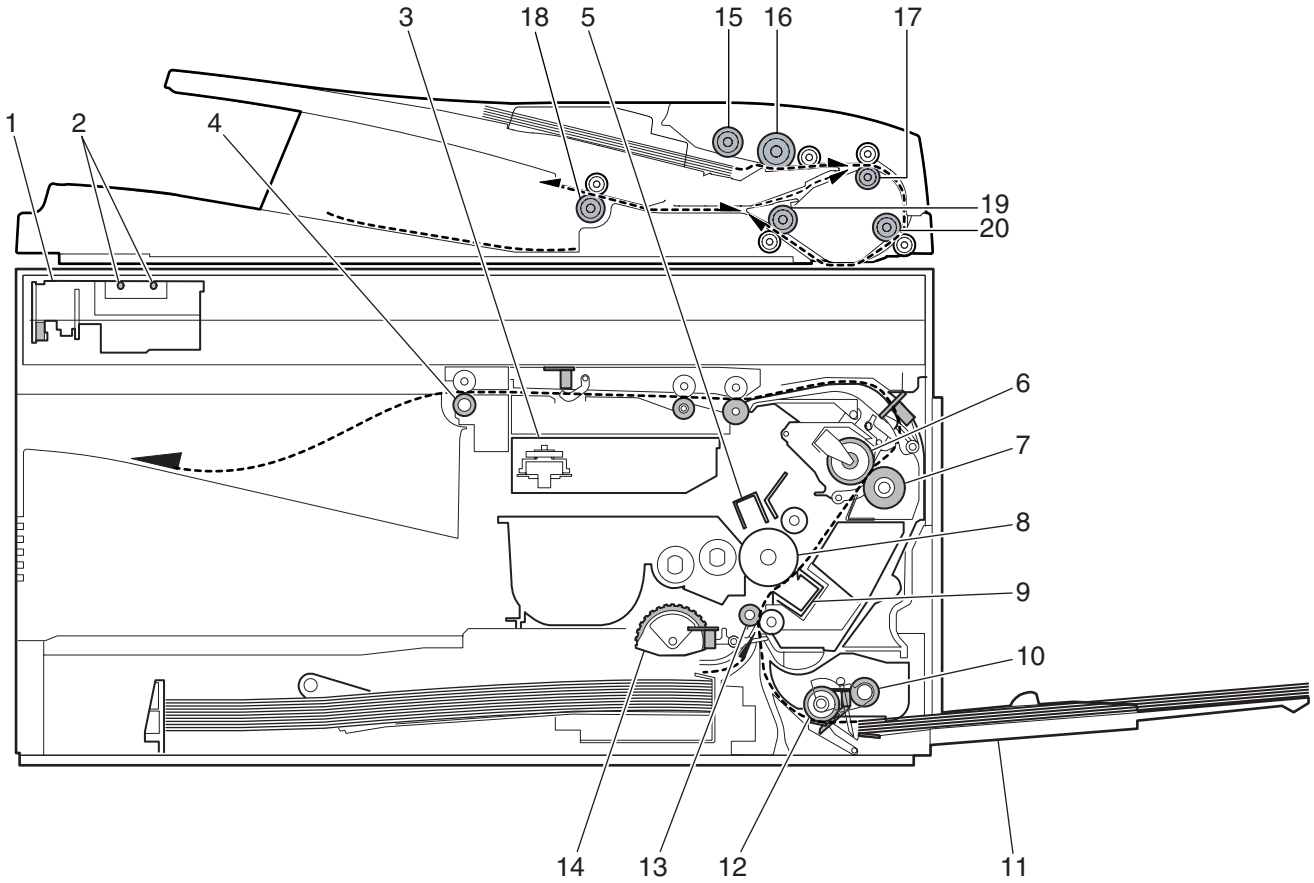
No.	Name	Signal	Type	Function	Output
1	Scanner unit home position sensor	MHPS	Transmission sensor	Scanner unit home position detection	"H" at home position
2	POD sensor	POD	Transmission sensor	Paper exit detection	"H" at paper pass
3	PPD2 sensor	PPD2	Transmission sensor	Paper transport detection 2	"L" 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	Paper empty sensor	SPID	Transmission sensor	Paper entry detection	"H" paper empty
8	Paper exit sensor	SRJD	Transmission sensor	Paper exit detection	"H" paper empty
9	PD1 sensor	PD1	Micro-switch	Paper width detect	"H" at A4 size or less "L" at A4 size or more
10	Upper door open/close sensor	SCOD	Transmission sensor	Cover open/close detection	"L" open
11	Paper sensor	SPPD	Transmission sensor	Paper transport detection	"H" paper empty

6. PWB unit



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	FAX-operation PWB	FAX operation input (GD-1300 option)
10	Power PWB	AC power input, DC voltage control
11	Modem PWB	FAX control (GD-1300 option)

7. Cross sectional view



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

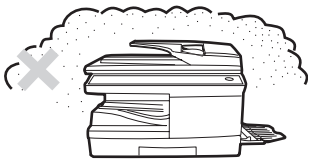
1. Copier installation

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

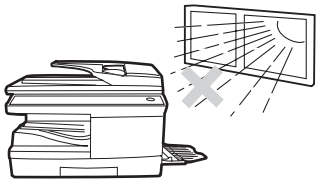
Caution: If the copier is moved from a cool place to a warm place, condensation may form inside the copier. Operation in this condition will cause poor copy quality and malfunctions. Leave the copier at room temperature for at least 2 hours before use.

Do not install your copier in areas that are:

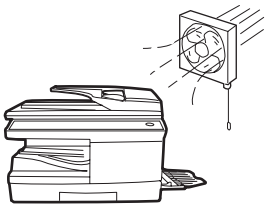
- damp, humid, or very dusty



- exposed to direct sunlight



- poorly ventilated



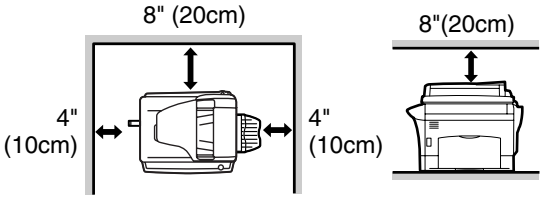
- subject to extreme temperature or humidity changes, e.g., near an air conditioner or heater.

The copier shall 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.

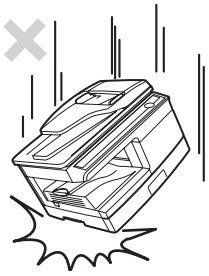
Be sure to allow the required space around the machine for servicing and proper ventilation.



2. Cautions on handling

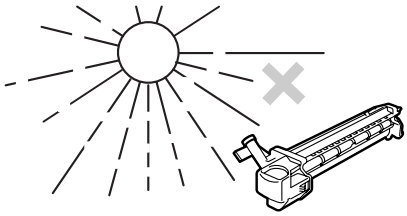
Be careful in handling the copier as follows to maintain the performance of this copier.

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 toner cartridges in a dark place without removing from the package before use.

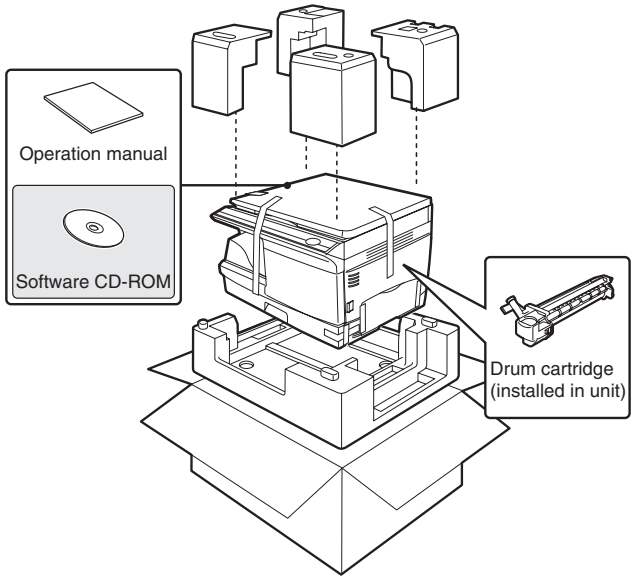
If they are exposed to direct sunlight, poor print quality may result.

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

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

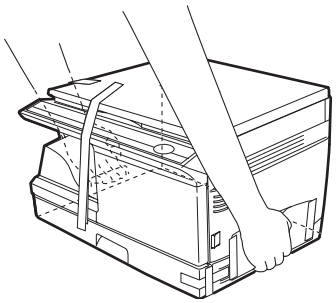
3. Checking packed components and accessories

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



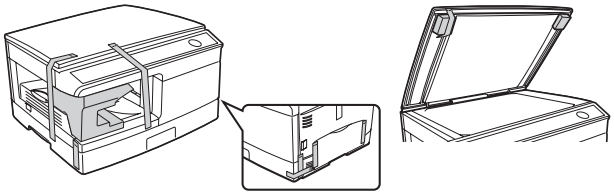
4. Unpacking

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

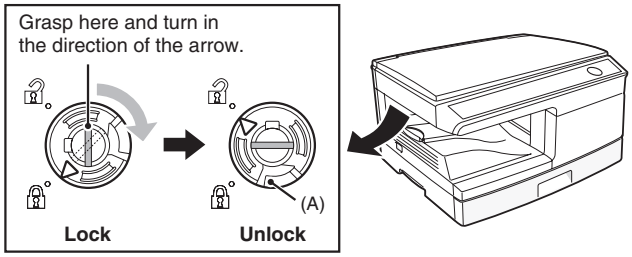


5. Removing protective packing materials

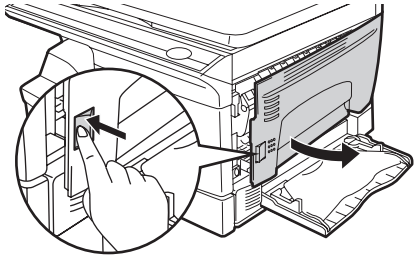
1) Remove all pieces of tape shown in the illustration below and then open the RADF and remove the protective materials. Take out the bag containing the toner cartridge.



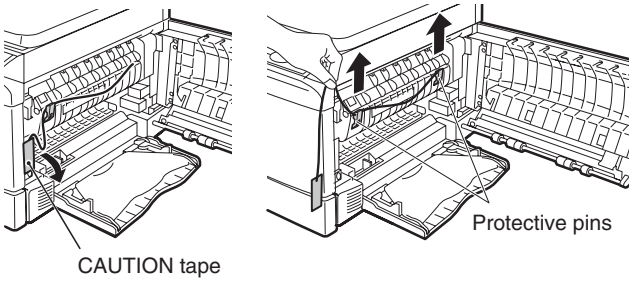
2) Release the scan head locking switch.



3) Open the bypass tray, and then open the side cover while pressing the side cover open button.

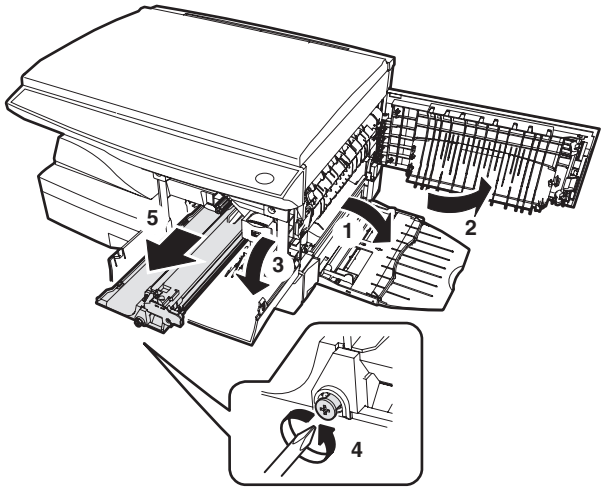


4) Remove the CAUTION tape from the front cover and remove the two protective pins from the fusing machine by pulling the strings upward one at a time.

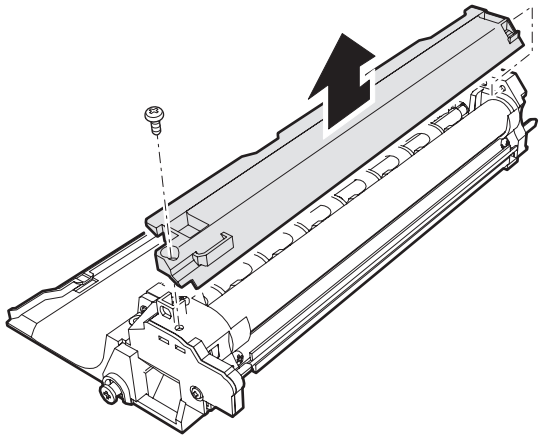


6. Developer unit installation

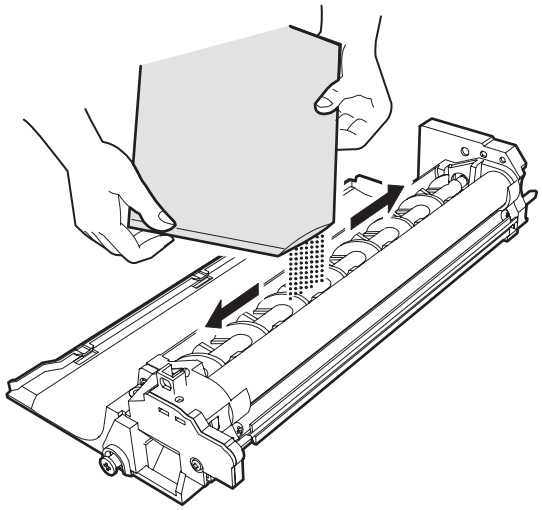
1) 2) 3) Open the side and front cabinets of the copier.
4) Remove the locking tape of the developer unit.
5) Remove the screw which is fixing the copier and Developer unit.
6) Remove Developer unit slowly from the copier.



7) Remove the screw (1 pc).
8) Remove Upper developer unit.



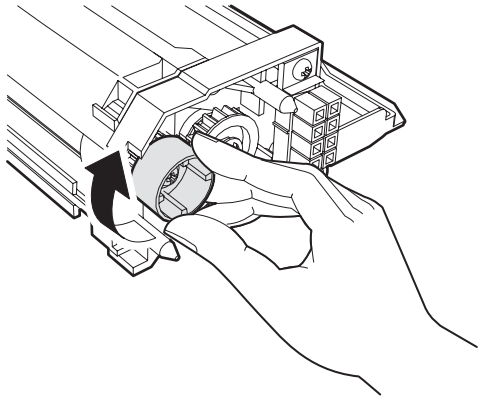
9) Shake the aluminum bag to stir developer
10) Supply developer from the aluminum bag to the top of the MX roller evenly.



Note: Be careful not to splash developer outside Developer unit.

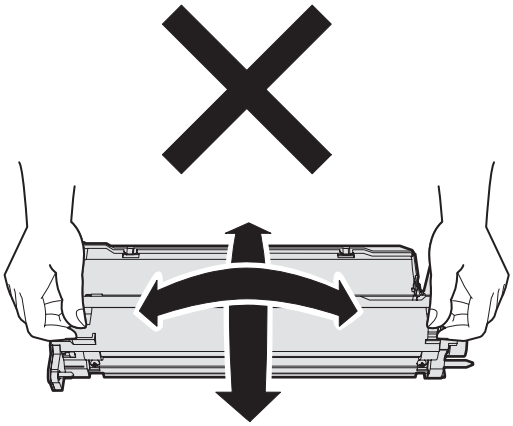
11) Attach Upper developer unit and fix it with a screw.

12) Rotate the MG roller gear to distribute developer evenly.



Note: Never rotate the gear in the reverse direction.

Note: When carrying Developer unit, do not tilt it extremely as shown with the arrow in the figure below.
(Prevention of splash of developer)



13) Insert Developer unit carefully into the copier.

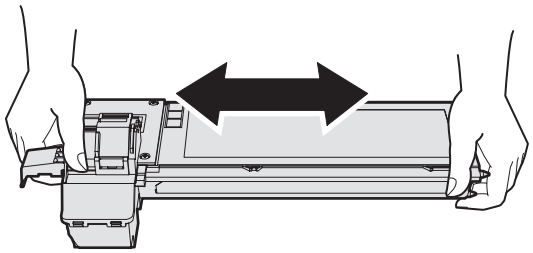
Note: Quick insertion may result in splash of developer. Be sure to insert carefully.

14) Confirm that Developer unit is completely inserted to the bottom of the machine, fix Developer unit and the machine with a screw.

15) Completion of Developer unit installation

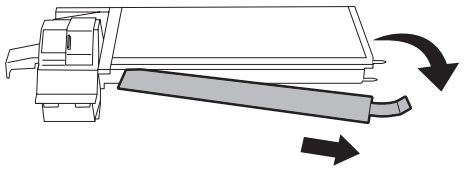
7. Toner cartridge installation

1) To prevent against uneven distribution of toner, hold Toner unit with both hands and shake it several times horizontally.



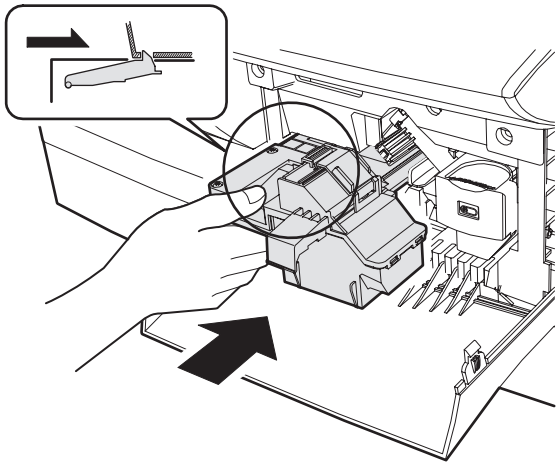
2) Hold the section of Toner unit shown in the figure below, remove the packing tape, and remove the cushion.

3) Pull out the cushion in the arrow direction.

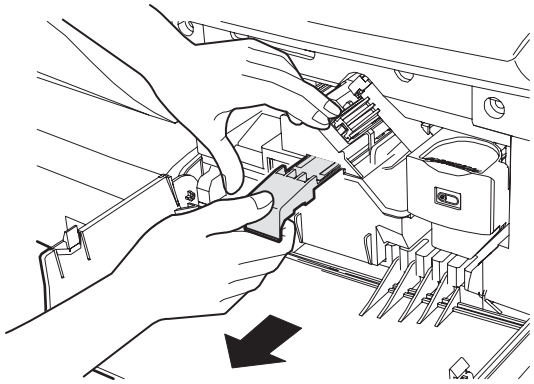


4) Insert Toner unit carefully into the copier.

5) Insert until the hook is engaged with the copier as shown in the figure below.



6) Pull out the shutter in the arrow direction.



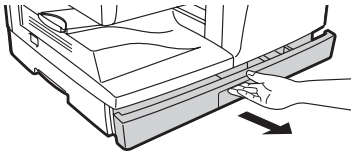
Note: Do not hold and carry the shutter. Otherwise the shutter may drop and Toner unit may drop.

7) Completion of Toner unit installation
Close the front and side cabinets.

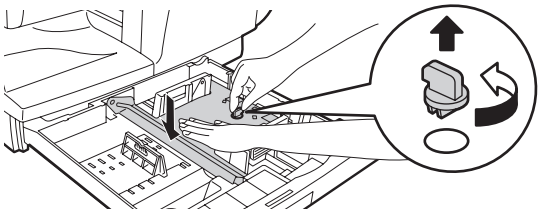
8. Loading the paper tray

Note: Make sure that the paper is not torn, is free of dust, and has no wrinkles or curled edges.

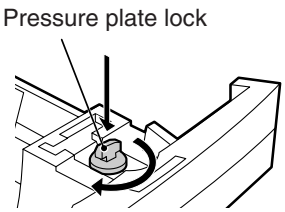
1) Raise the handle of the paper tray and pull the paper tray out until it stops.



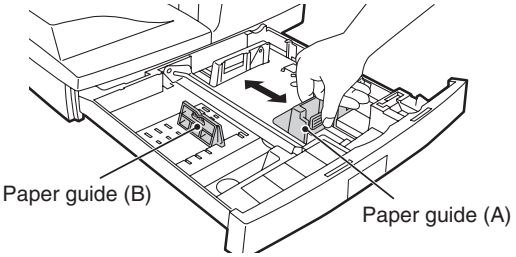
2) Remove the pressure plate lock. Rotate the pressure plate lock in the direction of the arrow to remove it while pressing down on the pressure plate of the paper tray.



3) Store the pressure plate lock which has been removed in step 2. To store the pressure plate lock, rotate the lock to secure it as shown below.



4) Squeeze the lock lever of the front guide and slide the paper guide (A) to match the width of the paper, and move the paper guide (B) to the appropriate slot as marked on the tray.

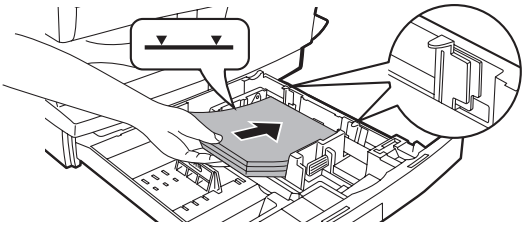


- The front guide is a slide-type guide. Grasp the locking knob on the guide and slide the guide to the indicator line of the paper to be loaded.
- The left guide is an insert-type guide. Remove it and then insert it at the indicator line of the paper to be loaded.

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

Note:

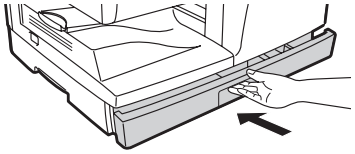
- Do not load paper above the maximum height line (▼ ▼). Exceeding the line will cause a paper misfeed.
- If the paper is not fanned, double-feeds or misfeeds may occur.
- Make sure the stack of paper is straight before loading it. When adding paper, take the remaining paper out and combine it into a single stack with the new paper.
- Make sure that all the paper in the stack is the same size and type.
- When loading paper, ensure that there is no space between the paper and the guide, and make sure that the guide is not set too narrow and causes the paper to bend. Incorrect loading will cause the paper to skew or misfeed.



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

Note:

- If you loaded a different size of paper than was loaded previously in the tray.
- When not using the machine for an extended period, remove all paper from the paper tray and store it in a dry place. If paper is left in the machine for an extended period, the paper will absorb moisture from the air, resulting in paper jams.



9. Power to copier

1) Ensure that the power switch of the copier is in the OFF position.
   Insert the attached power cord into the power cord socket at the rear of the copier.
2) Plug the other end of the power cord into the nearest outlet.
3) The document stopper may fall down by vibrations during transit of the product. If documents are set under such a state, the JAM display may be indicated.
   If the JAM display is indicated, remove the documents, turn OFF/ON the power SW, complete initializing of the RADF, then set the documents again.

10. Software

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

MFP driver

Printer driver

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

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

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.

Desktop Document Manager*

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

Button Manager*

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

*: The scanning feature can only be used with computers that are connected to the machine by a USB cable.

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
Operating system*2 *3	Windows 98, Windows Me, Windows 2000 Professional*4, Windows XP Professional*4, Windows XP Home Edition*4, Windows Vista*4
Display	1024 x 768 dots (XGA) display with 16bit
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: Compatible with Windows 98, Windows Me, Windows 2000 Professional, Windows XP Professional, Windows XP Home Edition or Windows Vista preinstalled model standardly equipped with a USB port.

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

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

*4: 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	Desktop Document Manager
USB	Windows 98/ Me/2000/XP/ Vista	Available*1	Available		

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

Install the software according to the Operation Manual.

B. Installing the software

Note:

- The screen images in this manual are mainly for Windows XP. With other versions of Windows, some screen images may be different from those in this manual.
- In the following explanations it is assumed that the mouse is configured for right hand operation.
- 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) 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.
7) To install all of the software, click the "Standard" button and go to step 12).

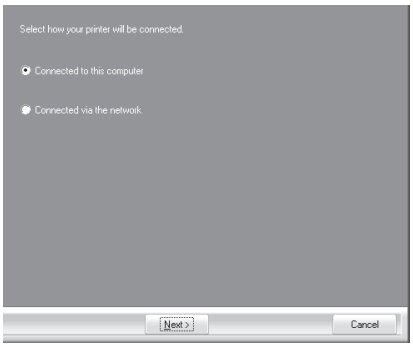
   To install particular packages, click the "Custom" button and go to next step.

8) Click the "MFP Driver" button.

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

9) Select "Connected to this computer" and click the "Next" button.

Follow the on-screen instructions.



Caution:

- If you are using Windows Vista 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 Desktop Document Manager, click the "Utility Software" button.

If you do not wish to install the Utility Software, click the "Close" button and go to step 12).

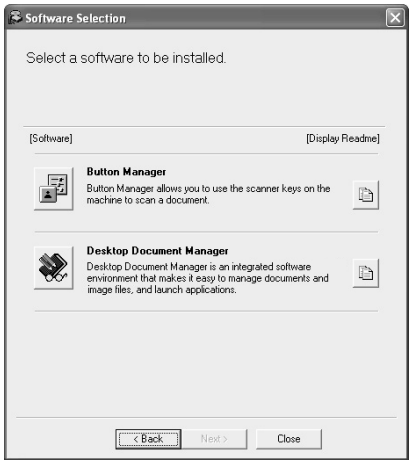
Note: After the installation, a message prompting you to restart your computer may appear. In this case, click the "Yes" button to restart your computer.

Installing the Utility Software

11) Click the "Button Manager" or the "Desktop Document Manager" 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 Desktop Document Manager installation.

If "Skip" is selected, the Desktop Document Manager installation will continue without installing Desktop Document Manager Imaging.

If "Continue" is selected, Desktop Document Manager Imaging will be installed. If Imaging for Windows is installed on your computer, Desktop Document Manager 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.

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".

This completes the installation of the software.

- If you installed Button Manager, set up Button Manager as explained in "C. Setting up Button Manager".
- If you installed Desktop Document Manager, the Desktop Document Manager setup screen will appear. Follow the instructions in the screen to set up Desktop Document Manager.

(1) 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.

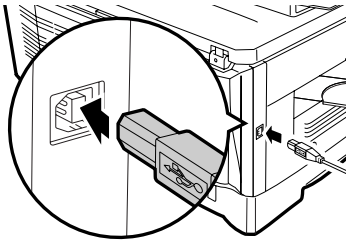
Caution:

- 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 or Windows Vista preinstalled.
- Do not connect the USB cable before installing the printer driver. The USB cable should be connected during installation of the printer driver.

Note

- If the machine will be connected using a USB 2.0 port of your computer, please purchase a USB cable that supports USB 2.0.
- To obtain the fastest USB 2.0 data transfer speed, "USB2.0 MODE SWITCH" in the machine's user programs must be set to "HI-SPEED". For more information, see "[12] USER PROGRAM".
- Use the machine's "HI-SPEED" mode only when using a computer that is running Windows 2000/XP/Vista.
- Even when the Microsoft USB 2.0 driver is used, it may not be possible to obtain full USB 2.0 speed if a PC card supporting USB 2.0 is used. To obtain the latest driver (which may enable a higher speed), contact the manufacturer of your PC card.
- Connection is also possible using a USB 1.1 port on your computer.
  However, the specifications will be USB 1.1 specifications (Full-Speed).

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



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

(2) Using the machine as a shared printer

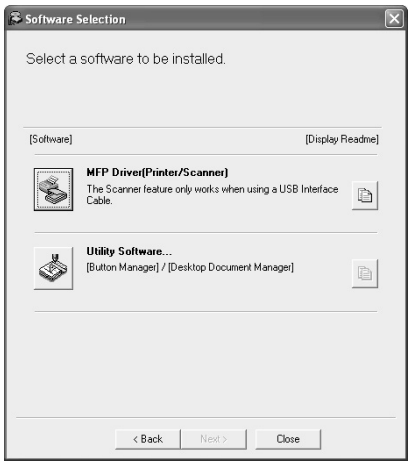
If the machine will be used as a shared printer on a network, follow these steps to install the printer driver in the client computer.

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

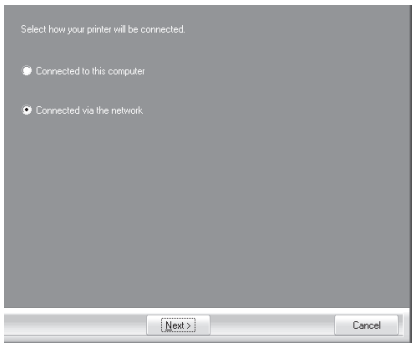
1) Perform steps 2) through 6) in "Installing the software".
2) Click the "Custom" button.

3) Click the "MFP Driver" button.

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

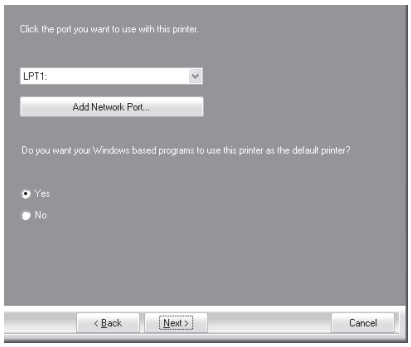


4) Select "Connected via the network" and click the "Next" button.



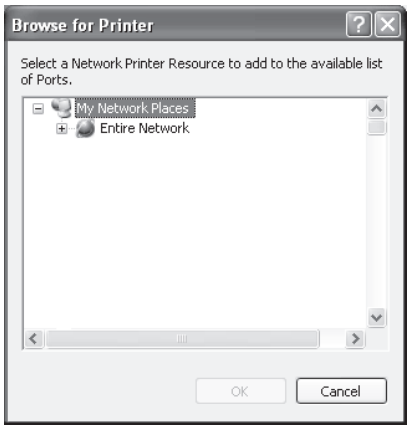
5) Click the "Add Network Port" button.

In Windows Vista, the "Add Network Port" button does not appear.



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 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".

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.

C. Setting up Button Manager

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

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

(1) Windows XP/Vista

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

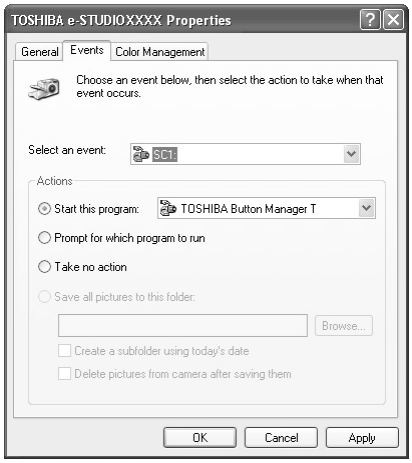
In Windows Vista, click the "Start" button, select "Control Panel" and click "Hardware and Sound", and then click "Scanners and Cameras".

2) Click the "TOSHIBA e-STUDIOXXXX" icon and select "Properties" from the "File" menu.

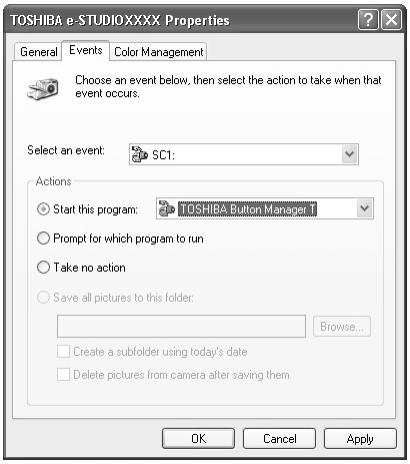
In Windows Vista, select "Properties" from the "Organize" menu.

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 "Toshiba Button Manager T" 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 "Toshiba Button Manager T" 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".

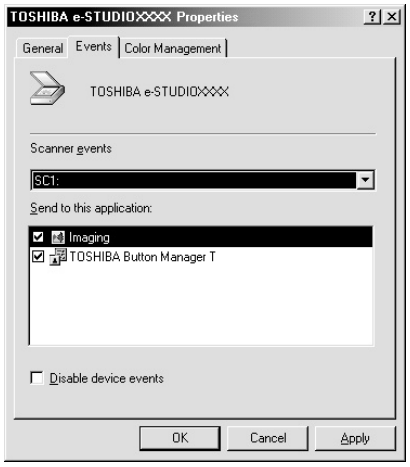
2) Double-click the "Scanners and Cameras" icon.

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

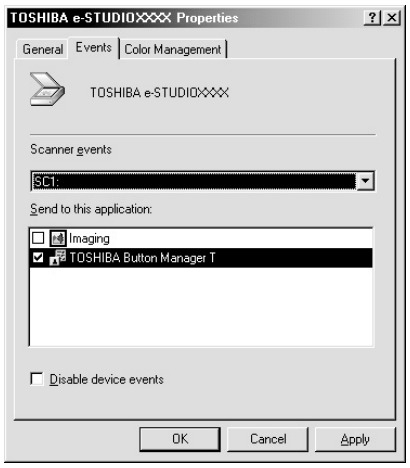
3) Select "TOSHIBA e-STUDIOXXXX" and click the "Properties" button.

In Windows Me, right click "TOSHIBA e-STUDIOXXXX" 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 "Toshiba Button Manager T" 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 "Toshiba Button Manager T" 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.

11. Interface

A. USB

Connector

4-pin ACON UBR23-4K2200

Type-B connector

Cable

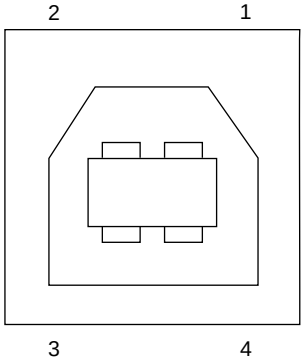
Shielded twisted pair cable

(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



12. Moving

Moving instructions

When moving the unit, follow the procedure below.

Note: When moving this unit, be sure to remove the toner 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 toner 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 toner 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.

13. Scanner moisture-proof parts

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

A. Components

Scanner moisture-proof parts

	Name	Part code	Qty
1	Scanner condensation prevention mylar		3
2	Optical right hole mylar B		2
3	Scanner motor metal plate cushion		2
4	Scanner upper surface cushion		1
5	Scanner motor lower mylar		1
6	Scanner UPG mylar J3		1
7	Fan housing cushion		1

B. Precautions at installation

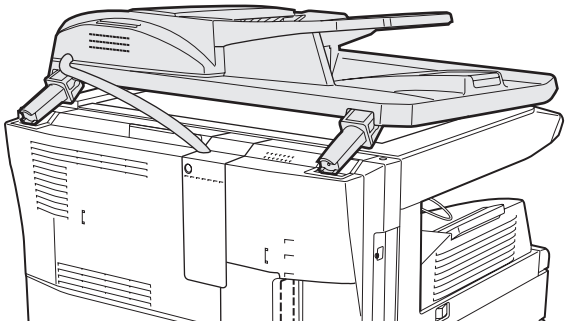
Clean the position where each cushion/mylar is attached with industrial alcohol before the work.

C. Attachment method

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

1) Detach the RADF.

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

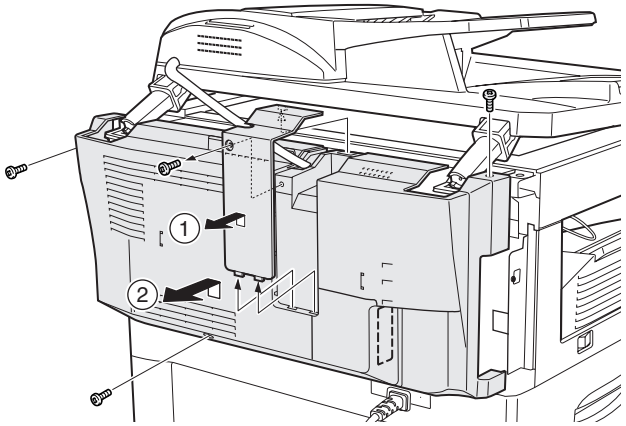


2) Remove the rear cabinet.

   <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 RADF, and remove the RADF from the machine.

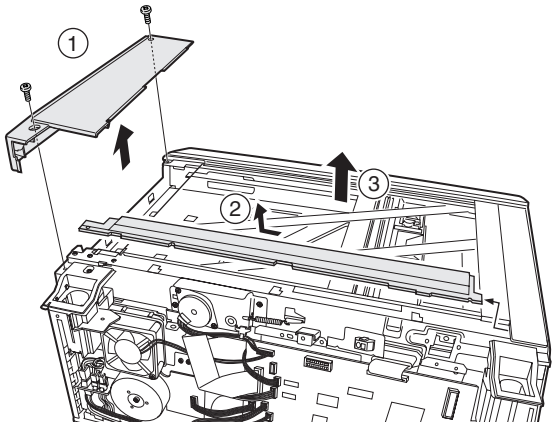


3) Remove the rear cover for the document glass.

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

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

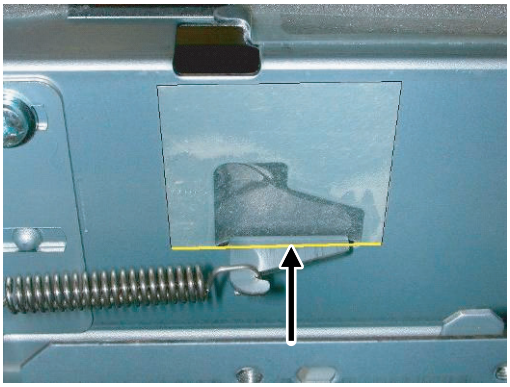
   <3> Remove the table glass.



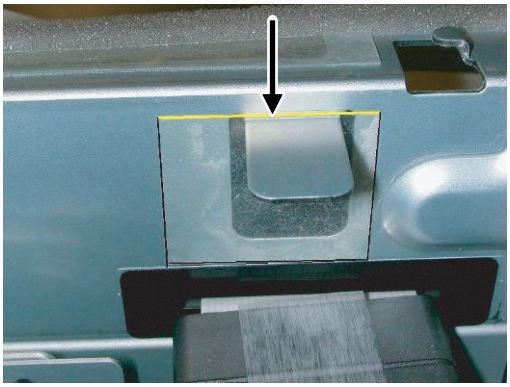
4) Attach the Scanner condensation prevention mylar at the 3 positions on the rear side of the main unit as described below.

   Note: The hole should be covered with the mylar.

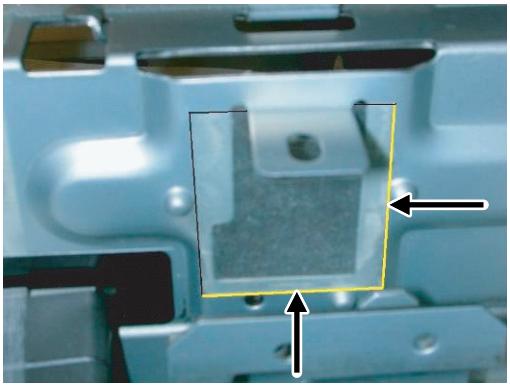
   Align the edge of the mylar to the R part (the yellow line in the diagram below) so that the hole of the metal plate is covered as much as possible.



   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).

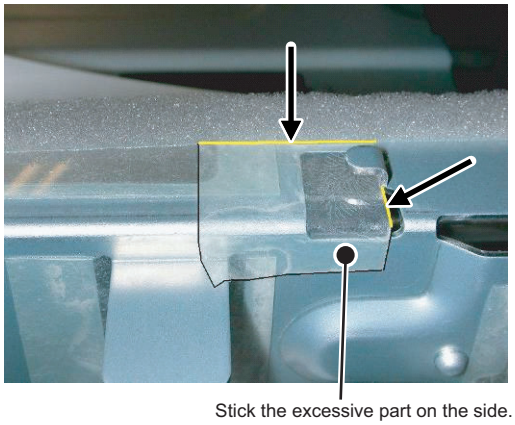


5) Attach the Optical right hole mylar B at the 2 positions shown in the diagrams below which are at the top of the rear side of the main unit.

Note: The holes should be covered with the mylar.

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

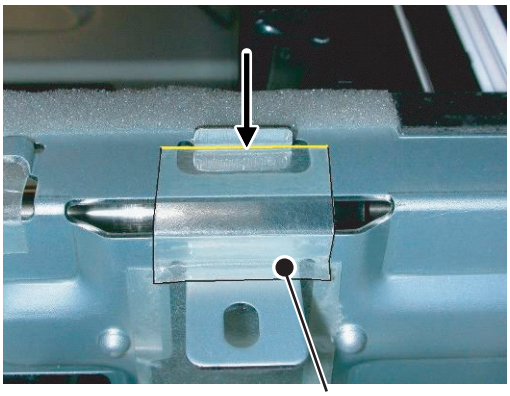
Align with the inside line of the bent part (the yellow line in the diagram below).



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.

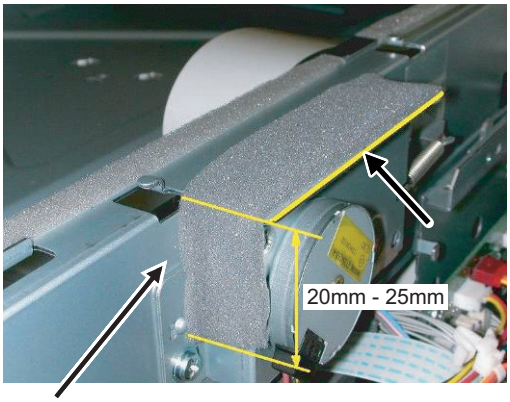


Stick the excessive part on the side.

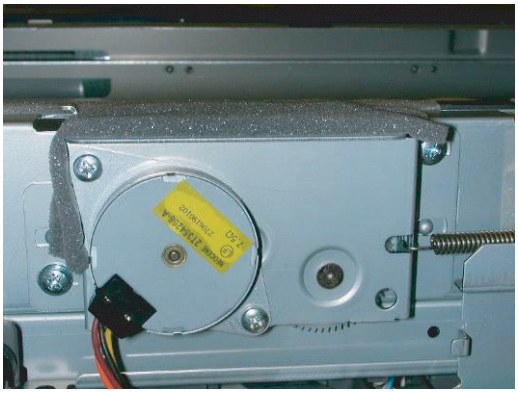
6) Attach the Scanner motor metal plate cushion at 1 position on the attachment plate of the motor on the rear side of the main unit.

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).

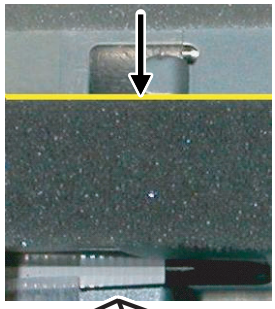


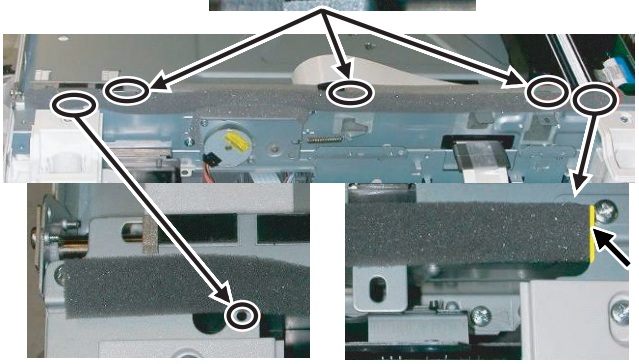
Press and attach the cushion aligning it to the metal plate so that there will be no gap between them.



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.

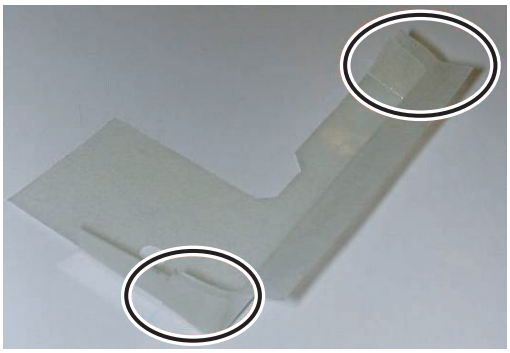
Align the edge of the cushion with the edge of the metal plate.

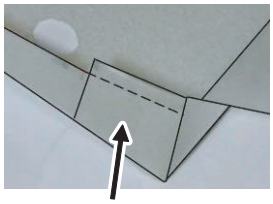
Bend the part which is sticking out to the rear side of the scanner and attach to the surface.

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

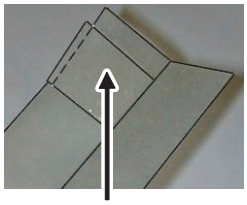
Press the cushion to make sure all the holes are covered.

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





Stick together.



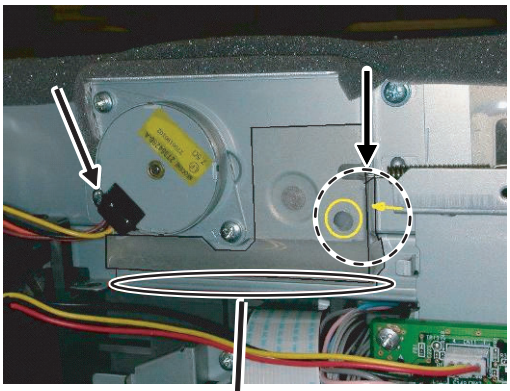
Stick together.

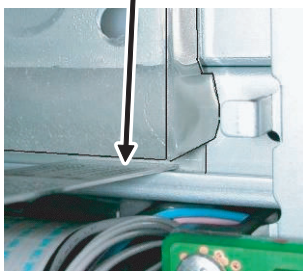
9) Attach the Scanner motor lower mylar at 1 position under the motor attachment plate on the rear side of the main unit.

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.



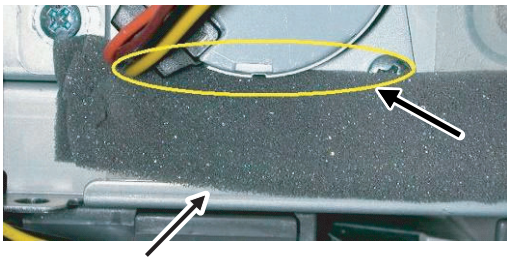


Press the mylar with a sharp-pointed stick or something so that it is stuck correctly.

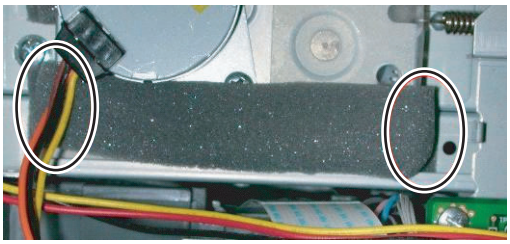
10) Attach the Scanner motor metal plate cushion covering the bottom part of the Scanner motor lower mylar.

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

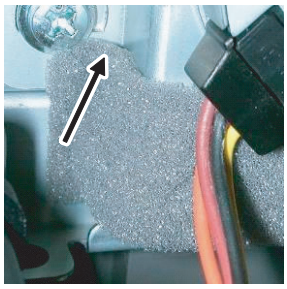
Attach the cushion to cover the gap between the mylar and the metal plate (the yellow mark).

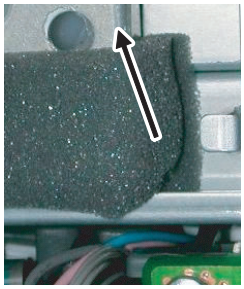


Stick the lower part of the cushion to the mylar, too.

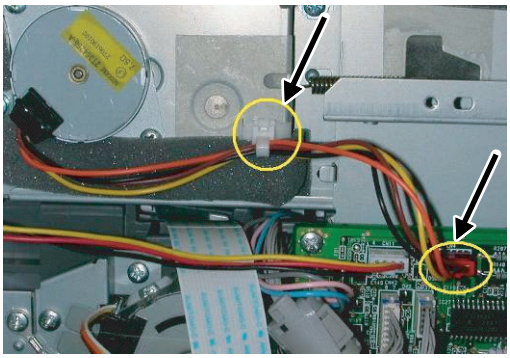


Press the cushion with a sharp-pointed stick or something to fill the gap between the mylar and the metal plate.





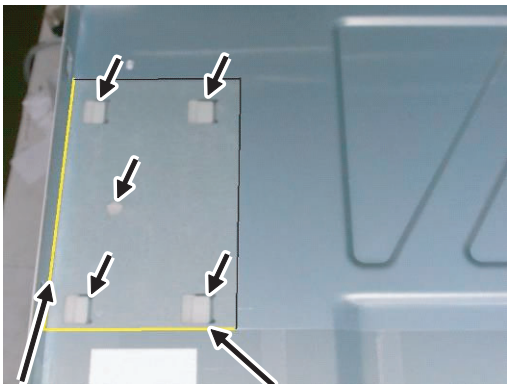
11) Attach the motor connector and the snap band to the original position.



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.

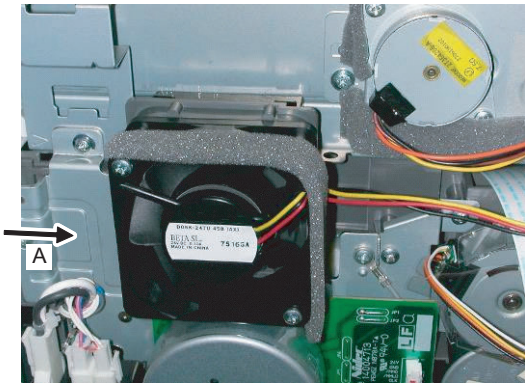
Attach along with the bent part of the metal plate and align the edge of the mylar with the line shown in the diagram (the yellow line in the diagram).

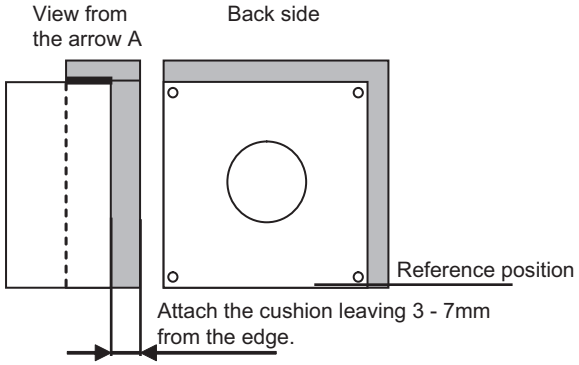


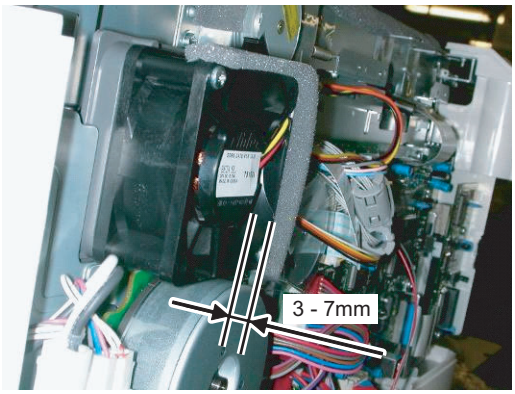
13) Attach the Fan housing cushion to the cooling fan at the position shown in the diagram below.

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.





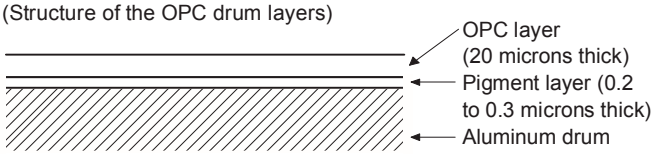


Attach the cushion leaving 3 - 7mm from the edge so that the gap between the Fan housing cushion and the filter of the rear cabinet is filled for sure.

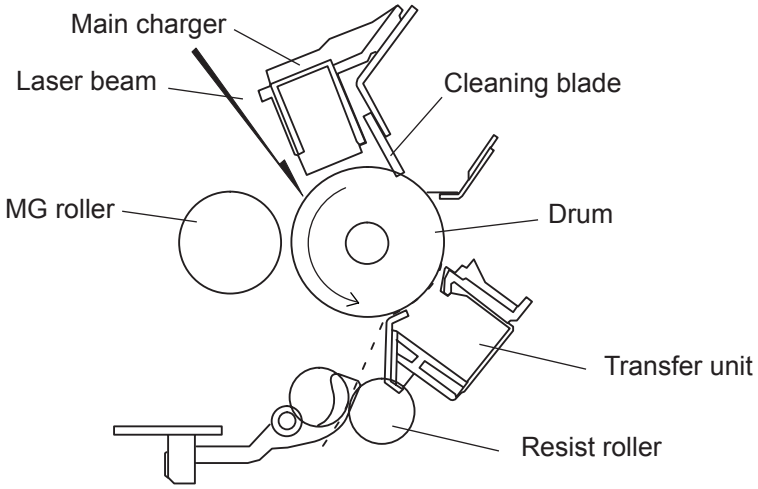
14) Attach the parts removed in the items 1), 2), and 3).

[6] COPY PROCESS

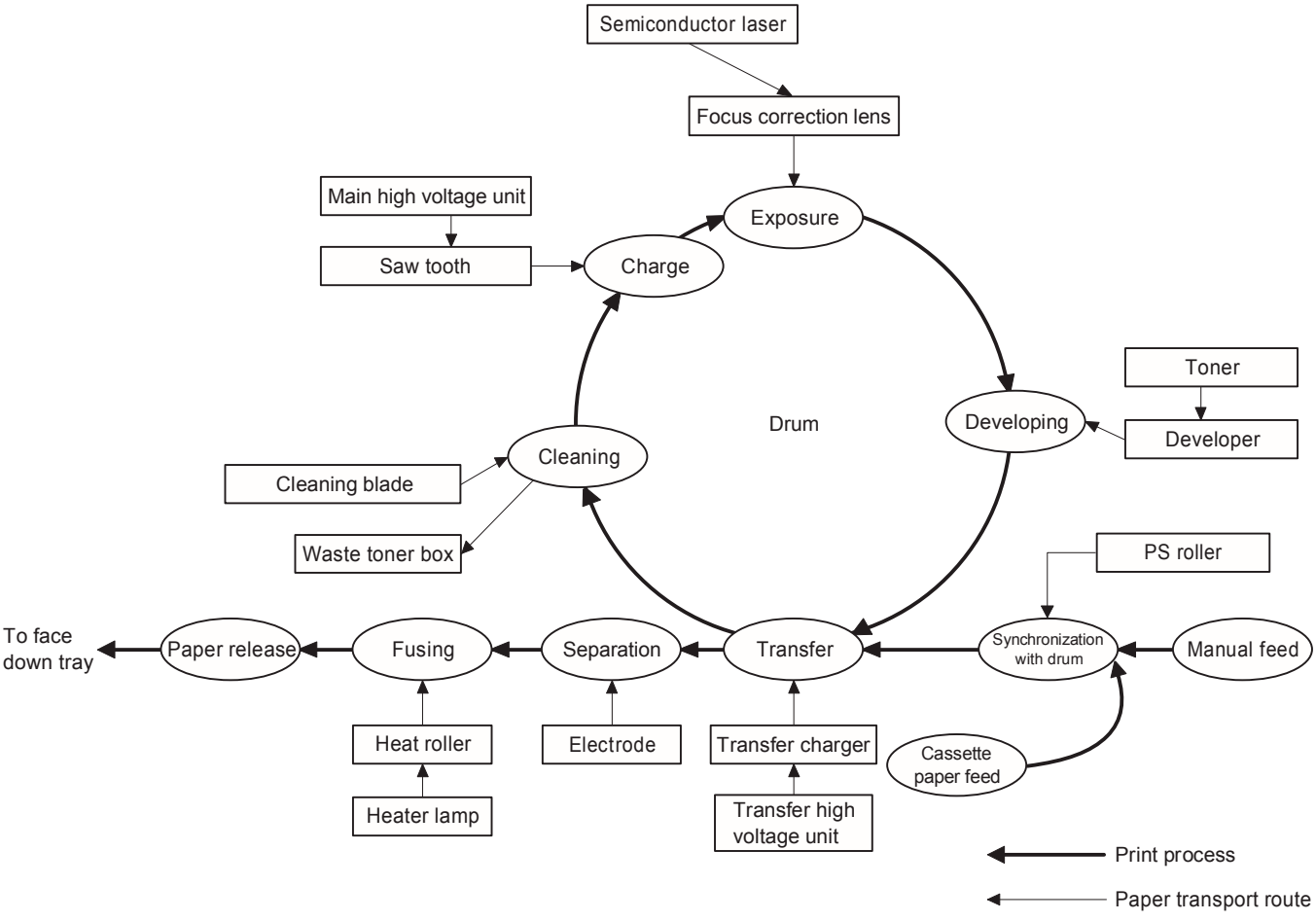
An OPC drum is used for the photoconductor.
(Structure of the OPC drum layers)



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.

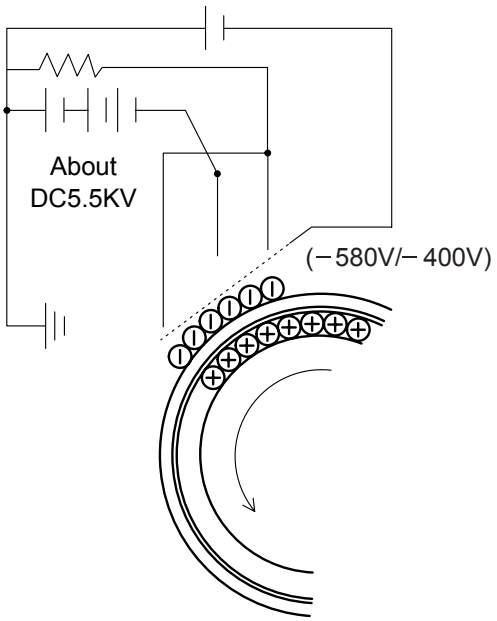
Step-6: Optical discharge
Residual charge on the drum surface is removed, by semiconductor laser beam.

3. Actual print process

Step-1: DC charge

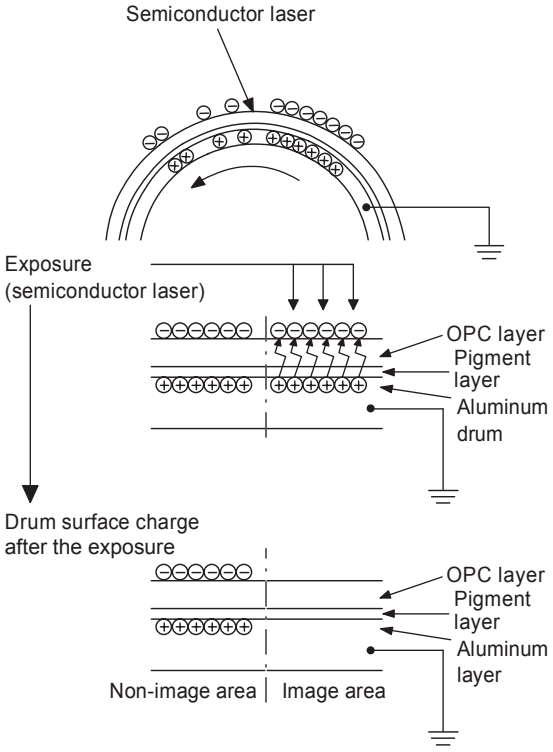
A uniform negative charge is applied over the OPC drum surface by the main charging unit. Stable potential is maintained by means of the Scorotron charger.

Positive charges are generated in the aluminum layer.



Step-2: Exposure (laser beam, lens)

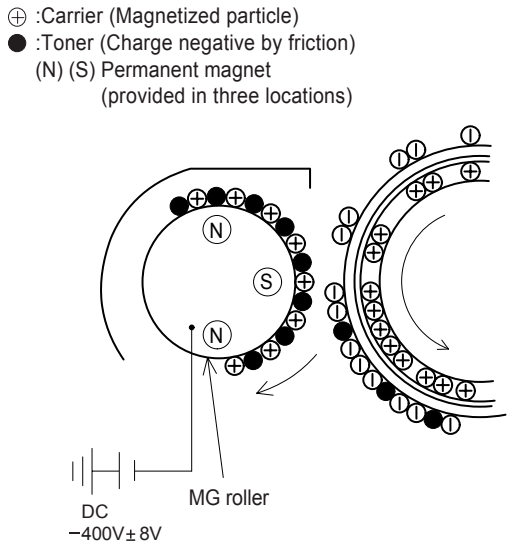
A Laser beam is generated from the semiconductor laser and controlled by the print pattern signal. The laser writes onto the OPC drum surface through the polygon mirrors and lens. The resistance of the OPC layer decreases for an area exposed by the laser beam (corresponding to the print pattern signal).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

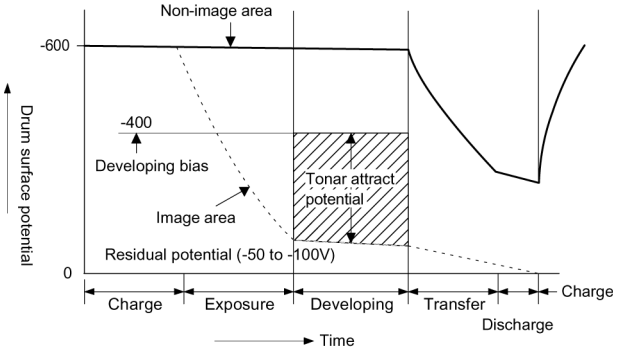


Step-3: Developing (DC bias)

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.

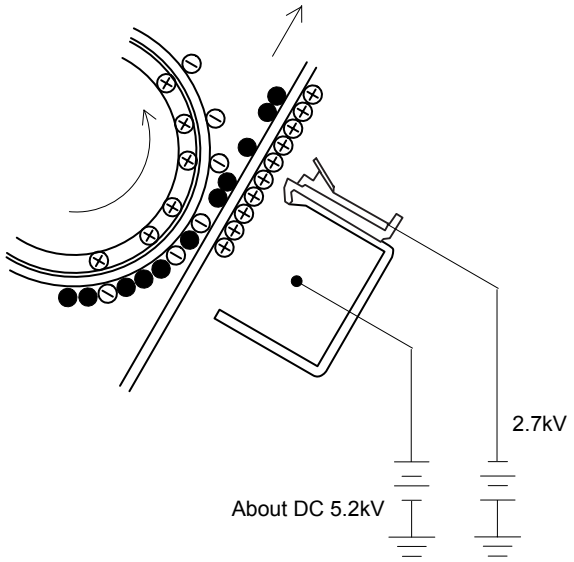




Toner is attracted over the shadowed area because of the developing bias.

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.

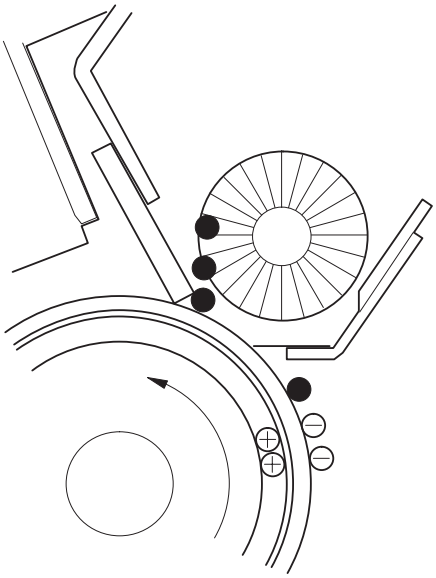


Step-5: Separation

Since the print paper is charged positively by the transfer corona, it is discharged by the separation corona. The separation corona is applied negative charge.

Step-6: Cleaning

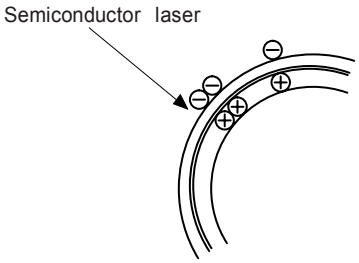
Toner remaining on the drum is removed and collected by the cleaning blade. It is transported to the waste toner collecting section in the cleaning unit by the waste toner transport roller.



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

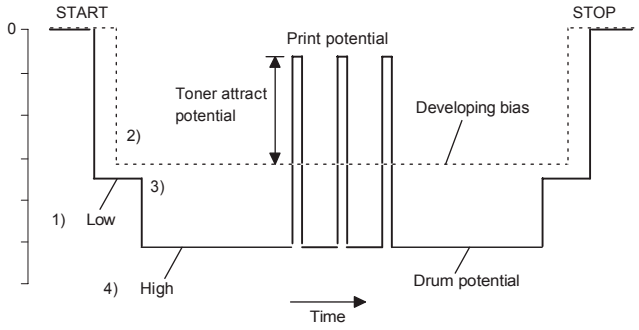
Function

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 photoconductor 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

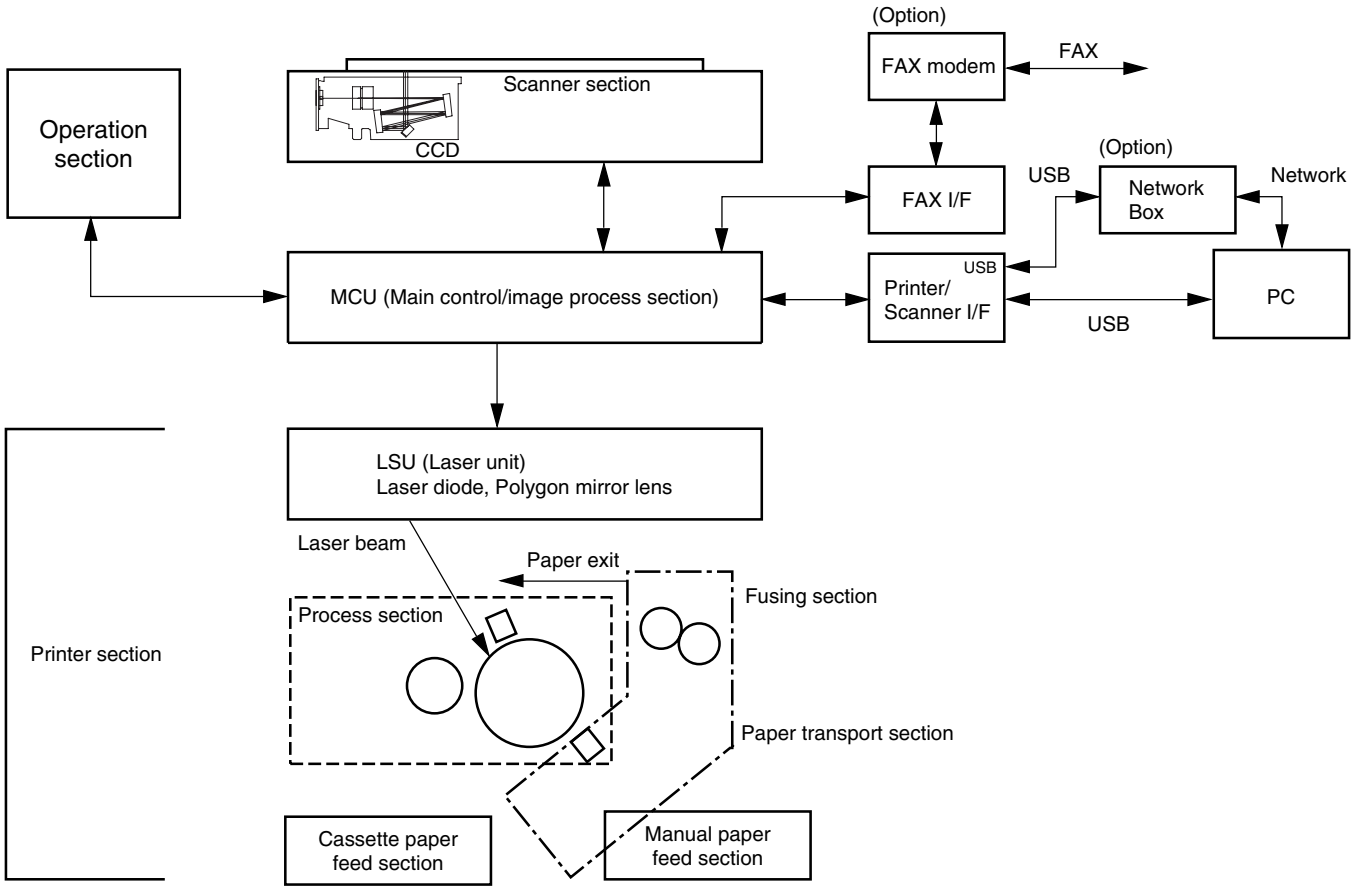
Normally, the developing bias voltage is retained for a certain time before the drum comes to a complete stop if the machine should stop before completing the normal print cycle. The developing bias can be added before resuming the operation after an abnormal interruption. Therefore, carrier will not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

Image scanning

2) When the COPY button 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 I/F 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 and the I/F to the PC according to the conditions requested by the PC or set 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.

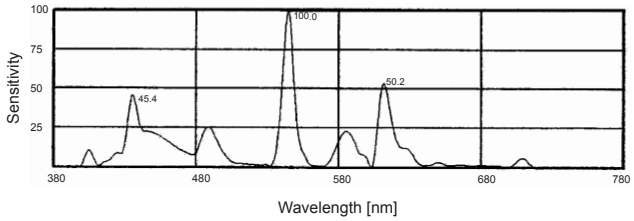
Light radiated from the light source is applied to the document on the document table. The reflected light from the document is reflected 4 times by No. 1 - No. 3 mirrors and passed through the reduction lens to form images on the light-receiving surface of 3-line CCD.

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)

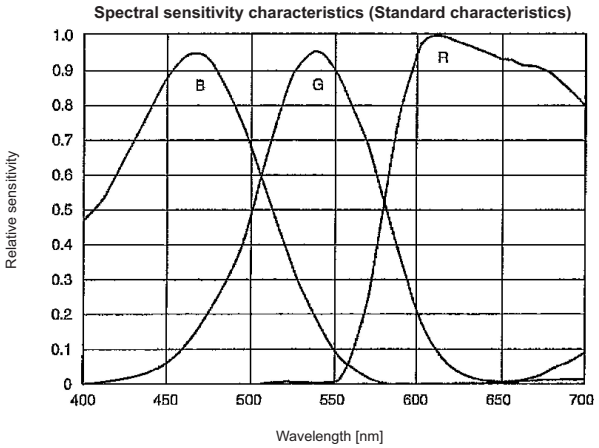
The resolution is 600dpi.

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

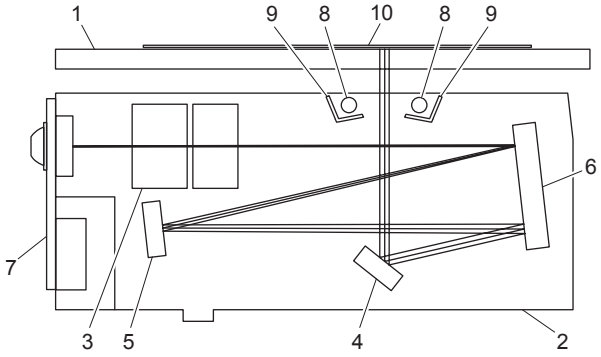
The color component for printing can be switched to red or blue by the service simulation.



(Spectrum characteristics of the lamp)



(Spectrum characteristics of the color CCD)



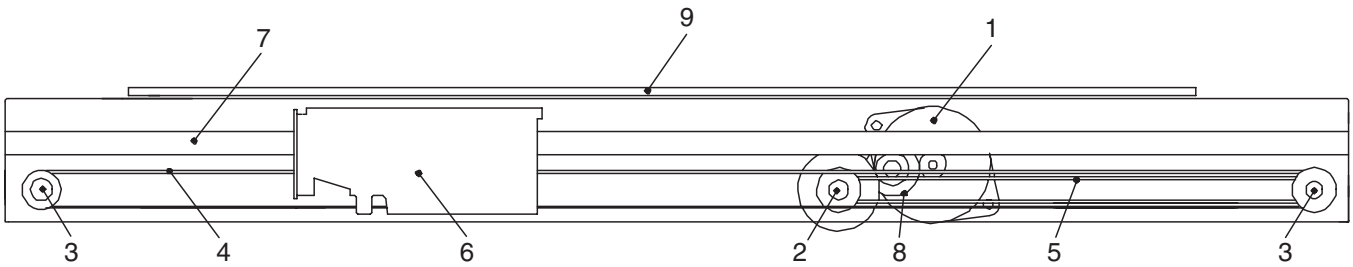
(Optical unit)

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

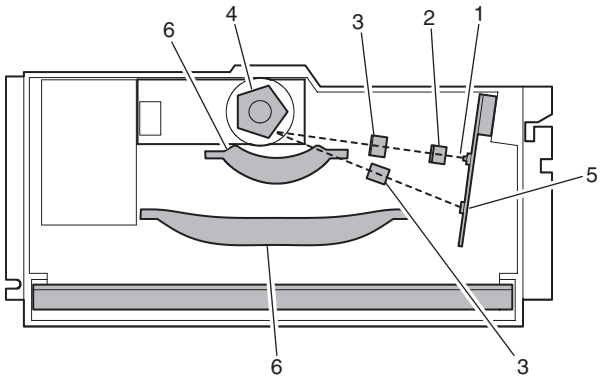
The image data sent from the MCU (image process circuit) is sent to the LSU (laser unit), where it is converted into laser beams.

A. Basic structure

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

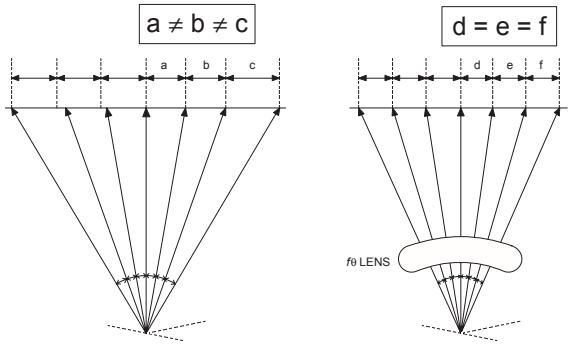
The semiconductor laser is used as the light source, and images are formed on the OPC drum by the polygon mirror and fθ lens, etc.

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.

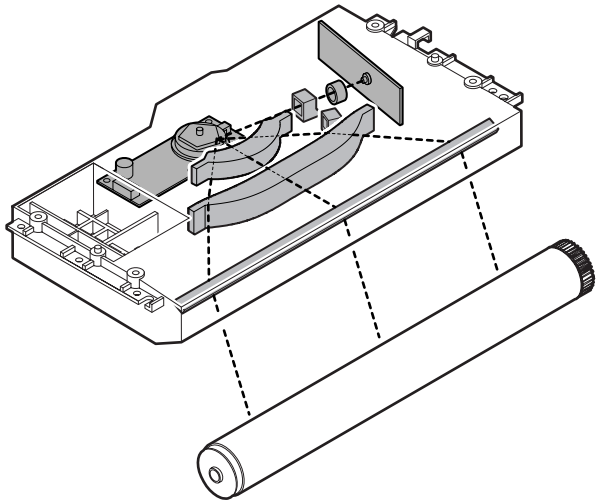


No	Component	Function
1	Semiconductor laser	Generates laser beams.
2	Collimator lens	Converges laser beams in parallel.
3	Cylinder lens	Takes the focus.
4	Polygon mirror, polygon motor	Reflects laser beams at a constant rpm.
5	BD (Lens, PWB)	Detects start timing of laser scanning.
6	fθ lens	Converges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

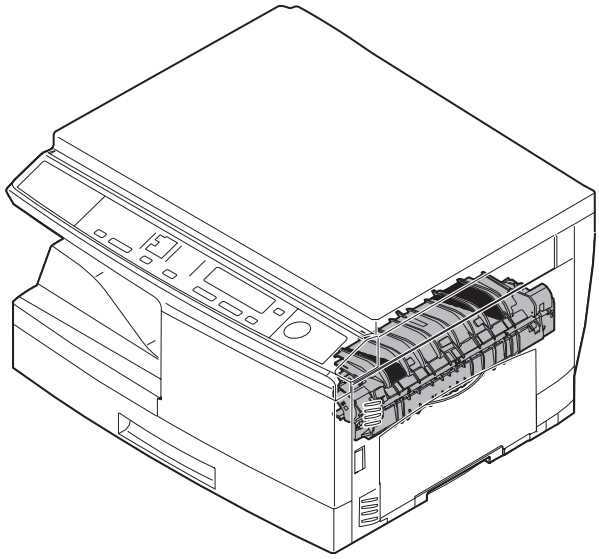
Resolution: 600dpi

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)

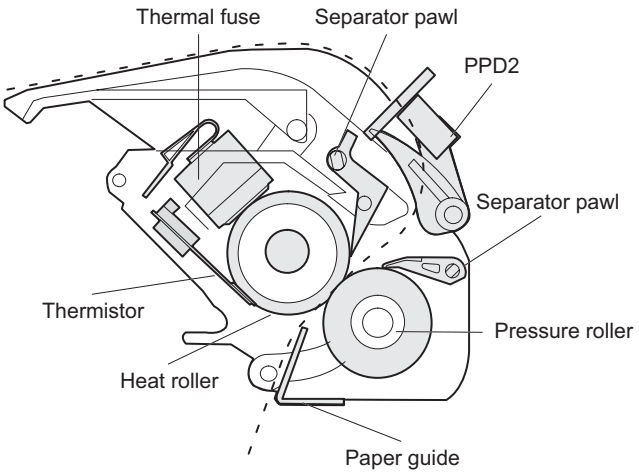
Polygon motor section: Brushless motor 20.787rpm
No. of mirror surfaces: 5 surfaces

4. Fuser section

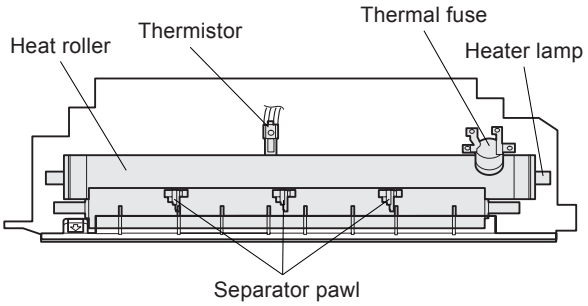


A. General description

General block diagram (cross section)



Top view



(1) Heat roller

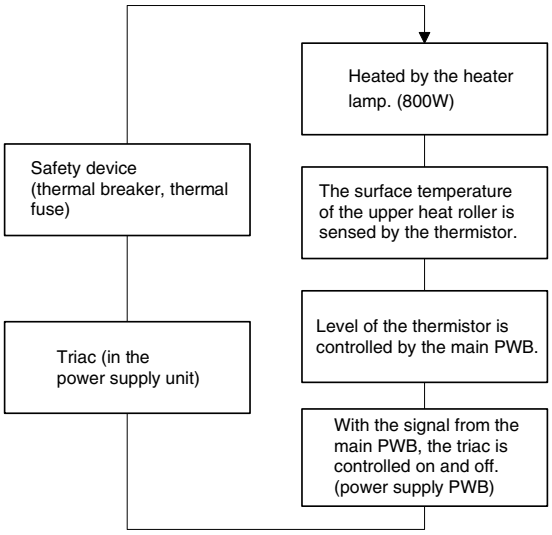
A Teflon roller is used for the heat roller and a silicone rubber roller is used for the lower heat roller for better toner fusing performance and paper separation.

(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

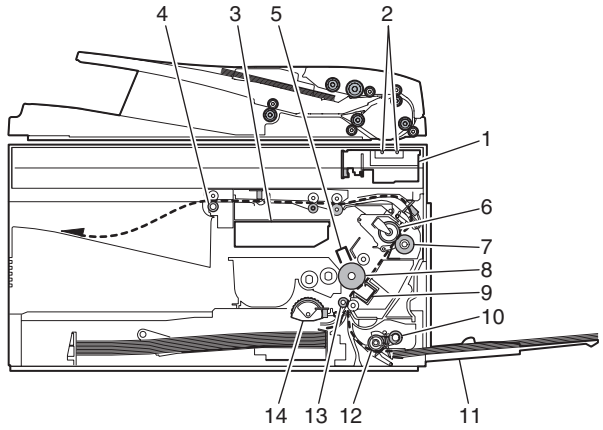
Fusing resistor

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

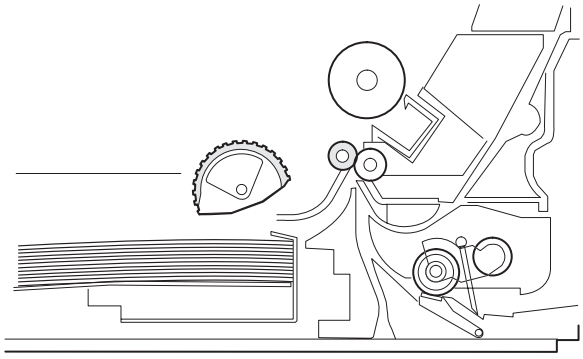
Paper feed is made in two ways; the tray paper feed and the manual paper feed. The tray is of universal-type, and has the capacity of 250 sheets.

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

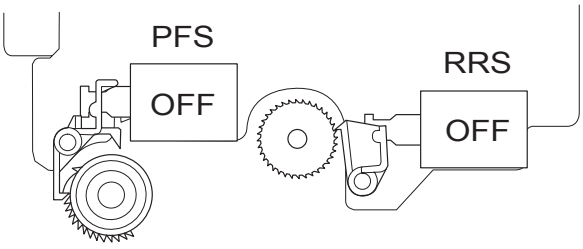
The general descriptions on the tray paper feed and the manual paper feed operation are given below.

(1) Cassette paper feed operation

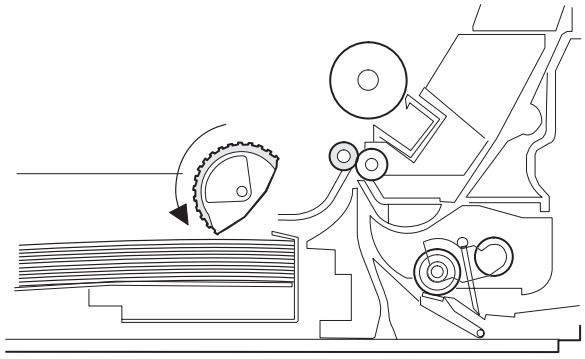
1) The figure below shows the positions of the pick-up roller, the paper feed clutch sleeve, and the paper feed latch in the initial state without pressing the COPY button after lighting the ready lamp.
The paper feed latch is in contact with the projection of the clutch sleeve.

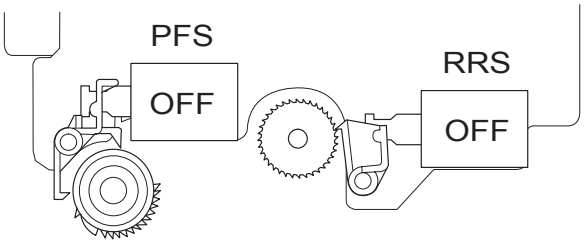


2) When the COPY button is pressed, the main drive motor starts rotating to drive each drive gear.
The pick-up drive gear also is driven at that time. Since, however, the paper feed latch is in contact with the projection of the clutch sleeve, rotation of the drive gear is not transmitted to the pick-up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



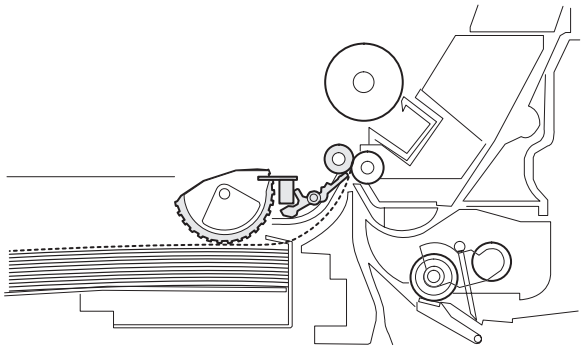
3) After about 0.1 sec from when the main motor start rotating, the tray paper feed solenoid (PFS) turns on for a moment.
This disengages the paper feed latch from the projection of the clutch sleeve, transmitting rotation of the pick-up drive gear to the paper feed roller shaft, rotating the pick-up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

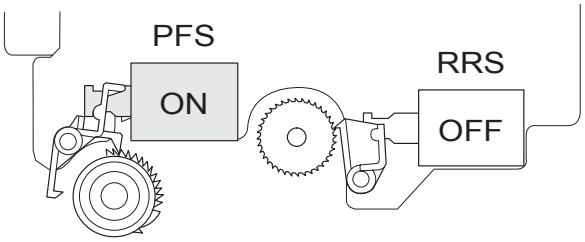




4) After more than half rotation of the pick-up roller, the paper feed latch is brought in contact with a notch on the clutch sleeve, stopping rotation of the pick-up roller.

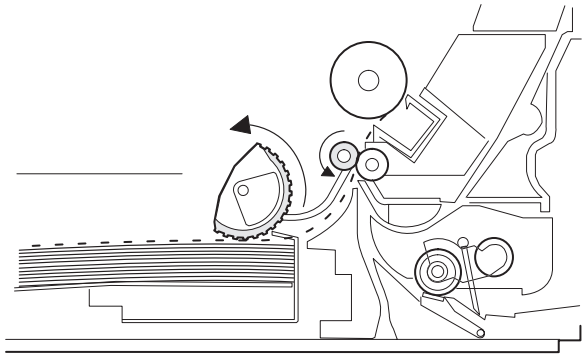
5) At this time, the paper is fed passed the paper entry detection switch (PPD1), and detected by it. After about 0.15 sec from detection of paper by PPD1, the tray paper feed solenoid (PFS) turns on so that the clutch sleeve projection comes into contact with the paper feed latch to stop the pick-up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

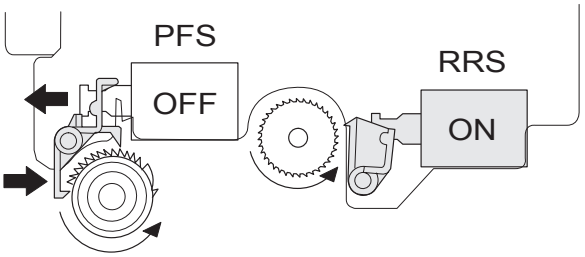




6) To release the resist roller, the tray paper feed solenoid and the resist solenoid are turned on by the paper start signal to disengage the resist start latch from the clutch sleeve, transmitting rotation of the resist drive gear to the resist roller shaft. Thus the paper is transported by the resist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

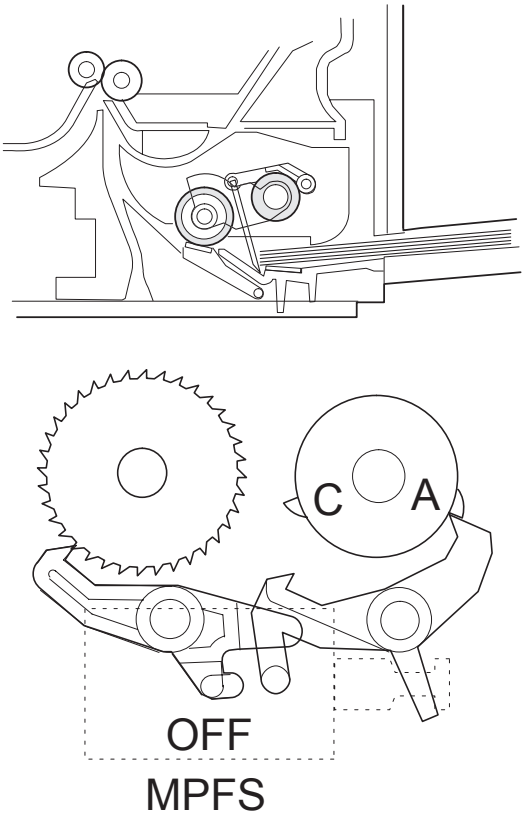




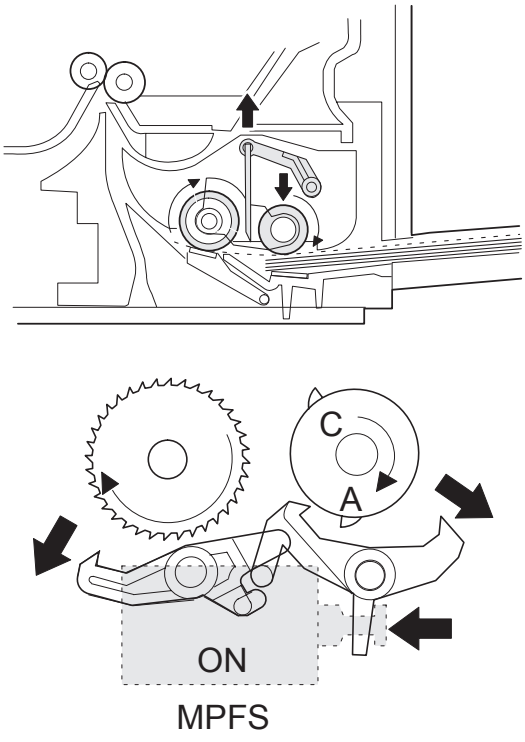
8) The paper separated from the drum is passed through the fusing paper guide, the heat roller (fusing section), POD (paper out detector) to the copy tray.

(2) Manual multi paper feed operation

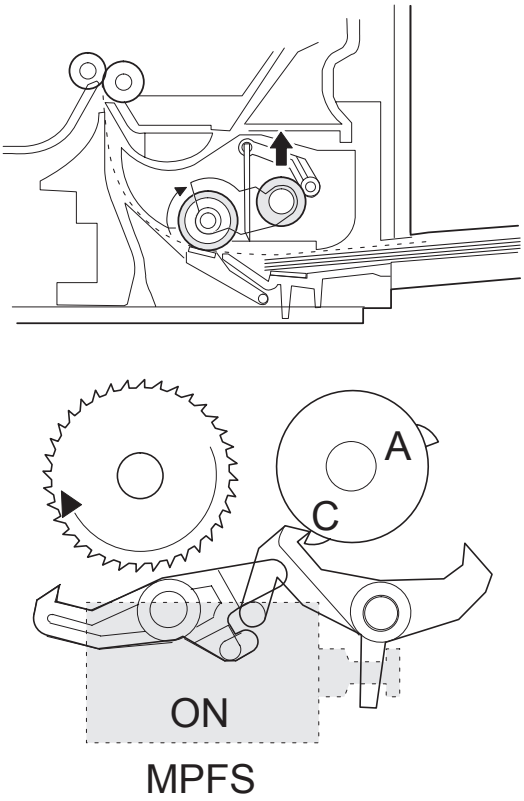
1) Before paper feed operation, the manual paper feed solenoid (MPFS) is turned OFF as shown in the figure below.



2) When the PRINT button 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.

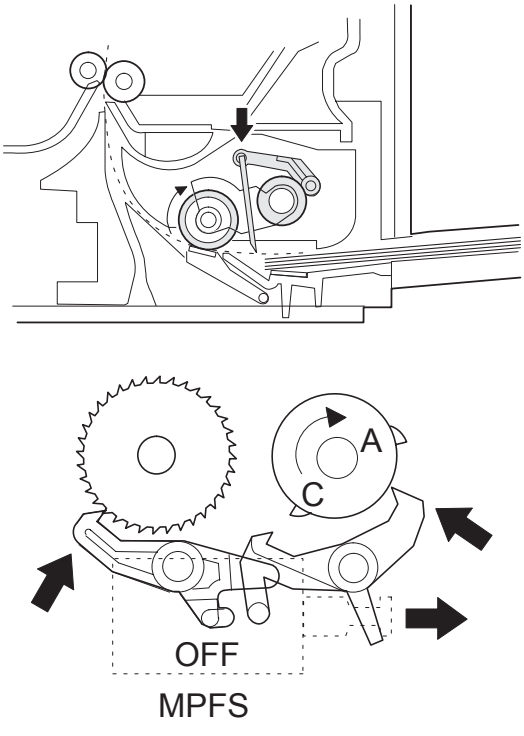


3) When pawl C of the manual paper feed clutch sleeve is engaged with the manual feed latch, the manual feed stopper falls and the manual take-up roller rises. At that time, the manual paper feed roller is rotating.



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 A-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

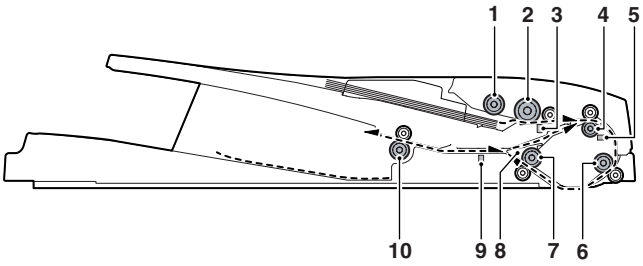
a	PPD1 jam	PPD1 does not turn off within 4 sec after turning on the resist roller.
b	PPD2 jam	PPD2 is off immediately after turning on the resist roller.
		PPD2 does not turn off within 1.2 sec after turning off the resist roller.
c	POD jam	POD does not turn on within 2.9 sec after turning on the resist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

6. RADF section

A. Outline

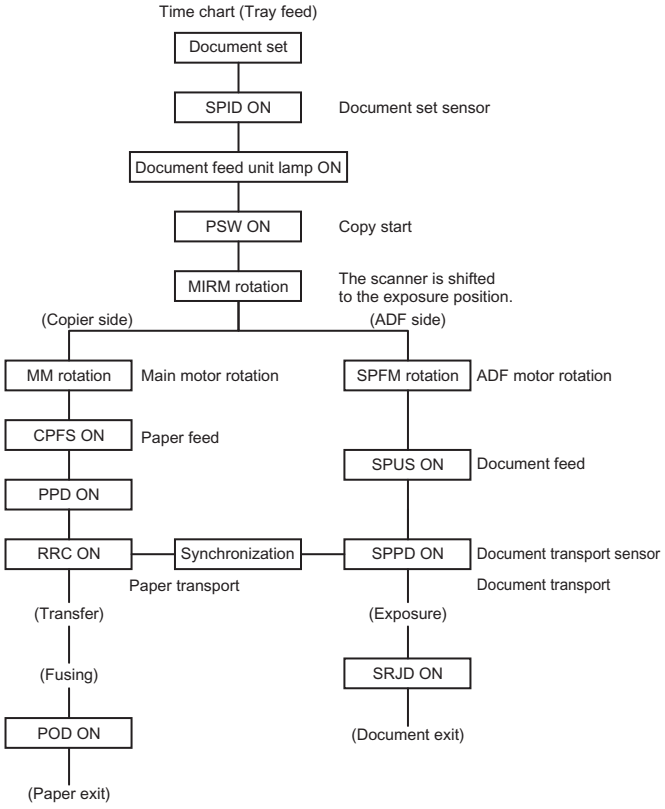
The RADF (Reversing Automatic Document Feeder) is installed to the e-STUDIO203SD / e-STUDIO203S as a standard provision, and it automatically copies up to 50 sheets of documents of a same size. (Only one set of copies)

B. Document transport path and basic composition

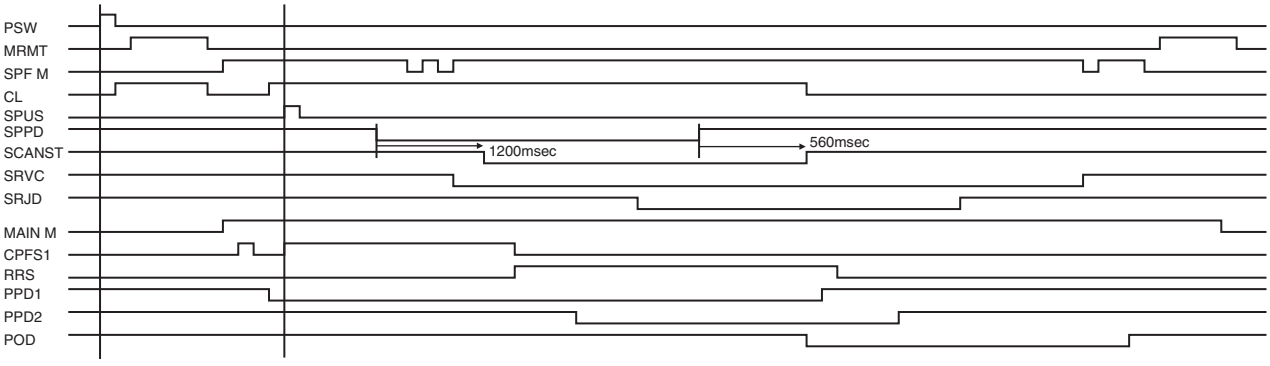


1	Pickup roller	2	Separation roller
3	Paper empty sensor	4	Upper transport roller
5	Paper sensor	6	PS roller
7	Lower transport roller	8	Reverse self-weight gate
9	Paper exit sensor	10	Paper exit roller

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.

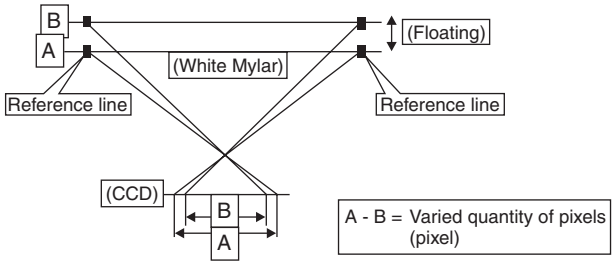


D. Cases where a document jam is caused

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 RADF 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)

E. RADF open/close detection (book document detection)

RADF 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 TC41-06.

If TC41-06 is not executed, the carriage unit may not read the reference line on the white Mylar, preventing the document from being fed.

7. D-D (Duplex to Duplex) mode paper/ document transport (Duplex model)

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:

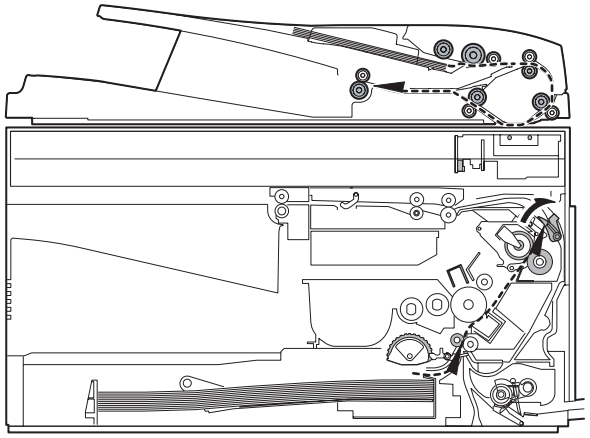
The document feed roller feeds the document from the paper feed roller to the PS roller.

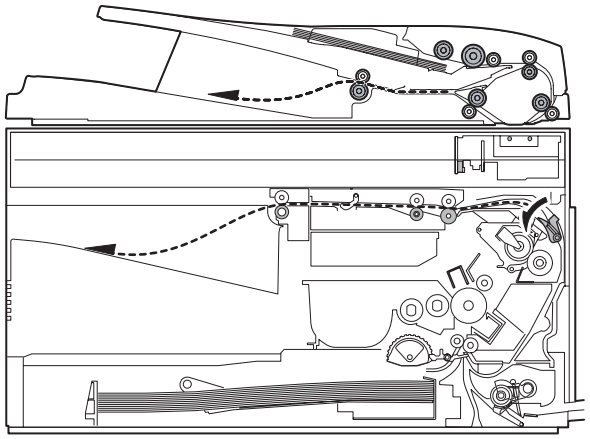
- The document is exposed in the exposure section, and transported to the document exit section by the lower transport roller and the paper exit roller.
- The document is transported to the paper exit tray. (However, it is not discharged completely.)
- The document is stopped once, and then switchback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

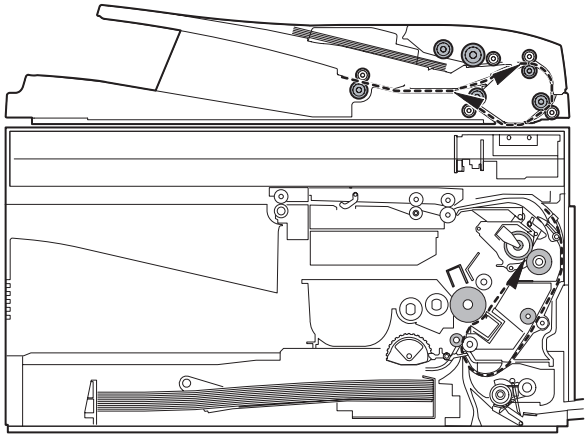
By switchback operation, the document is sent through the upper transport roller and the PS roller to the exposure section, where the back surface of the document is exposed.

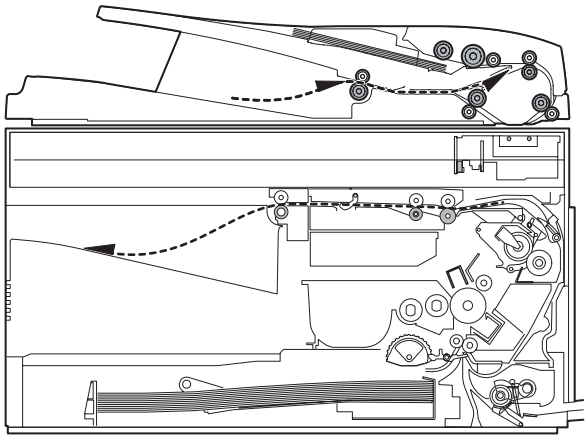
- The document is sent to the document exit section by the lower transport roller and the paper exit roller.
- The document is sent to the intermediate tray. (However, it is not discharged completely.)
- The document is stopped once, and switchback operation is performed.
- The document is sent through 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.





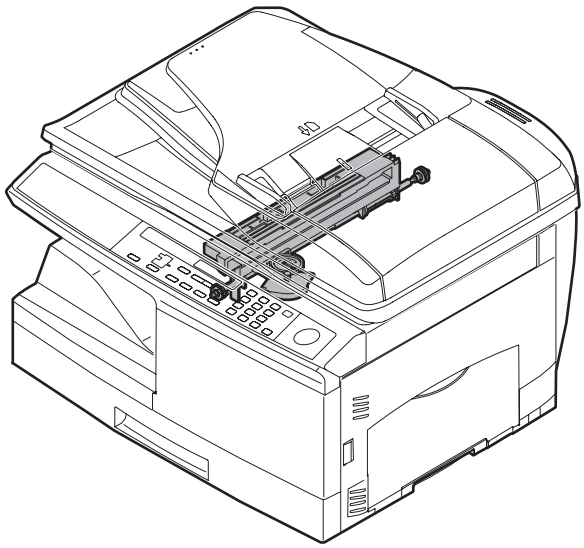
Rotation copy mode:

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.

8. Shifter



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 during the machine is powered. Especially be careful not to disconnect or connect the harness between the MCU PWB and the LSU (MCU PWB: CN20) 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. DV unit section
10. Duplex motor section (e-STUDIO203SD only)
11. Reverse roller section (e-STUDIO203SD only)
12. RADF section

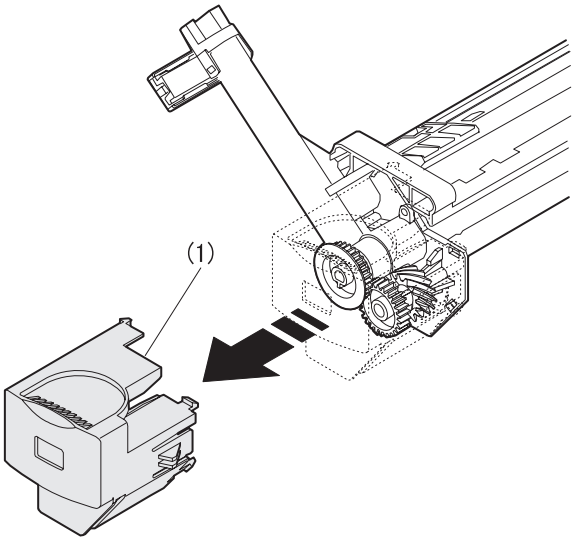
1. High voltage section

A. List

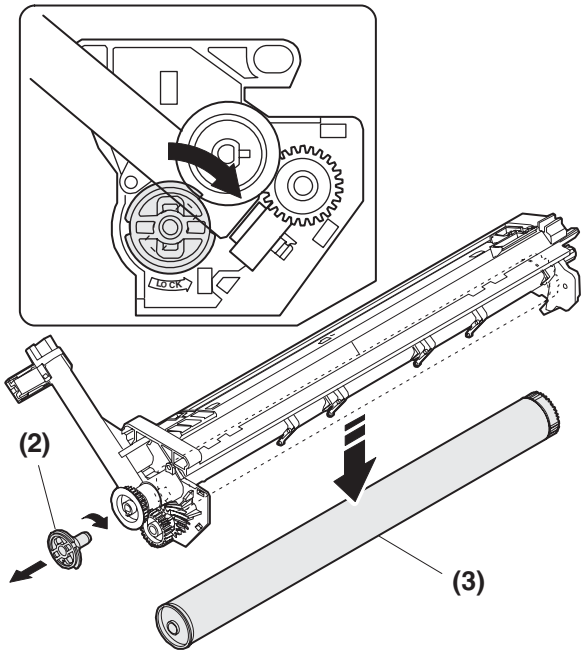
No.	Part name Ref.
1	Drum
2	Transfer charger unit
3	Charger wire

B. Drum replacement

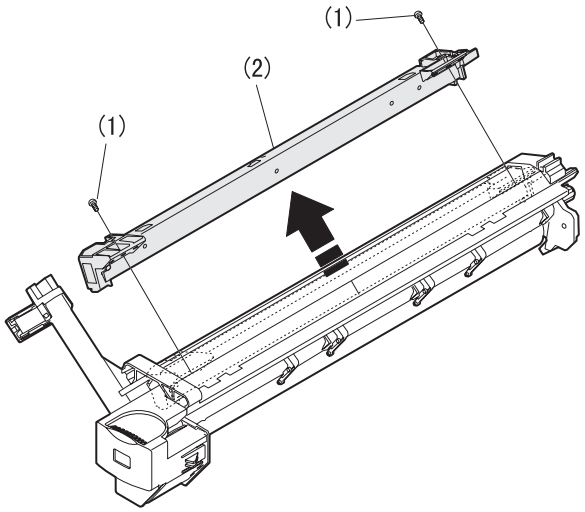
1) Remove the drum cover. (4 Lock Tabs)



2) Remove the drum fixing plate and the photoconductor drum.
(Note) Dispose the drum fixing plate which was removed.



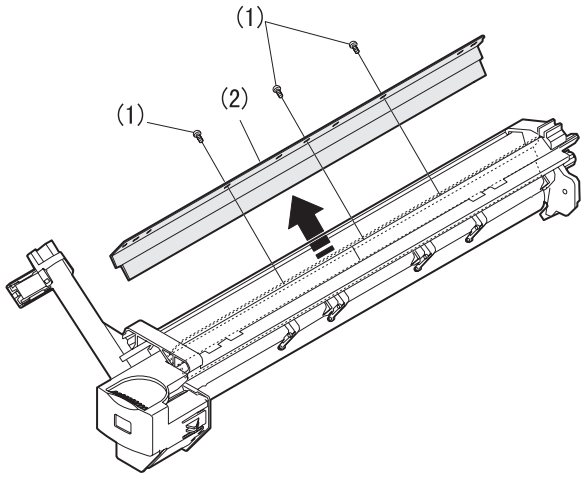
3) Check the cleaning blade and the red felt for no damage.
   - If there is any damage, execute all procedures from item 5) and later.
   - If there is no damage, execute the procedure of item 12).
4) Remove the main charger.
(When uneven charging occurs, clean the screen grid and the sawteeth with an air blower.)



5) Remove the cleaning blade.

Note: Dispose the cleaning blade which was removed.

If a cleaning error occurs, replace the cleaning blade. (Recommendable replacement cycle: Every 25K)



6) Clean the cleaning section and the waste toner pipe to remove waste toner completely with a vacuum cleaner.

7) Remove the felt and duplex tape completely.

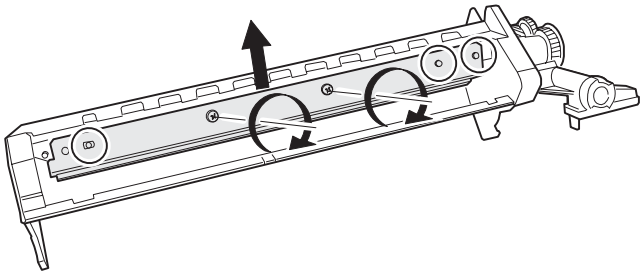
Note: Be careful not to scratch or bend the sub blade.

8) Attach the cleaning blade.

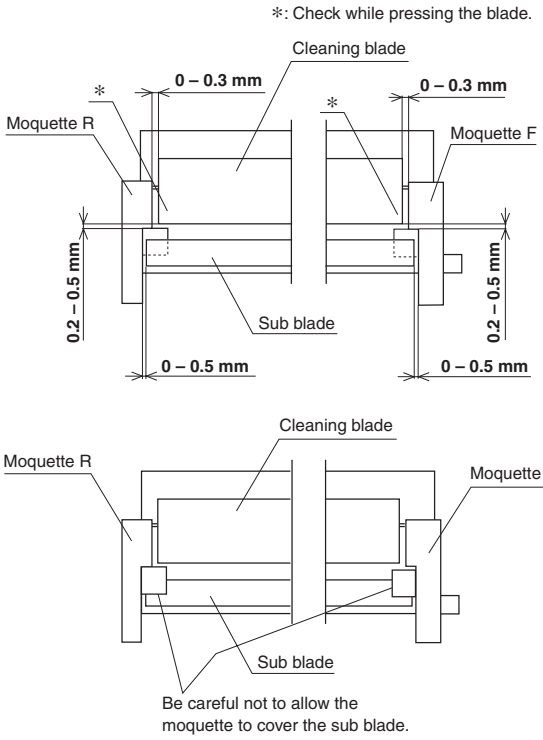
Securely insert the plate section of the cleaning blade into the unit and fix it with a screw.

Do not touch the cleaning blade rubber with your hand.

When attaching the cleaning blade, press the cleaning blade in the arrow direction and attach.



9) Attach the felt.



Example of NG

Attach the mocket with slightly pressing section A of the cleaning blade.

Do not touch the tip of the cleaning blade.

Do not put the mocket under the cleaning blade.

Do not put the mocket on the sub blade.

Do not press the sub blade with the mocket.

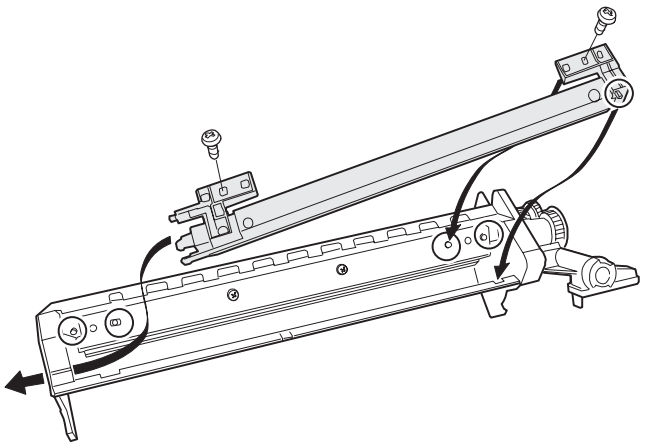
If the moquette F/R is deformed or damaged, replace it. (Recommendable replacement cycle: Every 25K)

10) Attach the main charger.

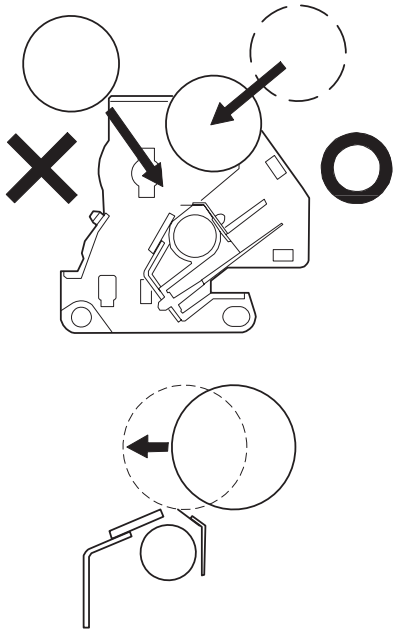
Securely set the MC holder on the projection of the process frame.

Securely insert two projections of the MC holder into the groove in the process frame.

When attaching the MC holder ass'y, be careful not to make contact with the cleaning blade.



11) Attach the drum fixing plate and the photoconductor drum.
Apply grease to the inside of the photoconductor drum. (Dia. 2)



Attach the drum from (b). (Prevention against the sub blade edge breakage)

Attach the drum so that its position with the sub blade is as shown.

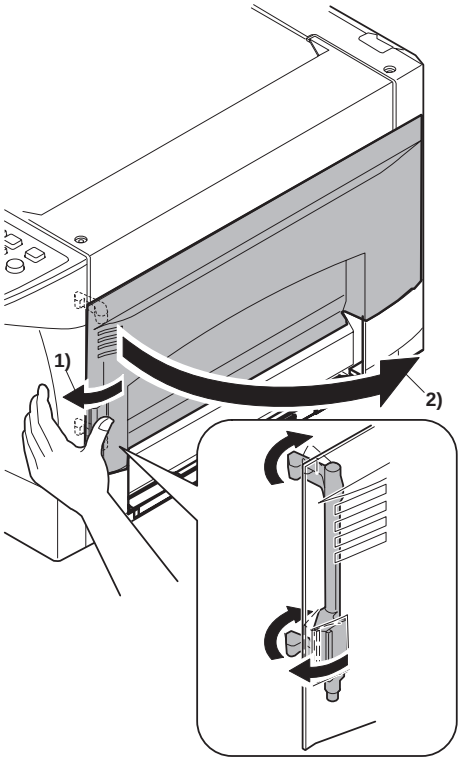
12) Attach the drum cover.

Note: After attaching the drum cover, do not make a copy.
When attaching the drum cover, engage the detection gear 20T rib with the 30T gear rib, and attach the drum cover to the process frame.

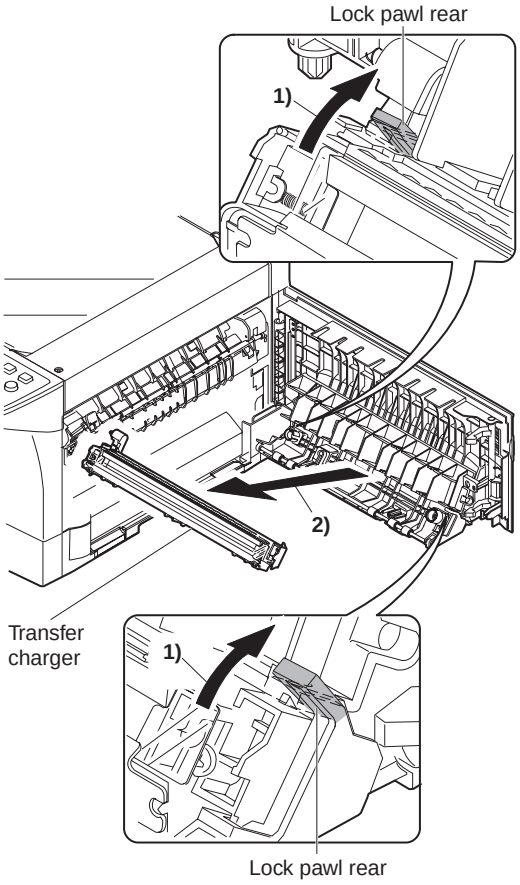
13) Insert the process unit into the machine until it is fully engaged.

C. Disassembly procedure (Transfer charger unit)

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.

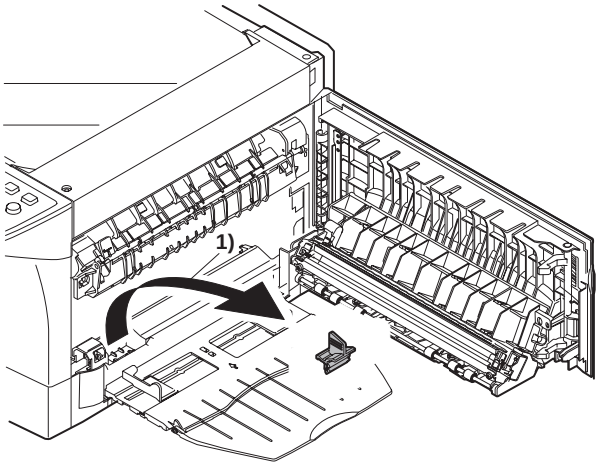


D. Assembly procedure

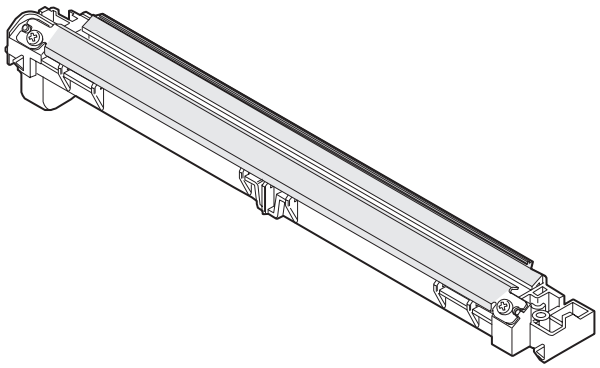
For assembly, reverse the disassembly procedure.

E. TC unit cleaning

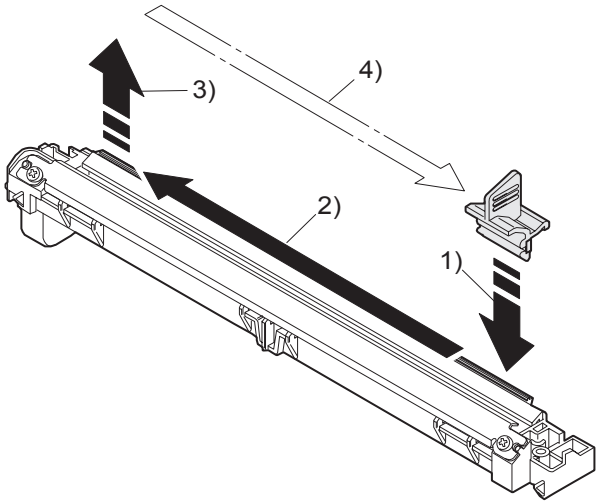
1) Remove the charger cleaner from the manual paper feed unit.



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.



F. 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.

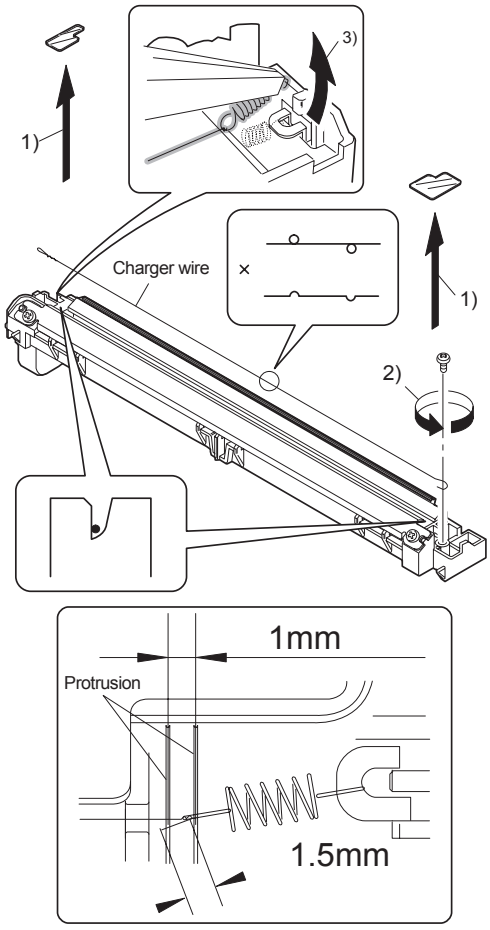


Fig.1

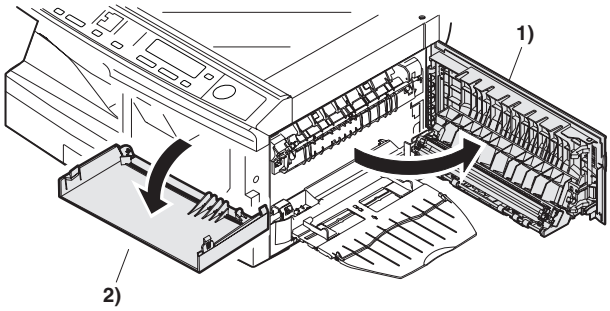
2. Operation panel section

A. List

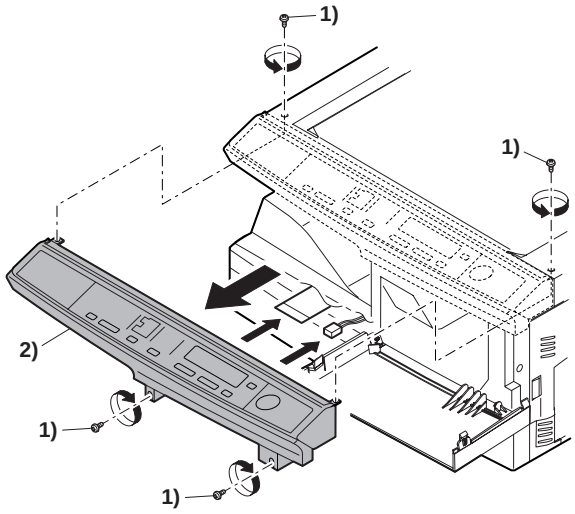
No.	Part name Ref.
1	Operation panel unit
2	Operation PWB

B. Disassembly procedure

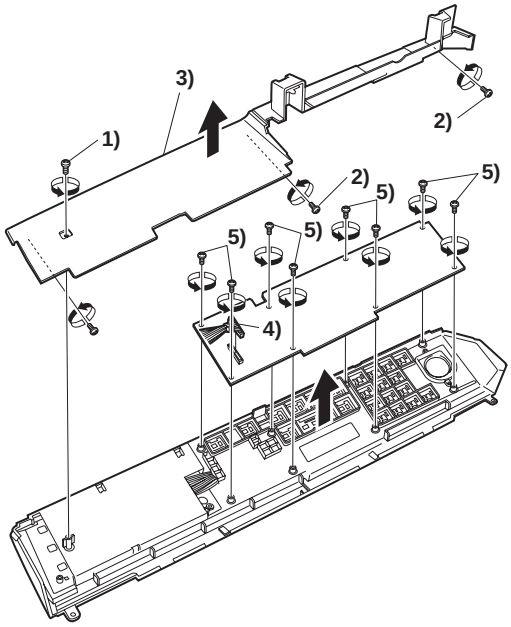
1) Open the side door, and Open the front cover.



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



3) Remove four screws, and remove the operation cabinet.
4) Disconnect the connector.
5) Remove eight screws, and remove the operation PWB.



C. Assembly procedure

For assembly, reverse the disassembly procedure

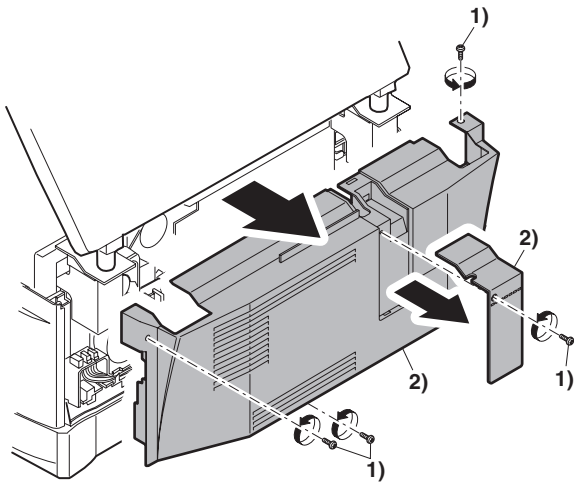
3. Optical section

A. List

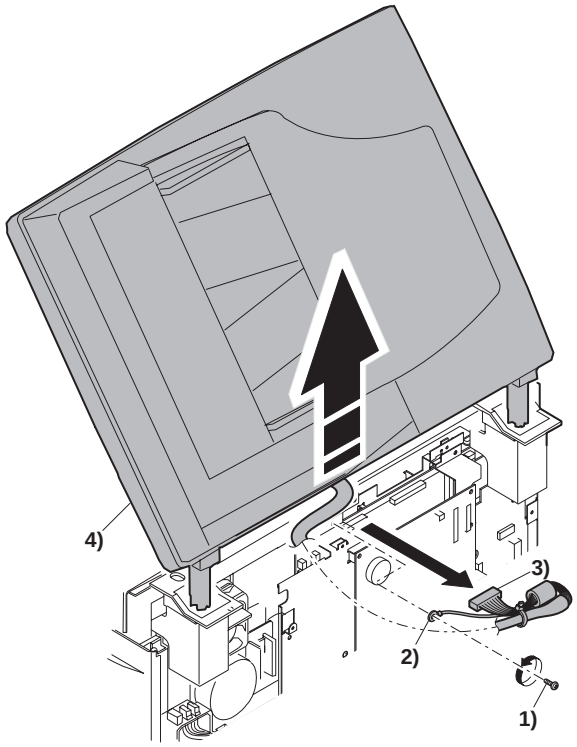
NO.	Part name Ref.
1	Copy lamp unit
2	Copy lamp
3	Lens unit

B. Disassembly procedure

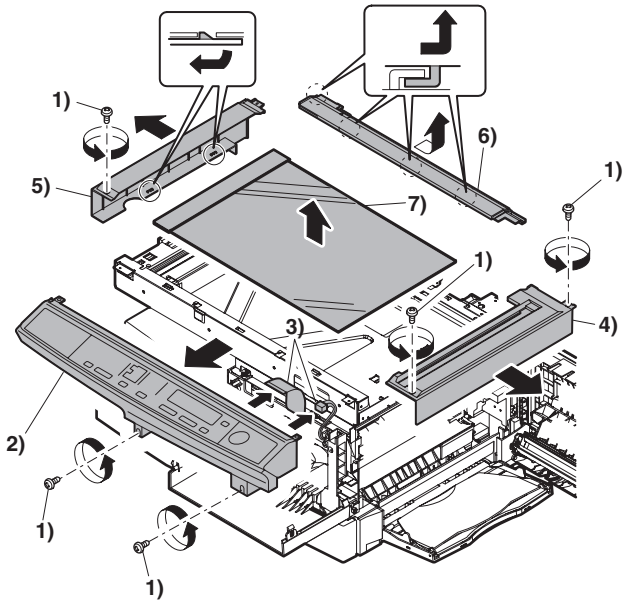
1) Remove four screws, and remove the rear cabinet and the rear cabinet cover.



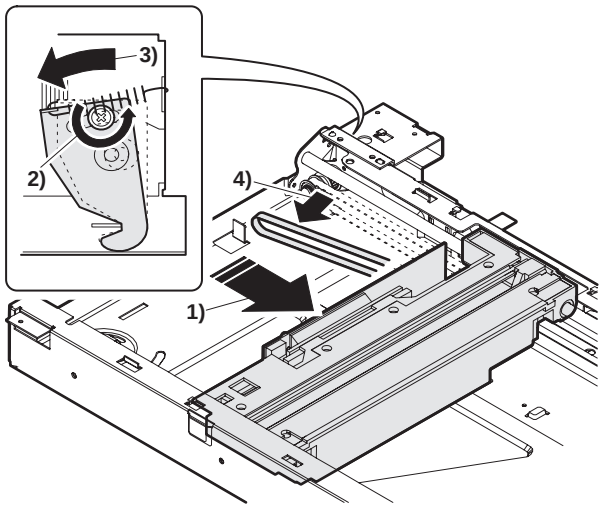
2) Remove the connector and the clamp, and remove the RADF unit.



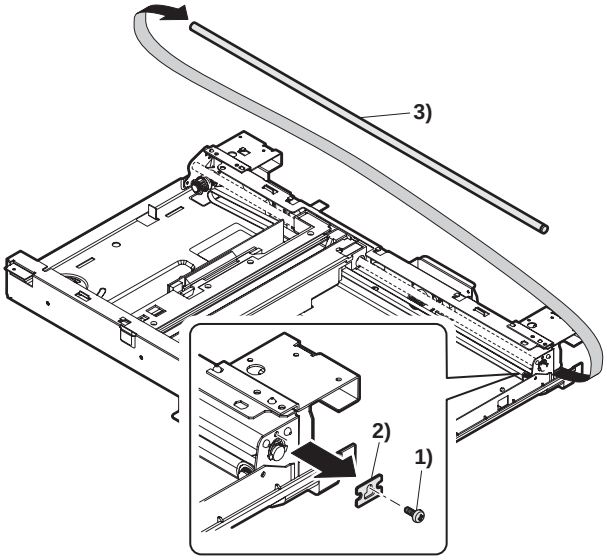
3) Remove five screws, remove the operation unit, and disconnect the connector.
4) Remove the right cabinet.
5) Remove the left cabinet.
6) Remove the rear cover.
7) Remove the table glass.



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



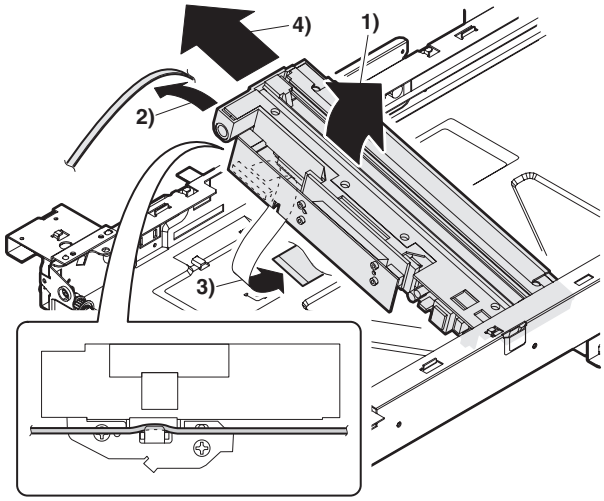
11) Remove the screw, and remove the rod stopper.
12) Remove the rod.



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

Note: When replacing the carriage unit, be sure to execute TC41-06.

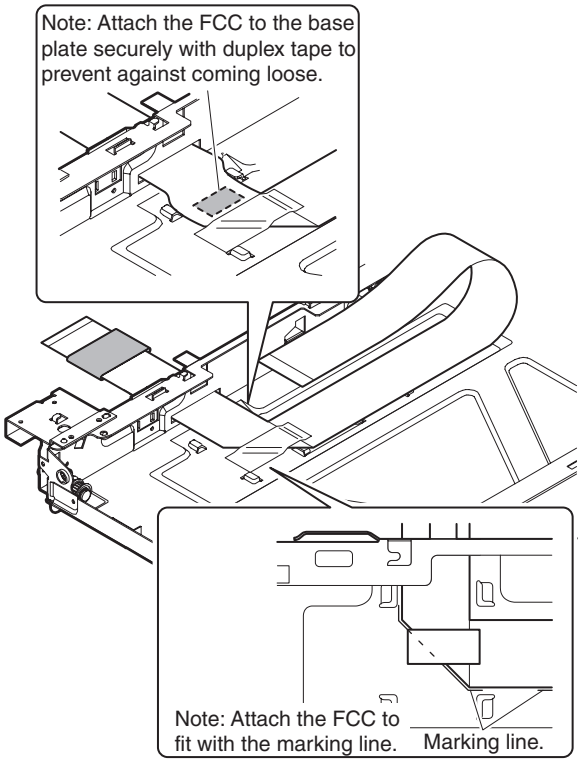
If TC41-06 is not executed, the carriage unit may not read the reference line on the white Mylar, preventing the document from being fed.

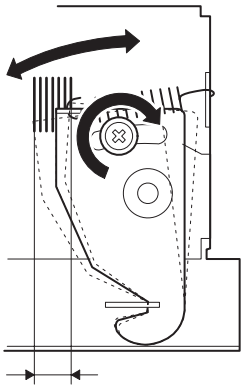


C. Assembly procedure

CCD core

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





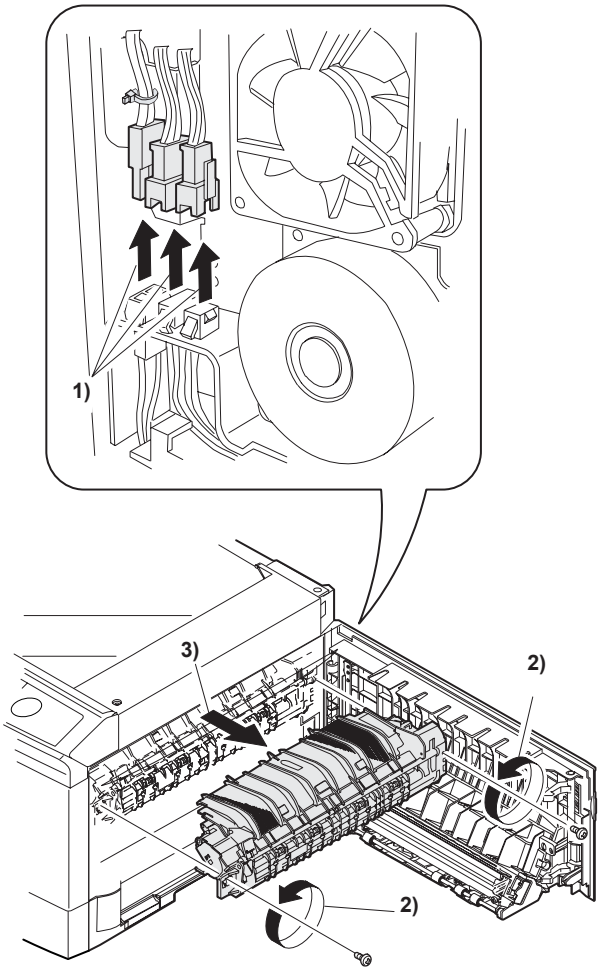
4. Fusing section

A. List

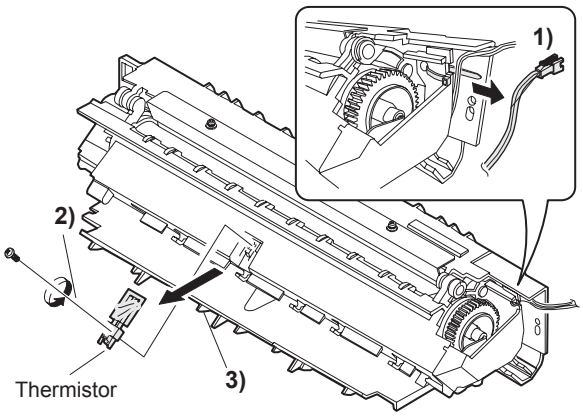
No.	Part name Ref.
1	Thermistor
2	PPD2 sensor
3	Heater lamp
4	Pressure roller
5	Heat roller

B. Disassembly procedure

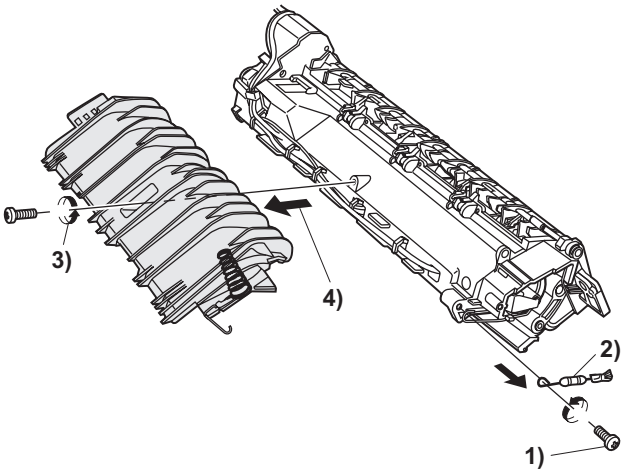
1) Remove the connectors (3 pcs.) of the rear cabinet.
2) Open the side cover, remove two screws, and remove the fusing unit.



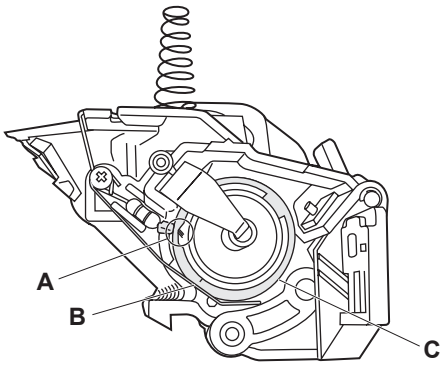
3) Cut the binding band, remove the screw, and remove the thermistor.



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

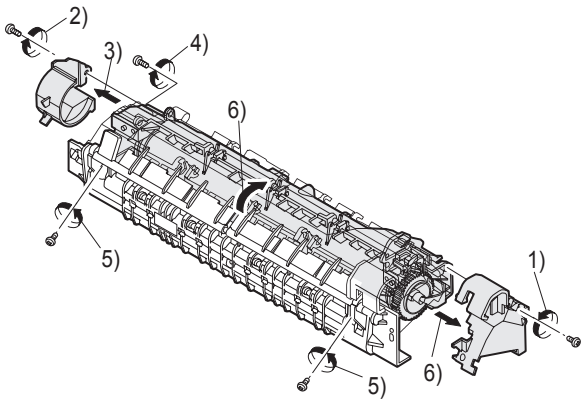


Note: When installing the resistor, check to confirm that the discharge brush section (A) is in contact with the upper heat roller.
Also check to confirm that the fusing lower earth spring (B) does not extend over the fusing bearing (C) after tightening the screw.

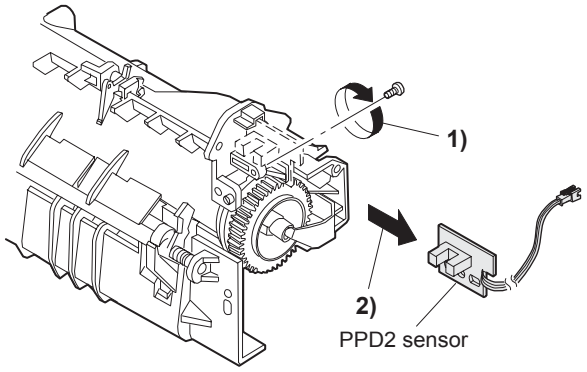


Pressure roller section disassembly

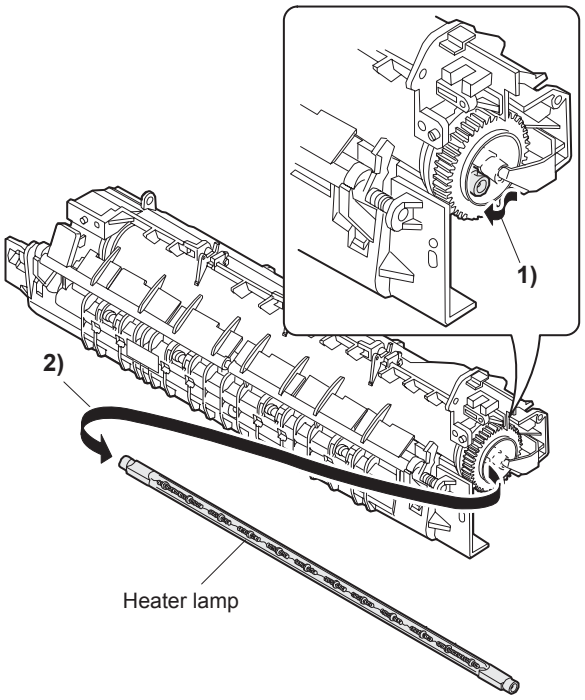
5) Remove three screws, remove the fusing cover lower on the right side, and open the heat roller section.



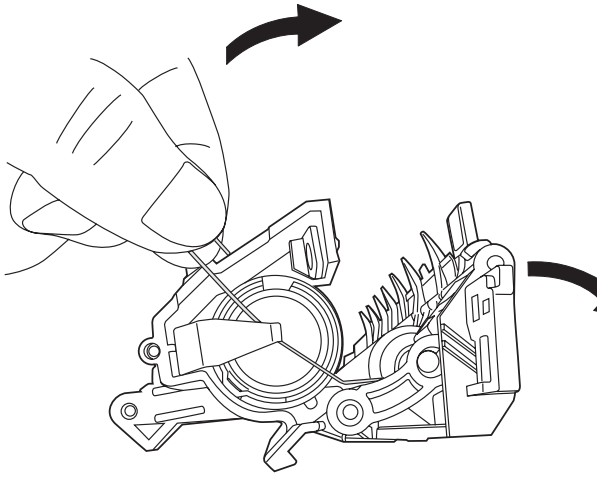
6) Remove the screw and remove the PPD2 sensor.



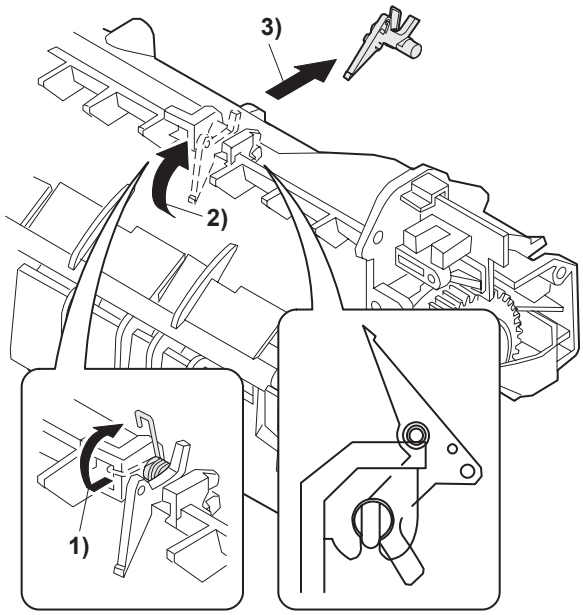
7) Remove the plate spring on the right and remove the heater lamp.



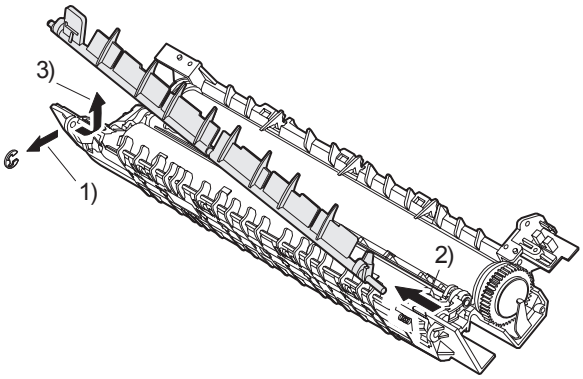
8) When opening the fusing unit, slide the fusing lower earth spring in the arrow direction, and open the unit.
If the fusing unit is opened without sliding the fusing lower earth spring, the fusing lower earth spring is deformed.
If the fusing lower earth spring is once deformed, the earth function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



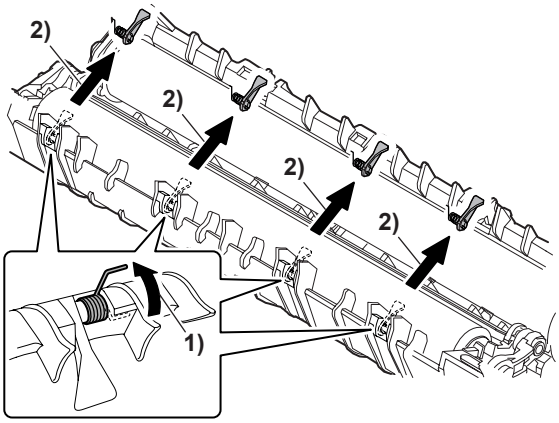
9) Remove the spring, and remove the upper separation pawls (3 pcs.).



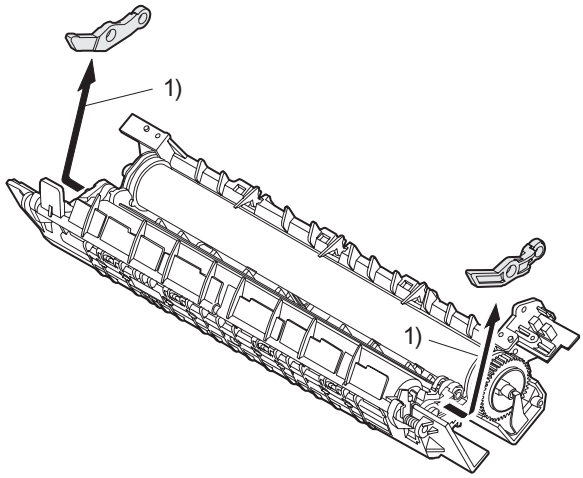
10) Remove the E-ring and remove the reverse gate.



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

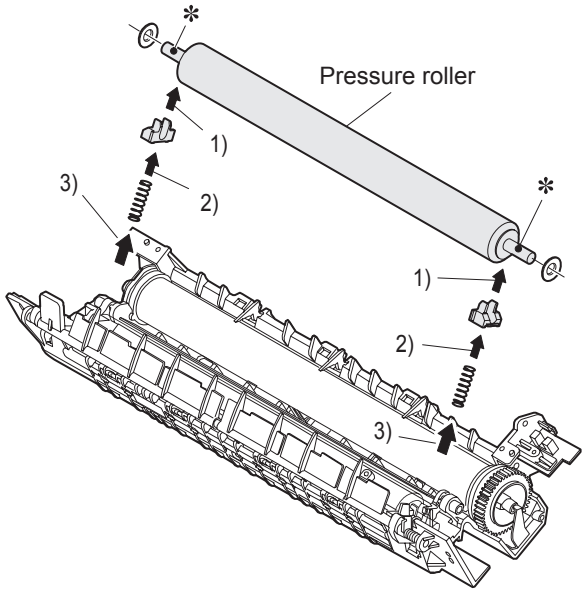


12) Remove the pressure release levers on the right and the left sides.



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

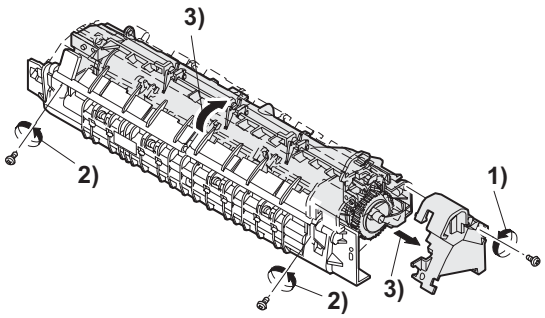
Note: Apply grease to the sections specified with an asterisk (∗).
Grease: "JFE552"



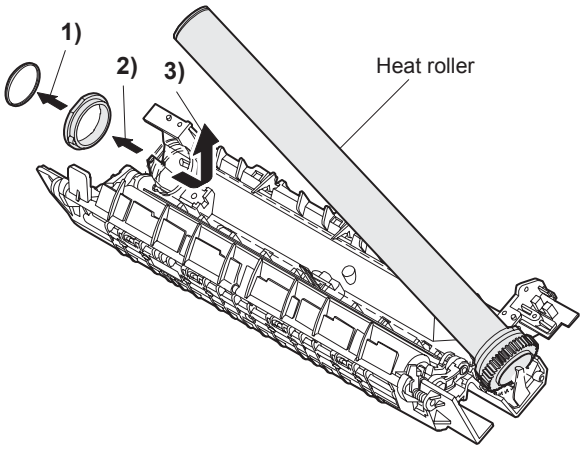
Heat roller disassembly

(Continued from procedure (4).)

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

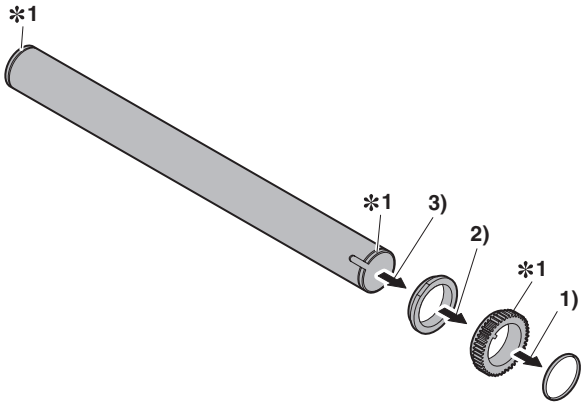


6) Remove the C-ring and the fusing bearing, and remove the heat roller.



7) Remove the parts from the heat roller.

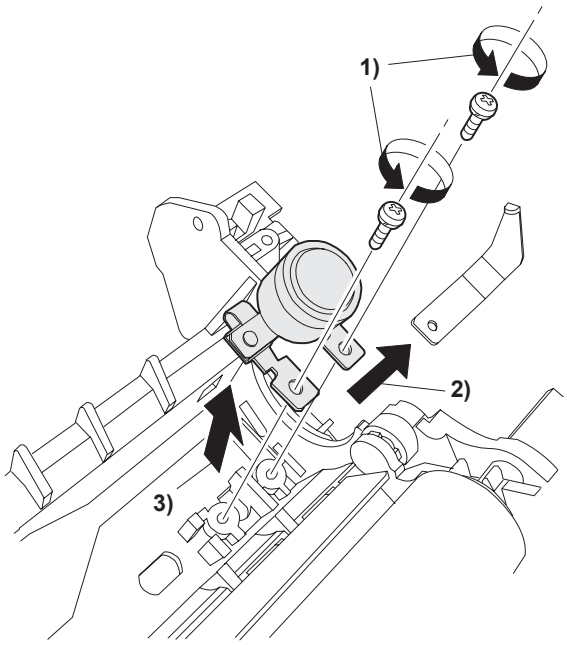
Note: Apply grease to the sections specified with ∗1.
Grease: "JFE552"



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
e-STUDIO203S/203SD	230°C



C. Assembly procedure

For assembly, reverse the disassembly procedure.

5. Tray paper feed/transport section

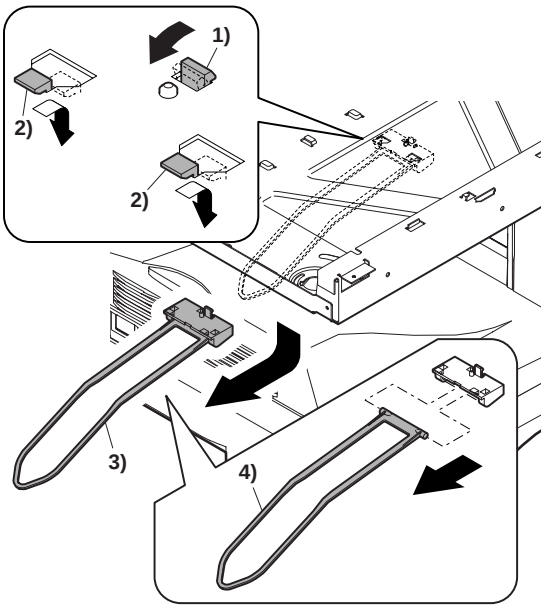
A. List

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

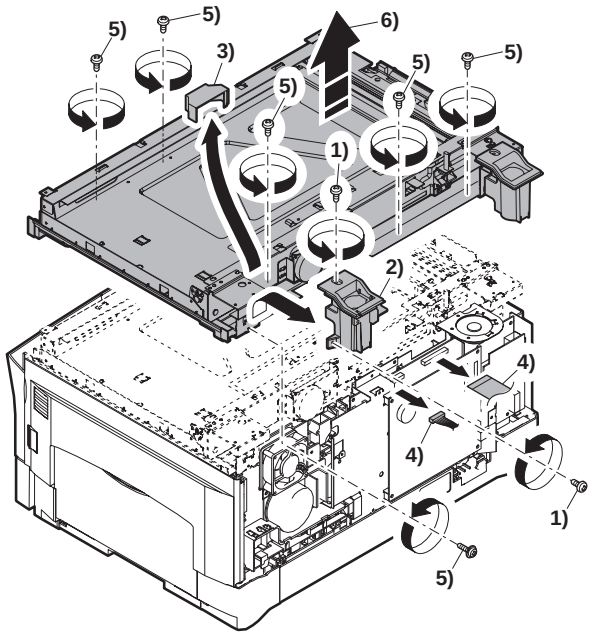
B. Disassembly procedure

1) Remove the paper holding arm.

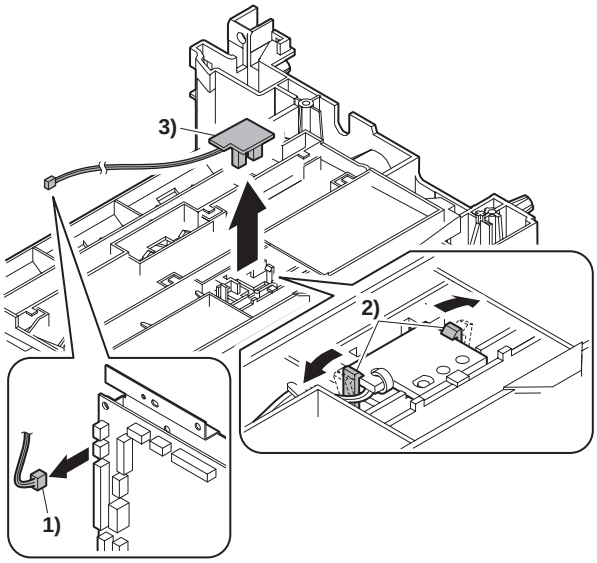
   Remove the arm holder from the main unit, and remove the holder from the arm.



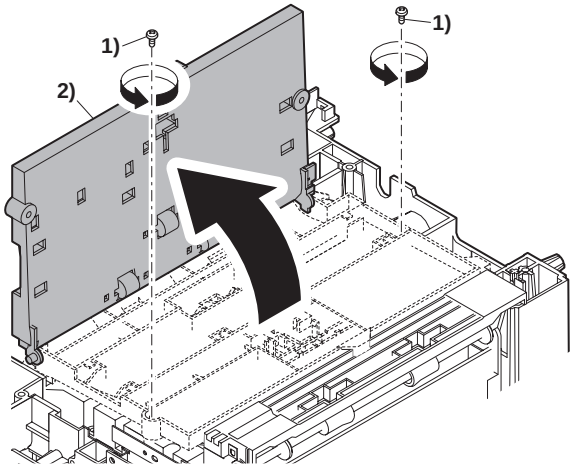
2) Remove two screws, and remove the hinge guide R.
3) Remove the fan duct and disconnect the connector. (2 positions)
4) Remove six screws, and remove the scanner unit.



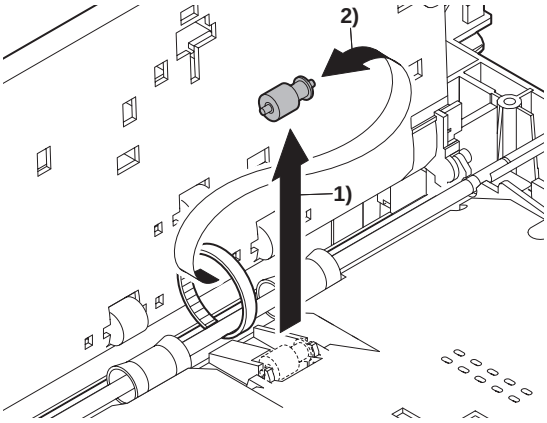
5) Disconnect the connector from the MCU PWB.
6) Disengage the pawls (2 positions), and remove the sensor PWB.



7) Remove the screw, and open the upper paper guide.

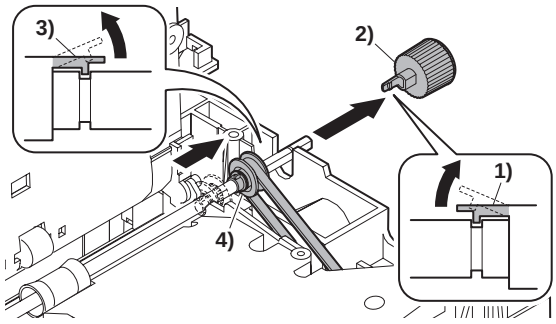


8) Remove the roller, and remove the belt.

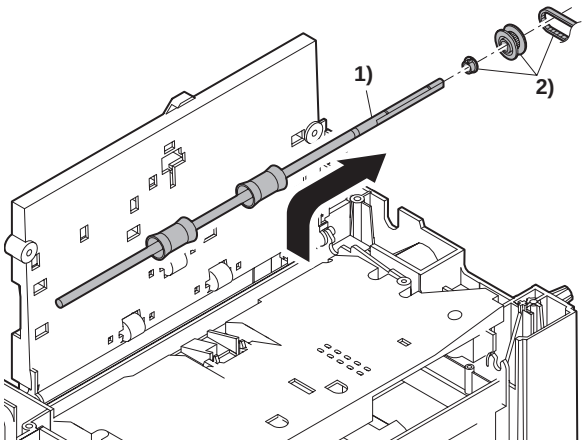


9) Disengage the pawl, and remove the roller knob.

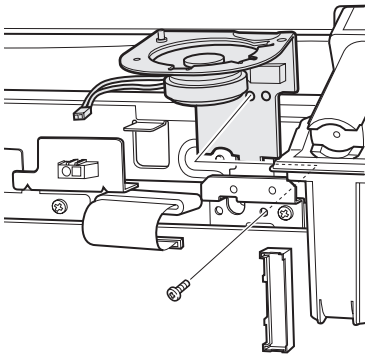
10) Disengage the pawl, and shift the pulley and the bearing.



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

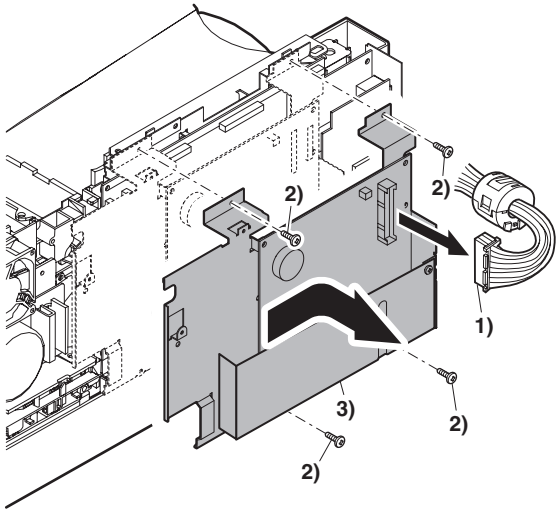


12) Remove the connector and the screw, and remove the speaker unit. (When the GD-1300 is installed)



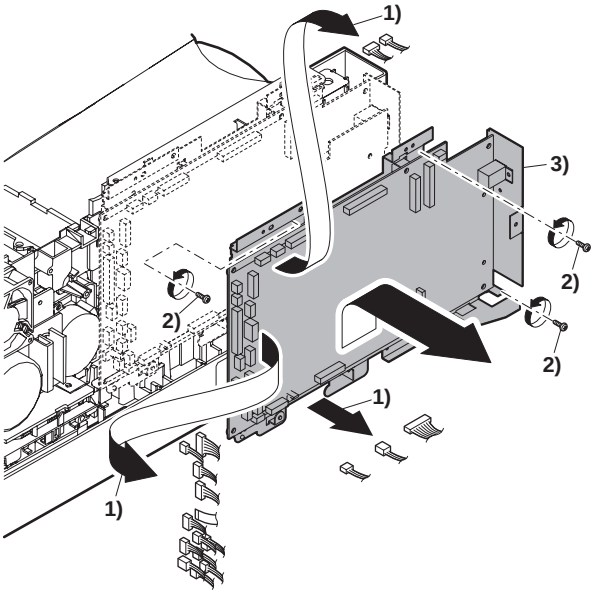
13) Remove the connector.

14) Remove four screws, and remove the FAX PWB unit. (When the GD-1300 is installed)

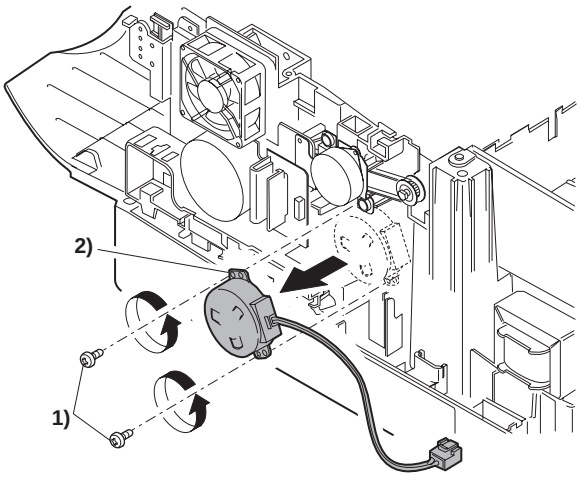


15) Disconnect the connectors.

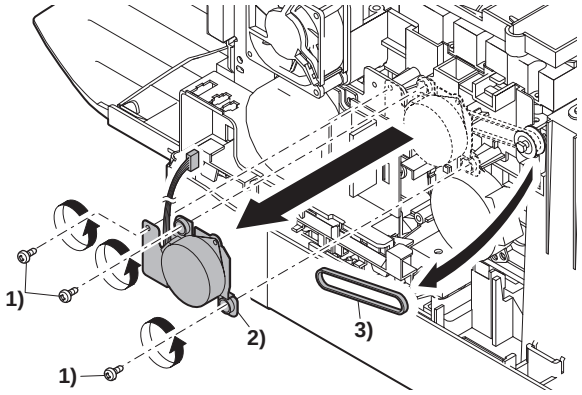
16) Remove three screws, and remove the MCU PWB.



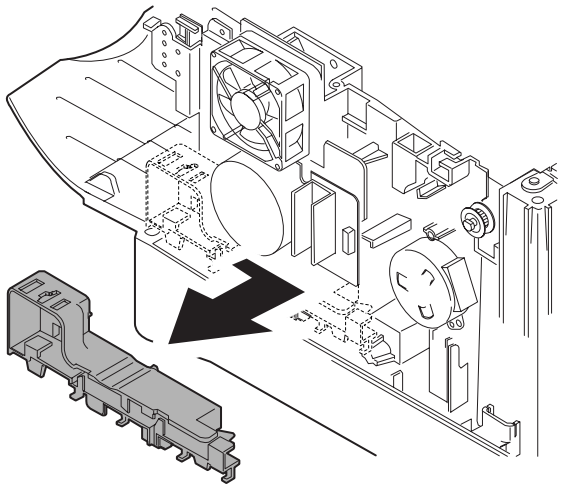
17) Remove two screws and remove the toner motor.



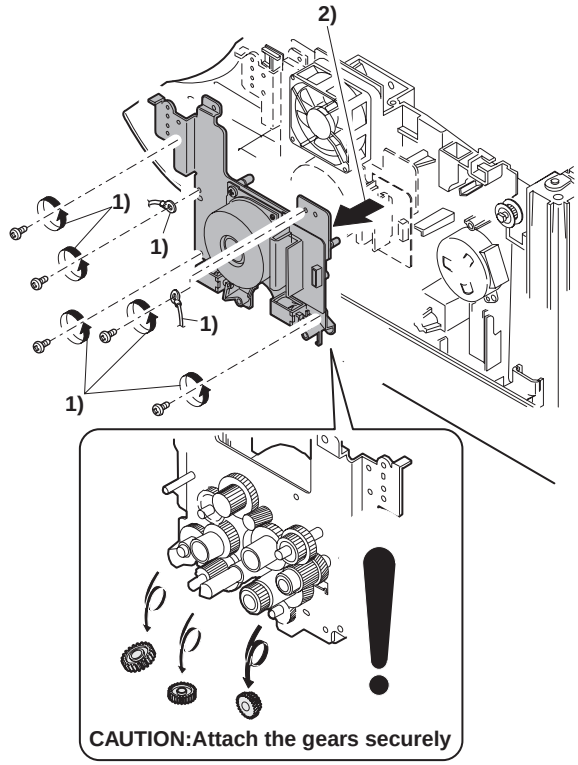
18) Remove three screws, and remove the DUP motor unit and the belt.



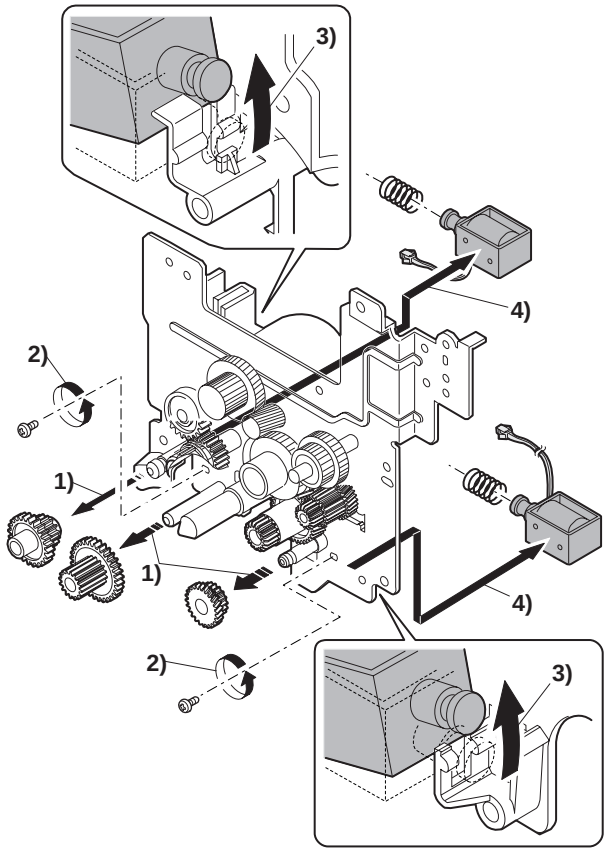
19) Remove the harness guide.



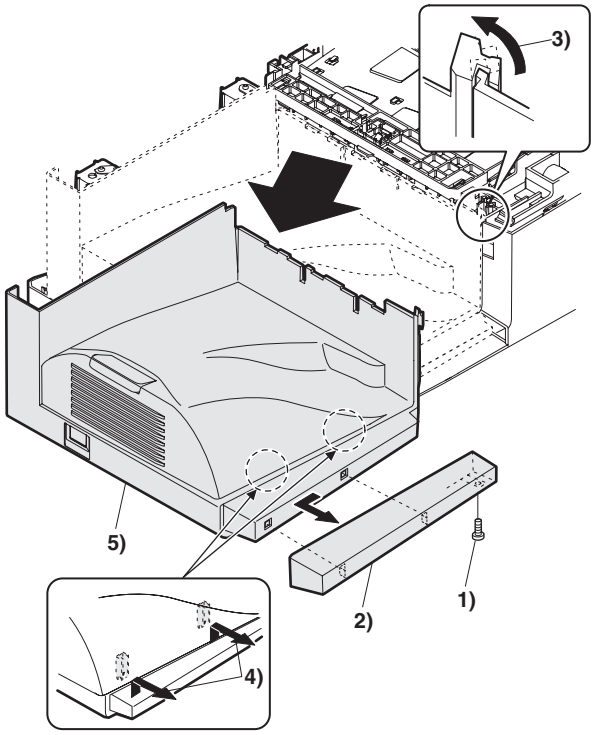
20) Remove five screws and the grounding wire, and remove the main drive unit.



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

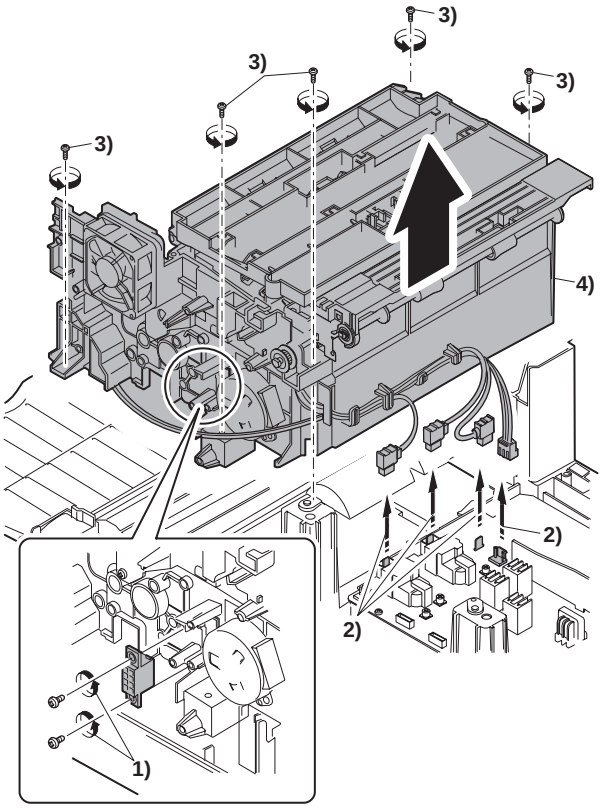


22) Remove the screw, slide the left cabinet to the left to detach it. Remove each pawl, and remove the paper exit tray.



23) Remove two screws and remove the fusing connector.

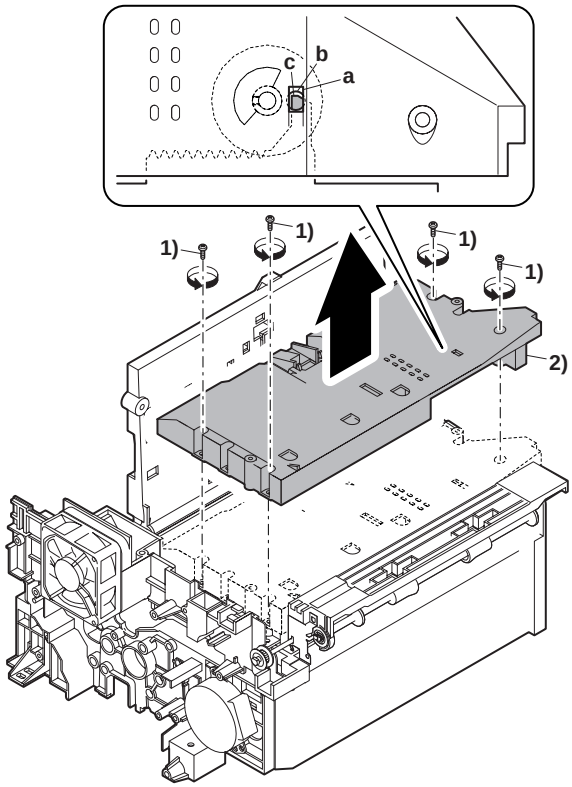
24) Remove five screws and the connector, and lift the intermediate frame unit to remove.



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

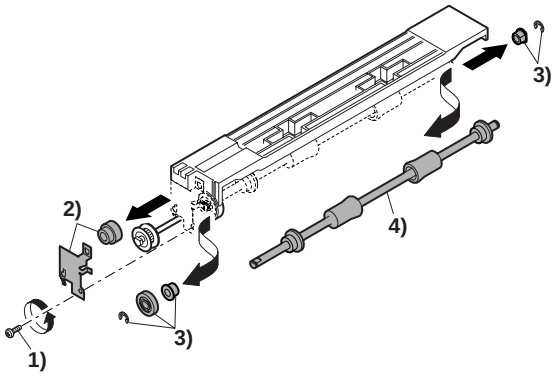
[Note for installation]

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.



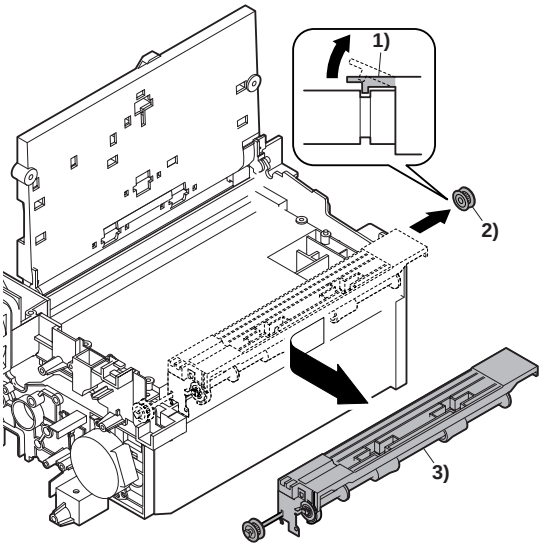
26) Disengage the pawl, and remove the pulley.

27) Shift and remove the shifter unit.

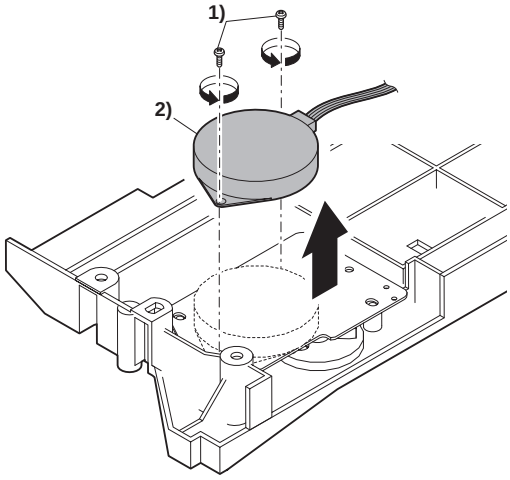


28) Remove the screw, and remove the grounding plate and the gear.

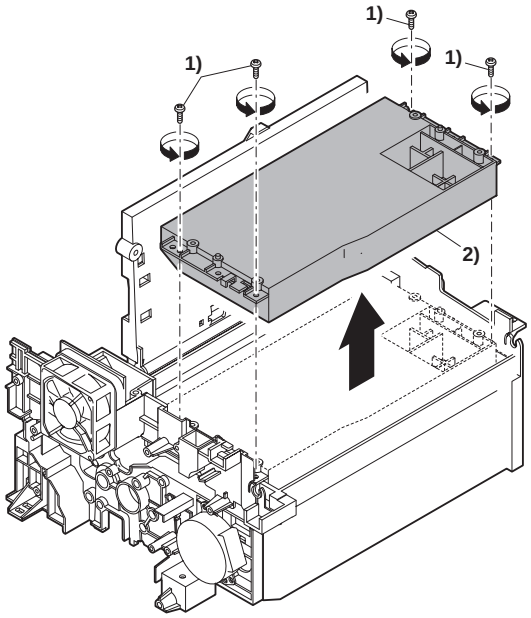
29) Remove the E-ring, the gear, and the bearing, and remove the shifter roller.



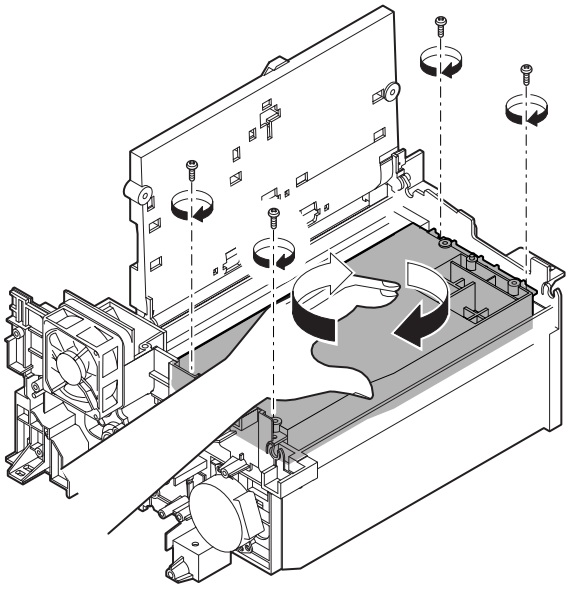
30) Put the lower paper guide unit upside down, remove two screws, and remove the shifter motor.



31) Remove four screws, and remove the LSU.

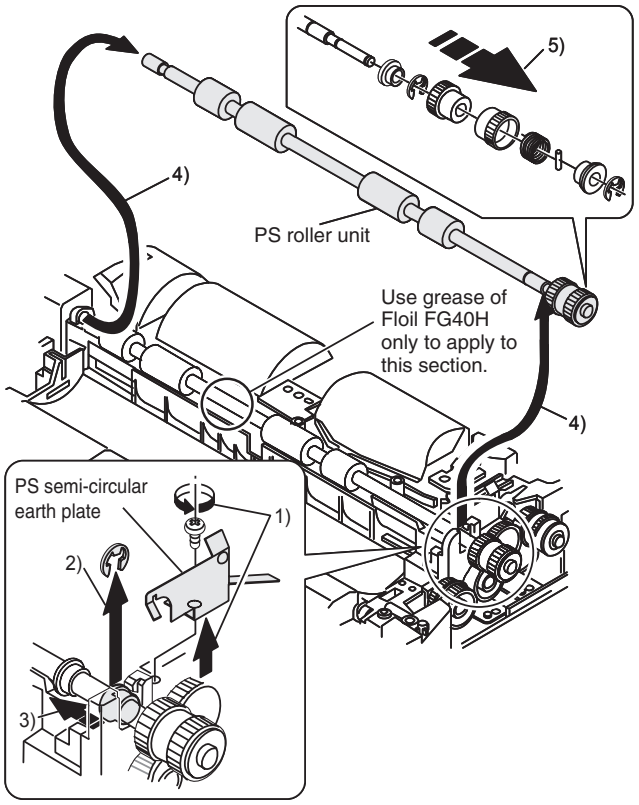


Note: When assembling, turn it to the right and attach.

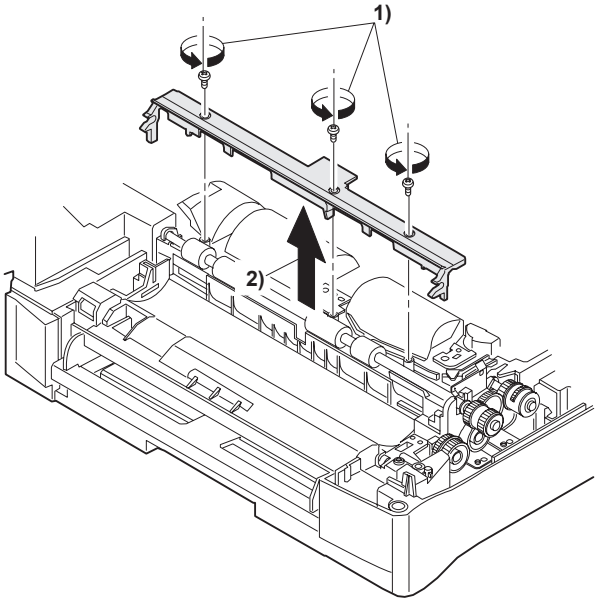


32) Remove the screw and the E-ring, and remove the PS semi-circular earth plate and the PS roller unit.

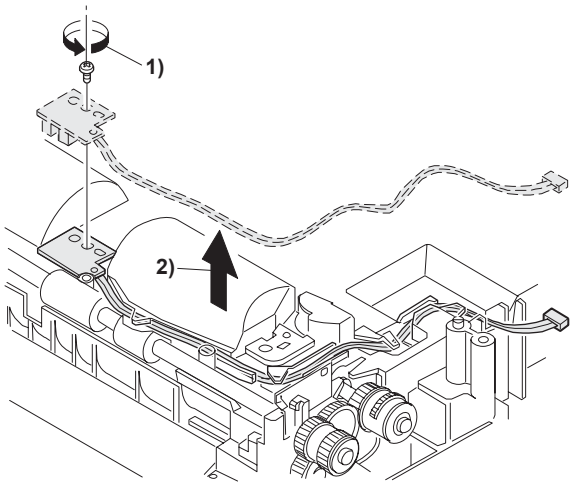
33) Remove the E-ring and remove the spring clutch from the PS roller unit.



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

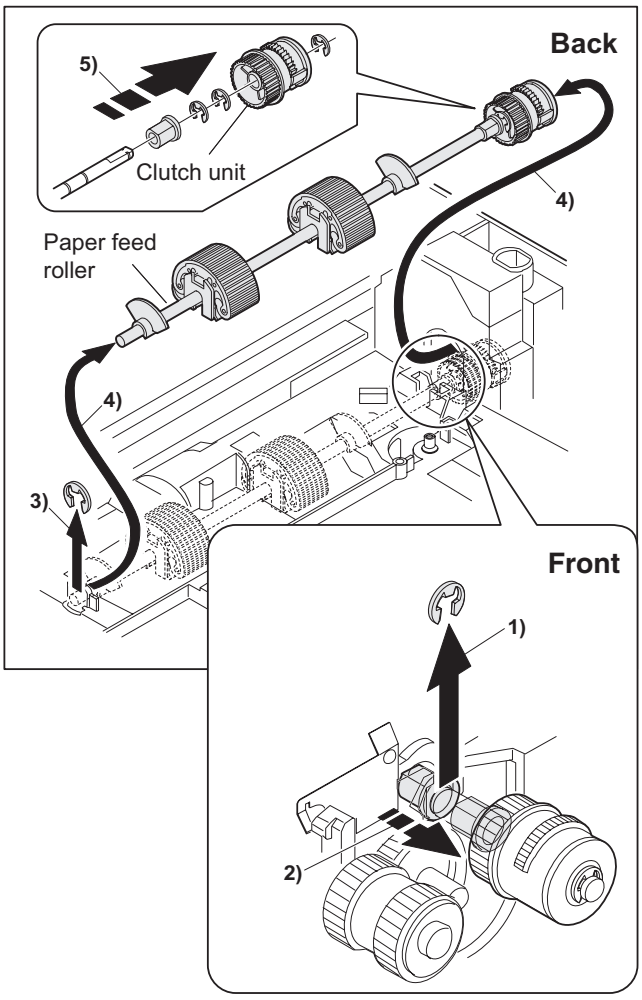


35) Remove the screw and the connector, and remove the PPD1 sensor PWB.



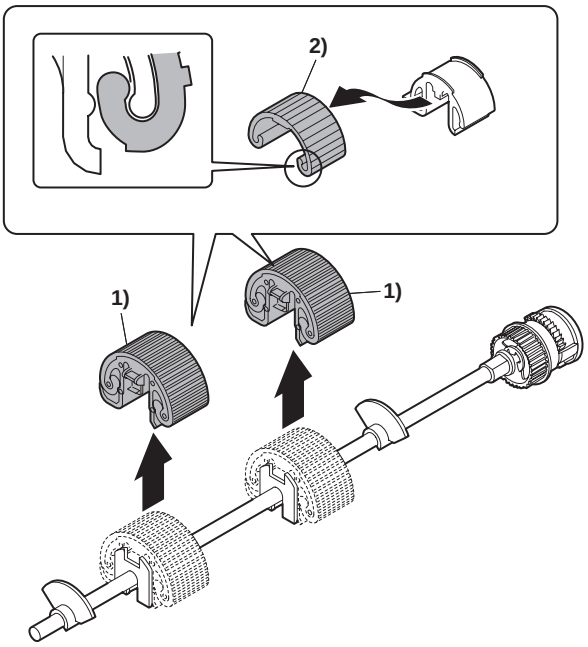
36) Remove two E-rings and remove the paper feed roller.

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



38) Remove the semi-circular roller unit.

39) Remove the semi-circular rubber.



C. Assembly procedure

For assembly, reverse the disassembly procedure.

6. Manual paper feed section

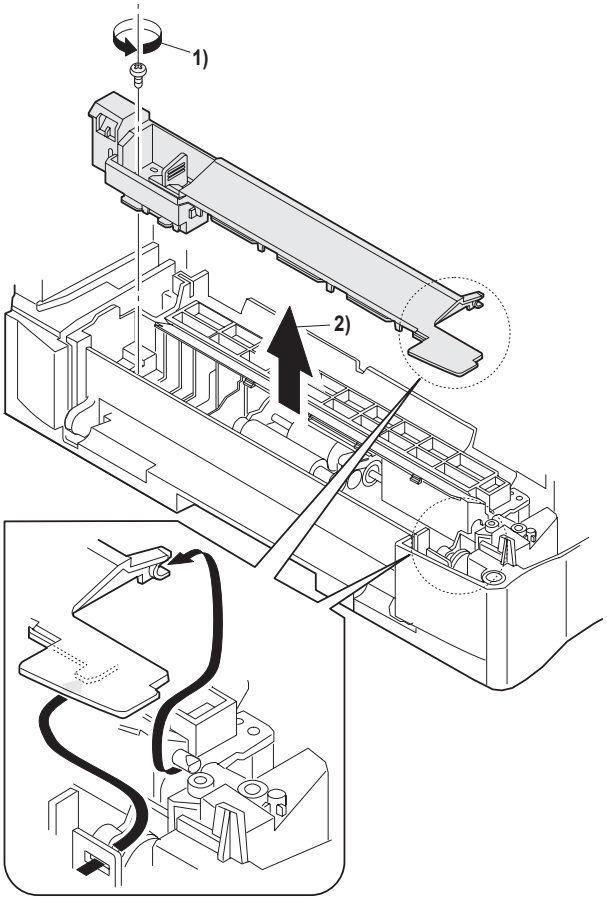
A. List

No.	Part name Ref.
1	Manual transport roller
2	Cassette detection switch
3	PPD1 sensor PWB
4	Side door detection unit

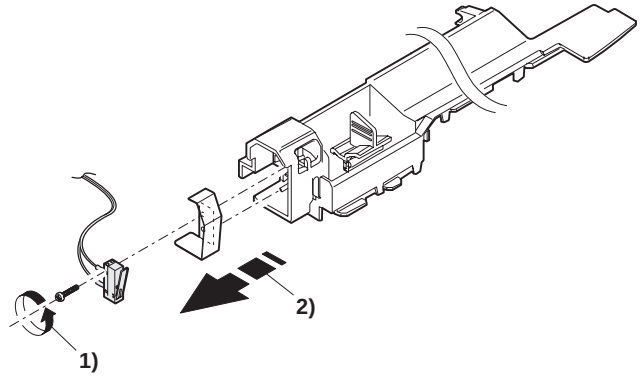
B. Disassembly procedure

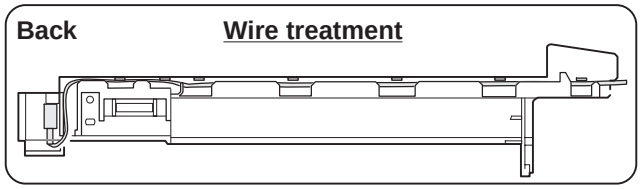
Multi unit

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

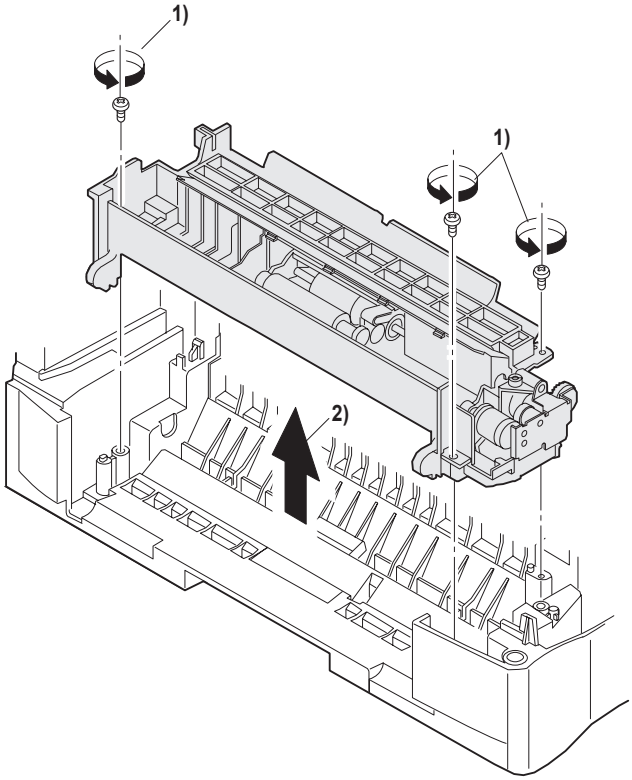


2) Remove the screw and remove the side door detection unit.

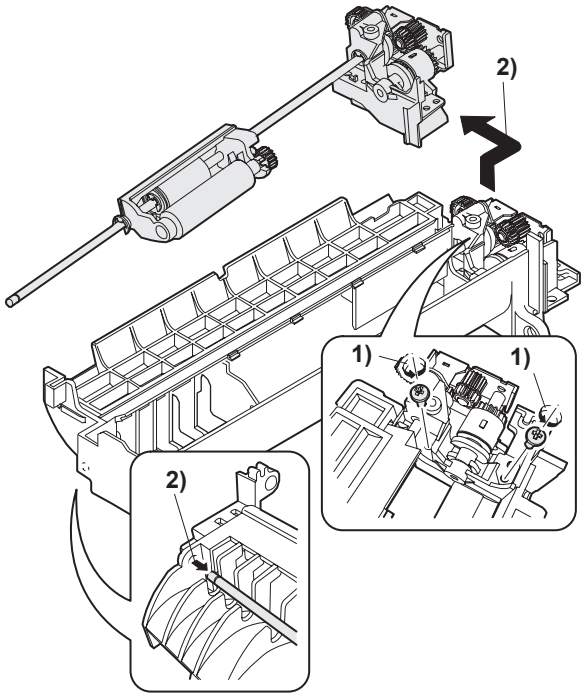




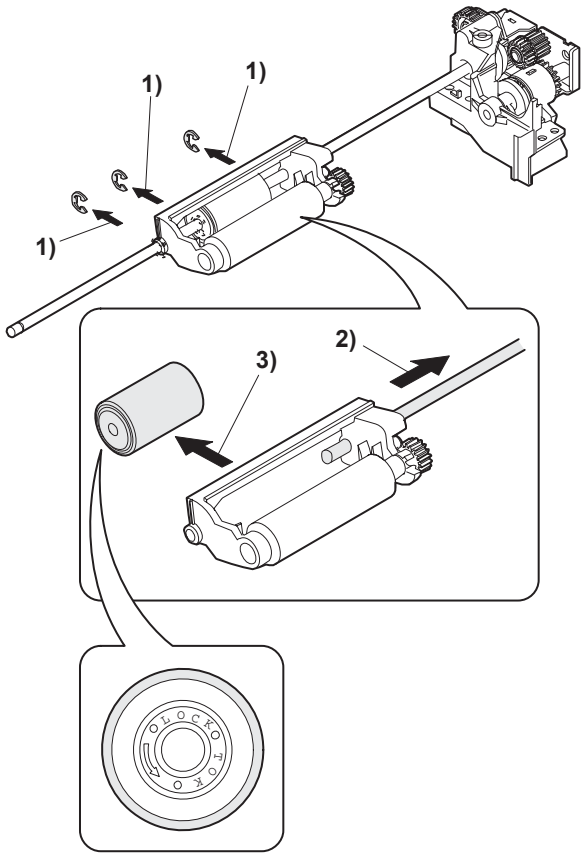
3) Remove three screws and remove the multi paper feed upper frame.



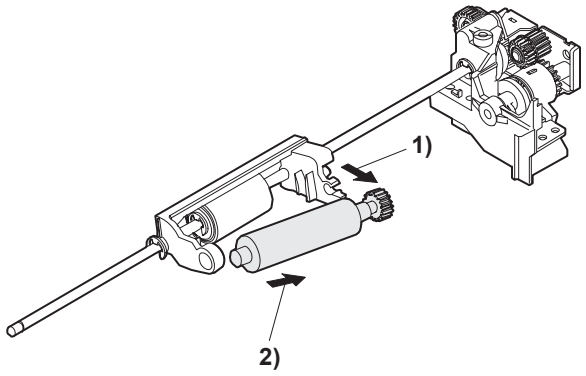
4) Remove two screws and remove the multi feed bracket unit from the multi paper feed upper frame.



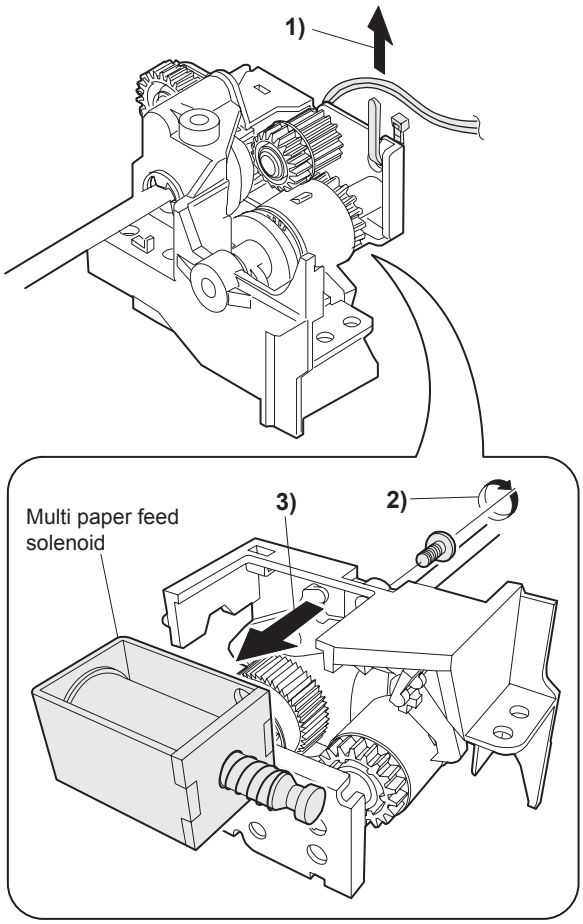
5) Remove three E-rings and remove the manual paper feed roller B9.



6) Remove the pick-up roller.



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

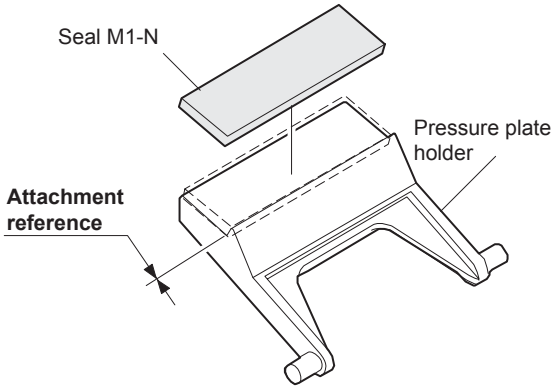


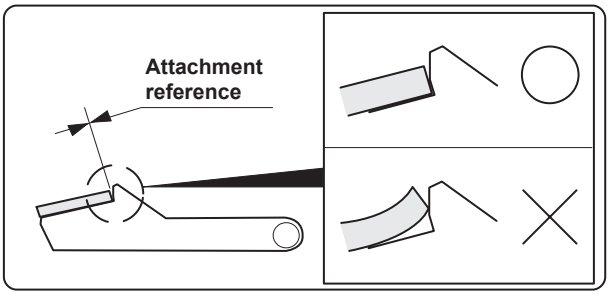
C. Assembly procedure

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.





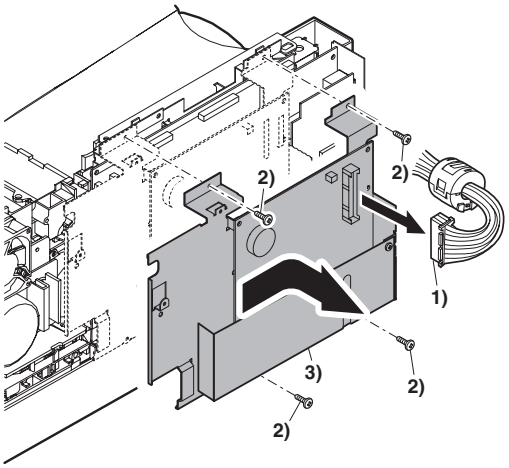
7. Rear frame section

A. List

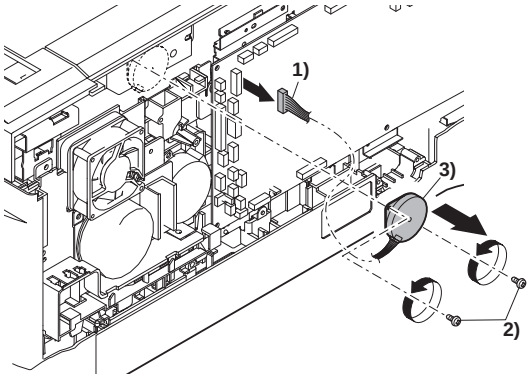
No.	Part name Ref.
1	FAX PWB (When the GD-1300 installed)
2	Mirror motor
3	Main motor
4	Exhaust fan motor
5	Main PWB

B. Disassembly procedure

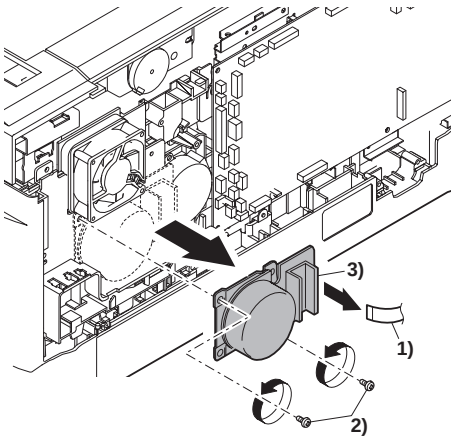
1) Remove the rear cabinet.
2) Remove the connector.
3) Remove four screws, and remove the FAX PWB unit. (When the GD-1300 is installed)



4) Disconnect the connector.
5) Remove two screws, and remove the scanner motor.

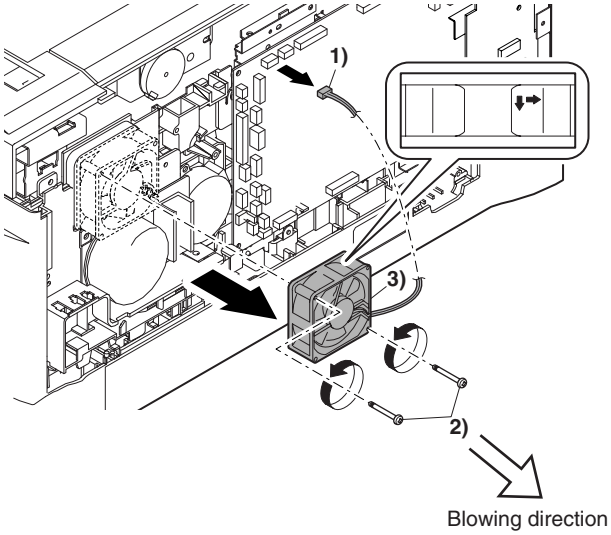


6) Remove two screws and one harness, and remove the main motor.

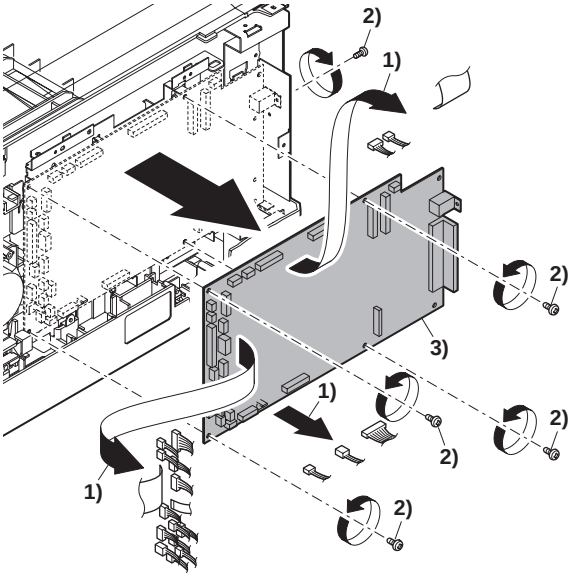


7) Remove two screws and one connector, and remove the exhaust fan motor.

Note: Be careful of the installing directions of the fan.
Attach it so that the blowing direction faces outside.



8) Disconnect the connectors.
9) Remove five screws, and remove the MCU PWB.



C. Assembly procedure

For assembly, reverse the disassembly procedure.

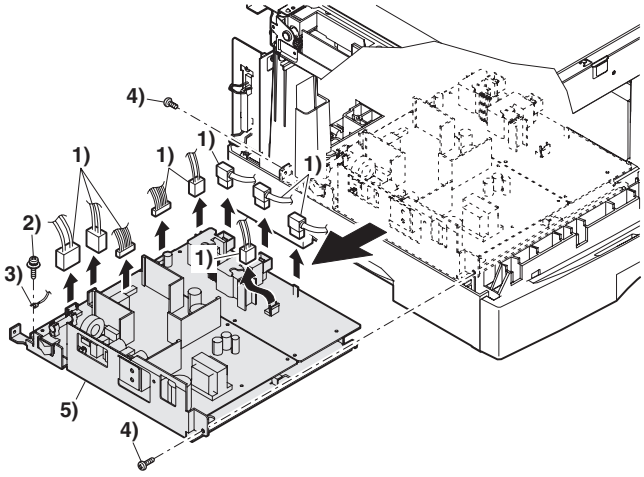
8. Power section

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.



Caution: Be careful not to touch the sharp edge on the circumference of the metal frame for the power supply.

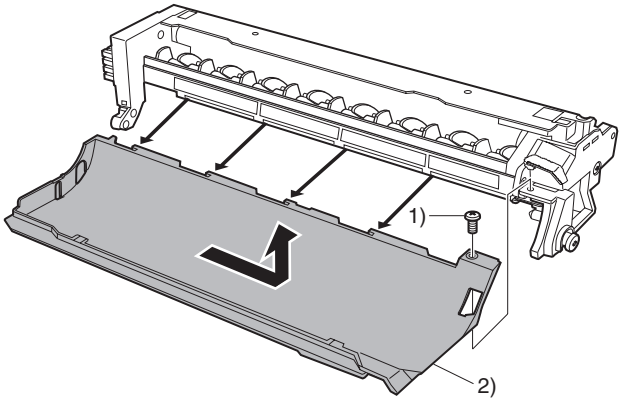
C. Assembly procedure

For assembly, reverse the disassembly procedure.

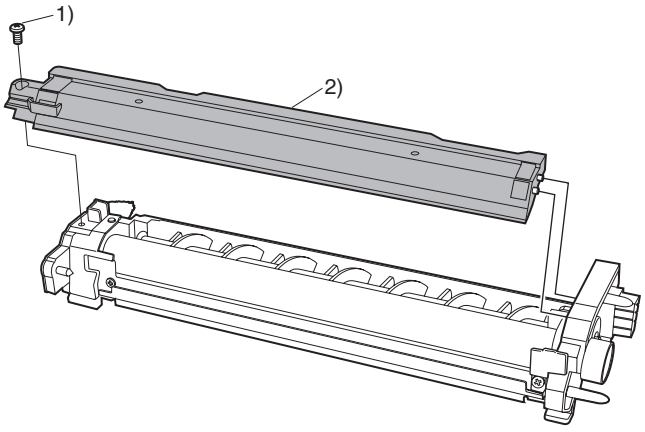
9. DV unit section

A. Developer

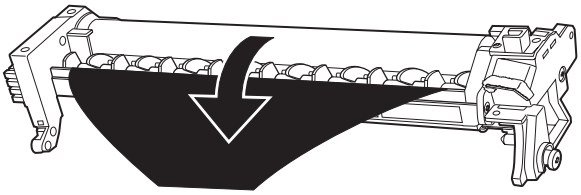
1) Remove the screw, slide the pawl to the right side, and remove the TN guide.



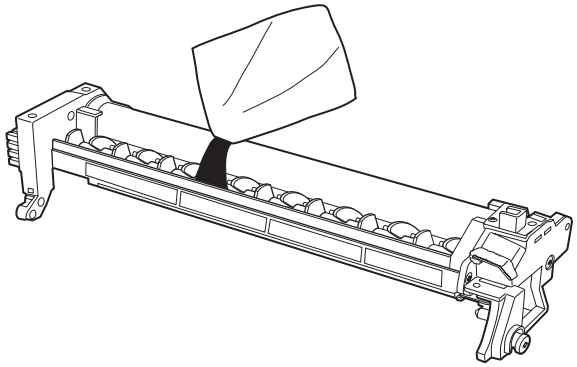
2) Remove the screw, and remove the DV cover.



3) Remove the used developer.

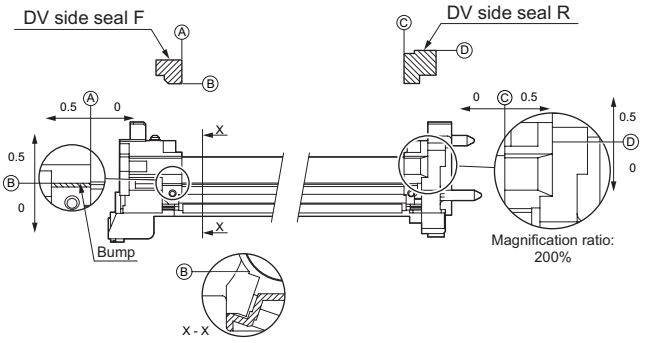


4) Supply new developer.



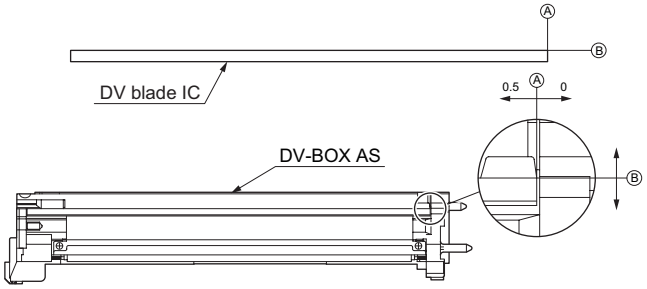
B. DV seal

1) Peel off the old DV seal.
2) Clean the attachment surface with alcohol.
3) Attach the new DV seal to the reference position.



C. DV blade

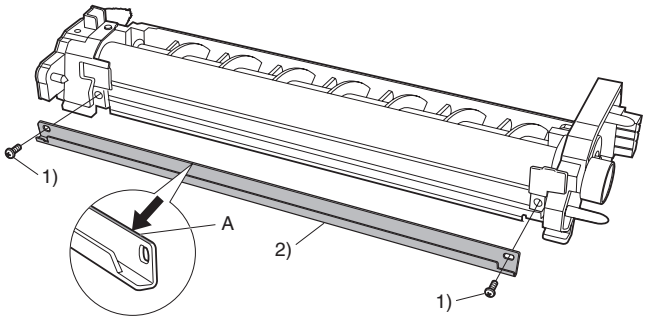
1) Peel off the old DV blade.
2) Clean the attachment surface with alcohol.
3) Attach the new DV blade to the reference position.



D. DV doctor

1) Remove the screw, and remove the DV doctor.

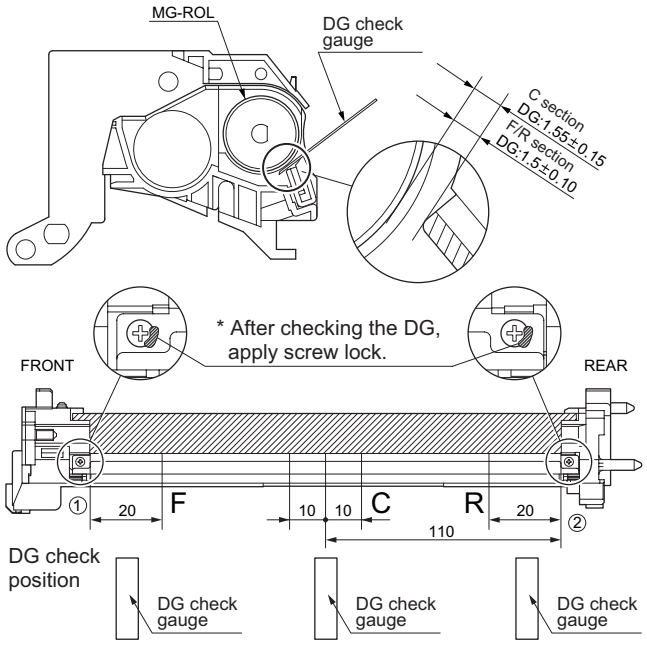
* Clean the edge (A) section.



■ **Note for installation**

1) Insert the DG check gauge as shown in the figure.
2) After checking, install the doctor gap and fix it with a screw.

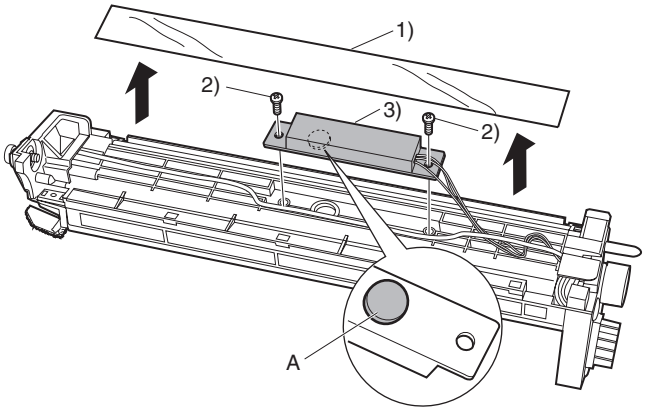
* Apply screw lock to the screw tightening section as shown in the figure below.



E. DV sensor

1) Remove the Mylar.
2) Remove the screw, and remove the DV sensor.

* Clean the sensor (A) section.



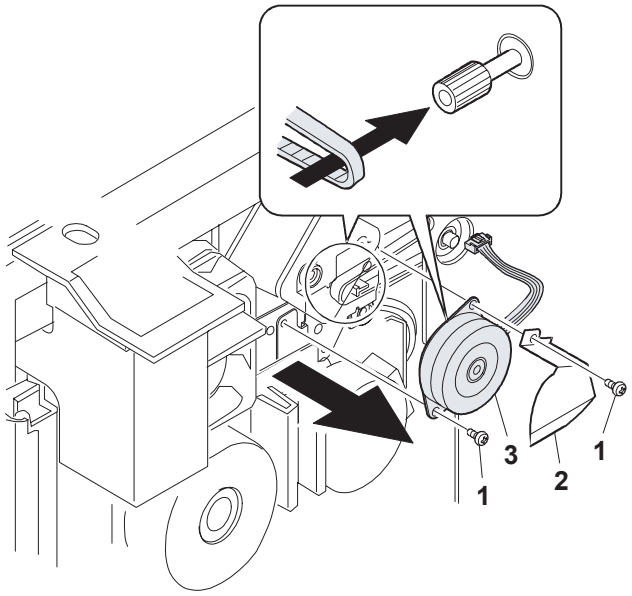
10. Duplex motor section (e-STUDIO203SD only)

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.

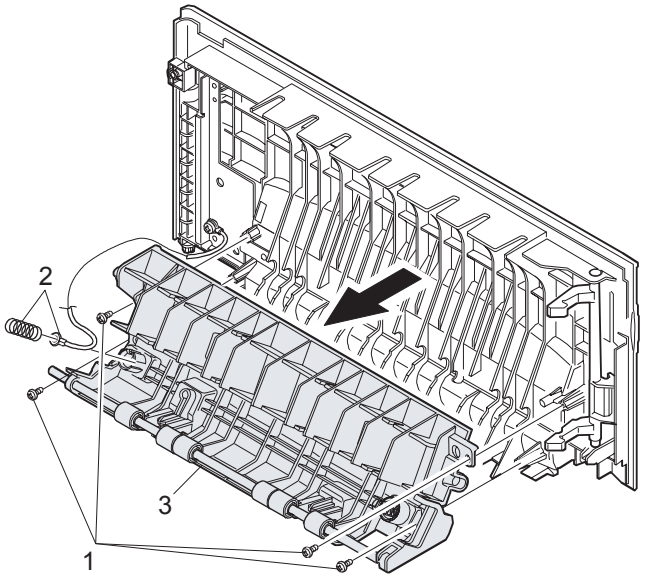
11. Reverse roller section (e-STUDIO203SD only)

A. List

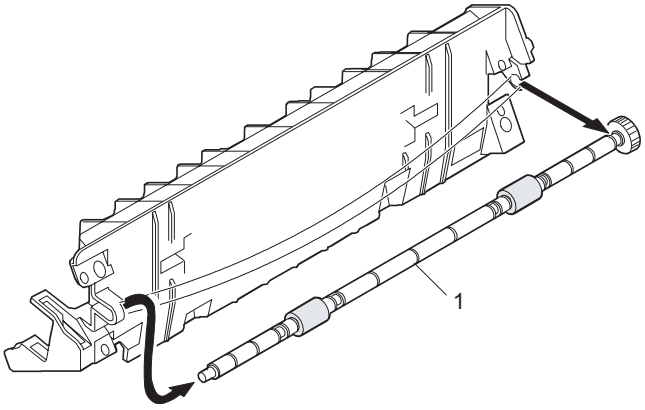
No.	Part name Ref.
1	Reverse roller

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.



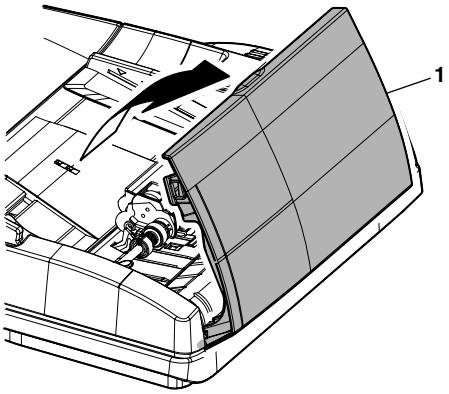
C. Assembly procedure

For assembly, reverse the disassembly procedure.

12. RADF section

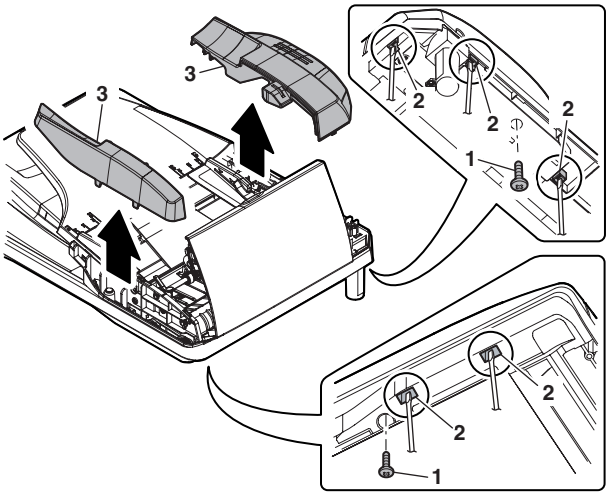
A. Front cabinet, rear cabinet

(1) Open the upper door unit.



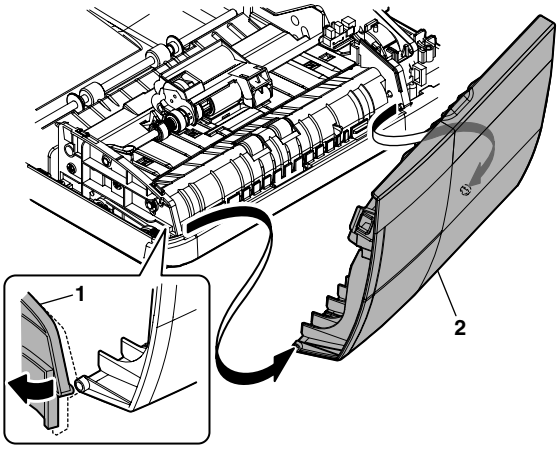
(2) Front cabinet and rear cabinet removal

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



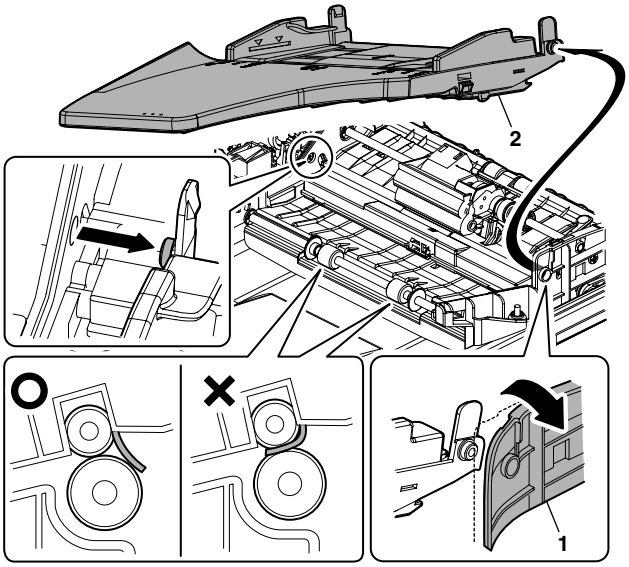
B. Upper door unit

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.

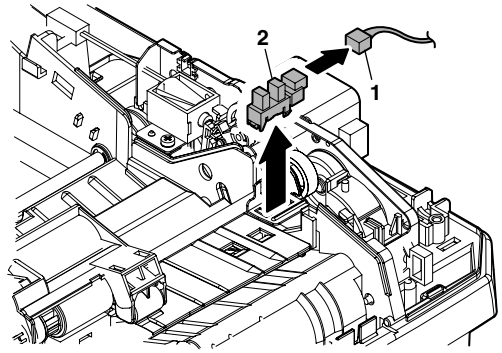


■ **Note for reassembly**

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

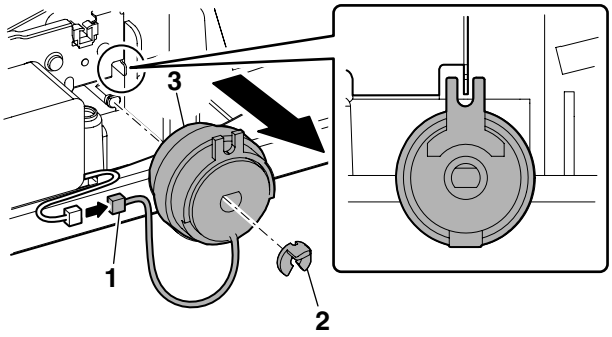
1) Disconnect one connector.
2) Remove the upper door open/close sensor.



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.

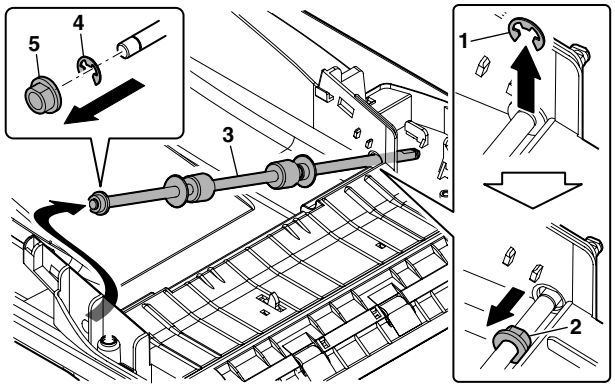


■ **Note for reassembly**

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

(2) Paper exit roller removal

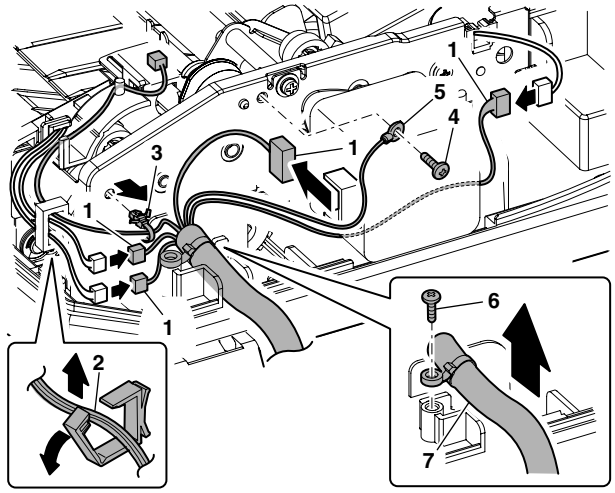
1) Remove the E-ring.
2) Slide the bearing.
3) Remove the paper exit roller.
4) Remove the E-ring.
5) Remove the bearing.



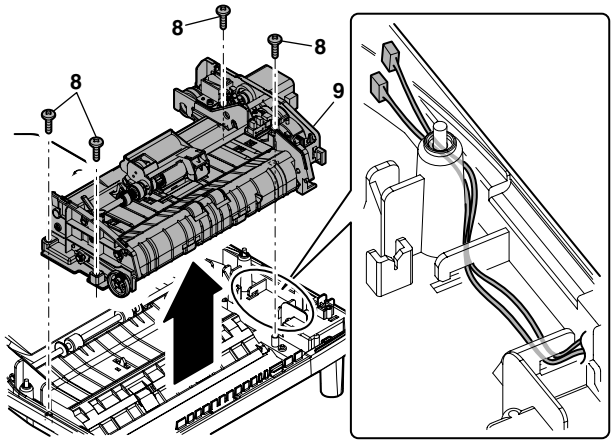
F. Drive unit

(1) Transport unit removal

1) Disconnect four connectors.
2) Remove the harness from the clamp.
3) Remove the snap band.
4) Remove one screw.
5) Remove the earth wire.
6) Remove one screw.
7) Disconnect the RADF harness.



8) Remove four screws.
9) Remove the transport unit.



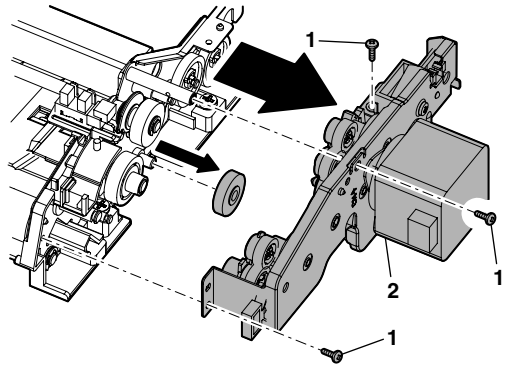
■ **Note for reassembly**

Before assembly, be sure to check that the harness is passed through the rib.

Arrange the RADF harness to the outside of the base tray so that it is nit pinched before assembly.

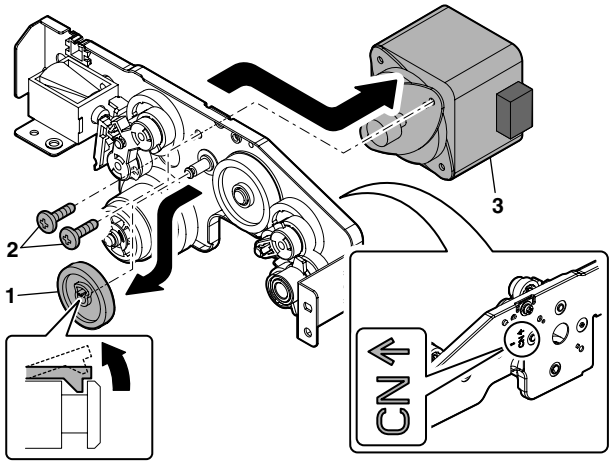
(2) Drive unit removal

1) Remove three screws.
2) Remove the drive unit.



(3) Drive motor removal

1) Remove the gear.
2) Remove two screws.
3) Remove the drive motor.



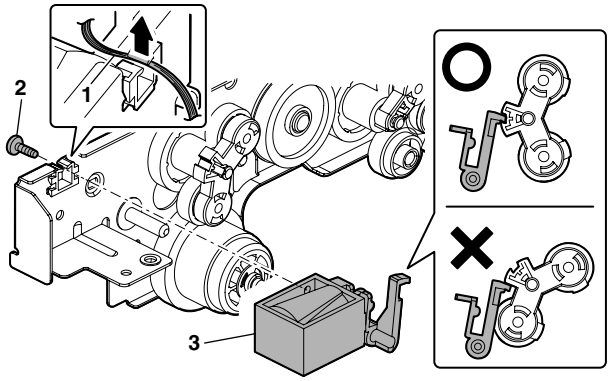
■ **Note for reassembly**

Connect the connectors according to the arrow indication marked on the motor mounting plate.

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.

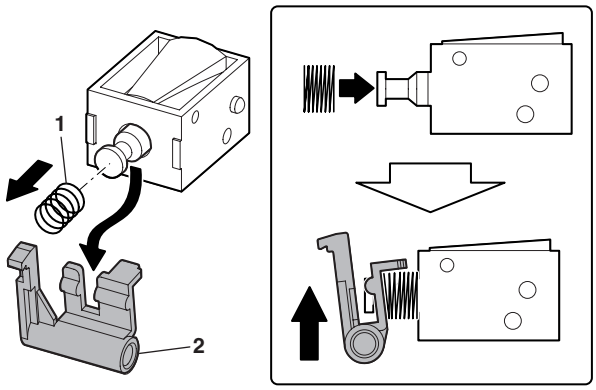


■ **Note for reassembly**

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.



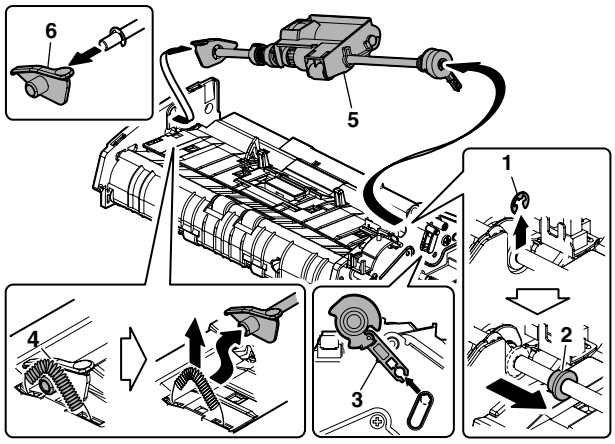
■ **Note for reassembly**

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

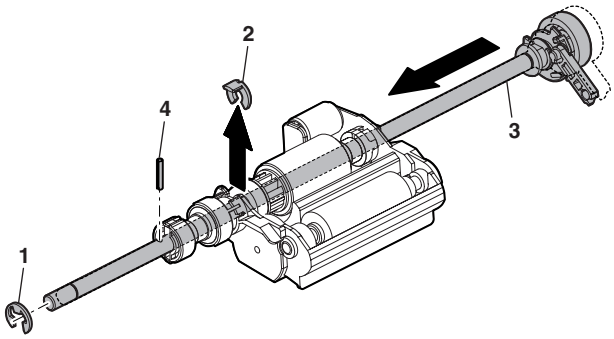
(1) Paper feed unit removal

1) Remove the E-ring.
2) Side 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.



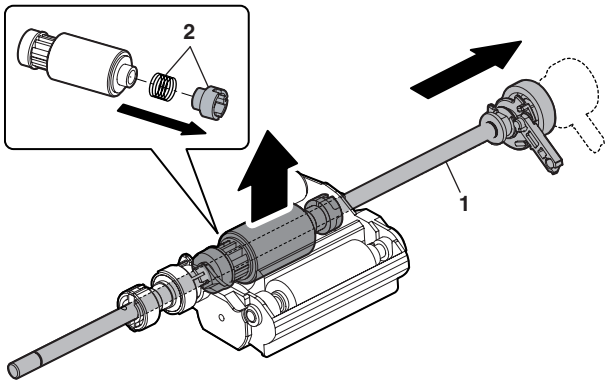
(2) Parts removal

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



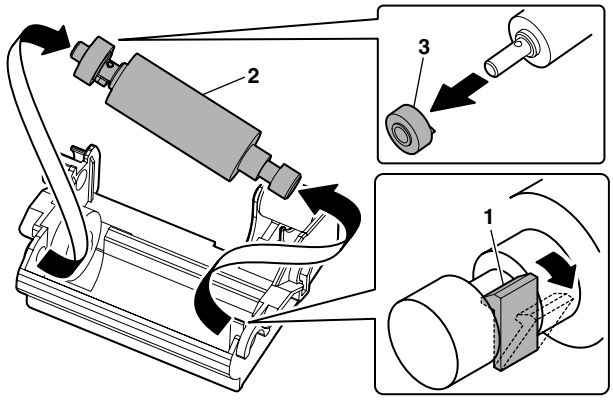
(3) Paper feed roller removal

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



(4) Pickup roller removal

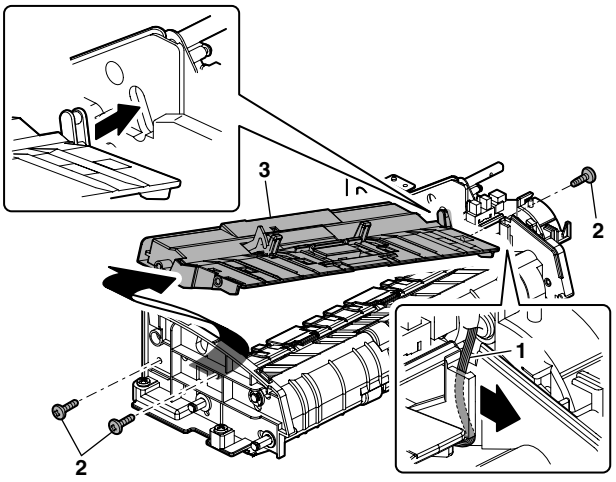
1) Disengage one pawl.
2) Remove the pickup drive gear from the pickup roller.



I. Paper empty sensor

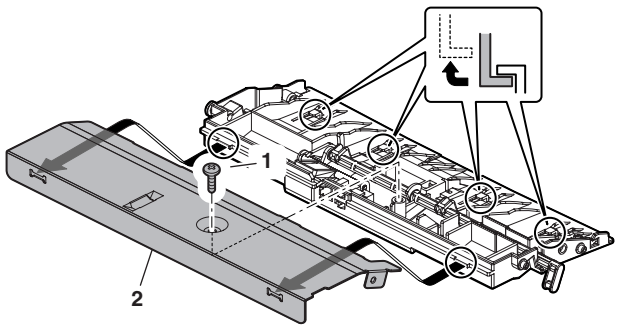
(1) Paper feed PG unit removal

1) Remove the harness.
2) Remove three screws.
3) Lift the front side, and remove the paper feed PG unit.



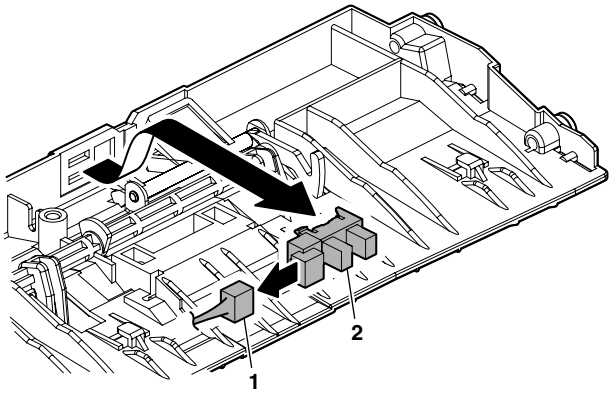
(2) Paper feed PG support plate removal

1) Remove one screw.
2) Slide and remove the paper feed PG support plate.



(3) Paper empty sensor removal

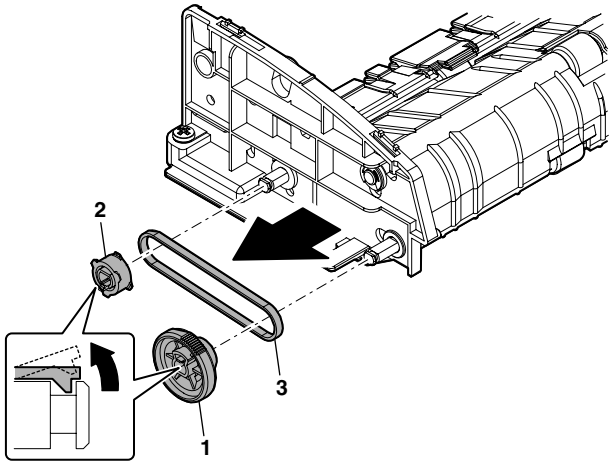
1) Disconnect one connector.
2) Remove the paper empty sensor.



J. PS roller

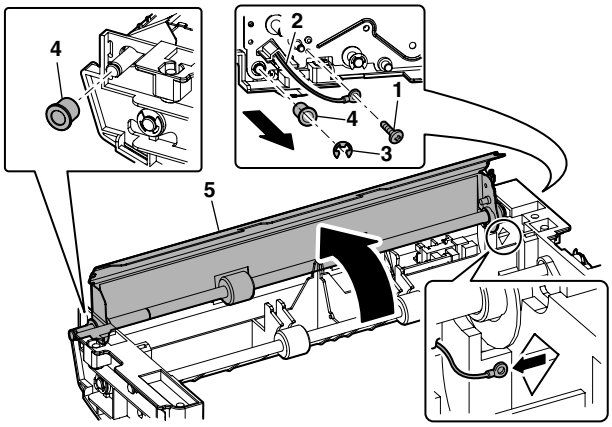
(1) Parts removal

1) Remove the gear.
2) Remove the pulley.
3) Remove the belt.



(2) Parts removal

1) Remove one screw.
2) Remove the earth wire.
3) Remove the E-ring.
4) Remove the bearing.
5) Open the scan plate.

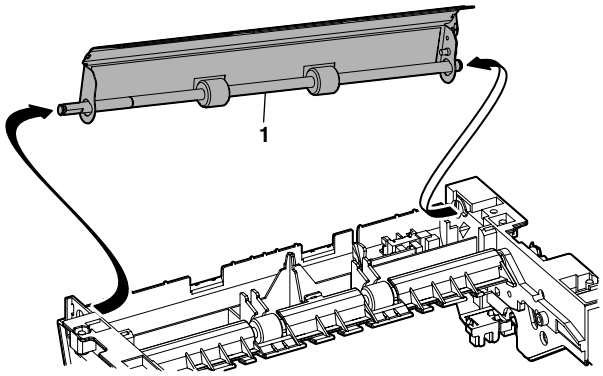


■ **Note for reassembly**

Pass the earth wire through the hole to the outside of the frame, then install parts.

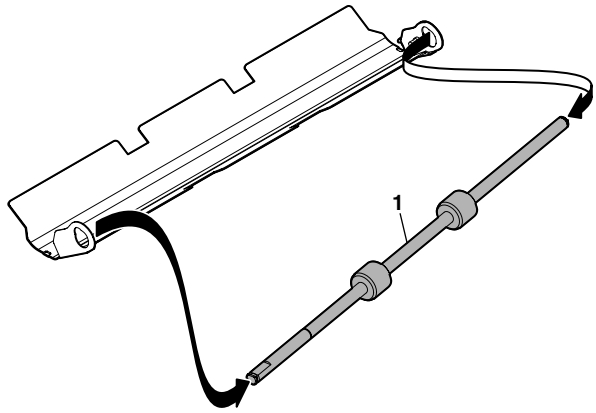
(3) Scan plate removal

1) Remove the scan plate.



(4) PS roller removal

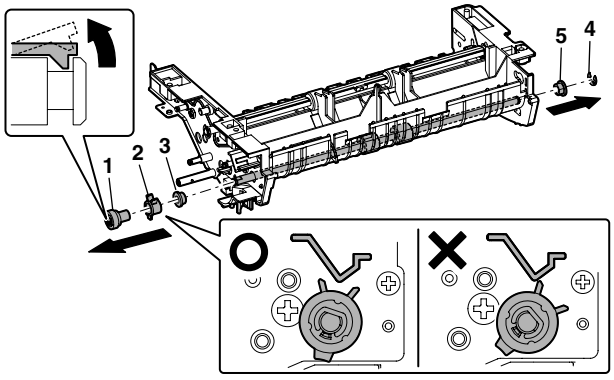
1) Remove the PS roller.



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.

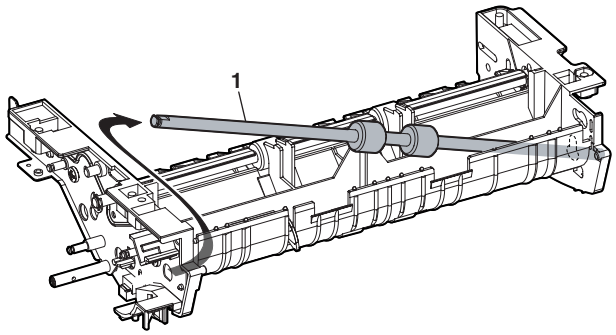


■ **Note for reassembly**

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

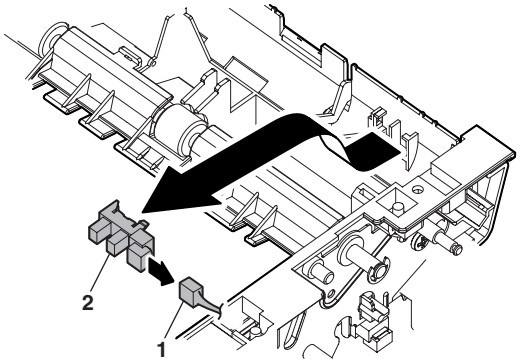
(2) Upper transport roller removal

1) Remove the upper transport roller.



L. Paper sensor

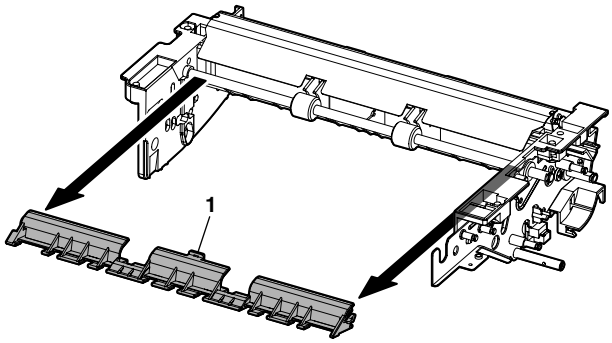
1) Disconnect one connector.
2) Remove the paper sensor.



M. Lower transport roller

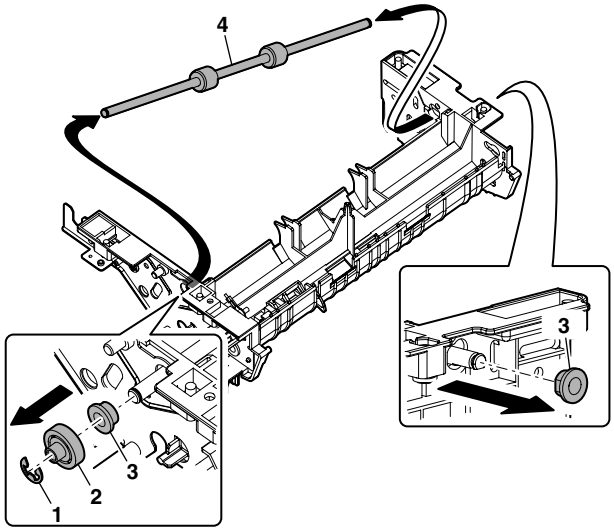
(1) Reverse self-weight gate removal

1) Remove the reverse self-weight gate.



(2) Lower transport roller removal

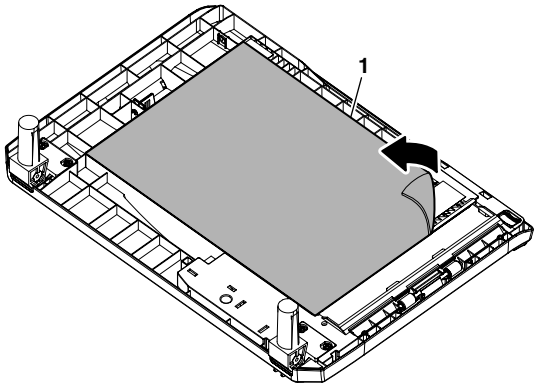
1) Remove the E-ring.
2) Remove the gear.
3) Remove the bearing.
4) Remove the lower transport roller.



N. Paper exit sensor

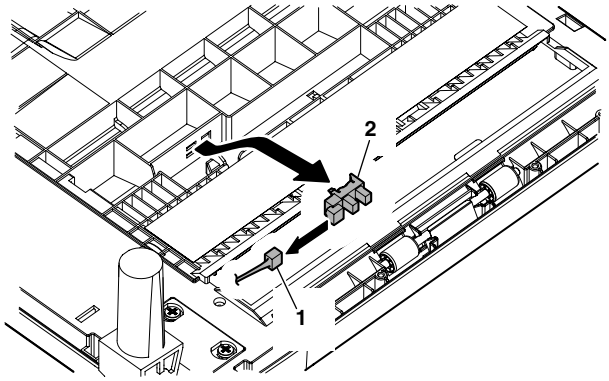
(1) OC mat removal

1) Remove the OC mat.



(2) Paper exit sensor removal

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



[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 TC 48-01.

(1) Outline

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

The adjustment is made by manual key operations. (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/sub scanning direction magnification ratio adjustment

a. Cases when the adjustment is required

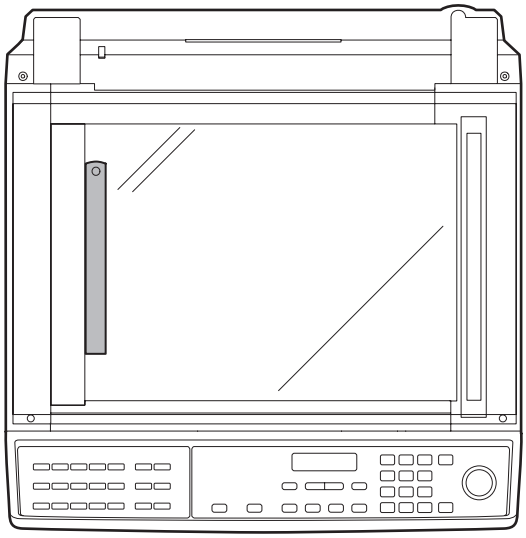
1) When the main PWB is replaced.
2) When the EEPROM in the main PWB is replaced.
3) When "U2" trouble occurs.
4) When repairing or replacing the optical section.

b. Necessary tools

- Scale

c. Main scanning direction adjustment procedure

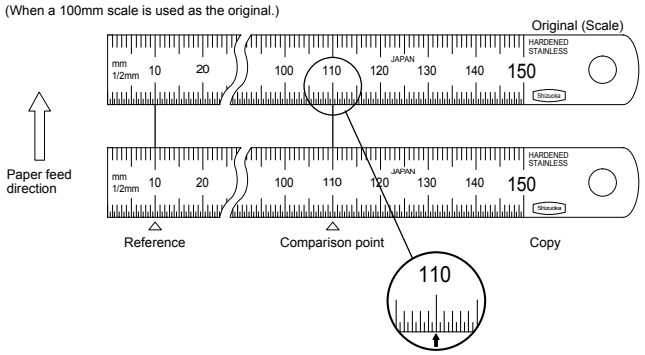
1) Set the scale vertically on the document table. (Use a long scale for precise adjustment.)



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

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

(When a 100mm scale is used as the original.)



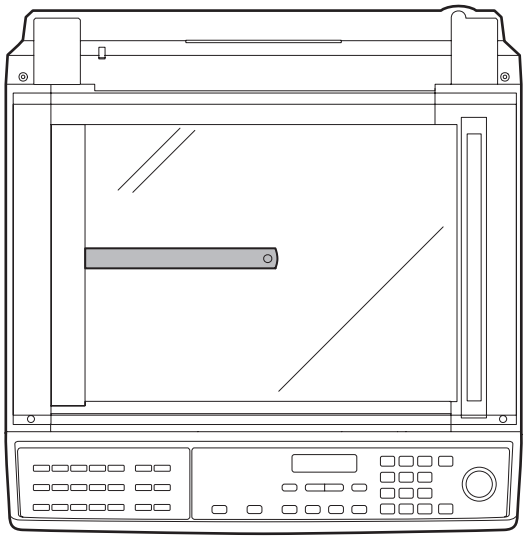
6) Check that the copy magnification ratio is within the specified range. If it is not within the specified range, perform the following procedures.
7) Execute TC 48-01 to select the main scanning direction copy magnification ratio adjustment mode.
   To select the adjustment mode, use the [←/→] key.

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

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

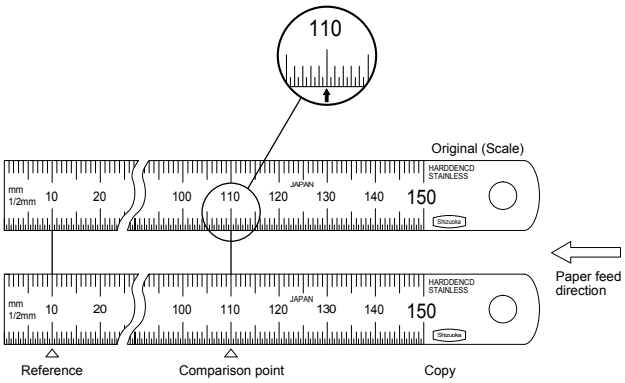
d. Sub scanning direction adjustment procedure

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.

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



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 TC 48-01 to select the sub scanning direction copy magnification ratio adjustment mode.
To select the adjustment mode, use the [←/→] key. (SCAN mode lamp ON)
8) Enter the new set value of sub scanning direction copy magnification ratio with the copy quantity set key, 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

The employed test commands and the contents are as follows:

Mode	Display item	Default	LED	TC
Print start position (Main cassette paper feed)	TRAY1	50	COPY mode lamp Main cassette lamp	50-01
(*) Print start position (2nd cassette paper feed)	TRAY2	50	COPY mode lamp 2nd cassette lamp	
Print start position (Manual paper feed)	MFT	50	COPY mode lamp Manual paper feed lamp	
Image lead edge void amount	DEN-A	50	PRINT mode lamp	
Image scan start position	RRC-A	50	SCAN mode lamp	
Image rear edge void amount	DEN-B	50	COPY mode lamp PRINT mode lamp SCAN mode lamp	
Print center offset (Main cassette paper feed)	TRAY1	50	COPY mode lamp Main cassette lamp	50-10
(*) Print center offset (2nd cassette paper feed)	TRAY2	50	COPY mode lamp 2nd cassette lamp	
Print center offset (Manual paper feed)	MFT	50	COPY mode lamp Manual paper feed lamp	
2nd print center offset (Main cassette paper feed)	SIDE2	50	PRINT mode lamp Main cassette lamp	

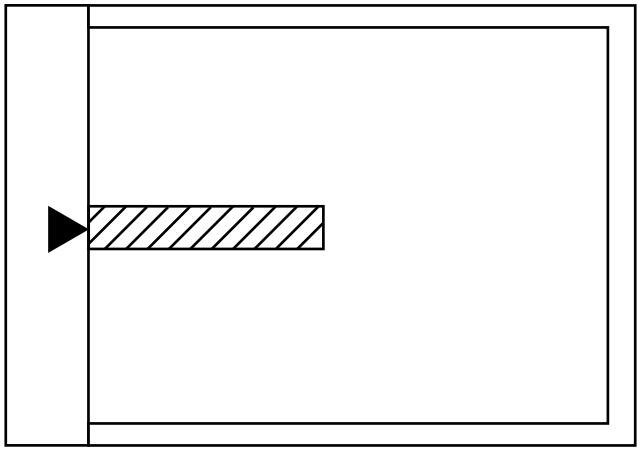
The modes can be selected by pressing [←/→] key.

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

* In the 2nd print center offset adjustment, print is made forcibly as 1to2/Long Edge from OC regardless of duplex setting.

(1) Lead edge adjustment

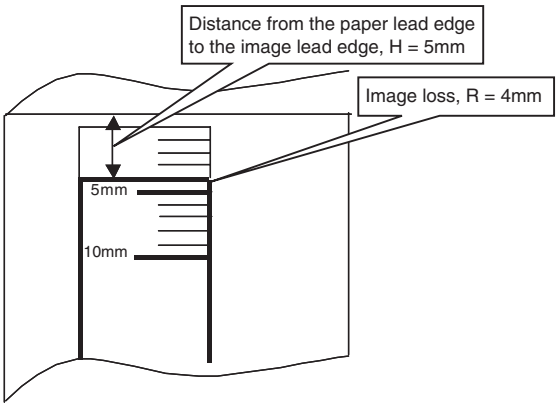
1) Set a scale to the center of the paper lead edge guide as shown below, and cover it with B4 or 8 1/2" x 14" paper or OC cover.



2) Execute TC 50 - 01
3) Set the print start position (A: AE mode lamp/COPY mode lamp ON), the lead edge void amount (B: TEXT mode lamp/PRINT mode lamp ON), the scan start position (C: PHOTO mode lamp/ SCAN mode lamp) to 1, and make a copy of the scale at 100%.
4) 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)
5) 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).
6) 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.)

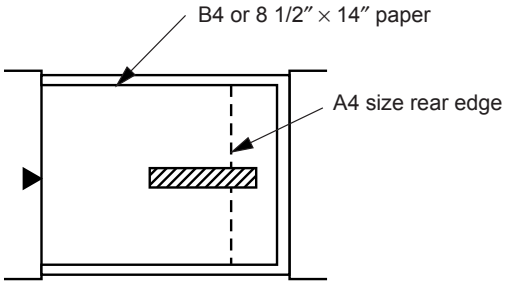
* The RADF adjustment is made by adjusting the RADF image scan start position after OC adjustment.

(Example)

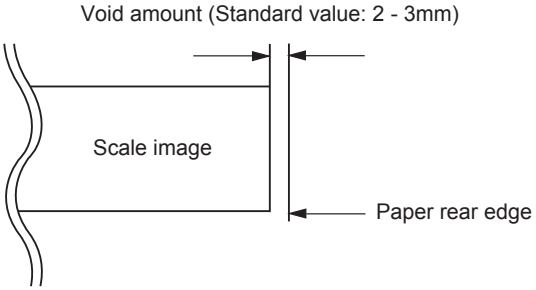


(2) Image rear edge void amount adjustment

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 TC 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.

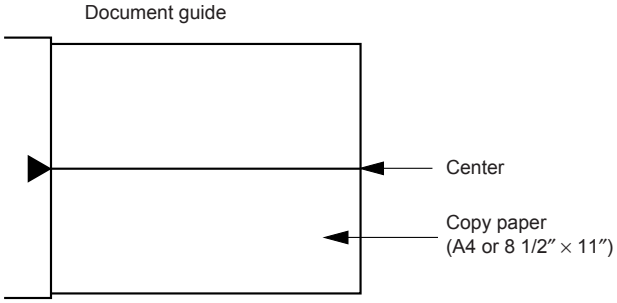


4) If the measurement value is out of the specified range, change the set value and repeat the adjustment procedure.
   The default value is 50.

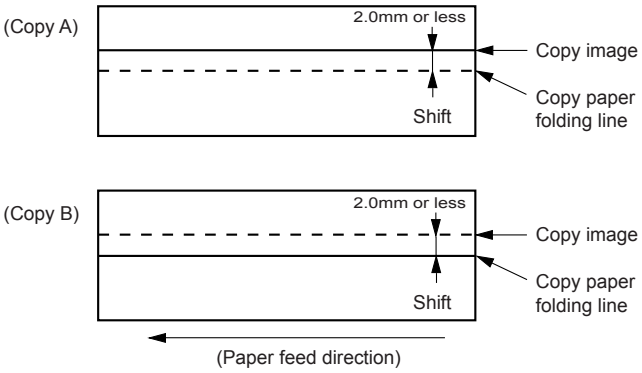
(3) Center offset adjustment

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 TC 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.

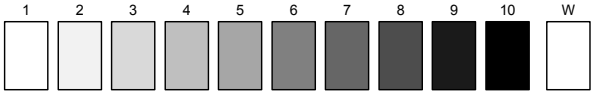
B. Note for copy density adjustment

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

- KODAK GRAY SCALE (Test chart)
- B4 (14" x 8 1/2") white paper
- The user program AE setting should be "3."



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

The copy density can be adjusted in 300dpi or in 600dpi.

Main code	Sub code	Resolution for copy density adjustment
46	01	300dpi
	02	600dpi

For selection of modes, use the copy mode select key.

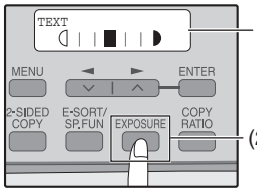
(1) Test chart (KODAK GRAY SCALE) setting

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.

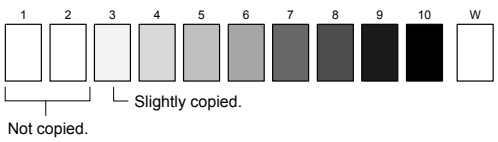
1) Execute TC 46-01 (300dpi). To adjust in 600dpi, execute TC 46-02.

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



Adjustment mode	Display item	LED	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 (KODAK Gray Scale).

	KODAK 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

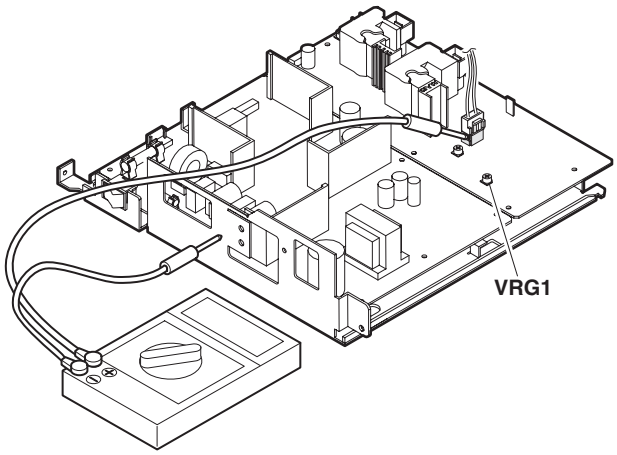
A. Main charger (Grid bias)

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 TC 8-02. (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.



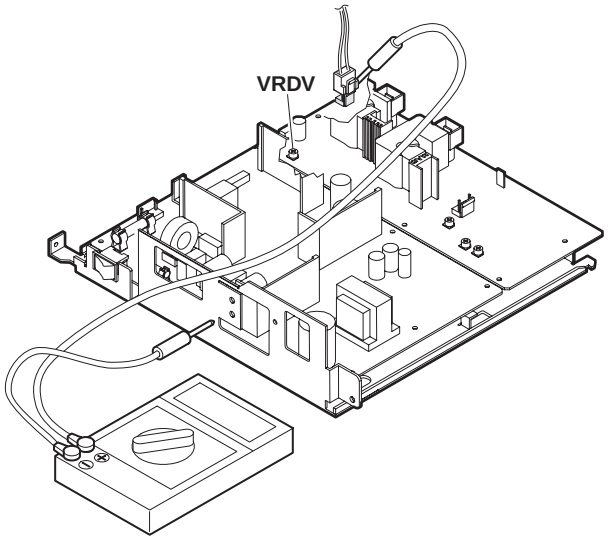
Caution: Be careful not to touch the sharp edge on the circumference of the metal frame for the power supply.

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 TC 25-01 to output the developing bias for 30sec, and check that the output is –400±8V.



Caution: Be careful not to touch the sharp edge on the circumference of the metal frame for the power supply.

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.

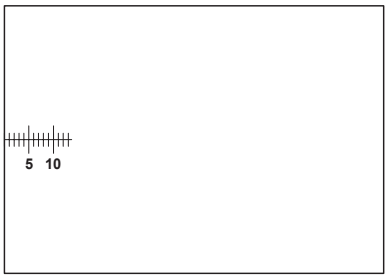
The image data is read, starting from its front end in the document delivery direction (Reference direction of document setting in the OC mode)and stored in memory.

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

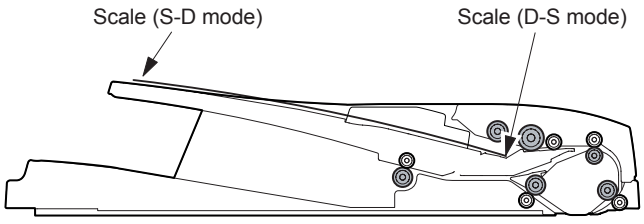
In other words, the front edge image loss of the image can be adjusted by changing the document read end position.

(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.

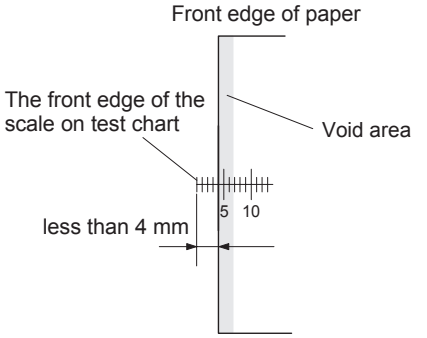


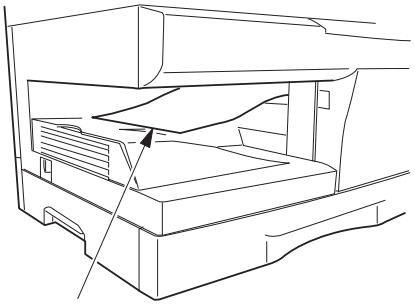
3) Execute test command 50-18.

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

Select the RADF 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 RADF 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) Image cut rear end void quantity (RADF) 50-19 (SCAN mode lamp)
   The size (length) of a document read from the RADF 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.)
2) Paper trailing edge void quantity 50-19 (PRINT mode lamp)
   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.

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

The adjustment modes can be selected by pressing [←/→] key. (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.

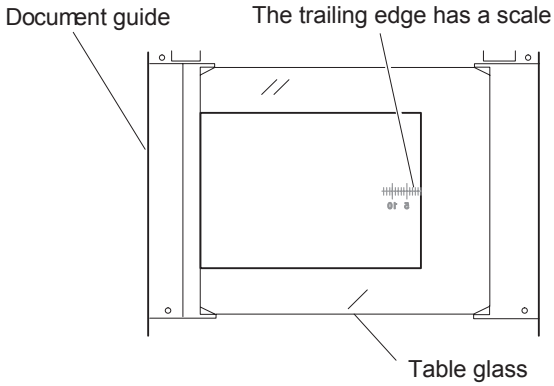
Mode	Display item	Default	LED
Paper rear edge void amount	DEN-B	50	PRINT mode lamp
Print start position (Duplex back surface)	RRC-D	50	SCAN mode lamp

* The initial value of duplex setting is 2to2.

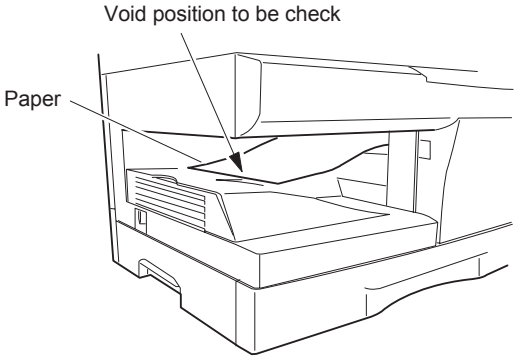
(Adjustment procedure)

(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) Execute test command 50-19 to turn on the PRINT mode lamp and make the printing mode in OC-D mode.
   Make a copy of the test chart to check the void area of the scale on the image.

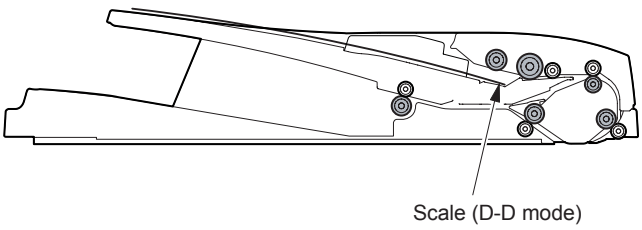


The trailing edge void on the first printing surface is shown above.

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

(2) Image cut trailing edge void quantity (RADF)

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



2) Execute test command 50-19 to turn on the SCAN mode lamp(on the operation panel) and make the printing mode in the D-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.
l Void position to be checked

5. RADF scan position automatic adjustment

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

When test command 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, RADF 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 RADF scan position with the adjustment value displayed. The RADF glass cover edge position is calculated from the difference between the RADF 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
RADF scan position auto adjustment	AUTO	1	COPY mode lamp
RADF scan position manual adjustment	MANU	1	PRINT mode lamp

Operation

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

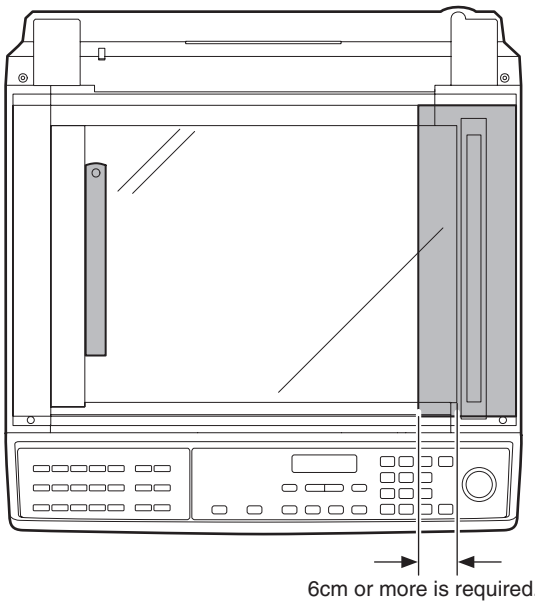
OK/ERR display in AUTO

<When OK>

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

<When ERR>

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

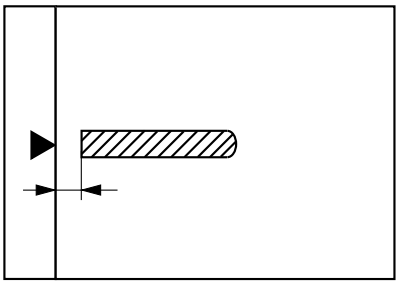


6cm or more is required.

6. RADF 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 RADF and make a duplex copy (D-D or D-S) in the normal ratio (100%).
3) Compare the scale image and the actual image.
If necessary, perform the following adjustment procedures.
4) Execute TC 48-05.
5) The current front surface sub scanning direction magnification ratio correction value is displayed in two digits on the display section.
To select SIDE1 and SIDE2, use [←/→] keys.
6) Enter the set value and press the start key.
When adjusting the RADF, use [2-SIDED COPY] key to select single/duplex after entering the one page print mode, performing 2-page single copy.

Mode	Display item	Default	LED
Sub scan magnification ratio adjustment on the surface of RADF document	SIDE1	50	COPY mode lamp
Sub scan magnification ratio adjustment on the surface of RADF document	SIDE2	50	PRINT mode lamp

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

<Adjustment specification>

Adjustment mode	Spec value	TC	Set value	Setting range
Sub scanning direction magnification ratio (RADF 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

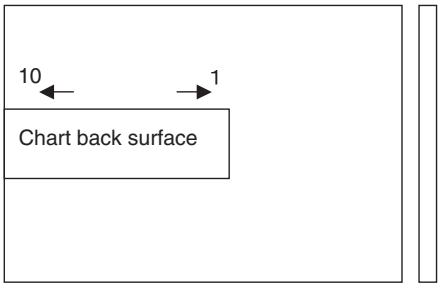
1) When the main PWB is replaced.
2) When the EEPROM in the main PWB is replaced.
3) When "U2" trouble occurs.
4) When repairing or replacing the optical section.

b. Adjustment procedure

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

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

Place the gray gradation chart (KODAK GRAY SCALE) 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.

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

c. Operation

1) Initial display

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

2) [ENTER/START] Correction start

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

<During canceling - When C/CA 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] TEST COMMAND, TROUBLE CODES

1. Entering the test command mode

To enter the serviceman test command mode, press the keys as follows:

[#] key → [*] key → [C] key → [*] key

To cancel the test command mode, press the [CA] key.

2. Key rule

[10KEY]:	Entry of MAIN CODE/SUB CODE Selection of an item Setup of an adjustment value in case of test commands for adjustment
[←/→]:	Selection of MAIN CODE/SUB CODE Selection of an item
[ENTER/START]:	Settlement <In case of test commands for print> [ENTER]: Settlement (Without print) [START]: Settlement/Print
[C]:	(Interrupting operation check) Returns to the upper hierarchy. In case of test command of operation check, terminates the operations.
[CA]:	Exits from the test command mode. For a test command of adjustment, the display returns to the initial display (00-00).

3. List of test commands

Main code	Sub code	Contents
1	01	Mirror scan (SCAN CHK)
	02	Mirror home position sensor (MHPS) status display (MHP-SENSOR)
	06	Mirror scan aging (SCAN AGING)
2	01	Reversing Automatic Document Feeder (RADF) aging (ADF AGING)
	02	RADF sensor status display (ADF SENSOR)
	03	RADF motor operation check (ADF MOTOR CHK)
	08	RADF paper feed solenoid operation check (ADF SPUS CHK)
	09	RADF reverse solenoid operation check (RADF SPFS CHK)
3	03	Shifter operation check (SHIFTER CHK)
5	01	Operation panel display check (LCD/LED CHK)
	02	Fusing lamp, cooling fan operation check (HT LAMP CHK)
	03	Copy lamp ON check (C-LAMP CHK)
6	01	Paper feed solenoid (CPFS1, CPFS2, MPFS) operation check (PSOL CHK)
	02	Resist roller solenoid (RRS) operation check (RES.R SOL CHK)
7	01	Check of warm-up display and aging with JAM (W-UP/AGING)
	06	Interval aging (INTERVAL AGING)
	08	Shift to copy with warm-up display (W-UP C-MODE)
8	01	Developing bias output (DVLP BIAS SET.)
	02	Main charger output (Grid HIGH) (MHV(H) SET.)
	03	Main charger output (Grid LOW) (MHV(L) SET.)
	06	Transfer charger output (THV SET.)
9	01	Duplex motor normal rotation check (DPLX ROT.) (e-STUDIO203SD only)
	02	Duplex motor reverse rotation check (DPLX ROT.REV.) (e-STUDIO203SD only)
	04	Duplex motor rotating speed adjustment (DPLX ROT.SPEED) (e-STUDIO203SD only)
10		Toner motor operation (TONER MOTOR)
14		Cancel of trouble other than U2 (TRBL CANC.)

Main code	Sub code	Contents
16		U2 trouble cancel (U2 TRBL CANC.)
20	01	Maintenance counter clear (M-CNT CLR.)
21	01	Maintenance cycle setting (M-CYCLE)
22	01	Maintenance counter display (M-CNT)
	02	Maintenance preset display (M-CNT PRESET)
	04	JAM total counter display (JAM TTL CNT)
	05	Total counter display (TTL CNT)
	06	Developer counter display (DVLP CNT)
	08	RADF counter display (ADF CNT)
	11	FAX-related counter display (Executable only when the FAX is installed.)
	12	Drum counter display (DRUM CNT)
	13	CRUM type display (CRUM TYPE)
	14	ROM version display (ROM VER.)
	16	Duplex counter display (DPLX CNT) (e-STUDIO203SD only)
	17	Copy counter display (COPIES CNT)
	18	Printer counter display (PRT.CNT)
	19	Scanner mode counter display (S-MODE CNT)
	21	Scanner counter display (SCAN CNT)
	22	RADF JAM counter display (S JAM CNT)
24	01	JAM total counter clear (JAM TTL CLR.)
	04	RADF counter clear (ADF CLR.)
	05	Duplex counter clear (DPLX CLR.) (e-STUDIO203SD only)
	06	Developer counter clear (DVLP CLR.)
	07	Drum counter clear (DRUM CLR.)
	08	Copy counter clear (COPIES CLR.)
	09	Printer counter clear (PRT.CLR.)
	10	FAX counter clear (FAX CLR.) (Executable only when the FAX is installed.)
	13	Scanner counter clear (SCAN CLR.)
	14	RADF JAM total counter clear (S JAM TTL CLR.)
	15	Scanner mode counter clear (S-MODE CLR.)
25	01	Main motor operation check (MAIN MOTOR CHK)
	10	Polygon motor operation check (LSU CHK)

Main code	Sub code	Contents
26	02	(R)ADF setting (ADF/RADF)
	03	Second cassette setting (2ND TRAY)
	04	Main unit duplex setting (DPLX)
	06	Destination setting (DESTINATION)
	07	Machine conditions check (CPM)
	20	Rear edge void setting (END EDGE)
	30	CE mark support control ON/OFF (CE MARK)
	37	Cancel of stop at developer life over (DVLP LIFE END)
	39	Memory capacity check (MEM.CHK)
	40	Polygon motor OFF time setting (Time required from completion of printing to turning OFF the motor) (LSU MOTOR OFF)
	42	Transfer ON timing control setting (TC ON TIMING)
	43	Side void amount setting (SIDE VOID)
	54	γ life correction setting (GAMMA CTRL)
	62	Energy-save mode copy lamp setting (C-LAMP E-S)
30	01	Paper sensor status display (P-SENSOR)
41	06	OC cover float detection level adjustment (OC FLOAT LEVEL)
	07	OC cover float detection margin setting (OC FLOAT MGN)
43	01	Fusing temperature setting (Normal copy) (FU TEMP)
	04	Fusing temperature setting in multi copy (FU TEMP MULTI)
	05	Fusing temperature setting in duplex copy (FU TEMP DPLX) (e-STUDIO203SD only)
	14	Fusing start temperature setting (FU TEMP START)
46	01	Copy density adjustment (300dpi) (EXP.LEVEL 300)
	02	Copy density adjustment (600dpi) (EXP.LEVEL 600)
	12	Density adjustment in the FAX mode (Collective adjustment) (Executable only when the FAX is installed.)
	13	FAX mode density adjustment (normal text) (Executable only when the FAX is installed.)
	14	FAX mode density adjustment (Fine text) (Executable only when the FAX is installed.)
	15	FAX mode density adjustment (Super fine) (Executable only when the FAX is installed.)
	18	Image contrast adjustment (300dpi) (GAMMA 300)
	19	Exposure mode setting (AE MODE)
	20	RADF exposure correction (EXP.LEVEL ADF)
	29	Image contrast adjustment (600dpi) (GAMMA 600)
	30	AE limit adjustment (AE LIMIT)
	31	Image sharpness adjustment (SHARPNESS)
	32	Copier color reproduction setting (COLOR REAPPEAR)
	39	FAX mode sharpness adjustment (Executable only when the FAX is installed.)
48	01	Mains can/sub scan direction magnification ratio (COPY MAG.)
	05	RADF mode sub scan direction magnification ratio in copying (RADF MAG.)
49	01	Download mode (DOWNLOAD MODE)

Main code	Sub code	Contents
50	01	Lead edge image position (LEAD EDGE)
	06	Copy lead edge position adjustment (RADF) (RADF EDGE)
	10	Print center offset adjustment (PRT.OFF-CENTER)
	12	Document feed off-center adjustment (ORG.OFF-CENTER)
	18	Memory reverse position adjustment in duplex copy (DPLX REVERSE)
	19	Duplex copy rear edge void adjustment (DPLX END EDGE) (e-STUDIO203SD only)
51	02	Resist amount adjustment (RESIST ADJ.)
53	08	RADF scan position automatic adjustment (ADF AUTO)
61	03	HSYNC output check (LSU CHK)
63	01	Shading check (SHADING CHK)
	02	Black level automatic correction (BLACK LEVEL)
	12	Light quantity stable wait time setting (LT.STABLE TIME)
	13	Light quantity stable width setting (LT.STABLE RNG.)
64	01	Self print (1by2 mode) (SELF PRT.)
66	01	FAX soft SW setting (Executable only when the FAX is installed.)
	02	FAX soft SW initializing (excluding the adjustment values) (Executable only when the FAX is installed.)
	03	FAX PWB memory check (Executable only when the FAX is installed.)
	04	Signal send mode (Max. value) (Executable only when the FAX is installed.)
	05	Signal send mode (Soft SW set value) (Executable only when the FAX is installed.)
	07	Image memory content print (Executable only when the FAX is installed.)
	10	Image memory content clear (Executable only when the FAX is installed.)
	11	300bps signal send (Max. value) (Executable only when the FAX is installed.)
	12	300bps signal send (Soft SW set value) (Executable only when the FAX is installed.)
	13	Dial test (Executable only when the FAX is installed.)
	17	DTMF signal send (Max. value) (Executable only when the FAX is installed.)
	18	DTMF signal send (Soft SW set value) (Executable only when the FAX is installed.)
	21	FAX information print (Executable only when the FAX is installed.)
	24	FAST SRAM clear (Executable only when the FAX is installed.)
	30	TEL/LIU status change check (Executable only when the FAX is installed.)
	33	Signal detection check (Executable only when the FAX is installed.)
	34	Communication time measurement (Executable only when the FAX is installed.)
	37	Speaker sound volume setting (Executable only when the FAX is installed.)
	38	Time setting/check (Executable only when the FAX is installed.)

4. Descriptions of various test commands

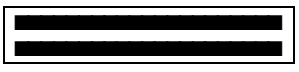
<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>1</td><td>01</td><td>Mirror scan (SCAN CHK)</td><td>
[Function]
When [ENTER/START] key is pressed, the home position is checked and the mirror base performs full scan at the speed of the set magnification ratio.
During operation, the set magnification ratio is displayed.
The mirror home position sensor status is displayed with the “COPY mode lamp”. (When the mirror is in the home position, the lamp lights up.)
During operation, the copy lamp lights up.
When [C] 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]
1) Initial display
<pre>01-01 SCAN CHK
            - 100% +</pre>
2) [←]
<pre>01-01 SCAN CHK
            - 99% +</pre>
3) [ENTER/START]
<pre>01-01 SCAN CHK
EXECUTING... - 78% +</pre>
2) [ZOOM]
<pre>01-01 SCAN CHK
            - 78% +</pre>
2) [→]
<pre>01-01 SCAN CHK
            - 101% +</pre>
</td></tr>
<tr><td></td><td>02</td><td>Mirror home position sensor (MHPS) status display (MHP-SENSOR)</td><td>
[Function]
Monitors the mirror home position sensor, and makes the "COPY mode lamp" turn on during the sensor ON status.
[Operation]
1) Initial display
<pre>01-02 MHP-SENSOR
EXECUTING...</pre>
</td></tr>
<tr><td></td><td>06</td><td>Mirror scan aging (SCAN AGING)</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 "COPY mode lamp." (The lamp is ON when the mirror is in the home position.)
During aging, the copy lamp is ON.
[Operation]
The operation is similar to test command 1-01.
</td></tr>
<tr><td>2</td><td>01</td><td>Reversing Automatic Document Feeder (RADF) aging
(ADF AGING)</td><td>
[Function]
When [ENTER/START] key is pressed, the set magnification ratio is acquired and duplex document transport is performed in the case of RADF.
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.
[Operation]
The operation is similar to test command 1-01.
</td></tr>
<tr><td></td><td>02</td><td>RADF sensor status display (ADF SENSOR)</td><td>
[Function]
The ON/OFF status of the RADF sensors can be checked with the LCD.
When a sensor is ON, the sensor name is displayed on the LCD.
<table>
<tr><th>Sensor</th><th>Display item</th></tr>
<tr><td>Document set sensor</td><td>SPID</td></tr>
<tr><td>RADF document transport sensor</td><td>SPPD</td></tr>
<tr><td>RADF paper feed cover open/close sensor</td><td>SDSW</td></tr>
<tr><td>RADF paper exit sensor</td><td>SPOD</td></tr>
</table>
[Operation]
1) Initial display
<pre>02-02 ADF SENSOR</pre>
2) When the sensor is ON:
<pre>02-02 ADF SENSOR
SPID SPPD SDSW SPOD</pre>
</td></tr>
<tr><td></td><td>03</td><td>RADF motor operation check (ADF MOTOR CHK)</td><td>
[Function]
When [ENTER/START] key is pressed, the motor rotates for 10sec at the speed corresponding to the set magnification ratio.
[Operation]
The operation is similar to test command 1-01.
</td></tr>
</table>

Main code	Sub code	Contents	Details of function/operation

2	08	RADF paper feed solenoid operation check (ADF SPUS CHK)	**[Function]**
			The RADF paper feed solenoid (SPUS) repeats ON for 500ms and OFF for 500ms 20 times by the use of the solenoid drive control Bios.
			[Operation]
			1) Initial display
			`02-08 ADF SPUS CHK`
			`EXECUTING...`

	09	RADF reverse solenoid operation check (RADF SPFS CHK)	**[Function]**
			The RADF reverse solenoid (SPFS) repeats ON for 500ms and OFF for 500ms 20 times by the use of the solenoid drive control Bios.
			[Operation]
			1) Initial display
			`02-09 RADF SPFS CHK`
			`EXECUTING...`

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

5	01	Operation panel display check (LCD/LED CHK)	**[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 SWITCH] 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 [C] 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 LCD displays 0.
			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 [C] 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.
			When [CA] 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]
			<LED check mode (All ON/Individual ON)>
			1) Initial display
			 
			2) When [MODE SWITCH] 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]
			`05-01 LCD/LED CHK.`
			`**`

<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>5</td><td>02</td><td>Fusing lamp, cooling fan operation check (HT LAMP CHK)</td><td>[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]
1) Initial display
<pre>05-02 HT LAMP CHK
EXECUTING...</pre></td></tr>
<tr><td></td><td>03</td><td>Copy lamp ON check (C-LAMP CHK)</td><td>[Function]
When [ENTER/START] key is pressed, the copy lamp turns ON for 5sec.
[Operation]
1) Initial display
<pre>05-03 C-LAMP CHK
EXECUTING...</pre></td></tr>
<tr><td>6</td><td>01</td><td>Paper feed solenoid (CPFS1, CPFS2, MPFS) operation check (PSOL CHK)</td><td>[Function]
When [ENTER/START] key is pressed, the selected paper feed solenoid repeats ON for 500ms and OF for 500ms 20times.
When [←/→/10KEY] 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]
1) Initial display
<pre>06-01 PSOL CHK
0:CPFS1</pre>2) [←/10KEY]
<pre>06-01 PSOL CHK
2:MPFS</pre>2) [→/10KEY]
<pre>06-01 PSOL CHK
1:CPFS2</pre>3) [ENTER/START]
<pre>06-01 PSOL CHK
EXECUTING...</pre>4) Returns to the initial display.</td></tr>
<tr><td></td><td>02</td><td>Resist roller solenoid (RRS) operation check (RES.R SOL CHK)</td><td>[Function]
When [ENTER/START] key is pressed, the resist solenoid repeats ON for 500ms and OFF for 500ms 20 times.
[Operation]
1) Initial display
<pre>06-02 RES.R SOL CHK
EXECUTING...</pre></td></tr>
<tr><td>7</td><td>01</td><td>Check of warm-up display and aging with JAM (W-UP/ AGING)</td><td>[Function]
Copying is repeated to make the set quantity of copies.
When the test command 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 [CA] key is pressed, the ready lamp lights up.
After that, enter the copy quantity with [10KEY] and press [ENTER/START] key to repeat copying of the set quantity (interval 0sec).
To cancel the test command, turn off the power or execute a test command which causes hardware reset.
[Operation]
1) Initial display
<pre>07-01 W-UP/AGING
0</pre>2) After 10sec
<pre>07-01 W-UP/AGING
10</pre></td></tr>
</table>

Main code	Sub code	Contents	Details of function/operation

7	06	Interval aging (INTERVAL AGING)	**[Function]**
			Copying is repeated to make the set quantity of copies.
			When the test command is executed, warm-up is performed and the ready lamp is lighted.
			Enter the copy quantity with the [10KEY] 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 test command, turn off the power or execute a test command which executes hardware reset.
			[Operation]
			1) Initial display (Basic display of copy)
			`READY TO COPY`
			`100%  A4  0`

	08	Shift to copy with warm-up display (W-UP C-MODE)	**[Function]**
			Enter the test command code, and warm-up is started and warm-up time is counted for every second from 0 and displayed.
			When [CA] 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 test command 7-01.)
			[Operation]
			1) Initial display
			`07-08 W-UP C-MODE`
			`0`
			2) After 10sec
			`07-08 W-UP C-MODE`
			`10`

8	01	Developing bias output (DVLP BIAS SET.)	**[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 test command 25-01.
			After completion of this process, the machine goes into the sub code entry standby mode.
			[Operation]
			1) Initial display
			`08-01 DVLP BIAS SET.`
			`EXECUTING...`

	02	Main charger output (Grid HIGH) (MHV(H) SET.)	**[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]
			1) Initial display
			`08-02 MHV(H) SET.`
			`EXECUTING...`

	03	Main charger output (Grid LOW) (MHV(L) SET.)	**[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]
			1) Initial display
			`08-03 MHV(L) SET.`
			`EXECUTING...`

	06	Transfer charger output (THV SET.)	**[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]
			1) Initial display
			`08-03 THV SET.`
			`EXECUTING...`

Main code	Sub code	Contents	Details of function/operation

9	01	Duplex motor normal rotation check (DPLX ROT.) (e-STUDIO203SD 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]
			1) Initial display
			`09-01 DPLX ROT.`
			`EXECUTING...`

	02	Duplex motor reverse rotation check (DPLX ROT.REV.) (e-STUDIO203SD 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]
			1) Initial display
			`09-02 DPLX ROT.REV.`
			`EXECUTING...`

	04	Duplex motor rotating speed adjustment (DPLX ROT. SPEED) (e-STUDIO203SD only)	**[Function]**
			When this Test Command is executed, the currently set value is displayed.
			Enter the adjustment value with [10KEY] 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: 8)
			[Operation]
			1) Initial display
			`09-04 DPLX ROT.SPEED`
			`8( 1-13)`
			2) [10KEY]
			`09-04 DPLX ROT.SPEED`
			`7( 1-13)`
			3) [ENTER/START]
			`09-04 DPLX ROT.SPEED`
			`7( 1-13)`

10		Toner motor operation (TONER MOTOR)	**[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]
			1) Initial display
			`10-00 TONER MOTOR`
			`EXECUTING...`

14		Cancel of trouble other than U2 (TRBL CANC.)	**[Function]**
			Used to cancel troubles other than U2.
			* Cancel troubles such as H trouble which writes data into EEPROM, and perform hardware reset.
			[Operation]
			1) Initial display
			`14-00 TRBL CANC.`
			`CLEARED`

16		U2 trouble cancel (U2 TRBL CANC.)	**[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]
			1) Initial display
			`16-00 U2 TRBL CANC.`
			`CLEARED`

20	01	Maintenance counter clear (M-CNT CLR.)	**[Function]**
			When [ENTER/START] key is pressed, the maintenance count value is cleared and "000,000" is displayed.
			[Operation]
			1) Initial display
			`20-01 M-CNT CLR.`
			`CLEARED 000,000`

<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>21</td><td>01</td><td>Maintenance cycle setting (M-CYCLE)</td><td>
[Function]
The code of the currently set maintenance cycle value is displayed (initial display) and the set data are saved.
<table>
<tr><th>Code</th><th>Setting</th><th>Remark</th></tr>
<tr><td>0</td><td>3,000 sheets</td><td></td></tr>
<tr><td>1</td><td>6,000 sheets</td><td></td></tr>
<tr><td>2</td><td>9,000 sheets</td><td></td></tr>
<tr><td>3</td><td>13,000 sheets</td><td></td></tr>
<tr><td>4</td><td>25,000 sheets</td><td>Default</td></tr>
<tr><td>5</td><td>Free (999,999 sheets)</td><td></td></tr>
</table>
[Operation]
1) The current set value is displayed.
<pre>21-01 M-CYCLE
4:25,000   (0-5)</pre>
2) [→/10KEY]
<pre>21-01 M-CYCLE
5:FREE   (0-5)</pre>
2) [←/10KEY]
<pre>21-01 M-CYCLE
3:13,000   (0-5)</pre>
3) [ENTER/START]
<pre>21-01 M-CYCLE
5:FREE   (0-5)</pre>
</td></tr>
<tr><td rowspan="6">22</td><td>01</td><td>Maintenance counter display (M-CNT)</td><td>
[Function]
The maintenance counter is displayed.
[Operation]
1) Initial display
<pre>22-01 M-CNT
          ,</pre>
</td></tr>
<tr><td>02</td><td>Maintenance preset display (M-CNT PRESET)</td><td>
[Function]
The quantity (25,000 sheets, etc.) corresponding to the code set with TC21-01 is displayed.
[Operation]
1) Initial display
<pre>22-02 M-CNT PRESET
          ,</pre>
</td></tr>
<tr><td>04</td><td>JAM total counter display (JAM TTL CNT)</td><td>
[Function]
The JAM total counter is displayed.
[Operation]
1) Initial display
<pre>22-04 JAM TTL CNT
          ,</pre>
</td></tr>
<tr><td>05</td><td>Total counter display (TTL CNT)</td><td>
[Function]
The total counter value is displayed.
[Operation]
1) Initial display
<pre>22-05 TTL CNT
          ,</pre>
</td></tr>
<tr><td>06</td><td>Developer counter display (DVLP CNT)</td><td>
[Function]
The developer counter data is acquired and displayed on the LCD.
[Operation]
1) Initial display
<pre>22-06 DVLP CNT
          ,</pre>
</td></tr>
<tr><td>08</td><td>RADF counter display (ADF CNT)</td><td>
[Function]
The RADF counter is displayed.
[Operation]
1) Initial display
<pre>22-08 ADF CNT
          ,</pre>
</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>22</td><td>11</td><td>FAX-related counter display (Executable only when the FAX is installed.)</td><td>
[Function]
The FAX-related counter is displayed.
[Operation]
1) Initial display
<pre>SELECT COUNTER
1:PAGE   2:TIME</pre>
* [CLEAR] key: FAX control is terminated.
2) Select 1
<pre>SEND PAGE:xxx,xxx
RECV PAGE:xxx,xxx</pre>
("xxx,xxx" is the current value.)
* [CLEAR] key: Returns to "1) Initial display".
2) Select 2
<pre>TX TIME:xxxx:xx.xx
RX TIME:xxxx:xx.xx</pre>
("xxxx: xxx. xx" is the current value.)
* [CLEAR] key: Returns to "1) Initial display".
</td></tr>
<tr><td></td><td>12</td><td>Drum counter display (DRUM CNT)</td><td>
[Function]
The drum counter is displayed.
[Operation]
1) Initial display
<pre>22-12 DRUM CNT
            ,</pre>
</td></tr>
<tr><td></td><td>13</td><td>CRUM type display (CRUM TYPE)</td><td>
[Function]
When the test command is executed, the CRUM type currently set (written) in the CRUM chip is displayed.
<table>
<tr><th>Code number</th><th>CRUM type</th><th>Display item</th></tr>
<tr><td>00</td><td>Not set</td><td>0</td></tr>
<tr><td>01</td><td>BTA-A</td><td>BTA-A</td></tr>
<tr><td>02</td><td>BTA-B</td><td>BTA-B</td></tr>
<tr><td>03</td><td>BTA-C</td><td>BTA-C</td></tr>
<tr><td>99</td><td>Conversion</td><td>CONVERSION</td></tr>
</table>
[Operation]
1) The CRUM type is displayed.
<pre>22-13 CRUM TYPE
01:BTA-A</pre>
</td></tr>
<tr><td></td><td>14</td><td>ROM version display (ROM VER.)</td><td>
[Function]
The P-ROM version is displayed.
Press [←/→/10KEY] 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]
1) Initial display
<pre>22-14 ROM VER.
MAIN PROG.   00.00</pre>
2) [→/10KEY]
<pre>22-14 ROM VER.
F-IMC PROG.   00.00</pre>
2) [←/10KEY]
<pre>22-14 ROM VER.
LCD DATA   00.00</pre>
</td></tr>
<tr><td></td><td>16</td><td>Duplex counter display (DPLX CNT) (e-STUDIO203SD only)</td><td>
[Function]
The duplex counter is displayed.
[Operation]
1) Initial display
<pre>22-16 DPLX CNT
            ,</pre>
</td></tr>
</table>

Main code	Sub code	Contents	Details of function/operation

22	17	Copy counter display (COPIES CNT)	**[Function]**
			The copy counter is displayed.
			[Operation]
			1) Initial display
			`22-17 COPIES CNT`
			`***,***`

	18	Printer counter display (PRT.CNT)	**[Function]**
			The printer counter is displayed.
			[Operation]
			1) Initial display
			`22-18 PRT.CNT`
			`***,***`

	19	Scanner mode counter display (S-MODE CNT)	**[Function]**
			The scanner mode counter is displayed.
			[Operation]
			1) Initial display
			`22-19 S-MODE CNT`
			`***,***`

	21	Scanner counter display (SCAN CNT)	**[Function]**
			The scanner counter is displayed.
			[Operation]
			1) Initial display
			`22-21 SCAN CNT`
			`***,***`

	22	RADF JAM counter display (S JAM CNT)	**[Function]**
			The RADF JAM counter is displayed.
			[Operation]
			1) Initial display
			`22-22 S JAM CNT`
			`***,***`

24	01	JAM total counter clear (JAM TTL CLR.)	**[Function]**
			When [ENTER/START] key is pressed, the JAM total counter is cleared to 0 and "000,000" is displayed on the LCD.
			[Operation]
			1) Initial display
			`24-01 JAM TTL CLR.`
			`CLEARED 000,000`

	04	RADF counter clear (ADF CLR.)	**[Function]**
			When [ENTER/START] key is pressed, the RADF counter value is cleared to 0 and "000,000" is displayed on the LCD.
			[Operation]
			1) Initial display
			`24-04 ADF CLR.`
			`CLEARED 000,000`

	05	Duplex counter clear (DPLX CLR.) (e-STUDIO203SD only)	**[Function]**
			When [ENTER/START] key is pressed, the duplex counter value is cleared to 0, and "000,000" is displayed on the LCD.
			[Operation]
			1) Initial display
			`24-05 DPLX CLR.`
			`CLEARED 000,000`

Main code	Sub code	Contents	Details of function/operation

24	06	Developer counter clear (DVLP CLR.)	**[Function]**
			When [ENTER/START] key is pressed, the developer counter value is cleared to 0, and "000,000" is displayed on the LCD.
			[Operation]
			1) Initial display
			`24-06 DVLP CLR.`
			`CLEARED 000,000`

	07	Drum counter clear (DRUM CLR.)	**[Function]**
			When [ENTER/START] key is pressed, the drum counter value is cleared to 0, and "000,000" is displayed on the LCD.
			[Operation]
			1) Initial display
			`24-07 DRUM CLR.`
			`CLEARED 000,000`

	08	Copy counter clear (COPIES CLR.)	**[Function]**
			When [ENTER/START] key is pressed, the copy counter value is cleared to 0, and "000,000" is displayed on the LCD.
			[Operation]
			1) Initial display
			`24-08 COPIES CLR.`
			`CLEARED 000,000`

	09	Printer counter clear (PRT.CLR.)	**[Function]**
			When [ENTER/START] key is pressed, the printer counter value is cleared to 0, and "000,000" is displayed on the LCD.
			[Operation]
			1) Initial display
			`24-09 PRT.CLR.`
			`CLEARED 000,000`

	10	FAX counter clear (FAX CLR.) (Executable only when the FAX is installed.)	**[Function]**
			When [ENTER/START] key is pressed, the FAX count value is set to 0 and "000,000" is displayed on the LCD.
			[Operation]
			1) Initial display
			`24-10 FAX CLR.`
			`CLEARED 000,000`

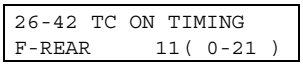
	13	Scanner counter clear (SCAN CLR.)	**[Function]**
			When [ENTER/START] key is pressed, the scanner counter value is cleared to 0, and "000,000" is displayed on the LCD.
			[Operation]
			1) Initial display
			`24-13 SCAN CLR.`
			`CLEARED 000,000`

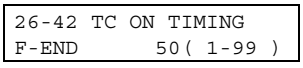
	14	RADF JAM total counter clear (S JAM TTL CLR.)	**[Function]**
			When [ENTER/START] key is pressed, the RADF JAM total counter value is cleared to 0, and "000,000" is displayed on the LCD.
			[Operation]
			1) Initial display
			`24-14 S JAM TTL CLR.`
			`CLEARED 000,000`

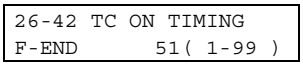
	15	Scanner mode counter clear (S-MODE CLR.)	**[Function]**
			When [ENTER/START] key is pressed, the scanner mode counter value is cleared to 0, and "000,000" is displayed on the LCD.
			[Operation]
			1) Initial display
			`24-15 S-MODE CLR.`
			`CLEARED 000,000`

<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td rowspan="4">25</td><td>01</td><td>Main motor operation check (MAIN MOTOR CHK)</td><td>[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]
1) Initial display
<pre>25-01 MAIN MOTOR CHK
EXECUTING...</pre></td></tr>
<tr><td>10</td><td>Polygon motor operation check (LSU CHK)</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]
1) Initial display
<pre>25-10 LSU CHK
EXECUTING...</pre></td></tr>
<tr><td rowspan="3">26</td><td>02</td><td>(R)ADF setting (ADF/RADF)</td><td>[Function]
When this test command is executed, the current set (R)ADF is displayed. Enter the code number corresponding to the desired (R)ADF and press [ENTER/START] key to save the setting.
<table><tr><th>Code number</th><th>ADF</th><th>Display item</th></tr><tr><td>0</td><td>ADF NO</td><td>ADF OFF</td></tr><tr><td>1</td><td>ADF YES*</td><td>ADF ON</td></tr><tr><td>2</td><td>RADF YES</td><td>RADF ON</td></tr></table>* Cannot be executed.
[Operation]
The operation is similar to test command 21-01.</td></tr>
<tr><td>03</td><td>Second cassette setting (2ND TRAY)</td><td>[Function]
When this test command 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 test command 21-01.</td></tr>
<tr><td>04</td><td>Main unit duplex setting (DPLX)</td><td>[Function]
When this test command 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>* e-STUDIO203S: cannot be executed.
[Operation]
The operation is similar to test command 21-01.</td></tr>
</table>

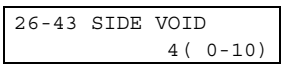
<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>26</td><td>06</td><td>Destination setting (DESTINATION)</td><td>
[Function]
When this test command is executed, the current set destination is displayed. Enter the code number corresponding 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>
<tr><td>3</td><td>China (EX Japan AB series + China paper support)</td><td>CHINA</td></tr>
</table>
* Code numbers 2 and 3 cannot be selected for the e-STUDIO203S and the e-STUDIO203SD.
[Operation]
The operation is similar to test command 21-01.
</td></tr>
<tr><td></td><td>07</td><td>Machine conditions check (CPM)</td><td>
[Function]
When this test command 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]
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 setting (END EDGE)</td><td>
[Function]
When this test command 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 test command 21-01.
</td></tr>
<tr><td></td><td>30</td><td>CE mark support control ON/OFF (CE MARK)</td><td>
[Function]
When this test command 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 test command 21-01.
</td></tr>
<tr><td></td><td>37</td><td>Cancel of stop at developer life over (DVLP LIFE END)</td><td>
[Function]
When this test command 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>Code number</th><th>Setting</th><th>Display item</th><th>Remark</th></tr>
<tr><td>0</td><td>Stop at developer life over</td><td>STOP</td><td></td></tr>
<tr><td>1</td><td>Cancel of stop at developer life over</td><td>NONSTOP</td><td></td></tr>
</table>
[Operation]
The operation is similar to test command 21-01.
</td></tr>
<tr><td></td><td>39</td><td>Memory capacity check (MEM.CHK)</td><td>
[Function]
When the test command 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]
1) Memory capacity display
<pre>
26-39 MEM.CHK
8 MBYTE
</pre>
</td></tr>
</table>

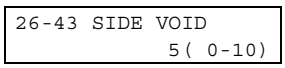
<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>26</td><td>40</td><td>Polygon motor OFF time setting (Time required from completion of printing to turning OFF the motor) (LSU MOTOR OFF)</td><td>
[Function]
When this test command is executed, 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>Code number</th><th>Setting</th><th>Display item</th><th>Remark</th></tr>
<tr><td>0</td><td>0sec</td><td>0 SEC.</td><td></td></tr>
<tr><td>1</td><td>30sec</td><td>30 SEC.</td><td>Default</td></tr>
<tr><td>2</td><td>60sec</td><td>60 SEC.</td><td></td></tr>
<tr><td>3</td><td>90sec</td><td>90 SEC.</td><td></td></tr>
</table>
[Operation]
The operation is similar to test command 21-01.
</td></tr>
<tr><td></td><td>42</td><td>Transfer ON timing control setting (TC ON TIMING)</td><td>
[Function]
When this test command is executed, the currently set value of the transfer ON timing is displayed (initial display), and the set value is saved.
<table>
<tr><th>Mode</th><th>Display item</th><th>Default</th><th>Setting range</th></tr>
<tr><td>Front surface paper lead edge</td><td>F-REAR</td><td>11</td><td>0 – 21</td></tr>
<tr><td>Front surface paper rear edge</td><td>F-END</td><td>50</td><td>1 – 99</td></tr>
<tr><td>Back surface paper lead edge</td><td>B-REAR</td><td>11</td><td>0 – 21</td></tr>
<tr><td>Back surface paper rear edge</td><td>B-END</td><td>50</td><td>1 – 99</td></tr>
</table>
<Front/back surface of paper lead edge adjustment table>
<table>
<tr><th>Code</th><th>Setting</th><th>Remark</th></tr>
<tr><td>0</td><td>0 msec</td><td></td></tr>
<tr><td>1</td><td>–20 msec</td><td></td></tr>
<tr><td>…</td><td>…</td><td></td></tr>
<tr><td>10</td><td>–2 msec</td><td></td></tr>
<tr><td>11</td><td>0 msec</td><td>Default</td></tr>
<tr><td>12</td><td>+2 msec</td><td></td></tr>
<tr><td>…</td><td>…</td><td></td></tr>
<tr><td>21</td><td>+20 msec</td><td></td></tr>
</table>
∗ The default value, "11," of the transfer ON timing indicates "236msec passed from PS release."
∗ When set to "0," it is same as setting to the default, "11."
∗ The transfer ON timing can be adjusted to 236msc ± 2ms.
<Front/back surface of paper rear edge adjustment table>
<table>
<tr><th>Code</th><th>Setting</th><th>Remark</th></tr>
<tr><td>1</td><td>–98 msec</td><td></td></tr>
<tr><td>…</td><td>…</td><td></td></tr>
<tr><td>49</td><td>–2 msec</td><td></td></tr>
<tr><td>50</td><td>0 msec</td><td>Default</td></tr>
<tr><td>51</td><td>+2 msec</td><td></td></tr>
<tr><td>…</td><td>…</td><td></td></tr>
<tr><td>99</td><td>+98 msec</td><td></td></tr>
</table>
∗ The default "50" of the transfer OFF timing indicates "210msec passed from PPD1 OFF."
∗ The transfer OFF timing can be adjusted to 210msec ± 2ms.
[Operation]
1) Initial display
<Front surface lead edge setting>


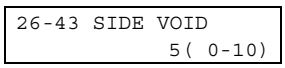
2) [←/→] Mode selection


3) [10KEY] Value entry


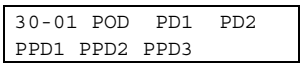
4) [ENTER/START] Settles the entered value. The display is shifted to the sub code input standby menu.
</td></tr>
</table>

<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>26</td><td>43</td><td>Side void amount setting (SIDE VOID)</td><td>
[Function]
When this test command 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]
1) Initial display


2) [10KEY]


3) [ENTER/START]


</td></tr>
<tr><td></td><td>54</td><td>γ life correction setting (GAMMA CTRL)</td><td>
[Function]
Used to set the γ life correction.
When this test command 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 test command 21-01.
</td></tr>
<tr><td></td><td>62</td><td>Energy-save mode copy lamp setting (C-LAMP E-S)</td><td>
[Function]
Used to set half-ON /OFF of the copy lamp in the pre-heat mode.
When this test command 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 test command 21-01.
</td></tr>
<tr><td>30</td><td>01</td><td>Paper sensor status display (P-SENSOR)</td><td>
[Function]
The paper sensor status is displayed on the LCD.
<table>
<tr><th>Sensor</th><th>Display item</th><th>Remark</th></tr>
<tr><td>Paper exit sensor</td><td>POD</td><td></td></tr>
<tr><td>No. 1 tray paper width sensor</td><td>PD1</td><td></td></tr>
<tr><td>No. 2 tray paper width sensor</td><td>PD2</td><td></td></tr>
<tr><td>Paper entry sensor</td><td>PPD1</td><td></td></tr>
<tr><td>Duplex sensor</td><td>PPD2</td><td></td></tr>
<tr><td>No. 2 tray paper feed sensor</td><td>PPD3</td><td></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]
1) Initial display

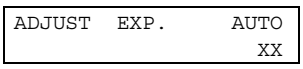

2) When sensor ON


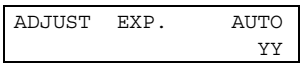
</td></tr>
</table>

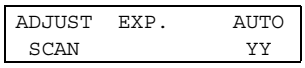
<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>41</td><td>06</td><td>OC cover float detection level adjustment (OC FLOAT LEVEL)</td><td>
[Function]
When this test command is executed, the current set value is displayed. When [ENTER/START] key is pressed, the mirror base unit moves to the ADF 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 detection level is not acquired, ERR display is made. (Default: 0)
Note that, this test command must be executed with the OC cover closed.
∗ If the value is 0, float detection is not performed in normal jobs.
[Operation]
1) Initial display
<pre>41-06 OC FLOAT LEVEL
                0</pre>
2) [ENTER/START]
<pre>41-06 OC FLOAT LEVEL
EXECUTING...</pre>
<Canceling - when C/CA 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 (OC FLOAT MGN)</td><td>
[Function]
For the number of pixels between black markers on the ADF 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 test command is "0," no float error occurs.
When this test command is executed, the current set value is displayed.
Enter the adjustment value with 10-key, and press [START] key. The setting is saved and the display is shifted to the sub code input standby menu.
Setting range: 0 – 99 (Copes with margin 0 – 99 pixels.)
Default: 30 (30 pixels)
[Operation]
The operation is similar to test command 9-04.
</td></tr>
<tr><td>43</td><td>01</td><td>Fusing temperature setting (Normal copy) (FU TEMP)</td><td>
[Function]
When this test command is executed, the current set code number is displayed. Press [←/→/10KEY] key 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.
<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>Default</td></tr>
<tr><td>5</td><td>195</td><td></td></tr>
<tr><td>6</td><td>200</td><td></td></tr>
<tr><td>7</td><td>205</td><td></td></tr>
<tr><td>8</td><td>210</td><td></td></tr>
</table>
<table>
<tr><th>Mode</th><th>Display item</th></tr>
<tr><td>Main cassette paper feed & 2nd cassette paper feed</td><td>TRAY1</td></tr>
<tr><td>Manual paper feed</td><td>MFT</td></tr>
</table>
∗ The cassette feed and the manual feed are controlled similarly.
[Operation]
1) Initial display <Main cassette paper feed & 2nd cassette paper feed setting>
<pre>43-01 FU TEMP
TRAY1   6(0-8)</pre>
2) [←/→] Mode selection
<pre>43-01 FU TEMP
MFT   6(0-8)</pre>
3) [10KEY] Value entry
<pre>43-01 FU TEMP
MFT   7(0-8)</pre>
4) [ENTER/START] Settles the entered value. The display is shifted to the sub code input standby menu.
</td></tr>
</table>

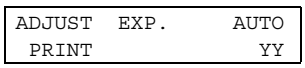
<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>43</td><td>04</td><td>Fusing temperature setting in multi copy
(FU TEMP MULTI)</td><td>
[Function]
For 20th sheet or later in multi copy, the fusing temperature is automatically changed from the temperature set with test command 43-1 to the temperature set with this test command.
When this test command 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</th><th>Default</th></tr>
<tr><td>Main cassette paper feed & 2nd cassette paper feed</td><td>TRAY1</td><td>3</td></tr>
<tr><td>Manual paper feed</td><td>MFT</td><td>3</td></tr>
<tr><td>Main cassette paper feed & 2nd cassette paper feed (small-size)</td><td>TRAY1 SH</td><td>3</td></tr>
<tr><td>Manual paper feed (small-size)</td><td>MFT SH</td><td>3</td></tr>
</table>
* The cassette feed and the manual feed are controlled similarly.
[Operation]
The operation is similar to test command 43-01.
</td></tr>
<tr><td></td><td>05</td><td>Fusing temperature setting in duplex copy (FU TEMP DPLX)
(e-STUDIO203SD only)</td><td>
[Function]
In the case of duplex copy, the shift temperature set with this test command is applied to the fusing temperature.
When this test command 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 test command 21-01.
</td></tr>
<tr><td></td><td>14</td><td>Fusing start temperature setting (FU TEMP START)</td><td>
[Function]
When this test command is started, the currently set code number is displayed.
Press [←/→/10KEY] 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 test command 43-01.
</td></tr>
</table>

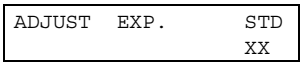
<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>46</td><td>01</td><td>Copy density adjustment (300dpi) (EXP.LEVEL 300)</td><td>
[Function]
Copy density is set for each mode.
When this test command is executed, the current se value is 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 [←/→] key to switch the mode. The set value of the selected mode is displayed on the LCD. (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</th><th>Default</th><th>LED</th></tr>
<tr><td>AE mode (300dpi)</td><td>AE</td><td>50</td><td>COPY mode lamp</td></tr>
<tr><td>TEXT mode (300dpi)</td><td>TEXT</td><td>50</td><td>PRINT mode lamp</td></tr>
<tr><td>PHOTO mode</td><td>PHOTO</td><td>50</td><td>SCAN mode lamp</td></tr>
<tr><td>TS mode (TEXT)(300dpi)</td><td>TSTXT</td><td>50</td><td>PRINT mode lamp
SCAN mode lamp</td></tr>
<tr><td>TS mode (AE)(300dpi)</td><td>TSAE</td><td>50</td><td>COPY mode lamp
SCAN mode lamp</td></tr>
</table>
[Operation]
1) Initial display
<pre>46-01 EXP.LEVEL 300
AE   100% 50(1-99)</pre>
2) [←] Mode selection
<pre>46-01 EXP.LEVEL 300
TSAE 100% 50(1-99)</pre>
2) [→] Mode selection
<pre>46-01 EXP.LEVEL 300
TEXT 100% 50(1-99)</pre>
3) [10KEY] Value entry
<pre>46-01 EXP.LEVEL 300
AE   100% 62(1-99)</pre>
4) [START] Fixing and printing value (No change on the LCD)
* Print is started in the set mode.
<pre>46-01 EXP.LEVEL 300
AE   100% 62(1-99)</pre>
4) To fix the set value without printing, press [Enter] key.
<pre>46-01 EXP.LEVEL 300
AE   100% 62(1-99)</pre>
* 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.
</td></tr>
<tr><td></td><td>02</td><td>Copy density adjustment (600dpi) (EXP.LEVEL 600)</td><td>
[Function]
Copy density is set for each mode.
When this test command 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 [←/→] key to switch the mode. The set value of the selected mode is displayed on the LCD. (Adjustment value: 1 – 99)
<table>
<tr><th>Mode</th><th>Display item</th><th>Default</th><th>LED</th></tr>
<tr><td>AE mode (600dpi)</td><td>AE</td><td>50</td><td>COPY mode lamp</td></tr>
<tr><td>TEXT mode (600dpi)</td><td>TEXT</td><td>50</td><td>PRINT mode lamp</td></tr>
<tr><td>PHOTO mode</td><td>PHOTO</td><td>50</td><td>SCAN mode lamp</td></tr>
<tr><td>TS mode (TEXT) (600dpi)</td><td>TSTXT</td><td>50</td><td>PRINT mode lamp
SCAN mode lamp</td></tr>
<tr><td>TS mode (AE) (600dpi)</td><td>TSAE</td><td>50</td><td>COPY mode lamp
SCAN mode lamp</td></tr>
</table>
[Operation]
The operation is similar to test command 46-01.
</td></tr>
</table>

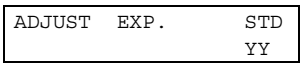
<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>46</td><td>12</td><td>Density adjustment in the FAX mode (Collective adjustment) (Executable only when the FAX is installed.)</td><td>
[Function]
When [START] key is pressed, scan is executed with the entered exposure adjustment value and the data stored on the FAX side is rewritten into the entered value.
All data of the exposure adjustment values are rewritten into the same value.
For the density adjustment table data, refer to TC46-13 (density adjustment (normal text) in the FAX mode).
[Operation]
1) Initial display


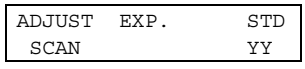
("XX" is the exposure adjustment value of normal text stored on the FAX side.)
2) Enter a 2-digit value as the exposure adjustment value.


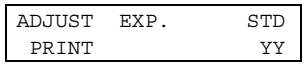
("YY" is the entered exposure adjustment value.)
3) Scan is started (self print), and the LED of [START] key is turned off.


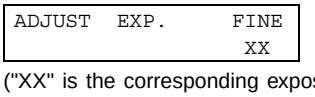
4) Print is started (self print).


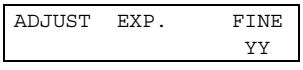
After completion of printing, returns to “2)” display.
</td></tr>
<tr><td></td><td>13</td><td>FAX mode density adjustment (normal text) (Executable only when the FAX is installed.)</td><td>
[Function]
Scan is started with the exposure adjustment value entered with [START] key, and the stored data of the selected mode on the FAX side is rewritten into the input value.
Density adjustment value data table
<table>
<tr><th>Mode</th><th>Photo</th><th>Exposure adjustment value</th></tr>
<tr><td>STD (Normal text)</td><td>off</td><td></td></tr>
<tr><td rowspan="2">Fine (Fine text)</td><td>on</td><td></td></tr>
<tr><td>off</td><td></td></tr>
<tr><td rowspan="2">Sfine (Super fine)</td><td>on</td><td></td></tr>
<tr><td>off</td><td></td></tr>
</table>
When initializing each data: 50
[Operation]
1) Initial display


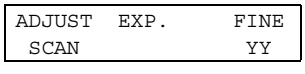
("XX" is the corresponding exposure adjustment value of normal text mode stored on the FAX side.)
2) Enter a 2-digit value as the exposure adjustment value with [10KEY].


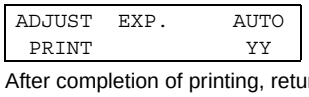
("YY" is the entered exposure adjustment value.)
3) Scan is started (self print), and the LED of [START] key is turned off.


4) Print is started (self print).


After completion of printing, returns to “2)” display.
</td></tr>
<tr><td></td><td>14</td><td>FAX mode density adjustment (Fine text) (Executable only when the FAX is installed.)</td><td>
[Function]
When [START] key is pressed, scan is started with the entered exposure adjustment value and the data of the selected mode on the FAX side is changed to the entered value.
For the density adjustment value table data, refer to TC46-13 (FAX mode density adjustment (normal text).)
[Operation]
1) Initial display


("XX" is the corresponding exposure adjustment value of the fine text mode stored on the FAX side.)
2) Enter a 2-digit value as the exposure adjustment value with [10KEY].


("YY" is the entered exposure adjustment value.)
3) Scan start (self print)


4) Print start (self print)


After completion of printing, returns to “2)” display.
</td></tr>
</table>

<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td rowspan="2">46</td><td>15</td><td>FAX mode density adjustment (Super fine) (Executable only when the FAX is installed.)</td><td>
[Function]
When [START] key is pressed, scan is started with the entered exposure adjustment value and the data of the selected mode on the FAX side is changed to the entered value.
For the density adjustment value table data, refer to TC46-13 (FAX mode density adjustment (normal text).)
[Operation]
1) Initial display
<pre>ADJUST EXP.   S-FINE
                    XX</pre>
("XX" is the corresponding exposure adjustment value of the super fine mode stored on the FAX side.)
2) Enter a 2-digit value as the exposure adjustment value with [10KEY].
<pre>ADJUST EXP.   S-FINE
                    YY</pre>
("YY" is the entered exposure adjustment value.)
3) Scan start (self print)
<pre>ADJUST EXP.   S-FINE
 SCAN   YY</pre>
4) Print start (self print)
<pre>ADJUST EXP.   S-FINE
 PRINT   YY</pre>
After completion of printing, returns to “2)” display.
</td></tr>
<tr><td>18</td><td>Image contrast adjustment (300dpi) (GAMMA 300)</td><td>
[Function]
Contrast is set for each mode.
When this test command 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 [←/→] key to switch the mode. The set value of the selected mode is displayed on the LCD. (Adjustment value: 1 – 99)
<table>
<tr><th>Mode</th><th>Display item</th><th>Default</th><th>LED</th></tr>
<tr><td>AE mode (300dpi)</td><td>AE</td><td>50</td><td>COPY mode lamp</td></tr>
<tr><td>TEXT mode (300dpi)</td><td>TEXT</td><td>50</td><td>PRINT mode lamp</td></tr>
<tr><td>PHOTO mode</td><td>PHOTO</td><td>50</td><td>SCAN mode lamp</td></tr>
<tr><td>TS mode (TEXT) (300dpi)</td><td>TSTXT</td><td>50</td><td>PRINT mode lamp
SCAN mode lamp</td></tr>
<tr><td>TS mode (AE) (300dpi)</td><td>TSAE</td><td>50</td><td>COPY mode lamp
SCAN mode lamp</td></tr>
</table>
* No density display on LCD.
[Operation]
The operation is similar to test command 46-01.
</td></tr>
</table>

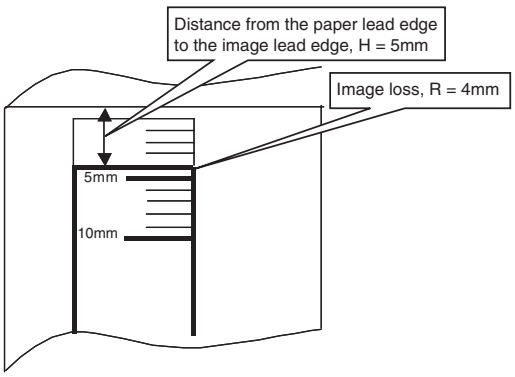
<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>46</td><td>19</td><td>Exposure mode setting (AE MODE)</td><td>
[Function]
<γ table setting>
When this test command is executed, the code number of the current set gamma table is displayed. (Default: 2)
Enter the code number corresponding to the desired gamma table, and press [←/→] key to change the mode and write into the EEPROM.
<AE operation mode>
When setting the γ table, press [→] key to change to the AE operation mode, and the current set code number of the AE operation mode is displayed. (Default: 0)
Enter the code number corresponding to the desired AE operation mode and press [←/→] key to change the mode and write into the EEPROM.
<PHOTO image process setting>
When [→] key is pressed in AE operation mode setting, the mode is changed to the PHOTO image process setting and the code number of the current set PHOTO image process setting is displayed. (Default: 1)
Enter the code number corresponding to the desired PHOTO image process setting and press [←/→] key to change the mode and write into the EEPROM.
<table>
<tr><th>Mode</th><th>Display item</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>1</td><td>Image quality priority mode</td><td>Default (NAD, ARD)</td></tr>
<tr><td>2</td><td>Toner consumption priority mode</td><td>Default (other)</td></tr>
<tr><td rowspan="2">AE</td><td rowspan="2">AE</td><td>0</td><td>Lead edge stop</td><td>Default</td></tr>
<tr><td>1</td><td>Real time process</td><td></td></tr>
<tr><td rowspan="2">PHOTO</td><td rowspan="2">PHOTO</td><td>1</td><td>Error diffusion process</td><td>Default</td></tr>
<tr><td>2</td><td>Dither process</td><td></td></tr>
</table>
[Operation]
1) Initial display
<γ table setting>
<pre>46-19 AE MODE
GAMMA   2(1-2)</pre>
2) [→] Mode selection
<pre>46-19 AE MODE
AE   0(0-1)</pre>
2) [←] Mode selection
<pre>46-19 AE MODE
PHOTO   1(1-2)</pre>
3) [10KEY] Value input
<pre>46-19 AE MODE
AE   1(0-1)</pre>
4) [ENTER/START] Save the set value. The machine goes to the sub code entry standby mode.
</td></tr>
<tr><td></td><td>20</td><td>RADF exposure correction (EXP.LEVEL ADF)</td><td>
[Function]
Used to adjust the exposure correction amount in the RADF mode. The adjustment is made by adjusting Vref voltage variation for the OC mode.
When this test command 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</th><th>Default</th><th>Remark</th></tr>
<tr><td>RADF</td><td>ADF</td><td>50</td><td></td></tr>
</table>
[Operation]
The operation is similar to test command 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>29</td><td>Image contrast adjustment (600dpi) (GAMMA 600)</td><td>
[Function]
Contrast is set for each mode.
When this test command 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 [←/→] key to switch the mode. The set value of the selected mode is displayed on the LCD. (Adjustment value: 1 – 99)
<table>
<tr><th>Mode</th><th>Display item</th><th>Default</th><th>LED</th></tr>
<tr><td>AE mode (600dpi)</td><td>AE</td><td>50</td><td>COPY mode lamp</td></tr>
<tr><td>TEXT mode (600dpi)</td><td>TEXT</td><td>50</td><td>PRINT mode lamp</td></tr>
<tr><td>PHOTO mode</td><td>PHOTO</td><td>50</td><td>SCAN mode lamp</td></tr>
<tr><td>TS mode (TEXT)(600dpi)</td><td>TSTXT</td><td>50</td><td>PRINT mode lamp
SCAN mode lamp</td></tr>
<tr><td>TS mode (AE)(600dpi)</td><td>TSAE</td><td>50</td><td>COPY mode lamp
SCAN mode lamp</td></tr>
</table>
∗ No density display on LCD.
[Operation]
The operation is similar to test command 46-01.
</td></tr>
<tr><td></td><td>30</td><td>AE limit adjustment (AE LIMIT)</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 [←/→] key, setting is changed. (Setting range: 0 – 31, Default: 0)
<table>
<tr><th>Mode</th><th>Display item</th><th>Remark</th></tr>
<tr><td>Limit value for AE</td><td>AE</td><td></td></tr>
<tr><td>Limit value for AE (toner save)</td><td>TEXT</td><td></td></tr>
</table>
<Remark>
When test command 26-06 (Destination setting) or test command 46-19 Auto Exposure mode is changed, the setting of this test command is also changed to the default in connection.
[Operation]
The operation is similar to test command 46-19.
</td></tr>
<tr><td></td><td>31</td><td>Image sharpness adjustment (SHARPNESS)</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 test command 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 [←/→] key. The code number of the selected mode is dip0slayed on the LCD.
<table>
<tr><th>Mode</th><th>Display item</th><th>Default setting</th><th>LED</th></tr>
<tr><td>AE mode</td><td>AE</td><td>1</td><td>COPY mode lamp</td></tr>
<tr><td>TEXT mode</td><td>TEXT</td><td>1</td><td>PRINT mode lamp</td></tr>
<tr><td>PHOTO mode</td><td>PHOTO</td><td>1</td><td>SCAN mode lamp</td></tr>
<tr><td>TS mode (TEXT)</td><td>TSTXT</td><td>1</td><td>PRINT mode lamp
SCAN mode lamp</td></tr>
<tr><td>TS mode (AE)</td><td>TSAE</td><td>1</td><td>COPY mode lamp
SCAN mode lamp</td></tr>
</table>
[Operation]
The operation is similar to test command 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>32</td><td>Copier color reproduction setting (COLOR REAPPEAR)</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 test command 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 [←/→] key. The code number of the selected mode is dip0slayed on the LCD.
<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</th><th>Default setting</th><th>LED</th></tr>
<tr><td>AE mode (including TS)</td><td>AE</td><td>0</td><td>COPY mode lamp</td></tr>
<tr><td>TEXT mode (including TS)</td><td>TEXT</td><td>0</td><td>PRINT mode lamp</td></tr>
<tr><td>PHOTO mode</td><td>PHOTO</td><td>0</td><td>SCAN mode lamp</td></tr>
</table>
[Operation]
The operation is similar to test command 46-01.
</td></tr>
<tr><td></td><td>39</td><td>FAX mode sharpness adjustment (Executable only when the FAX is installed.)</td><td>
[Function]
When [START] key is pressed, scan is started with the entered sharpness adjustment value, and the data of the selected mode stored on the FAX side is changed to the entered value.
Sharpness adjustment value data table
<table>
<tr><th>Mode</th><th>Sharpness adjustment value</th></tr>
<tr><td>1: STD</td><td></td></tr>
<tr><td>2: FINE</td><td></td></tr>
<tr><td>3: S-FINE</td><td></td></tr>
<tr><td>4: FINE/PHOTO</td><td></td></tr>
<tr><td>5: S-FINE/PHOTO</td><td></td></tr>
</table>
When initializing each data: 1
[Operation]
1) Initial display
<pre>SHARPNESS SETTING
PRESS ←,→</pre>
2) [←/→] or after 2sec
Every time when [→] key is pressed, the second line is changed in the sequence of No. 1 → 2 → 3 → 4 → 5 → 1.
When [←] key is pressed, the sequence is reversed.
<pre>SHARPNESS SET (1-5)
1:STD</pre>
3) Select the arrow key 1-5, and the LED of [START] key is lighted.
<pre>SHARPNESS SETTING
ZZZZ(0-2)   X</pre>
("ZZZZ" is the mode selected among STD, FINE, S-FINE, FINE/PHOTO, and S-FINE/PHOTO.)
("X" is the corresponding sharpness adjustment value of the selected mode stored on the FAX side.)
∗ [CLEAR] key: Returns to “2)” display.
4) Enter a one-digit value (0-2) as the sharpness adjustment value with [10KEY].
<pre>SHARPNESS SETTING
ZZZZ(0-2)   Y</pre>
("Y" is the entered sharpness adjustment value.)
∗ [CLEAR] key: Returns to “2)” display.
5) Scan start (self print)
<pre>SHARPNESS SETTING
 SCAN   Y</pre>
6) Print start (self print)
<pre>SHARPNESS SETTING
 PRINT   Y</pre>
After completion of printing, returns to “4)” display.
</td></tr>
</table>

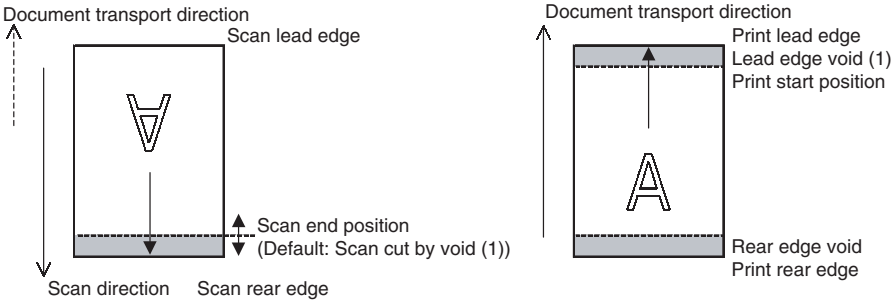
<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>48</td><td>01</td><td>Main scan/sub scan direction magnification ratio (COPY MAG.)</td><td>
[Function]
Used to adjust the magnification ratio in the main scan (front/rear) direction and sub scan direction.
Enter the adjustment value with [10KEY]. 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 [←/→] key. (Adjustment range: 1 – 99, Default: 50)
<table>
<tr><th>Mode</th><th>Display item</th><th>Default value</th><th>LED</th></tr>
<tr><td>Main scan direction magnification ratio</td><td>F-R</td><td>50</td><td>PRINT mode lamp</td></tr>
<tr><td>OC mode sub scan direction magnification ratio</td><td>SCAN</td><td>50</td><td>SCAN mode lamp</td></tr>
</table>
[Operation]
The operation is similar to test command 46-01.
</td></tr>
<tr><td></td><td>05</td><td>RADF mode sub scan direction magnification ratio in copying (RADF MAG.)</td><td>
[Function]
Used to display the current RADF mode sub scan direction magnification ratio on the LCD.
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 [←/→] key. (Adjustment range: 1 – 99, Default: 50)
When adjusting the RADF, 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</th><th>Default</th><th>LED</th></tr>
<tr><td>Sub scan magnification ratio adjustment on the front surface of RADF document</td><td>S-S</td><td>SIDE1</td><td>50</td><td>COPY mode lamp</td></tr>
<tr><td>Sub scan magnification ratio adjustment on the back surface of RADF document</td><td>D-S</td><td>SIDE2</td><td>50</td><td>PRINT mode lamp</td></tr>
</table>
∗ When there is no document in RADF, copy is inhibited.
[Operation]
The operation is similar to test command 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>49</td><td>01</td><td>Download mode
(DOWNLOAD MODE)</td><td>
[Function]
When this test command is executed, "DLOWNLOAD MODE" is displayed on the LCD and the machine goes into the program writing mode from PC to Flash ROM.
Use the writing tool on the PC and write the program.
During writing, the display shows as follows:
After completion of download, turn OFF/ON the power to reset.
<table>
<tr><th>Status</th><th>Display item</th></tr>
<tr><td>Download data receiving</td><td>RECEIVING</td></tr>
<tr><td>Loader function transfer</td><td>LOADER COPYING</td></tr>
<tr><td>Date delete start</td><td>FLASH ERASE</td></tr>
<tr><td>Data write (Boot section)</td><td>BOOT WRITING</td></tr>
<tr><td>Data write (Program section)</td><td>PROGRAM WRITING</td></tr>
<tr><td>Data write (EEPROM)</td><td>E2PROM WRITING</td></tr>
<tr><td>Data write (LCD)</td><td>LCD DATE WRITING</td></tr>
<tr><td>During SUM CHECK</td><td>FLASH ROM SUM CHECK</td></tr>
<tr><td>During BOOT SUM CHECK</td><td>BOOT SUM CHECK</td></tr>
<tr><td>During EEPROM SUM CHECK</td><td>EEPROM SUM CHECK</td></tr>
<tr><td>Download complete</td><td>DOWNLOAD COMPLETE!</td></tr>
</table>
In case of an error in download, the following message is displayed on the LCD.
<table>
<tr><th>Error status</th><th>Display item</th></tr>
<tr><td>PC data receiving</td><td>E-01 PC TRANS</td></tr>
<tr><td>Loader function transfer</td><td>E-02 LOADER COPY</td></tr>
<tr><td>FLASH ROM delete</td><td>E-03 FLASH ERASE</td></tr>
<tr><td>Boot section FLASH ROM write</td><td>E-04 BOOT WRITE</td></tr>
<tr><td>Program section FLASH ROM write</td><td>E-05 PROGRAM WRITE</td></tr>
<tr><td>Loader section SUM CHECK</td><td>E-06 LOADER SUM</td></tr>
<tr><td>Boot section SUM CHECK</td><td>E-07 BOOT SUM</td></tr>
<tr><td>Program section SUM CHECK</td><td>E-08 PROGRAM SUM</td></tr>
<tr><td>E2PROM SUM CHECK</td><td>E-09 E2PROM SUM</td></tr>
<tr><td>E2PROM write</td><td>E-10 E2PROM WRITE</td></tr>
<tr><td>E2PROM read Verify</td><td>E-11 E2PROM READ</td></tr>
<tr><td>E2PROM collating Verify</td><td>E-12 E2PROM COLLATE</td></tr>
<tr><td>Boot section lens check</td><td>E-13 BOOT LENGTH</td></tr>
<tr><td>Program section lens check</td><td>E-14 PROGRAM LENGTH</td></tr>
<tr><td>E2PROM lens check</td><td>E-15 E2PROM LENGTH</td></tr>
<tr><td>Total data size check</td><td>E-16 DATE SIZE</td></tr>
<tr><td>IMC communication error</td><td>E-17 IMC TRANS</td></tr>
<tr><td>IMC FRASH ROM write</td><td>E-18 IMC FLASH WRITE</td></tr>
<tr><td>LCD section lens check</td><td>E-19 LCD DATE LENGTH</td></tr>
<tr><td>LCD section FLASH ROM write</td><td>E-20 LCD DATE WRITE</td></tr>
<tr><td>LCD section SUM CHECK</td><td>E-21 LCD DATE SUM</td></tr>
</table>
To enter the download mode, there is a method to use key operations as well as to use a test command. With the power OFF, press and hold [CA] + [←], turn on the power.
[Operation]
1) Initial display
<pre>DOWNLOAD MODE</pre>
</td></tr>
</table>

<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>50</td><td>01</td><td>Lead edge image position (LEAD EDGE)</td><td>
[Function]
Used to adjust the copy image position and the lead edge void amount on copy paper. The adjustment is made by adjusting the image scan start position at 100% and the print start position (resist roller ON timing). When this test command is executed, the current set value is displayed in 2 digits. (Center value: 50)
When [←/→] key is pressed, the setting mode and the display are changed.
Enter the adjustment value and press [START] key to save the set value and make a copy.
When the adjustment is made by the main cassette paper feed, the adjustment values of all the paper feed ports become the same. (When the set value is increased by 1, shift is made by 0.1mm.)
<table>
<tr><th>Mode</th><th>Display item</th><th>Default</th><th>LED</th></tr>
<tr><td>Print start position (Main cassette paper feed)</td><td>TRAY1</td><td>50</td><td>COPY mode lamp
Main cassette lamp</td></tr>
<tr><td>(*) Print start position (2nd cassette paper feed)</td><td>TRAY2</td><td>50</td><td>COPY mode lamp
2nd cassette lamp</td></tr>
<tr><td>Print start position (Manual paper feed)</td><td>MFT</td><td>50</td><td>COPY mode lamp
Manual paper feed lamp</td></tr>
<tr><td>Image lead edge void amount</td><td>DEN-A</td><td>50</td><td>PRINT mode lamp
Main cassette lamp</td></tr>
<tr><td>Image scan start position</td><td>RRC-A</td><td>50</td><td>SCAN mode lamp
Main cassette lamp</td></tr>
<tr><td>Image rear edge void amount (Cassette paper feed)</td><td>DEN-B</td><td>50</td><td>COPY mode lamp
PRINT mode lamp
SCAN mode lamp
Main cassette lamp</td></tr>
<tr><td>Image rear edge void amount (Manual paper feed)</td><td>RRC-B</td><td>50</td><td>COPY mode lamp
PRINT mode lamp
Manual paper feed lamp</td></tr>
</table>
(*): 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 (A: AE mode lamp/COPY mode lamp ON), the lead edge void amount (B: TEXT mode lamp/PRINT mode lamp ON), the scan start position (C: PHOTO mode lamp/SCAN mode lamp) to zero, and make a copy of the scale at 100%.
2) Measure the image loss (Rmm) of the scale.
Set C = 10 x R (mm). (Example: Set to 40.)
When the value of C is increased by 10, the image loss is decreased by 1mm. (Default: 50)
3) Measure the distance (Hmm) from the paper lead edge to the image print start position.
Set A = 10 x H (mm). (Example: Set to 50.)
When the value of A is increased by 10, the image lead edge is moved to the paper lead edge by 1mm. (Default: 50).
4) Set the lead edge void amount to B = 50 (2.5mm). (Default: 50)
When the value of B is increased by 10, the void is extended by about 0.1mm. (For 25 or less, however, the void amount is regarded as 0.)
* The RSFP adjustment is made by adjusting the RADF image scan start position after OC adjustment.
(Example)


[Operation]
The operation is similar to test command 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>06</td><td>Copy lead edge position adjustment (RADF)
(RADF EDGE)</td><td>
[Function]
Used to adjust the RADF 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 [←/→] key. (Adjustment range: 1 – 99, Default: 50)
When scanning a back surface of document, the mode must be changed to operate the RADF by pressing [2-SIDED COPY] key.
<table>
<tr><th>Mode</th><th>Initial value of duplex setting</th><th>Display item</th><th>Default</th><th>LED</th></tr>
<tr><td>Front surface document scan position adjustment</td><td>S-S</td><td>SIDE1</td><td>50</td><td>COPY mode lamp</td></tr>
<tr><td>Back surface document scan position adjustment</td><td>D-S</td><td>SIDE2</td><td>50</td><td>PRINT mode lamp</td></tr>
<tr><td>Rear edge void adjustment (RADF)</td><td>S-S</td><td>END</td><td>50</td><td>SCAN mode lamp</td></tr>
</table>
∗ When there is no document in the RADF, copy is inhibited.
∗ When paper is discharged, the shifter is operated.
[Operation]
The operation is similar to test command 46-01.
</td></tr>
<tr><td></td><td>10</td><td>Print center offset adjustment (PRT.OFF-CENTER)</td><td>
[Function]
Used to adjust the center offset position of copy images on copy paper and that in scanning document.
When this test command 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 [←/→] key.
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 RADF is used, select the mode for use of the RADF by [2-SIDED COPY] key.
<table>
<tr><th>Mode</th><th>Display item</th><th>Default</th><th>LED</th></tr>
<tr><td>Print center offset
(Main cassette paper feed)</td><td>TRAY1</td><td>50</td><td>COPY mode lamp
Main cassette lamp</td></tr>
<tr><td>(*) Print center offset
(2nd cassette paper feed)</td><td>TRAY2</td><td>50</td><td>COPY mode lamp
2nd cassette lamp</td></tr>
<tr><td>Print center offset (Manual paper feed)</td><td>MFT</td><td>50</td><td>COPY mode lamp
Manual paper feed lamp</td></tr>
<tr><td>(**) 2nd print center offset
(Main cassette paper feed)</td><td>SIDE2</td><td>50</td><td>PRINT mode lamp
Main cassette lamp</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 test command 46-01.
</td></tr>
<tr><td></td><td>12</td><td>Document feed off-center adjustment (ORG.OFF-CENTER)</td><td>
[Function]
Used to adjust document scan off-center adjustment.
The adjustment modes can be selected by pressing [←/→] key. (Adjustment range: 1 – 99, Default: 50)
When the adjustment value is increased, the print result is shifted to left.
<table>
<tr><th>Mode</th><th>Initial value of duplex setting</th><th>Display item</th><th>Default</th><th>LED</th></tr>
<tr><td>Platen document scan</td><td>S-S</td><td>OC</td><td>50</td><td>COPY mode lamp</td></tr>
<tr><td>ADF document front scan</td><td>S-S</td><td>ADF</td><td>50</td><td>PRINT mode lamp</td></tr>
<tr><td>RADF document back scan</td><td>D-S</td><td>RADF</td><td>50</td><td>SCAN mode lamp</td></tr>
</table>
∗ When paper is discharged, the shifter is operated.
[Operation]
The operation is similar to test command 46-01.
</td></tr>
</table>

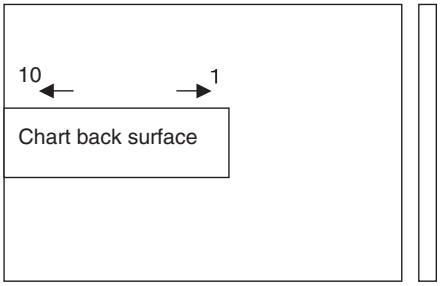
<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>50</td><td>18</td><td>Memory reverse position adjustment in duplex copy (DPLX REVERSE)</td><td>
[Function]
When this test command is executed, the current set correction value is displayed.
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 test command 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 test command.
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 [←/→] key.
<table>
<tr><th>Mode</th><th>Initial value of duplex setting</th><th>Display item</th><th>Default</th><th>LED</th></tr>
<tr><td>OC memory reverse output position (e-STUDIO203SD only)</td><td>S-D</td><td>OC</td><td>50</td><td>COPY mode lamp</td></tr>
<tr><td>RADF memory reverse output position</td><td>D-S</td><td>ADF</td><td>50</td><td>PRINT mode lamp</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 test command 46-01.
</td></tr>
<tr><td></td><td>19</td><td>Duplex copy rear edge void adjustment (DPLX END EDGE)
(e-STUDIO203SD only)</td><td>
[Function]
Used to adjust the rear edge void amount in duplex copy.
When this test command is executed, the current set value is displayed in 2 digits. (Center value: 50.) The adjustment modes can be selected by pressing [←/→] key. (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</th><th>Default</th><th>LED</th></tr>
<tr><td>Paper rear edge void amount</td><td>DEN-B</td><td>50</td><td>PRINT mode lamp</td></tr>
<tr><td>Print start position (Duplex back surface)</td><td>RRC-D</td><td>50</td><td>SCAN mode lamp</td></tr>
</table>
∗ The initial value for duplex setting is "1to2/Short Edge" for the OC setting, or "2to2" for the RADF setting.
∗ When paper is discharged, the shifter is operated.
[Operation]
The operation is similar to test command 46-01.
</td></tr>
</table>

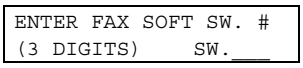
<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>51</td><td>02</td><td>Resist amount adjustment (RESIST ADJ.)</td><td>
[Function]
Used to adjust the contact pressure of the main unit resist roller and the RADF resist roller onto paper. When this test command is executed, the current set value is displayed.
The adjustment modes can be selected by pressing [←/→] key.
Enter the adjustment value with [10KEY] and press [START] key to save the set value and make a copy.
<table>
<tr><th>Mode</th><th>Display item</th><th>Default</th><th>LED</th></tr>
<tr><td>Main cassette paper fed</td><td>TRAY1</td><td>50</td><td>COPY mode lamp
Main cassette lamp</td></tr>
<tr><td>(*) 2nd cassette paper feed</td><td>TRAY2</td><td>50</td><td>COPY mode lamp
2nd cassette lamp</td></tr>
<tr><td>Manual paper feed</td><td>MFT</td><td>50</td><td>COPY mode lamp
Manual paper feed lamp</td></tr>
<tr><td>RADF document paper feed (Front surface)</td><td>SIDE1</td><td>50</td><td>COPY mode lamp
PRINT mode lamp
SCAN mode lamp
Main cassette lamp</td></tr>
<tr><td>RADF document paper feed (Back surface)</td><td>SIDE2</td><td>50</td><td>COPY mode lamp
PRINT mode lamp
Main cassette lamp</td></tr>
<tr><td>(*) Duplex back surface</td><td>DUP-2</td><td>50</td><td>PRINT mode lamp
SCAN mode lamp
Main cassette lamp</td></tr>
</table>
(*): Support for the installation models. For non-installation models, skip.
[Operation]
The operation is similar to test command 46-01.
</td></tr>
<tr><td>53</td><td>08</td><td>RADF scan position automatic adjustment (ADF AUTO)</td><td>
[Function]
Place a A4 paper (white chart) so that it covers the RADF scan glass and the OC glass together, and close the RADF.
When this test command 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, RADF 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 RADF scan position with the adjustment value displayed. The RADF glass cover edge position is calculated from the difference between the RADF 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</th><th>Default</th><th>LED</th></tr>
<tr><td>RADF scan position auto adjustment</td><td>AUTO</td><td>1</td><td>COPY mode lamp</td></tr>
<tr><td>RADF scan position manual adjustment</td><td>MANU</td><td>1</td><td>PRINT mode lamp</td></tr>
</table>
[Operation]
The operation is similar to test command 46-01. (In MANUAL)
OK/ERR display in AUTO
<When OK>
<pre>53-08 ADF AUTO
AUTO 100% **   OK</pre>
<When ERR>
<pre>53-08 ADF AUTO
AUTO 100% **   ERR</pre>
</td></tr>
<tr><td>61</td><td>03</td><td>HSYNC output check (LSU CHK)</td><td>
[Function]
When [ENTER/START] key is pressed, HSYNC is performed and the polygon motor is rotated for 30sec.
At that time, the COPY mode lamp is lighted for 100msec every time when HSYNC is detected.
[Operation]
1) Initial display
<pre>61-03 LSU CHK
EXECUTING...</pre>
</td></tr>
</table>

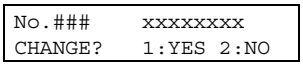
Main code	Sub code	Contents	Details of function/operation

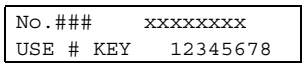
63	01	Shading check (SHADING CHK)	**[Function]**
			Used to display the detection level of white plate for shading.
			When [ENTER/START] key is pressed, the mirror base unit moves to the white plate for shading and the copy lamp is lighted.
			When the light quantity is stabilized, revision is made 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. (3 digits)
			[Operation]
			1) Initial display
			`63-01 SHADING CHK`
			`EXECUTING...  000`

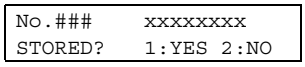
	02	Black level automatic correction (BLACK LEVEL)	**[Function]**
			Used to acquire the black level target value used for the black level adjustment of white balance.
			When this test command is executed, the current correction value is displayed in 3 digits of 12bit hexadecimal number.
			Place the gray gradation chart (KODAK GRAY SCALE) 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.
			* Default: 0
			* If the value is set to the default, operation is made with 0x60.
			[Operation]
			1) Initial display
			`63-02 BLACK LEVEL`
			`000`
			2) [ENTER/START] Correction start
			`63-02 BLACK LEVEL`
			`EXECUTING...`
			<During canceling - When C/CA 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`

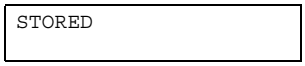
	12	Light quantity stable wait time setting (LT.STABLE TIME)	**[Function]** Used to set the wait time before entering the light quantity level stable evaluation process in the light quantity stable process of white balance. (Note: The light quantity stable level in the previous light quantity stable state is used as the target. When the light quantity level reaches the target during the wait time, the set time of this test command is ignored and the operation enters the stable evaluation process.) When this test command is executed, the currently set value is displayed. Enter the adjustment value with [10KEY] 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 test command 9-04.

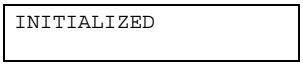
<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>63</td><td>13</td><td>Light quantity stable width setting (LT.STABLE RNG.)</td><td>[Function]
When the difference between the maximum and the minimum values of the light quantity level sampled for 3.2sec in the cycle of 100msec in the white balance light quantity stable process is within the range set with this test command, 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 test command is executed, the currently set value is displayed.
Enter the adjustment value with [10KEY] 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 test command 9-04.</td></tr>
<tr><td>64</td><td>01</td><td>Self print (1by2 mode) (SELF PRT.)</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 test command 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 test command 21-01.</td></tr>
<tr><td rowspan="2">66</td><td>01</td><td>FAX soft SW setting (Executable only when the FAX is installed.)</td><td>[Function]
Use to check the FAX soft SW setting.
Every time when the key is pressed, the bit on the first line is switched 0 and 1.
[Operation]
1) Initial display
 

∗ [CLEAR] key: FAX control is terminated.
2) Enter a 3-digit value of soft SW No. (To enter the fourth digit, shift to the left.), and the press [ENTER] key.
 

"xxxxxxxx" is the set content.
∗ Select 2: Returns to the soft SW No. entry display.
3) Select 1
 

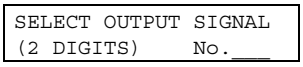
4) Change with 1-8 of [10KEY] and the press [ENTER] key.
 

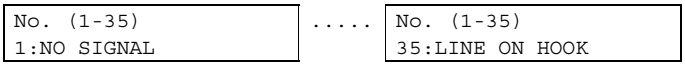
"xxxxxxxx" is the set content.
∗ Select 2: Returns to the soft SW No. entry display.
5) Select 1
 

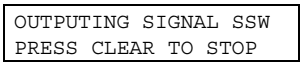
After 2sec, returns to "1) Initial display".</td></tr>
<tr><td>02</td><td>FAX soft SW initializing (excluding the adjustment values) (Executable only when the FAX is installed.)</td><td>[Function]
Use to initializing FAX soft SW.
[Operation]
1) Initial display
 

After 2sec, FAX control is terminated.</td></tr>
</table>

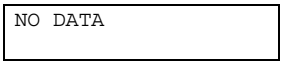
<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>66</td><td>03</td><td>FAX PWB memory check (Executable only when the FAX is installed.)</td><td>
[Function]
Use to check the FAX PWB memory.
[Operation]
1) Initial display
SELECT CHECK MEMORY
PRESS ←, →
2) [←/→] or after 2sec
Every time when [→] key is pressed, the second line is changed in the sequence of No. 1 → 2 → 3 → 1.
When [←] key is pressed, the sequence is reversed.
SELECT MEMORY (1-3)
1:DRAM
SELECT MEMORY (1-3)
2:SRAM
SELECT MEMORY (1-3)
3:FLASH
* [CLEAR] key: FAX control is terminated.
3) [ENTER] key
CHECKING MEMORY
4) After completion of check
• When the result is OK
MEMORY CHECK RESULT
OK
• In case of address bus check error
MEMORY CHECK RESULT
XXXXXXXX A-BUS NG
• In case of data bus check error
MEMORY CHECK RESULT
XXXXXXXX D-BUS NG
• In case of sum check error
MEMORY CHECK RESULT
XXXXXXXX SUM NG
• In case of data check error
MEMORY CHECK RESULT
XXXXXXXX DATA NG
• In case of erase check error
MEMORY CHECK RESULT
XXXXXXXX ERASE NG
* [CLEAR] key: Returns to "1) Initial display".
</td></tr>
<tr><td></td><td>04</td><td>Signal send mode (Max. value) (Executable only when the FAX is installed.)</td><td>
[Function]
Use to set the signal send mode (Max. value).
Facsimile test command design specifications.
<table>
<tr><td>1</td><td>NO SIGNAL</td><td>13</td><td>7200bps(V34)</td><td>25</td><td>2400bps(V27ter)</td></tr>
<tr><td>2</td><td>33600bps(V34)</td><td>14</td><td>4800bps(V34)</td><td>26</td><td>300bps(FLAG)</td></tr>
<tr><td>3</td><td>31200bps(V34)</td><td>15</td><td>2400bps(V34)</td><td>27</td><td>2100Hz(CED)</td></tr>
<tr><td>4</td><td>28800bps(V34)</td><td>16</td><td>14400bps(V33)</td><td>28</td><td>1100Hz(CNG)</td></tr>
<tr><td>5</td><td>26400bps(V34)</td><td>17</td><td>12000bps(V33)</td><td>29</td><td>300bps(V21)</td></tr>
<tr><td>6</td><td>24000bps(V34)</td><td>18</td><td>14400bps(V17)</td><td>30</td><td>2100Hz(ANSam)</td></tr>
<tr><td>7</td><td>21600bps(V34)</td><td>19</td><td>12000bps(V17)</td><td>31</td><td>DUMMY RING</td></tr>
<tr><td>8</td><td>19200bps(V34)</td><td>20</td><td>9600bps(V17)</td><td>32</td><td>NO VOICE ANSWER</td></tr>
<tr><td>9</td><td>16800bps(V34)</td><td>21</td><td>7200bps(V17)</td><td>33</td><td>NO RING BACK TONE</td></tr>
<tr><td>10</td><td>14400bps(V34)</td><td>22</td><td>9600bps(V29)</td><td>34</td><td>LINE OFF HOOK</td></tr>
<tr><td>11</td><td>12000bps(V34)</td><td>23</td><td>7200bps(V29)</td><td>35</td><td>LINE ON HOOK</td></tr>
<tr><td>12</td><td>9600bps(V34)</td><td>24</td><td>4800bps(V27ter)</td><td></td><td></td></tr>
</table>
[Operation]
1) Initial display
SELECT OUTPUT SIGNAL
(2 DIGITS) No.___
2) 2-digit (1-35) with [10KEY] / [←/→] / 2sec after
Pressing [→] key or [←] key reverses the sequence.
No. (1-35)
1:NO SIGNAL
.....
No. (1-35)
35:LINE ON HOOK
* [CLEAR] key: FAX control is terminated.
3) [ENTER] key
Send after setting
OUTPUTING SIGNAL MAX
PRESS CLEAR TO STOP
* [CLEAR] key: Returns to "1) Initial display".
</td></tr>
</table>

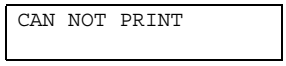
<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>66</td><td>05</td><td>Signal send mode (Soft SW set value) (Executable only when the FAX is installed.)</td><td>
[Function]
Use to set the signal send mode (Soft SW set value).
Facsimile test command design specifications.
<table>
<tr><td>1</td><td>NO SIGNAL</td><td>13</td><td>7200bps(V34)</td><td>25</td><td>2400bps(V27ter)</td></tr>
<tr><td>2</td><td>33600bps(V34)</td><td>14</td><td>4800bps(V34)</td><td>26</td><td>300bps(FLAG)</td></tr>
<tr><td>3</td><td>31200bps(V34)</td><td>15</td><td>2400bps(V34)</td><td>27</td><td>2100Hz(CED)</td></tr>
<tr><td>4</td><td>28800bps(V34)</td><td>16</td><td>14400bps(V33)</td><td>28</td><td>1100Hz(CNG)</td></tr>
<tr><td>5</td><td>26400bps(V34)</td><td>17</td><td>12000bps(V33)</td><td>29</td><td>300bps(V21)</td></tr>
<tr><td>6</td><td>24000bps(V34)</td><td>18</td><td>14400bps(V17)</td><td>30</td><td>2100Hz(ANSam)</td></tr>
<tr><td>7</td><td>21600bps(V34)</td><td>19</td><td>12000bps(V17)</td><td>31</td><td>DUMMY RING</td></tr>
<tr><td>8</td><td>19200bps(V34)</td><td>20</td><td>9600bps(V17)</td><td>32</td><td>NO VOICE ANSWER</td></tr>
<tr><td>9</td><td>16800bps(V34)</td><td>21</td><td>7200bps(V17)</td><td>33</td><td>NO RING BACK TONE</td></tr>
<tr><td>10</td><td>14400bps(V34)</td><td>22</td><td>9600bps(V29)</td><td>34</td><td>LINE OFF HOOK</td></tr>
<tr><td>11</td><td>12000bps(V34)</td><td>23</td><td>7200bps(V29)</td><td>35</td><td>LINE ON HOOK</td></tr>
<tr><td>12</td><td>9600bps(V34)</td><td>24</td><td>4800bps(V27ter)</td><td></td><td></td></tr>
</table>
[Operation]
1) Initial display


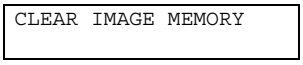
2) 2-digit (1-35) with [10KEY] / [←/→] / 2sec after
Pressing [→] key or [←] key reverses the sequence.


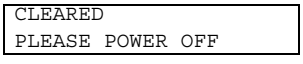
* [CLEAR] key: FAX control is terminated.
3) [ENTER] key
Send after setting


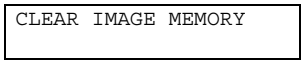
* [CLEAR] key: Returns to "1) Initial display".
</td></tr>
<tr><td></td><td>07</td><td>Image memory content print (Executable only when the FAX is installed.)</td><td>
[Function]
Use to print the image memory content.
[Operation]
• When print is allowed

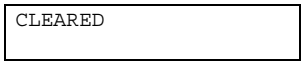

After completion of printing, FAX control is terminated.
• When there is no print data


After 2 sec, FAX control is terminated.
• When print is inhibited


After 2 sec, FAX control is terminated.
</td></tr>
<tr><td></td><td>10</td><td>Image memory content clear (Executable only when the FAX is installed.)</td><td>
[Function]
Use to clear the image memory content.
[Operation]
• When there are some print data


After completion of memory clear, the buzzer sounds.


Remains unchanged until the power is turned off.
• When there are no print data


After completion of memory clear


After 2sec, FAX control is terminated.
</td></tr>
</table>

Main code	Sub code	Contents	Details of function/operation

66	11	300bps signal send (Max. value) (Executable only when the FAX is installed.)	**[Function]**
			Use to set the 300bps signal send (Max. value).
			1: NO SIGNAL
			2: 11111
			3: 11110
			4: 00000
			5: 010101
			6: 00001
			[Operation]
			1) Initial display
			`SELECT SIGNAL`
			`PRESS ←, →`
			2) [←/→] or after 2sec
			Every time when [→] key is pressed, the second line is changed in the sequence of No. 1 → 2 → 3 → 4 → 5 → 6 → 1.
			When [←] key is pressed, the sequence is reversed.
			`SELECT SIGNAL (1-6)` `1:NO SIGNAL` ..... `SELECT SIGNAL (1-6)` `6:00001`
			* [CLEAR] key: FAX control is terminated.
			3) [ENTER] key
			`OUTPUTING SIGNAL MAX`
			`PRESS CLEAR TO STOP`
			* [CLEAR] key: Returns to "1) Initial display".

	12	300bps signal send (Soft SW set value) (Executable only when the FAX is installed.)	**[Function]**
			Use to set the 300bps signal send (Soft SW set value).
			1: NO SIGNAL
			2: 11111
			3: 11110
			4: 00000
			5: 010101
			6: 00001
			[Operation]
			1) Initial display
			`SELECT SIGNAL`
			`PRESS ←, →`
			2) [←/→] or after 2sec
			Every time when [→] key is pressed, the second line is changed in the sequence of No. 1 → 2 → 3 → 4 → 5 → 6 → 1.
			When [←] key is pressed, the sequence is reversed.
			`SELECT SIGNAL (1-6)` `1:NO SIGNAL` ..... `SELECT SIGNAL (1-6)` `6:00001`
			* [CLEAR] key: FAX control is terminated.
			3) [ENTER] key
			`OUTPUTING SIGNAL SSW`
			`PRESS CLEAR TO STOP`
			* [CLEAR] key: Returns to "1) Initial display".

<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td>66</td><td>13</td><td>Dial test (Executable only when the FAX is installed.)</td><td>
[Function]
Use to the dial test.
[Operation]
■ Dial test (PULSE)
1) Initial display
<pre>SELECT SIGNAL
1:PULSE   2:DTMF</pre>
∗ [CLEAR] key: FAX control is terminated.
2) Select 1
<pre>INPUT MAKE TIME
(0-15)   __</pre>
3) Enter the make time in 2 digits.
<pre>INPUT DIAL #
XXXX</pre>
XXXX: Default
∗ After deleting with [CLEAR] key, input can be made.
4) [ENTER] key
<pre>SEND yyPPS xxms
1:YES 2:NO</pre>
"yy" is the selected pulse 10 or 20.
"xx" is the input value.
∗ Select 2: Returns to “2)” display.
5) Select 1
Switched to 10/20PPS set with pulse selection inside.
6) After setting
<pre>SENDING yyPPS xxms</pre>
7) After completion of sending
<pre>TERMINATE ?
1:YES 2:NO</pre>
∗ Select 2: Returns to “4)” display.
8) Select 1
<pre>TERMINATED</pre>
After 2sec, returns to "1) Initial display".
■ Dial test (DTMF)
1) Initial display
<pre>SELECT SIGNAL
1:PULSE   2:DTMF</pre>
∗ [CLEAR] key: FAX control is terminated.
2) Select 2
<pre>SELECT HIGH LEVEL
1:DEFAULT 2:SOFT SW.</pre>
↓ Select 2
↓
<pre>INPUT VALUE
(0-15)   __</pre>
3) Select 1 ↓
<pre>SELECT LOW LEVEL
1:DEFAULT 2:SOFT SW.</pre>
↓ Select 2
↓
<pre>INPUT VALUE
(0-15)   __</pre>
4) Select 1 ↓
<pre>INPUT DIAL #
XXXX</pre>
XXXX: Default
∗ After deleting with [CLEAR] key, input can be made.
4) [ENTER] key
<pre>H:xx   L:yy
1:YES 2:NO</pre>
"xx" indicates HI, and "yy" indicates Low Soft SW.
∗ Select 2: Returns to “4)” display.
5) Select 1
HI/LO is selected with the signal level inside.
6) After setting the signal send level
<pre>SENDING DTMF</pre>
7) After completion of sending
<pre>TERMINATE ?
1:YES 2:NO</pre>
∗ Select 2: Returns to “4)” display.
8) Select 1
<pre>TERMINATED</pre>
After 2sec, returns to "1) Initial display".
</td></tr>
<tr><td></td><td>17</td><td>DTMF signal send (Max. value) (Executable only when the FAX is installed.)</td><td>
[Function]
Use to set the DTMF signal send (Max. value).
[Operation]
1) Initial display
<pre>INPUT DIAL #</pre>
∗ [CLEAR] key: FAX control is terminated.
2) [10KEY] input
The content selected with signal send level selection is set inside.
3) Communication is started after setting the signal send level.
<pre>SENDING SIGNAL MAX
PRESS CLEAR TO STOP</pre>
∗ [CLEAR] key: Returns to "1) Initial display".
</td></tr>
</table>

<table>
<tr><th>Main code</th><th>Sub code</th><th>Contents</th><th>Details of function/operation</th></tr>
<tr><td rowspan="4">66</td><td>18</td><td>DTMF signal send (Soft SW set value) (Executable only when the FAX is installed.)</td><td>
[Function]
Use to set the DTMF signal send (Soft SW set value).
[Operation]
1) Initial display
<pre>INPUT DIAL #</pre>
∗ [CLEAR] key: FAX control is terminated.
2) [10KEY] input
The content selected with signal send level selection is set inside.
3) Communication is started after setting the signal send level.
<pre>SENDING SIGNAL SSW
PRESS CLEAR TO STOP</pre>
∗ [CLEAR] key: Returns to "1) Initial display".
</td></tr>
<tr><td>21</td><td>FAX information print (Executable only when the FAX is installed.)</td><td>
[Function]
Use to print the FAX information.
[Operation]
1) Initial display
<pre>SELECT REPORT (1-3)
PRESS ←, →</pre>
2) [←/→] or after 2sec
Every time when [→] key is pressed, the second line is changed in the sequence of 1 → 2 → 3 → 1.
When [←] key is pressed, the sequence is reversed.
<pre>SELECT REPORT (1-3)
1:USER SW. LIST</pre>
<pre>SELECT REPORT (1-3)
2:SOFT SW. LIST</pre>
<pre>SELECT REPORT (1-3)
3:PROTOCOL</pre>
∗ [CLEAR] key: FAX control is terminated.
3) [ENTER] key
• When print is allowed
<pre>PRINT STORED</pre>
After completion of printing, FAX control is terminated.
• When print is inhibited
<pre>CAN NOT PRINT</pre>
After 2sec, FAX control is terminated.
</td></tr>
<tr><td>24</td><td>FAST SRAM clear (Executable only when the FAX is installed.)</td><td>
[Function]
Use to clear the FAST SRAM.
[Operation]
1) Initial display
<pre>CLEAR FAST SRAM</pre>
2) After completion of clearing
<pre>CLEARED</pre>
After 2sec, FAX control is terminated.
</td></tr>
<tr><td>30</td><td>TEL/LIU status change check (Executable only when the FAX is installed.)</td><td>
[Function]
Use to check the TEL/LIU status change.
[Operation]
1) Initial display
<pre>HS2 :xxx HS1 :xxx
RHS :xxx EXHS:xxx</pre>
↑
The display is switched every 2sec.
↓
<pre>CHECKING
PRESS CLEAR TO STOP</pre>
∗ [CLEAR] key: FAX control is terminated.
</td></tr>
</table>

Main code	Sub code	Contents	Details of function/operation

66	33	Signal detection check (Executable only when the FAX is installed.)	**[Function]**
			Use to check the signal detection.
			[Operation]
			1) Initial display
			`CHECKING NONE`
			`PRESS CLEAR TO STOP`
			When a signal is detected, the display is changed from NONE to the following.
			CI/CNG/CED/BT/DT/Flag/SDT/DTMF
			* [CLEAR] key: FAX control is terminated.

	34	Communication time measurement (Executable only when the FAX is installed.)	**[Function]**
			Use to measurement the communication time.
			[Operation]
			1) Initial display
			`COMM. TIME`
			`xx:xx:xx:xxx msec`
			"xx:xx:xx:xxx" indicates o'clock, minute, second, millisecond.
			* [CLEAR] key: FAX control is terminated.

	37	Speaker sound volume setting (Executable only when the FAX is installed.)	**[Function]**
			Use to set the speaker sound volume.
			1: NO SOUND
			2: LOW
			3: MID
			4: HIGH
			[Operation]
			1) Initial display
			`SELECT SPEEKER VOL.`
			`PRESS ←, →`
			2) [←/→] or after 2sec
			Every time when [→] key is pressed, the second line is changed in the sequence of 1 → 2 → 3 → 4 → 1.
			When [←] key is pressed, the sequence is reversed.
			`SELECT (1-4)` `1:NO SOUND` `SELECT (1-4)` `2:LOW` .....
			* [CLEAR] key: FAX control is terminated.
			3) [ENTER] key
			`STORED`
			`xxx`
			xxx: Set content
			After 2sec, FAX control is terminated.

Main code	Sub code	Contents	Details of function/operation

66	38	Time setting/check
		(Executable only when the FAX is installed.)
			[Function]
			Use to check the time setting.
			[Operation]
			1) Initial display
			`SELECT TO SET`
			`1:DATE  2:TIME`
			* [CLEAR] key: FAX control is terminated.
			2) Select 1
			`xxxx.xx.xx(xxx)`
			`CHANGE?  1:YES 2:NO`
			"xxxx.xx.xx(xxx)" is the current value. (No revision of display)
			3) Select 1
			`INPUT YEAR`
			`(4 DIGITS)____.__.__`
			* Select 2: Returns to "1) Initial display".
			4) Enter the year in 4 digits.
			`INPUT MONTH`
			`(1-12)  1998.__.__`
			5) Enter the month in 2 digits.
			`INPUT DAY`
			`(1-31)  1998.01.__`
			6) Enter the day in 2 digits.
			`xxxx.xx.xx(xxx)`
			`STORED?  1:YES 2:NO`
			"xxxx.xx.xx(xxx) is the entered value.
			* Select 2: Returns to "1) Initial display".
			7) Select 1
			`STORED`
			After 2sec, returns to "1) Initial display".
			2) Select 2
			`xx:xx`
			`CHANGE?  1:YES 2:NO`
			"xx:xx" is the current value.
			3) Select 1
			`INPUT HOUR`
			`(0-24)  __:__`
			* Select 2: Returns to "1) Initial display".
			4) Enter o'clock in 2 digits.
			`INPUT MINUTE`
			`(00-59)  01:__`
			5) Enter minute in 2 digits.
			`xx:xx`
			`STORED?  1:YES 2:NO`
			"xx:xx" is the current value.
			* Select 2: Returns to "1) Initial display".
			6) Select 1
			`STORED`
			After 2sec, returns to "1) Initial display".

5. Trouble codes

A. Trouble codes list

Main code	Sub code	Details of trouble
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
F2	02	Toner supply abnormality
	04	Improper cartridge (Destination error, life cycle error)
F5	02	Copy lamp lighting abnormality
H2	00	Thermistor open
H3	00	Heat roller high temperature detection
H4	00	Heat roller low temperature detection
L1	00	Feeding is not completed within the specified time after starting feeding. (The scan head locking switch is locked)
L3	00	Scanner return trouble
L4	01	Main motor lock detection
	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)
	40	CRUM chip communication error

B. Details of trouble codes

Main code	Sub code	Details of trouble	
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 TC 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 TC 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.
E7	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.
	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 RADF 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 (TC 5-03). 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.
F2	02	Content	Toner supply abnormality
		Detail	The maximum toner supply time is greatly exceeded.
		Cause	CRUM chip trouble Improper developing unit
		Check and remedy	Replace the CRUM chip. Replace the developing unit.
	04	Content	Improper cartridge (Destination error, life cycle error)
		Detail	The destination of the main unit differs from that of the CRUM. When the life cycle information is other than Not Used (FFh).
		Cause	CRUM chip trouble Improper developing unit
		Check and remedy	Replace the CRUM chip. Replace the developing unit.

Main code	Sub code	Details of trouble	
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 TC 5-03 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 TC 14 to clear the self diagnostic display.
H3	00	Content	Heat roller high temperature detection
		Detail	The fusing temperature exceeds 240°C.
		Cause	Thermistor abnormality Control PWB abnormality Fusing section connector disconnection.
		Check and remedy	Use TC 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 TC 14 to clear the self diagnostic display.

Main code	Sub code	Details of trouble	
H4	00	Content	Heat roller low temperature detection
		Detail	1) When the target temperature (165°C) is not reached in 55 sec after starting warming-up. 2) When the temperature below 100°C is detected for 300ms under the ready print state. * "Starting warming-up" means not only that in power supply but also reset that in reset from shut-off and in side door close. (The timing of generating H4 is not limited to that in power supply.)
		Cause	Thermistor abnormality Heater lamp abnormality Thermostat abnormality Control PWB abnormality
		Check and remedy	Use TC 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 TC 14 to clear the self diagnostic display.
L1	00	Content	Feeding is not completed within the specified time after starting feeding. (The scan head locking switch is locked)
		Detail	Though the mirror base is shifted by about 30mm, the MHPS is not turned OFF.
		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 TC 1-01 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 TC 1-02 to check the mirror home position sensor.

Main code	Sub code	Details of trouble	
L3	00	Content	Scanner return trouble
		Detail	When the mirror base is returned for the specified time (6 sec) in mirror initializing after turning on the power, the mirror home position sensor (MHPS) does not turn ON. Or when the mirror base is returned for the specified time (about 6 sec) after start of copy return, the mirror home position sensor (MHPS) does not turn ON.
		Cause	Mirror unit abnormality Scanner wire disconnection Origin detection sensor abnormality Mirror motor harness abnormality
		Check and remedy	Use TC 1-01 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 TC 1-02 to check the mirror home position sensor.
L4	01	Content	Main motor lock detection
		Detail	When the main motor encoder pulse is not detected for 1000 msec.
		Cause	Main motor unit abnormality Improper connection or disconnection the main motor and the harness. MCU PWB abnormality
		Check and remedy	Use TC 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.

Main code	Sub code	Details of trouble	
L6	10	Content	Polygon motor lock detection
		Detail	The lock signal (specified rpm signal) does not return within a certain time (about 20 sec) from starting the polygon motor rotation.
		Cause	Polygon motor unit abnormality Improper connection or disconnection of the polygon motor and the harness. MCU PWB abnormality
		Check and remedy	Use TC 61-01 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. Cancel by turning OFF/ON the power. 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 TC 16 to cancel the trouble. Replace the MCU PWB.
	40	Content	CRUM chip communication error
		Detail	An error occurs in MCU-CRUM chip communication.
		Cause	CRUM chip trouble Defective contact of developing unit MCU PWB trouble
		Check and remedy	Replace the CRUM chip. Check installation of the developing unit. Cancel by turning OFF/ON the power. Replace the MCU PWB.

[11] MAINTENANCE

1. Maintenance table

×: Check (Clean, adjust, or replace when required.) ○: Clean ▲: Replace △: Adjust ☆: Lubricate

Section	Parts	25K	50K	75K	100K	125K	Remark
Developing	Developer	▲	▲	▲	▲	▲	
	DV blade	○	▲	○	▲	○	
	DV side seal (F/R)	○	▲	○	▲	○	
	DV doctor	×	×	×	×	×	White streaks are made on the image.
Process peripheral	Drum	▲	▲	▲	▲	▲	

2. Maintenance display system

Toner	Life	8K	
	Remaining quantity	NEAR EMPTY About 12.5%	EMPTY
	LED	ON	Flash
	Machine	Operation allowed	Stop
Developer	Life	25K	
	LED	ON at 25K of the developer count.	
	Machine	Selection is available between Not Stop and Stop by Service Simulation (SIM 26-37) Setup. (If Stop is selected, the LED will flash and stop at 25K.) ∗ Default: Not Stop ∗ Clear: SIM 24-06	
Maintenance	LED	Selection is available among 25K, 13K, 9K, 6K, 3K, and free (no lighting) with SIM 21-1. ∗ Default: 25K ∗ Clear: SIM 20-1	
	Machine	Not stop.	

Note: When developer is replaced, be sure to execute simulation No. 24-06 to reset the counter.

[12] USER PROGRAM

The user settings consist of the following items.

1. User programs

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 (e-STUDIO203SD only)	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.
11	2-SIDED COPY MODE (e-STUDIO203SD only)	**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 (v) 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.

Program number	Program name	Setting codes (factory default setting appears in bold)	Explanation
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: ADF/RADF (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 RADF. • 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 RADF OPEN	**1: ON** 2: OFF	• You can set the operation that takes place if the [START] key is pressed when the RADF is not completely closed. (Valid only when the multi-bypass paper feed is used.)
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	**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*2	**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.

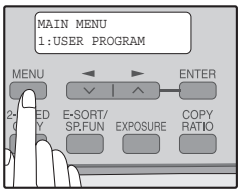
*1: The scanning speed increases when the USB 2.0 mode is set to "HI-SPEED", however, the printing speed does not increase considerably.

*2: When the 250-sheet paper feed unit is installed.

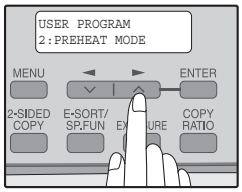
2. Selecting a setting for a user program

1) Press the [MENU] key and then press the [ENTER] key.

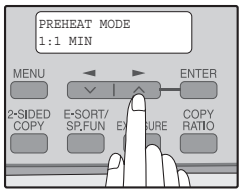
   In printer mode, the user programs are accessed by simply pressing the [MENU] key.



2) Press the [<] key [v] or [>] key [^] to select the item that you wish to configure in the USER PROGRAM items, and then press the [ENTER] key.
   - See "1. User programs" for the program name and program code.
   - You can also select a program by directly entering the program number with the numeric keys.



3) Press the [<] key [v] or [>] key [^] to change the setting of the selected item.
   - See "1. User programs" for the program code.



NOTE:

- If you mistakenly select the wrong item, press the [CLEAR] key [C] 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.

Audible signals (key entry beep, invalid key beep, base setting beep)

The machine sounds three different types of beep signals: a key entry beep that sounds when a valid key is pressed, an invalid key beep that sounds when an invalid key is pressed, and a base setting beep that sounds when a setting is the same as the base setting (base settings are explained below). The base setting beep is initially disabled. If you wish to enable the base setting beep, see "SOUND AT DEFAULT". If you wish to change the volume of the beep signals or disable them, see "KEY TOUCH SOUND".

The beep patterns of each type of beep signal are as follows:

Key entry beep: One beep
Invalid key beep: Two beeps
Base setting beep: Three beeps

Base settings

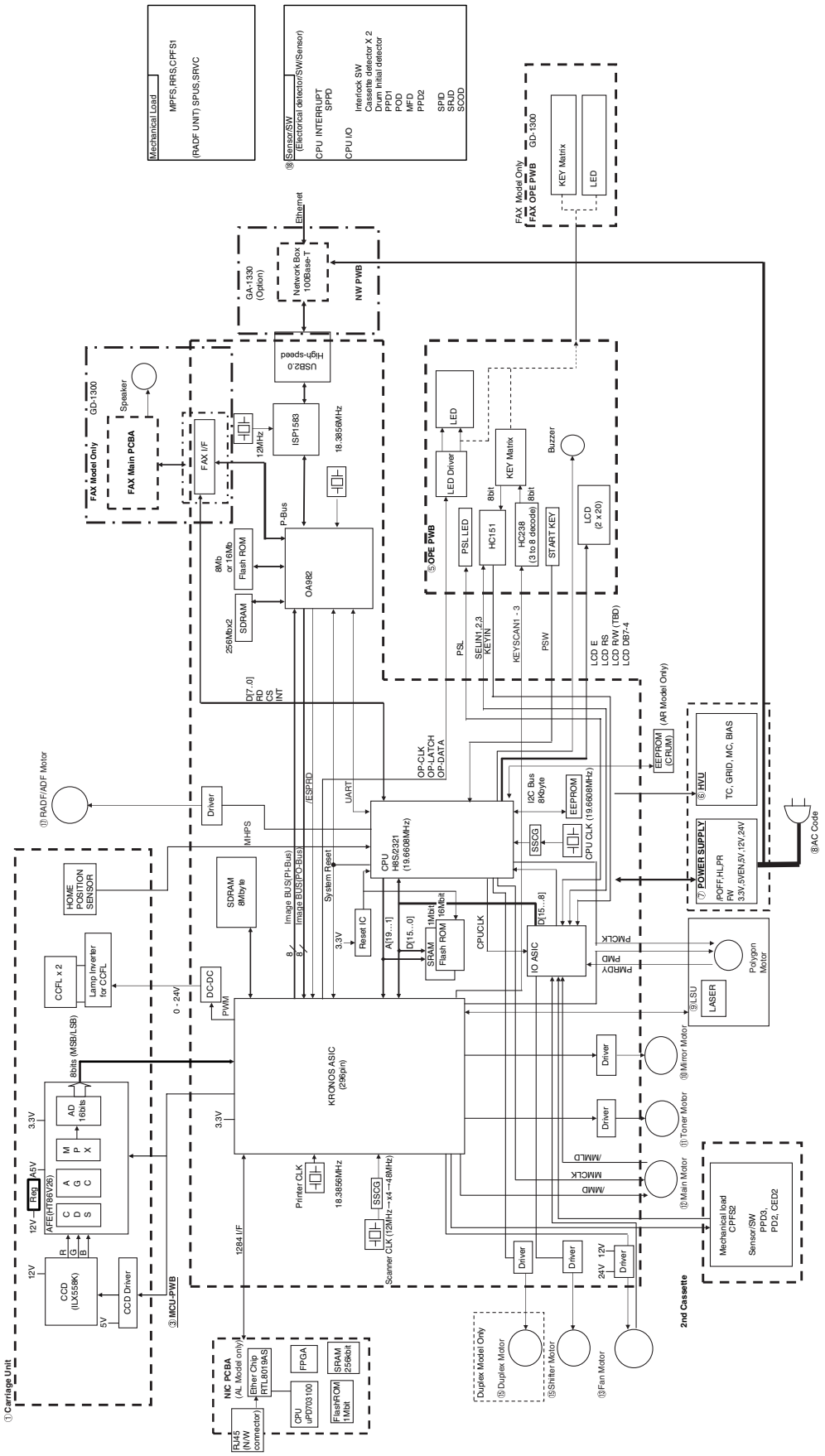
The base settings are preset standard selections for each copy setting. The base settings are as follows:

Copy ratio: 100%
Paper feed location: Tray 1 (Upper paper tray)
Light and Dark level: Center
AUTO/TEXT/PHOTO: AUTO

[13] ELECTRICAL SECTION

1. Block diagram

A. Overall block diagram



2. Signal name list

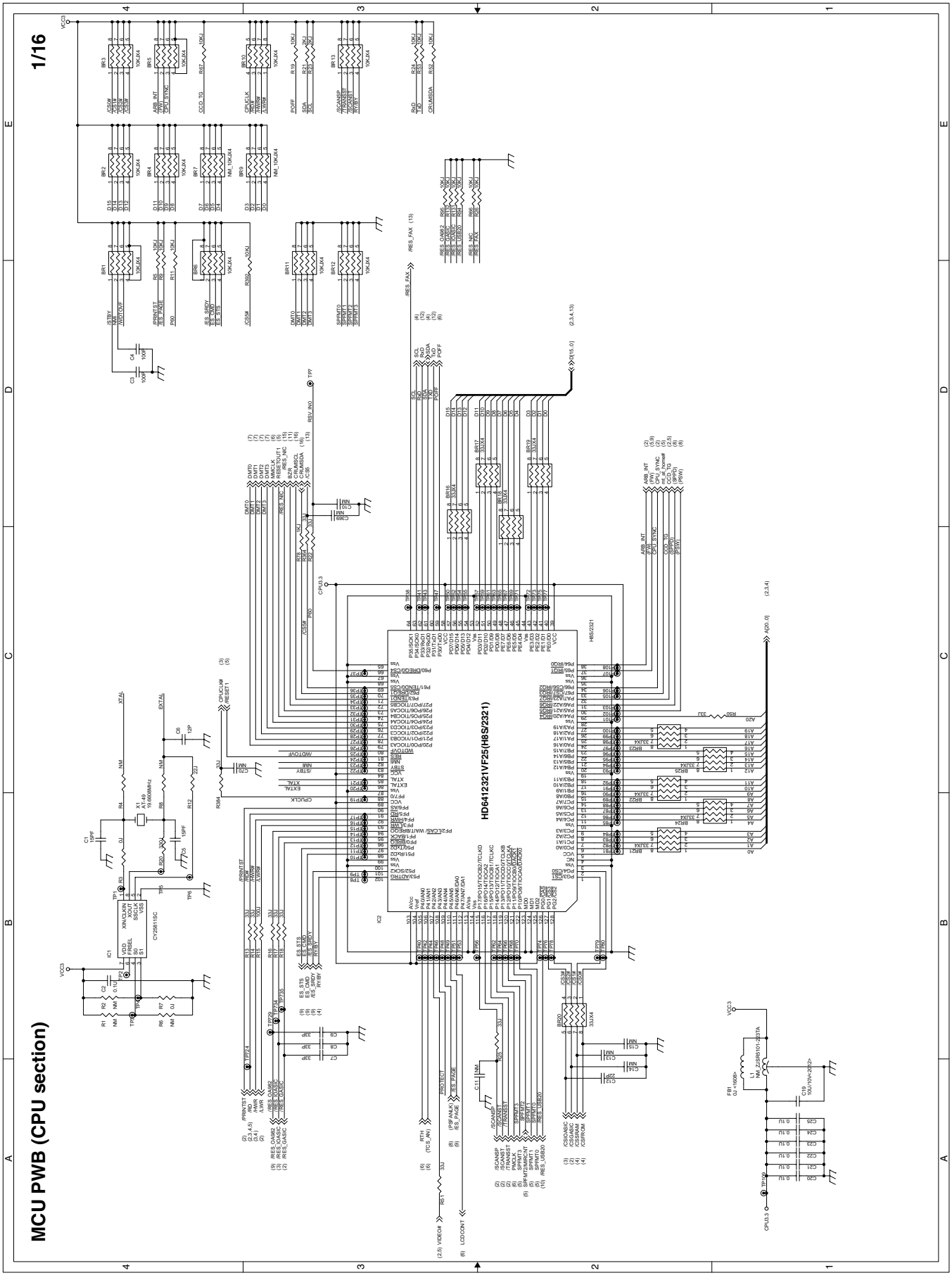
Signal name	Name	Function/Operation	Section
(ADCLK)	AFE	AFE control signal	Scanner unit section
(AFE_DB0)	AFE	Image scan data	Scanner unit section
(AFE_DB1)	AFE	Image scan data	Scanner unit section
(AFE_DB2)	AFE	Image scan data	Scanner unit section
(AFE_DB3)	AFE	Image scan data	Scanner unit section
(AFE_DB4)	AFE	Image scan data	Scanner unit section
(AFE_DB5)	AFE	Image scan data	Scanner unit section
(AFE_DB6)	AFE	Image scan data	Scanner unit section
(AFE_DB7)	AFE	Image scan data	Scanner unit section
(AFE_SCK)	AFE	AFE control signal	Scanner unit section
(AFE_SDI)	AFE	AFE serial data	Scanner unit section
(AFE_SEN)	AFE	AFE control signal	Scanner unit section
(BSAMP)	AFE	AFE control signal	Scanner unit section
(VSAMP)	AFE	AFE control signal	Scanner unit section
/BIAS	HV bias signal	HV bias drive	Process section
/CPFS1	1st CS pickup solenoid		Paper transport section
/CPFS2	2nd CS pickup solenoid		2nd cassette 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
/FAX_RST	FAX PWB reset signal		FAX optional section
/GRIDL	HV grid signal	Main charger grid control	Process section
/LDEN	Laser	Laser circuit control signal	LSU
/MC	HV MC signal	Main charger control	Process section
/MDM_IRQ	FAX PWB interrupt		FAX optional section
/MMCLK	Main motor	Clock signal to the polygon motor	Main drive section
/MMD	Main motor	Polygon motor drive signal	Main drive section
/MPFS	Multi bypass solenoid		Paper transport section
/PMD	Polygon motor	Polygon motor drive signal	LSU
/POFF	Low voltage power	Output power control	Power section
/PR	Heater lamp	Power relay control	Power section
/RD	Control signal	MCU bus control signal	FAX optional section
/RRS	1st transport solenoid		Paper transport section
/RSV_SOL	Reverse solenoid		RADF 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
/SPUS	Paper feed solenoid		RADF section
/SRVC	Reverse clutch		RADF section
/SYNC	Laser	Horizontal sync signal from the LSU	LSU
/TC	HV TC signal	Transfer charger grid control	Process section
/VFMCNT	Fan speed signal	Fan rotation speed control	Optical section
/VIDEO	Laser	Laser drive signal	LSU
BZR	Buzzer signal	Buzzer	Operation 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
CED1	Machine cassette detection		Paper transport section
CED2	2nd CS cassette detection		2nd cassette section
DVSEL	Developing tank detection		Developing section
FANLK	Fusing fan	Fan lock detection signal	Optical section
FW	Low voltage power	Zero cross detection	Power section
HLOUT	Heater lamp	Heater lamp control	Power section
KEYIN	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

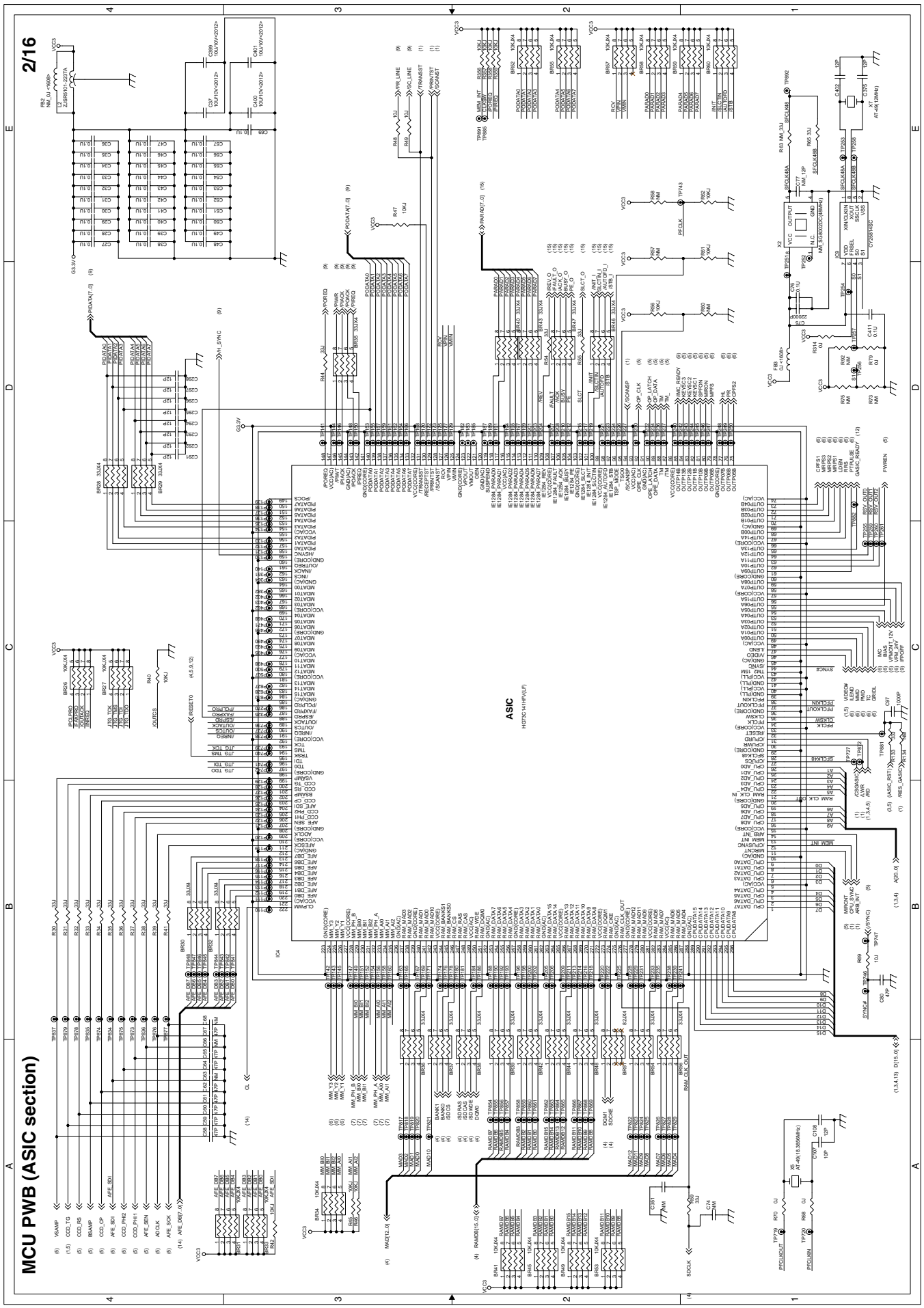
Signal name	Name	Function/Operation	Section
LCDDB5	LCD data signal	Signal for LCD	Operation section
LCDDB6	LCD data signal	Signal for LCD	Operation section
LCDDB7	LCD data signal	Signal for LCD	Operation section
LCDE	LCD control signal	Signal for LCD	Operation section
LCDRS	LCD control signal	Signal for LCD	Operation section
LEDPOD	POD sensor power		Paper exit section
LEDPPD1	PPD sensor power		Paper transport section
LEDPPD2	PPD2 sensor power		Fusing section
LEDSCOD	SCOD sensor power		RADF section
LEDSPID	SPID sensor power		RADF section
LEDSPPD	SPPD sensor power		RADF section
LEDSRJD	SRJD sensor power		RADF section
MCU_D0	Data signal	MCU bus control signal	FAX optional section
MCU_D1	Data signal	MCU bus control signal	FAX optional section
MCU_D2	Data signal	MCU bus control signal	FAX optional section
MCU_D3	Data signal	MCU bus control signal	FAX optional section
MCU_D4	Data signal	MCU bus control signal	FAX optional section
MCU_D5	Data signal	MCU bus control signal	FAX optional section
MCU_D6	Data signal	MCU bus control signal	FAX optional section
MCU_D7	Data signal	MCU bus control signal	FAX optional section
MCU_INT	MCU interrupt	MCU bus control signal	FAX optional section
MCU_NCS	Control signal	MCU bus control signal	FAX optional section
MHPS	MHPS sensor	Carriage HP detection	Optical section
MMLD	Main motor	Polygon motor ON/OFF detection signal	Main drive section
MODEM_IN	FAX connection detection signal		FAX optional section
OP-DATA	LED driver control		Operation section
OP-LATCH	LED driver control		Operation section
OP_CLK	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
PB_ADDR0	Address signal	Peripheral bus control signal	FAX optional section
PB_ADDR1	Address signal	Peripheral bus control signal	FAX optional section
PB_ADDR2	Address signal	Peripheral bus control signal	FAX optional section
PB_ADDR3	Address signal	Peripheral bus control signal	FAX optional section
PB_ADDR4	Address signal	Peripheral bus control signal	FAX optional section
PB_ADDR5	Address signal	Peripheral bus control signal	FAX optional section
PB_ADDR6	Address signal	Peripheral bus control signal	FAX optional section
PB_ADDR7	Address signal	Peripheral bus control signal	FAX optional section
PB_DATA0	Data signal	Peripheral bus control signal	FAX optional section
PB_DATA1	Data signal	Peripheral bus control signal	FAX optional section
PB_DATA2	Data signal	Peripheral bus control signal	FAX optional section
PB_DATA3	Data signal	Peripheral bus control signal	FAX optional section
PB_DATA4	Data signal	Peripheral bus control signal	FAX optional section
PB_DATA5	Data signal	Peripheral bus control signal	FAX optional section
PB_DATA6	Data signal	Peripheral bus control signal	FAX optional section
PB_DATA7	Data signal	Peripheral bus control signal	FAX optional section
PB_NAE0	Control signal	Peripheral bus control signal	FAX optional section
PB_NCS1	Control signal	Peripheral bus control signal	FAX optional section
PB_NOE	Control signal	Peripheral bus control signal	FAX optional section
PB_NWE	Control signal	Peripheral bus control signal	FAX optional section
PD1	PD SW sensor	1st CS paper width sensor	Paper transport section
PD2	PD2 SW sensor	2nd CS paper width detection	2nd cassette section
PMCLK_A	Polygon motor	Clock signal to the polygon motor	LSU
PMRDY	Polygon motor	Polygon motor ON/OFF detection signal	LSU
POD	POD sensor	Paper transport detection	Paper exit section
PPD1	PPD sensor	Paper transport detection	Paper transport section
PPD2	PPD2 sensor	Paper transport detection	Fusing section
PPD3	PPD3 sensor	2nd CS paper transport detection	2nd cassette section
PSL	Power save LED		Operation section
PSW	Start button control		Operation section
RTH_IN	Thermistor	Fusing section thermistor temperature detection	Fusing section
SCOD	SCOD sensor	RADF cover open sensor	RADF section

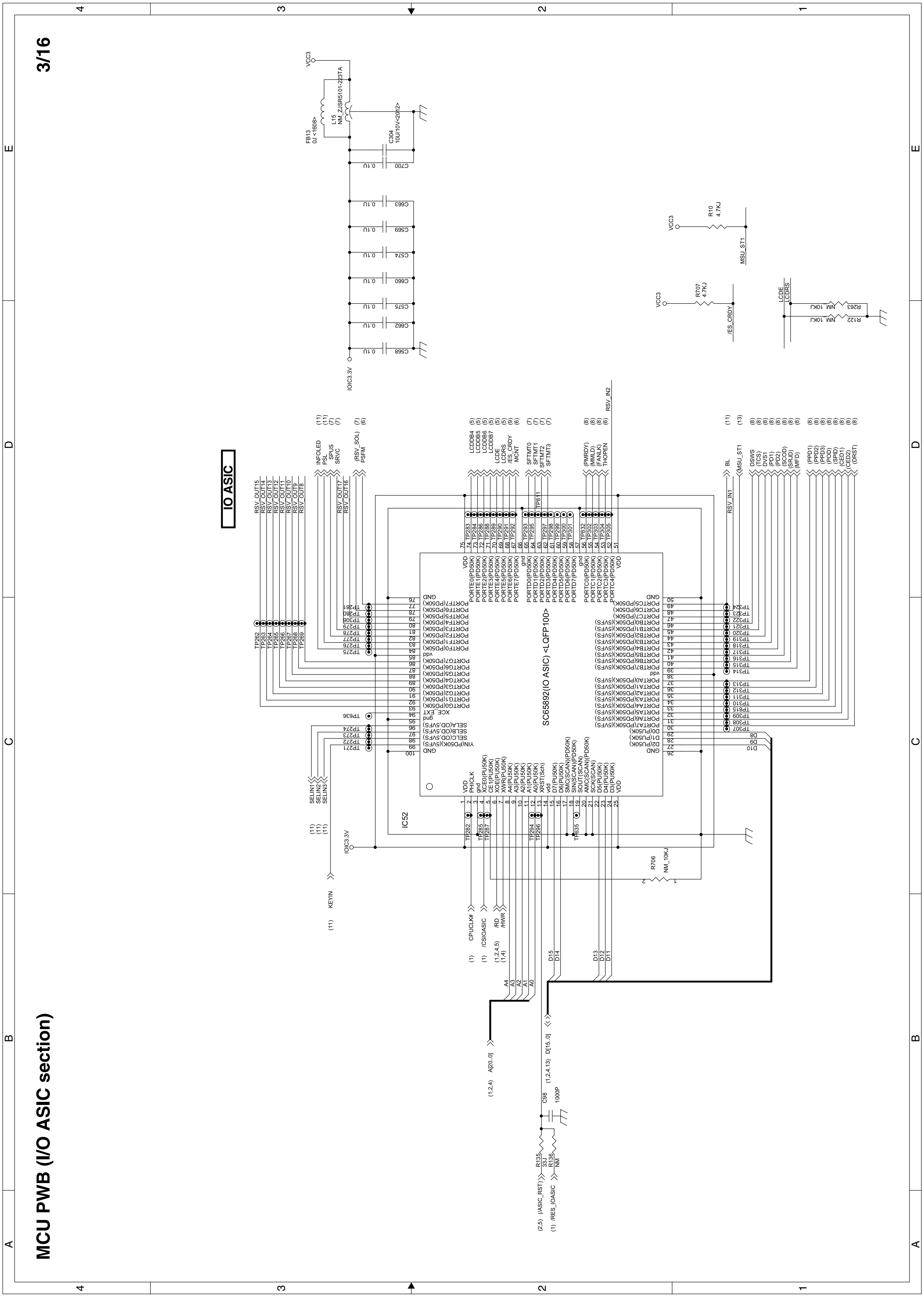
Signal name	Name	Function/Operation	Section
SELIN1	Select signal	HC151 select signal	Operation section
SELIN2	Select signal	HC151 select signal	Operation section
SELIN3	Select signal	HC151 select signal	Operation section
SHOLD	Laser	Laser APC signal	LSU
SPID	SPID sensor	RADF UN paper entry sensor	RADF section
SPMT_0	RADF motor	RADF motor phase control	RADF section
SPMT_1	RADF motor	RADF motor phase control	RADF section
SPMT_2	RADF motor	RADF motor phase control	RADF section
SPMT_3	RADF motor	RADF motor phase control	RADF section
SPPD	SPPD sensor	RADF transport detection	RADF section
SRJD	SRJD sensor	RADF paper exit sensor	RADF section
TCS	Toner sensor	Toner quantity detection	Developing section
TMA_O	Toner motor	Toner motor phase control	Toner motor drive section
TMB_O	Toner motor	Toner motor phase control	Toner motor drive section
USB +D	USB signal		USB section
USB -D	USB signal		USB section
VCL	Copy lamp	Copy lamp control	Scanner unit section
VFMOUT	Fusing fan	Fan drive signal	Optical section

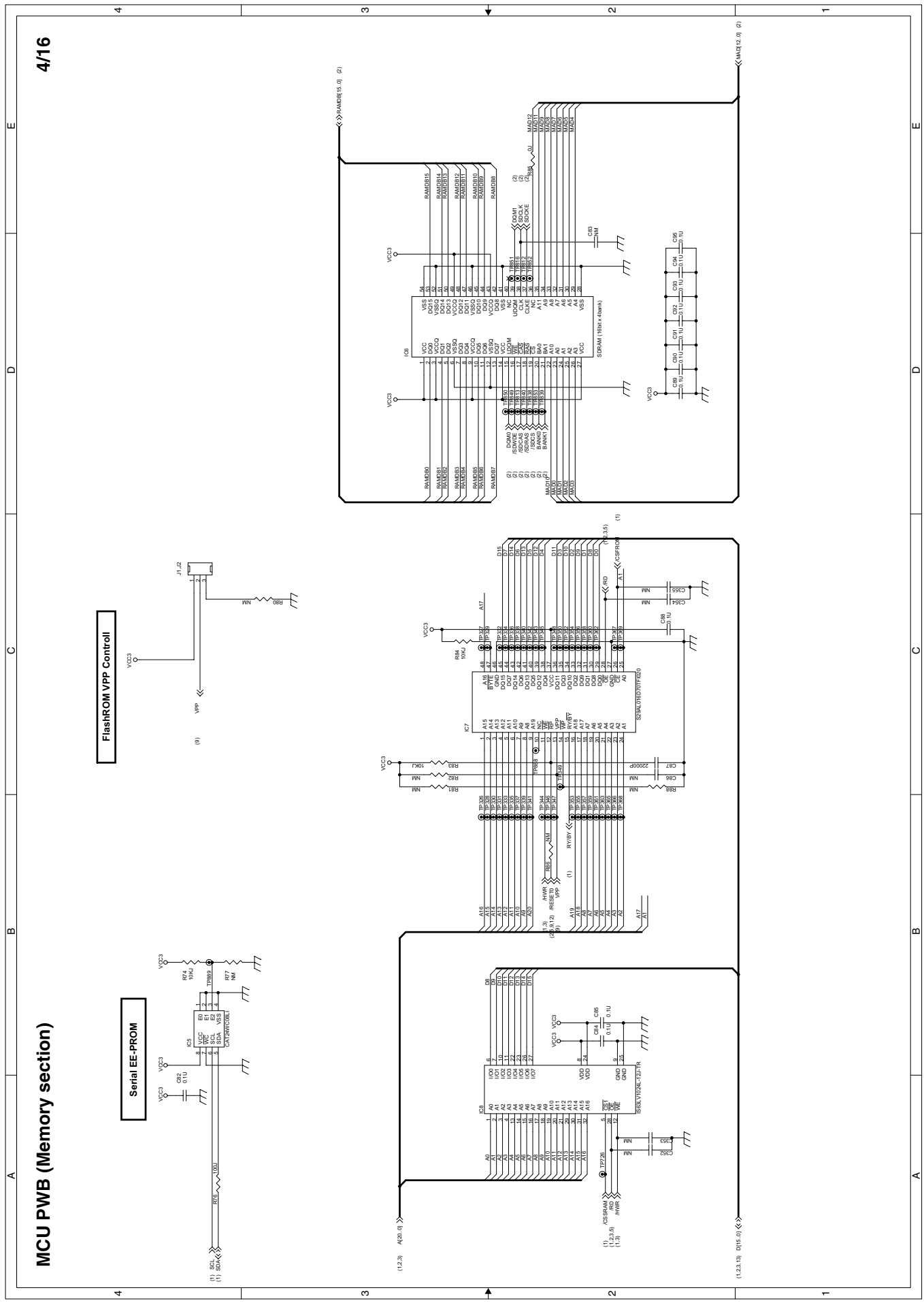
[14] CIRCUIT DIAGRAM

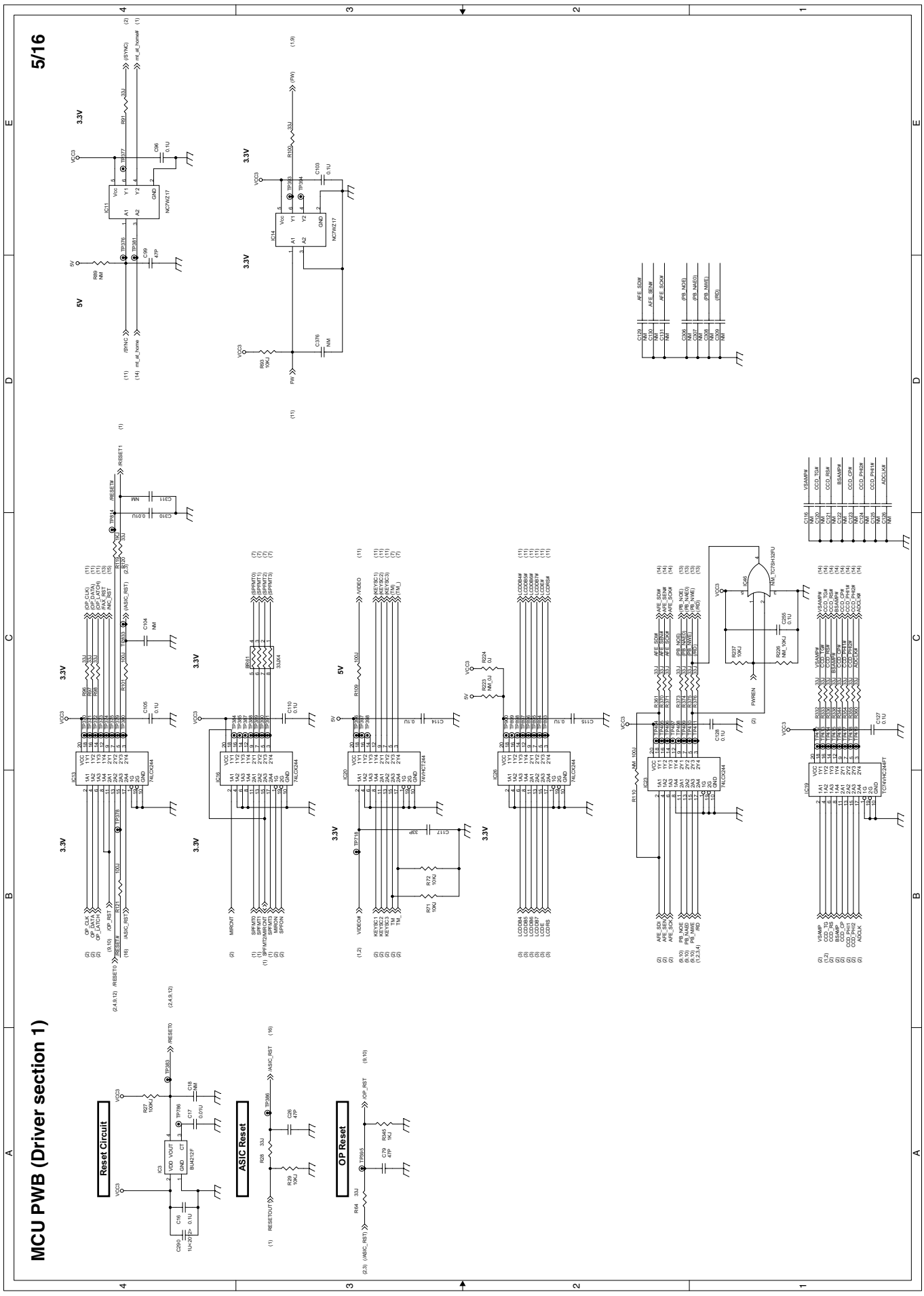
1. MCU PWB

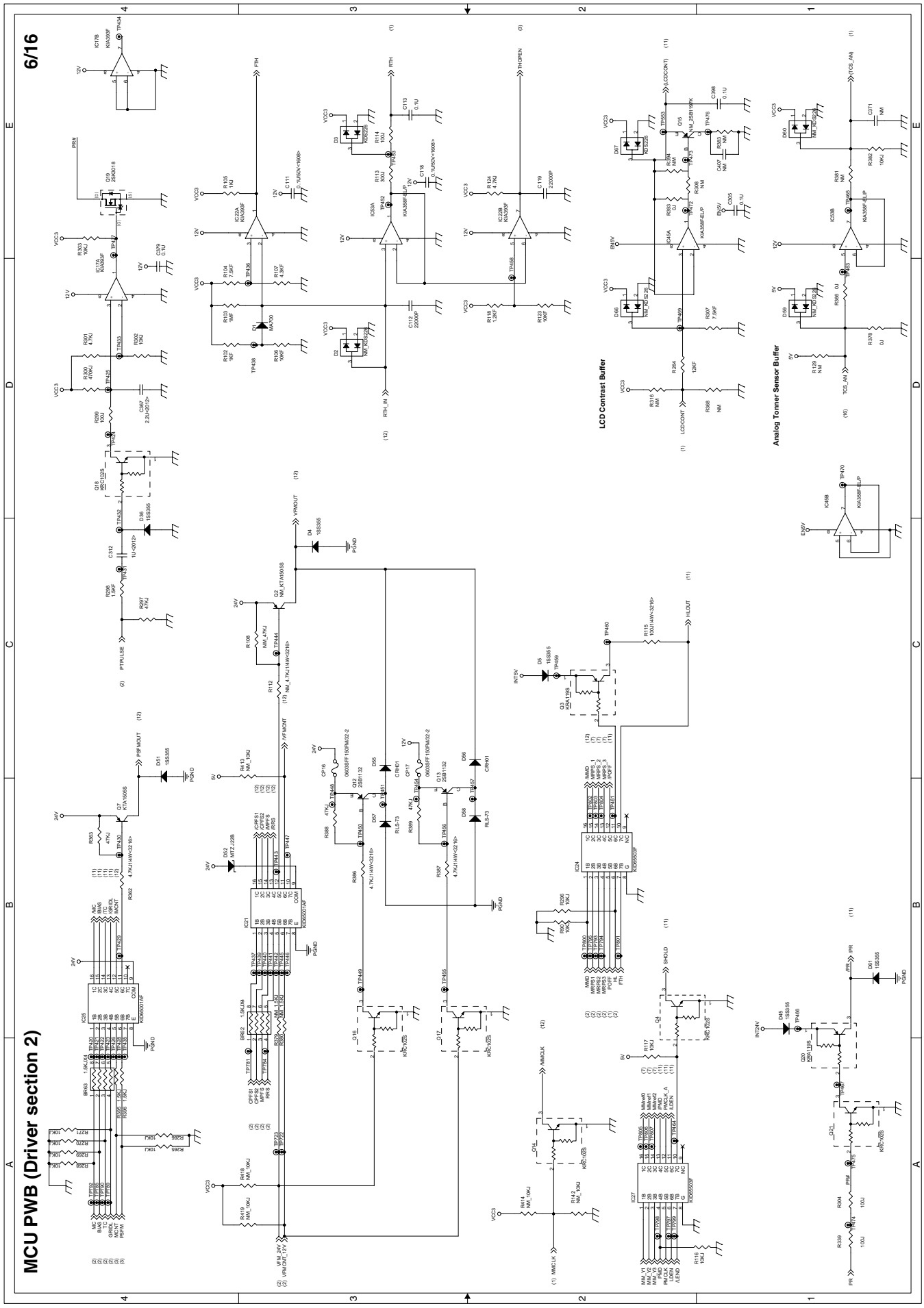


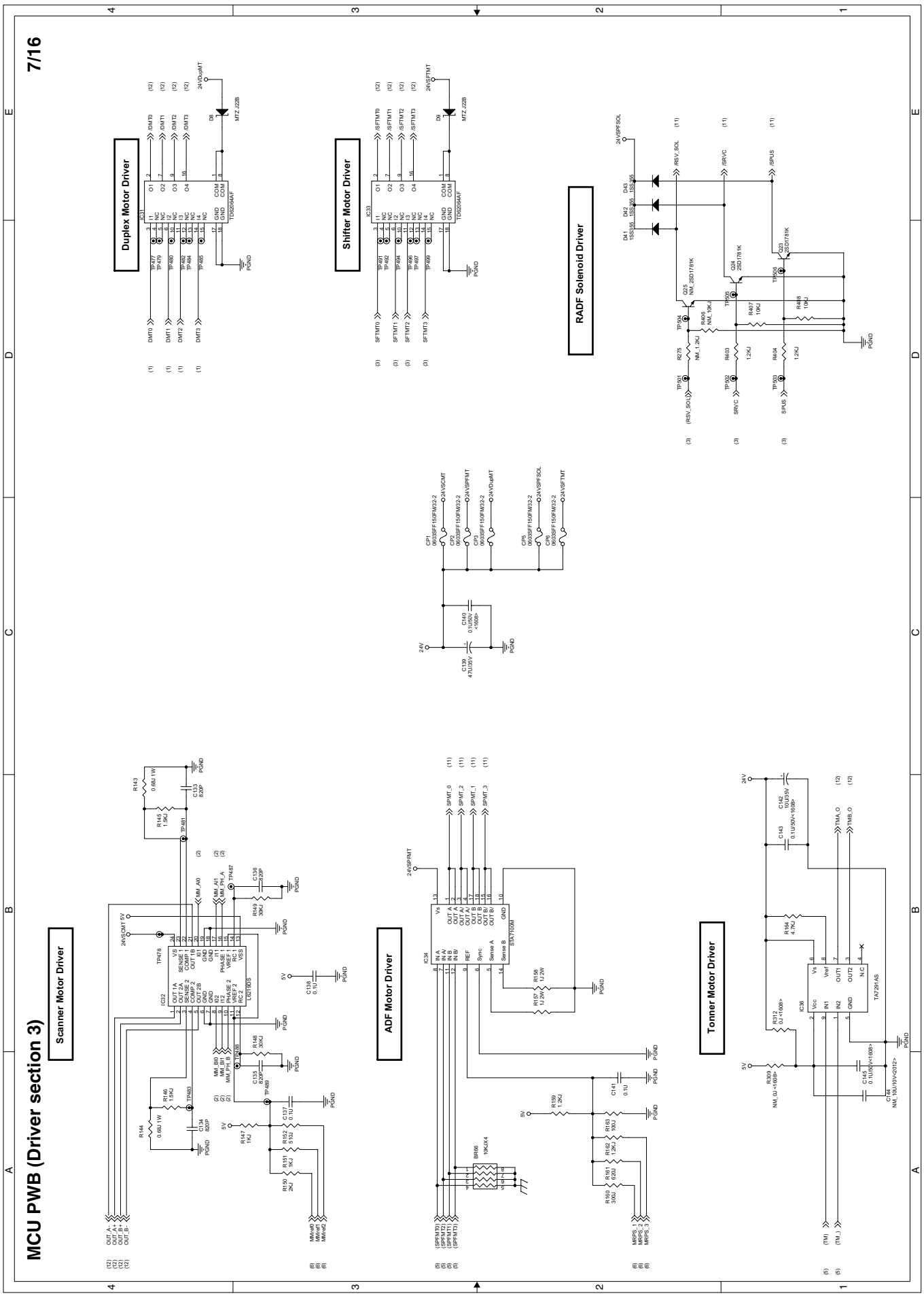

MCU PWB (ASIC section)
2/16
ASIC
HG72C141HF(V/LF)
IC4


MCU PWB (I/O ASIC section)
3/16
IO ASIC
SC65892(I/O ASIC) <LQFP100>
IC52
IOIC3.3V
VCC3
FB13
L15
C304
R707
R10
R706
R135
R136
C98
KEYIN
CPUCLK#
/CSIOASIC
A[20..0]
D[15..0]
(/ASIC_RST)
/RES_IOASIC
/ES_CRDY
MSU_ST1
RSV_IN1
RSV_IN2

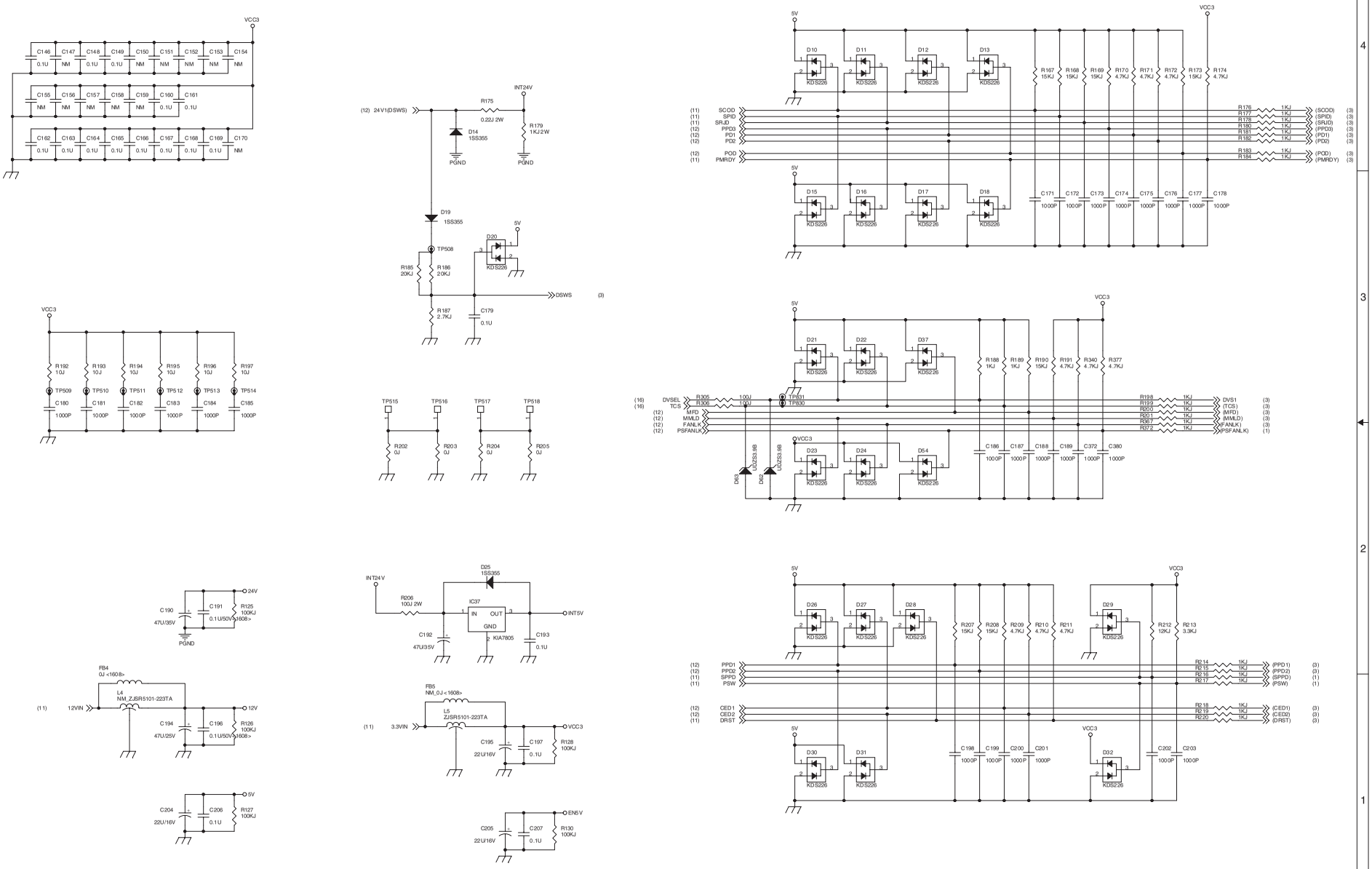

MCU PWB (Memory section)
4/16
FlashROM VPP Controll
Serial EE-PROM
SDRAM (16bit x 4bank)
SRAM (16bit x 4bank)


MCU PWB (Driver section 1)
5/16
Reset Circuit
ASIC Reset
OP Reset


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

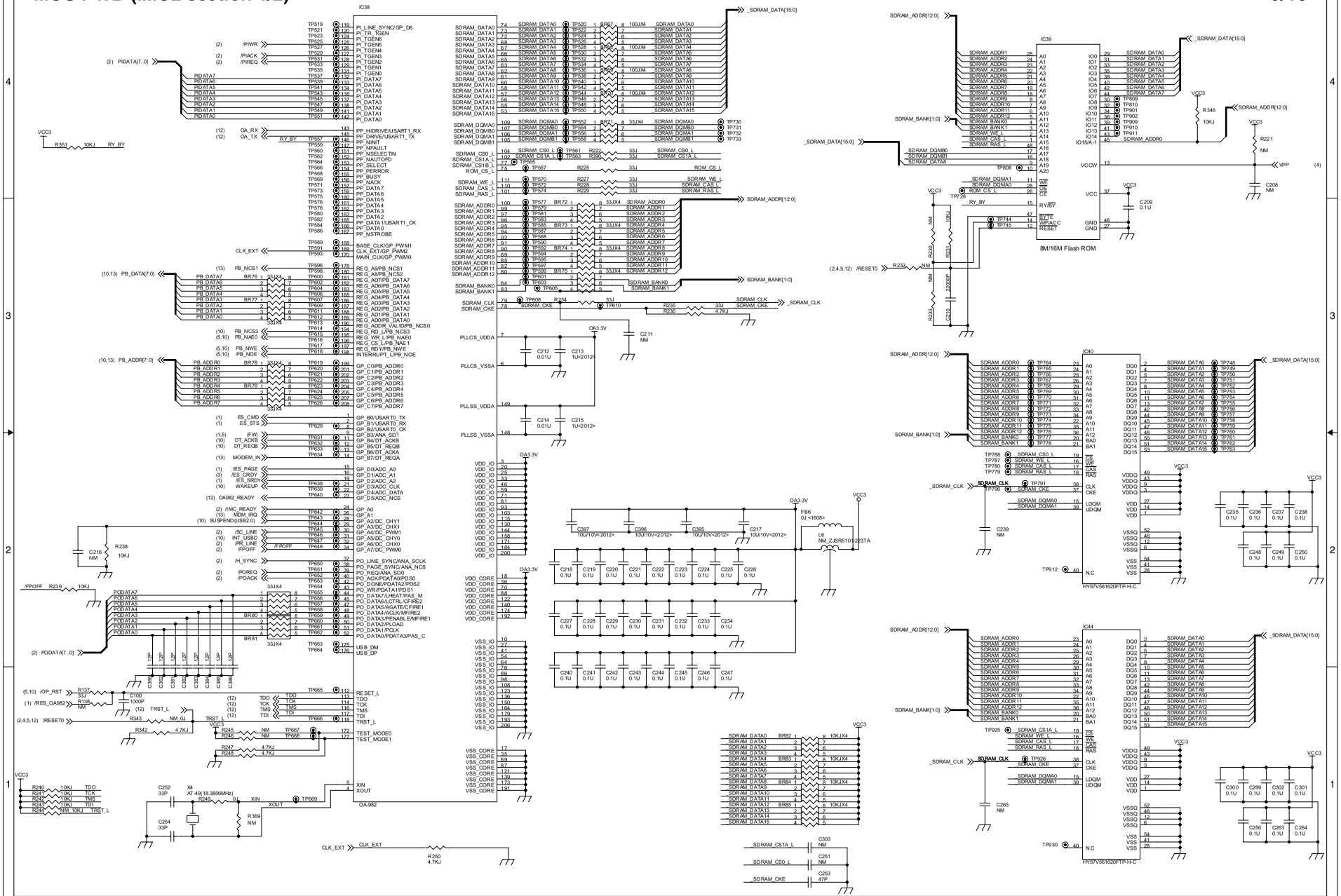

7/16
MCU PWB (Driver section 3)
Duplex Motor Driver
Shifter Motor Driver
RADF Solenoid Driver
Scanner Motor Driver
ADF Motor Driver
Tonner Motor Driver

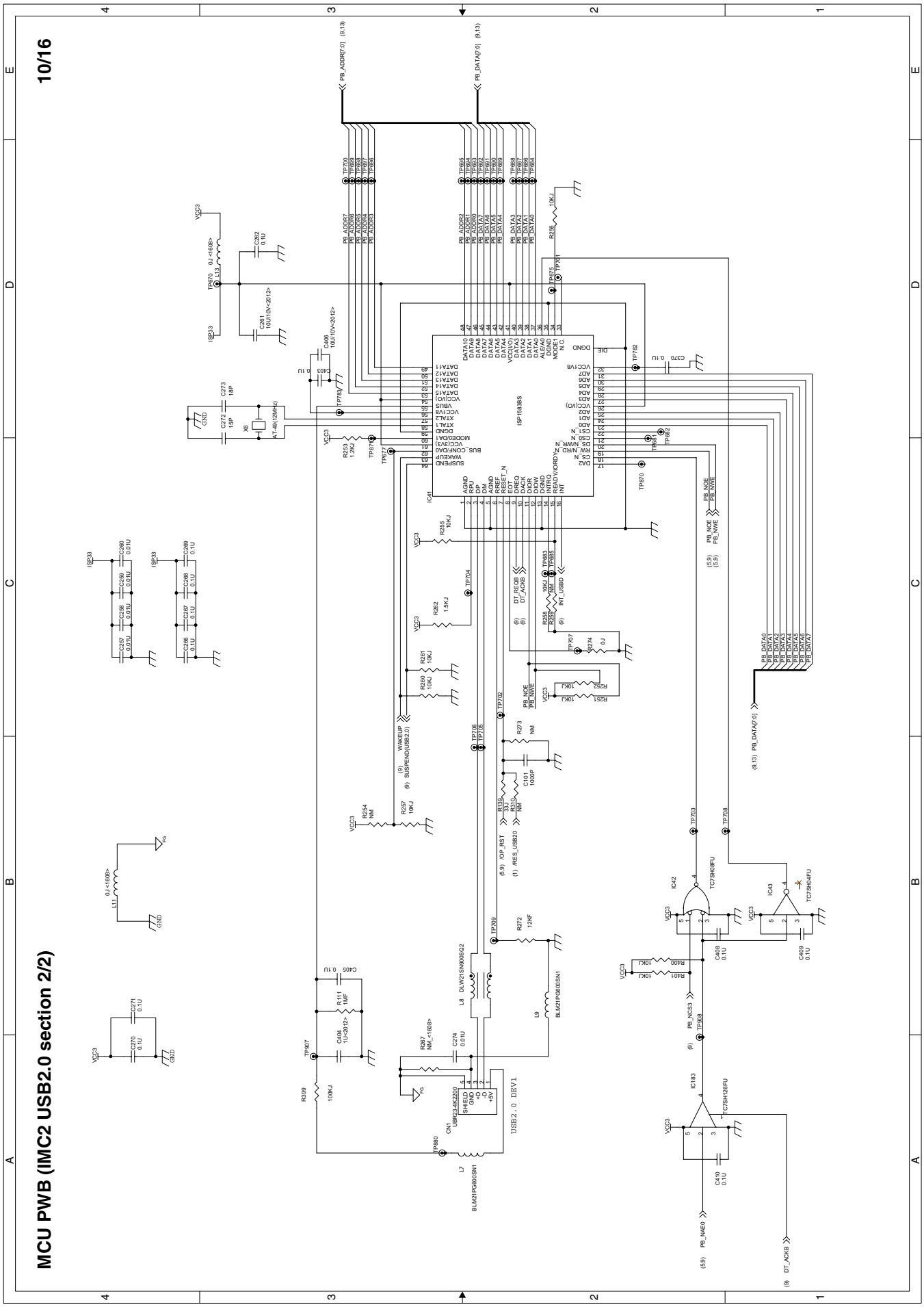
MCU PWB (Noise filter/Pull-up section)



MCU PWB (IMC2 section 1/2)

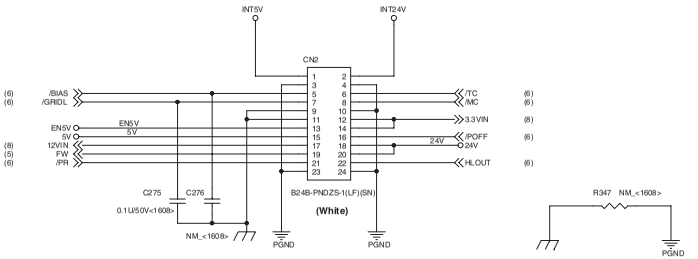
9/16



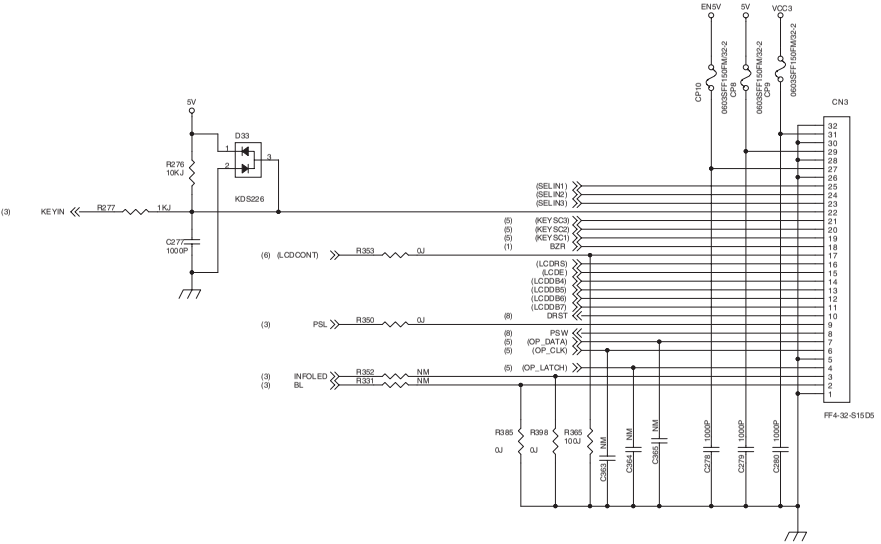

MCU PWB (IMC2 USB2.0 section 2/2)
10/16
ISP1583BS
IC41
USB2.0 DEV1
IC42
IC43
IC183
TC7SH08FU
TC7SH04FU
TC7SH126FU
PB_ADDR[7:0]
PB_DATA[7:0]
WAKEUP
SUSPEND(USB2.0)
/OP_RST
/RES_USB20
DT_REQB
DT_ACKB
INT_USBD
PB_NOE
PB_NWE
PB_NCS3
PB_NAE0
DT_ACKB

MCU PWB (Connector section 1)

To Power unit

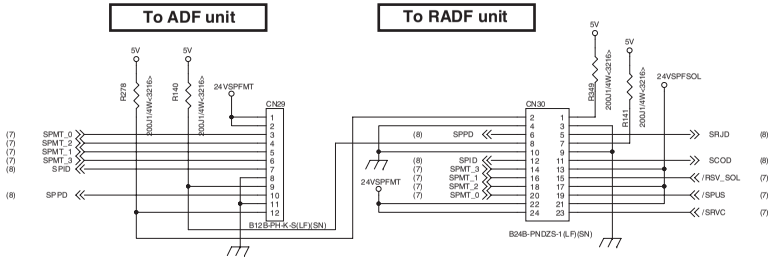


To Operational PWB

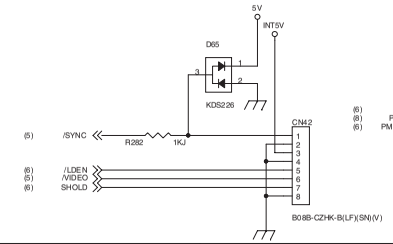


To ADF unit

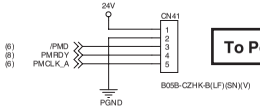
To RADF unit



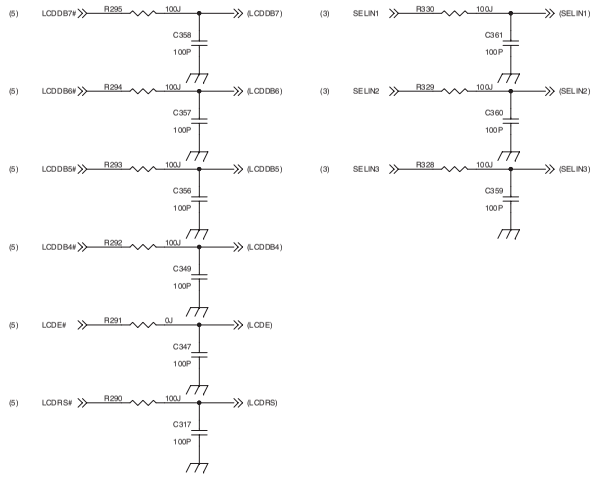
To LSU



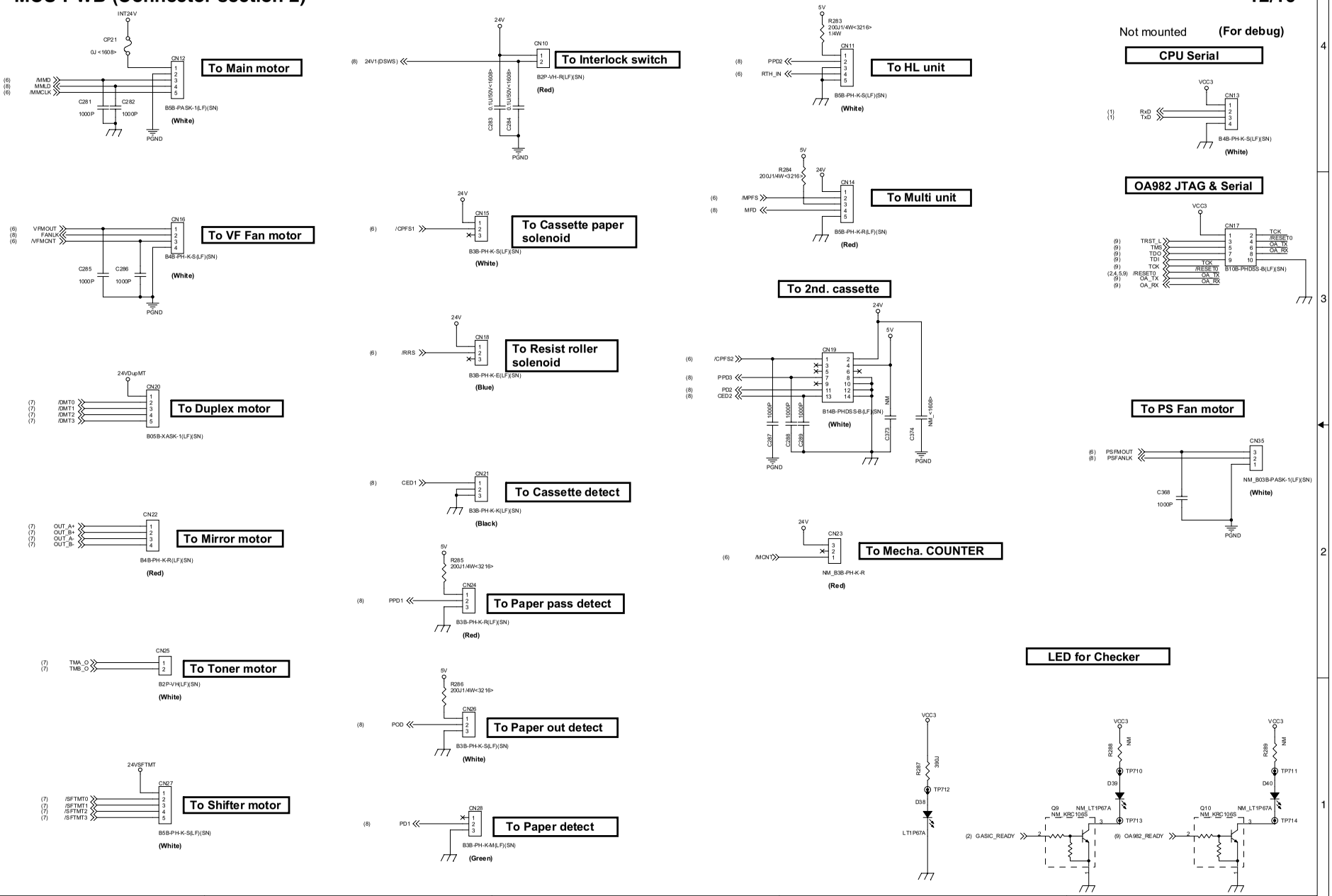
To Polygon motor

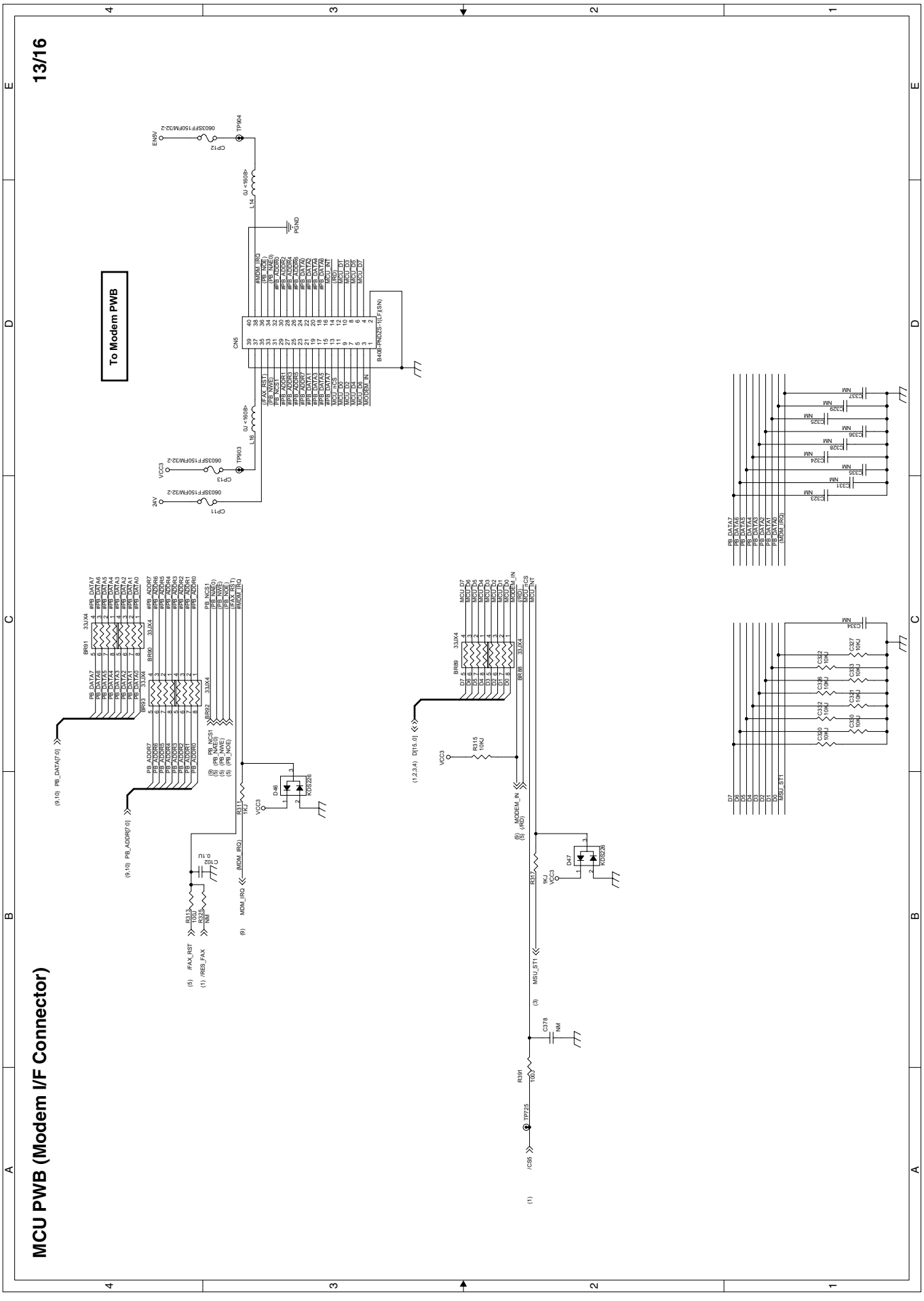


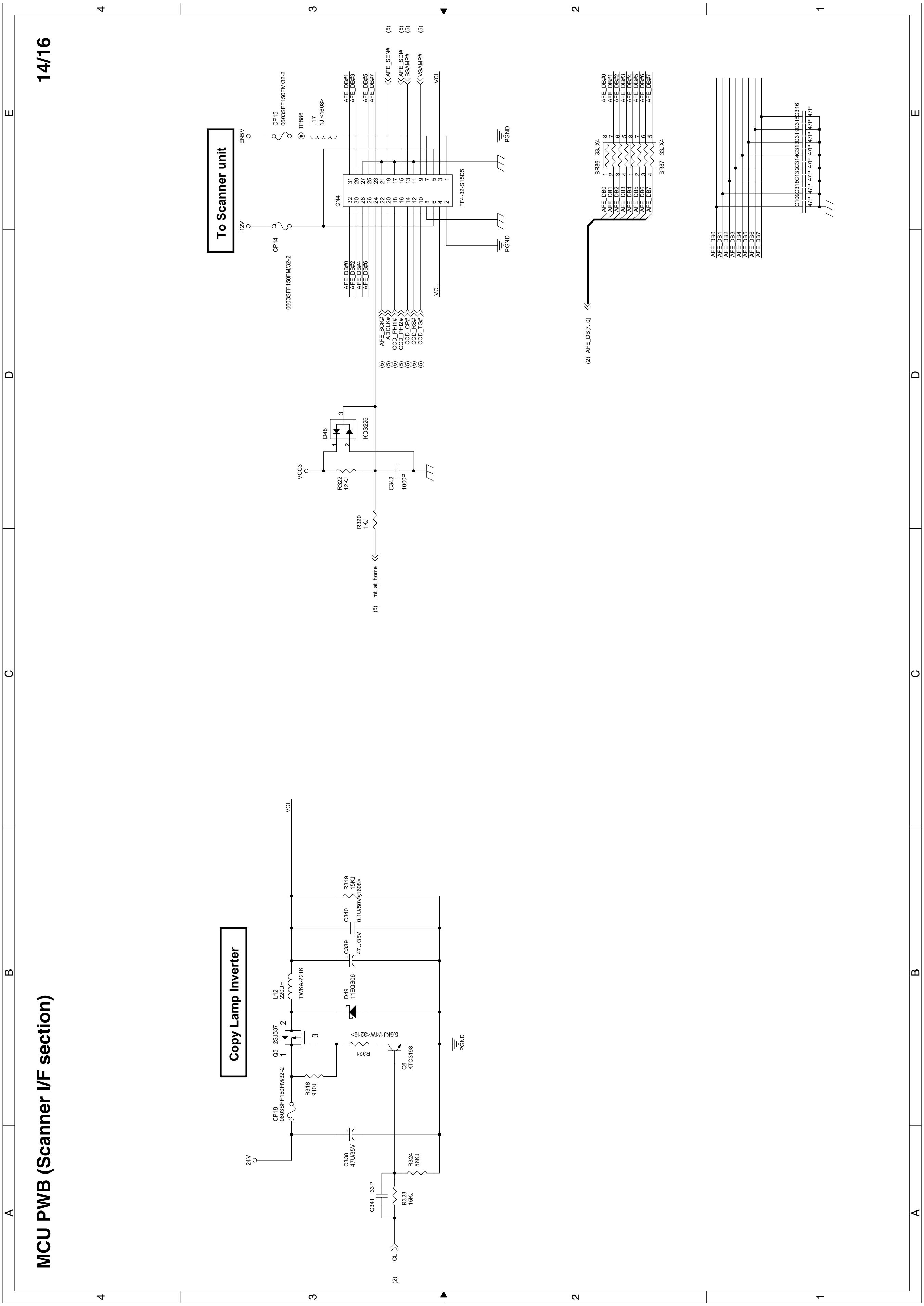
To LD

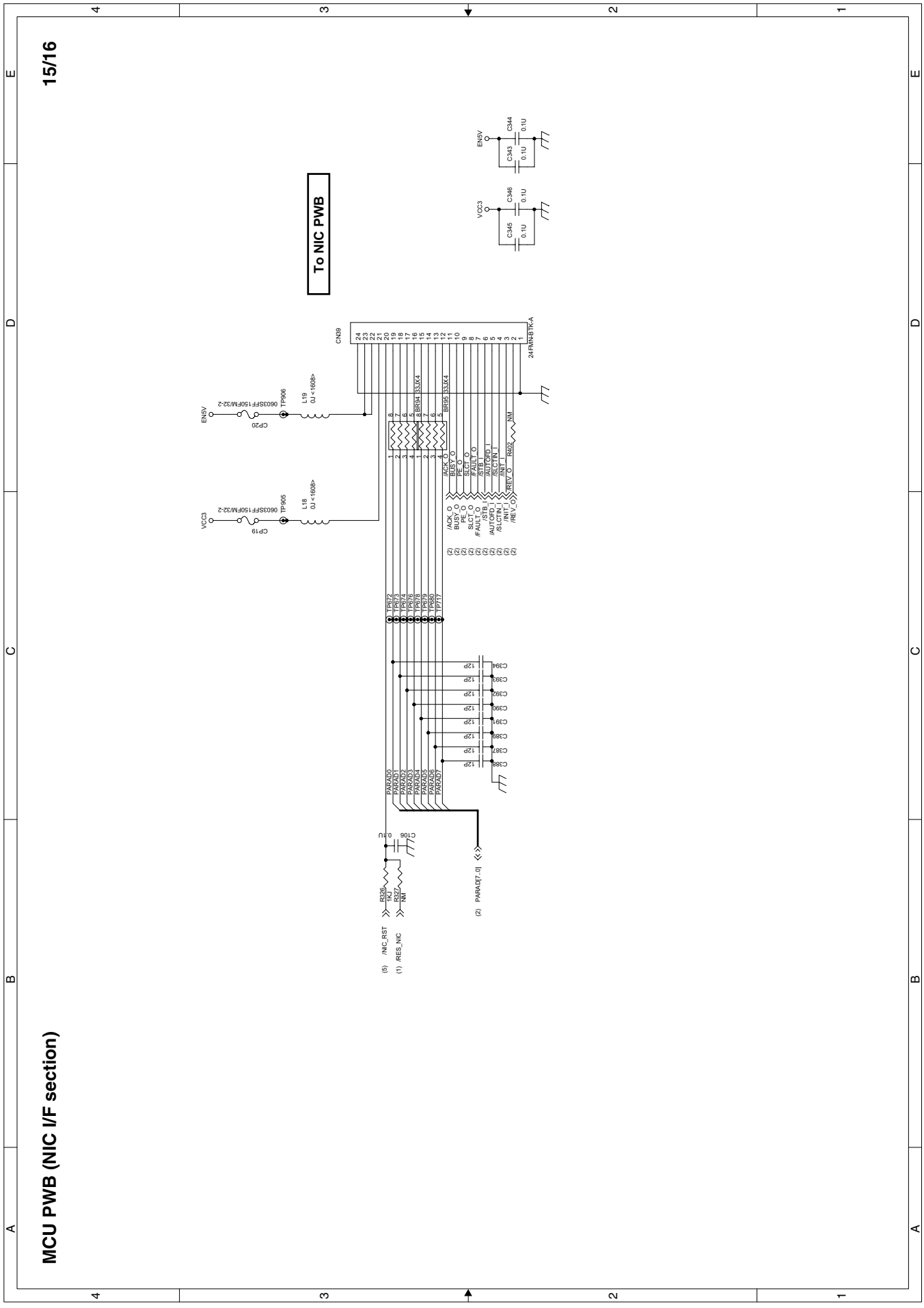


MCU PWB (Connector section 2)

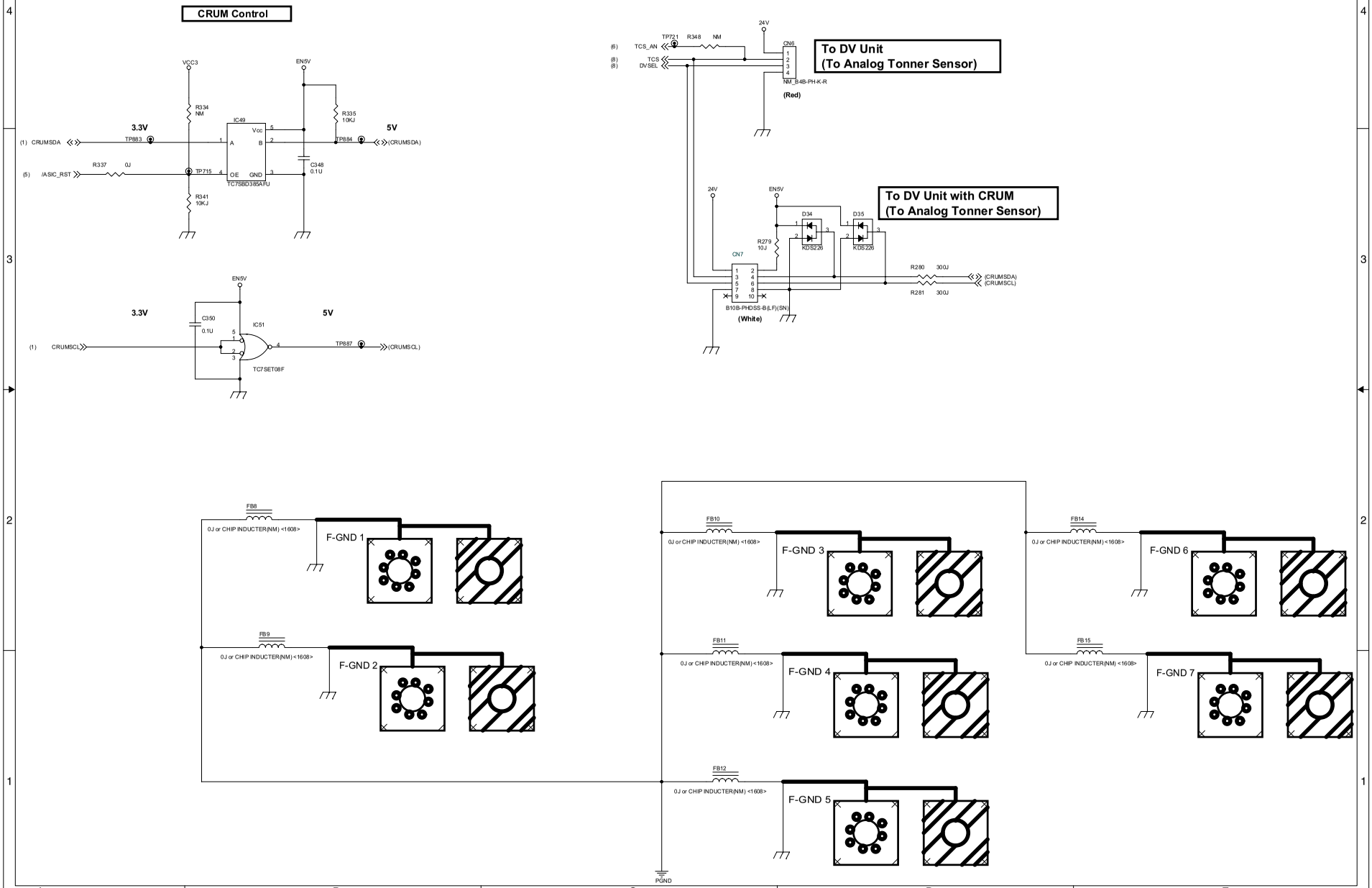



MCU PWB (Modem I/F Connector)
13/16
To Modem PWB

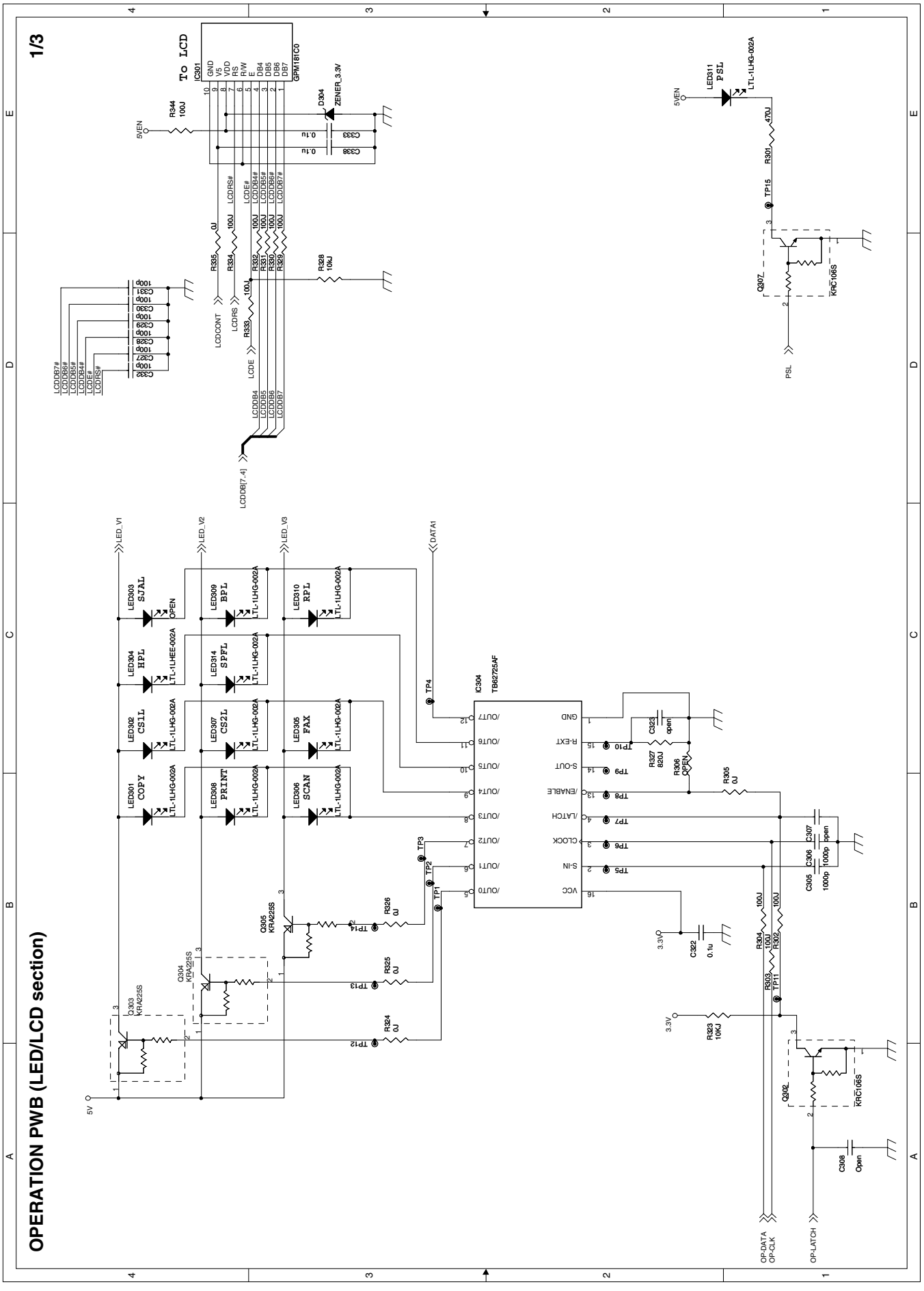

MCU PWB (Scanner I/F section)
14/16
To Scanner unit
Copy Lamp Inverter
CN4
FF4-32-S15D5
CP14
CP15
0603SFF150FM/32-2
EN5V
12V
TP886
L17
1J <1608>
AFE_DB#0
AFE_DB#1
AFE_DB#2
AFE_DB#3
AFE_DB#4
AFE_DB#5
AFE_DB#6
AFE_DB#7
AFE_SEN#
AFE_SDI#
BSAMP#
VSAMP#
AFE_SCK#
ADCLK#
CCD_PHI1#
CCD_PHI2#
CCD_CP#
CCD_RS#
CCD_TG#
VCL
PGND
BR86
BR87
33JX4
AFE_DB[7..0]
C109
C316
47P
D48
KDS226
VCC3
R322
12KJ
C342
1000P
R320
1KJ
mt_at_home
24V
CP18
C338
47U/35V
R318
910J
Q5
2SJ537
L12
220UH
TWKA-221K
D49
11EQS06
C339
47U/35V
C340
0.1U/50V<1608>
R319
15KJ
R321
5.6KJ1/4W<3216>
Q6
KTC3198
R324
56KJ
C341
33P
R323
15KJ
CL

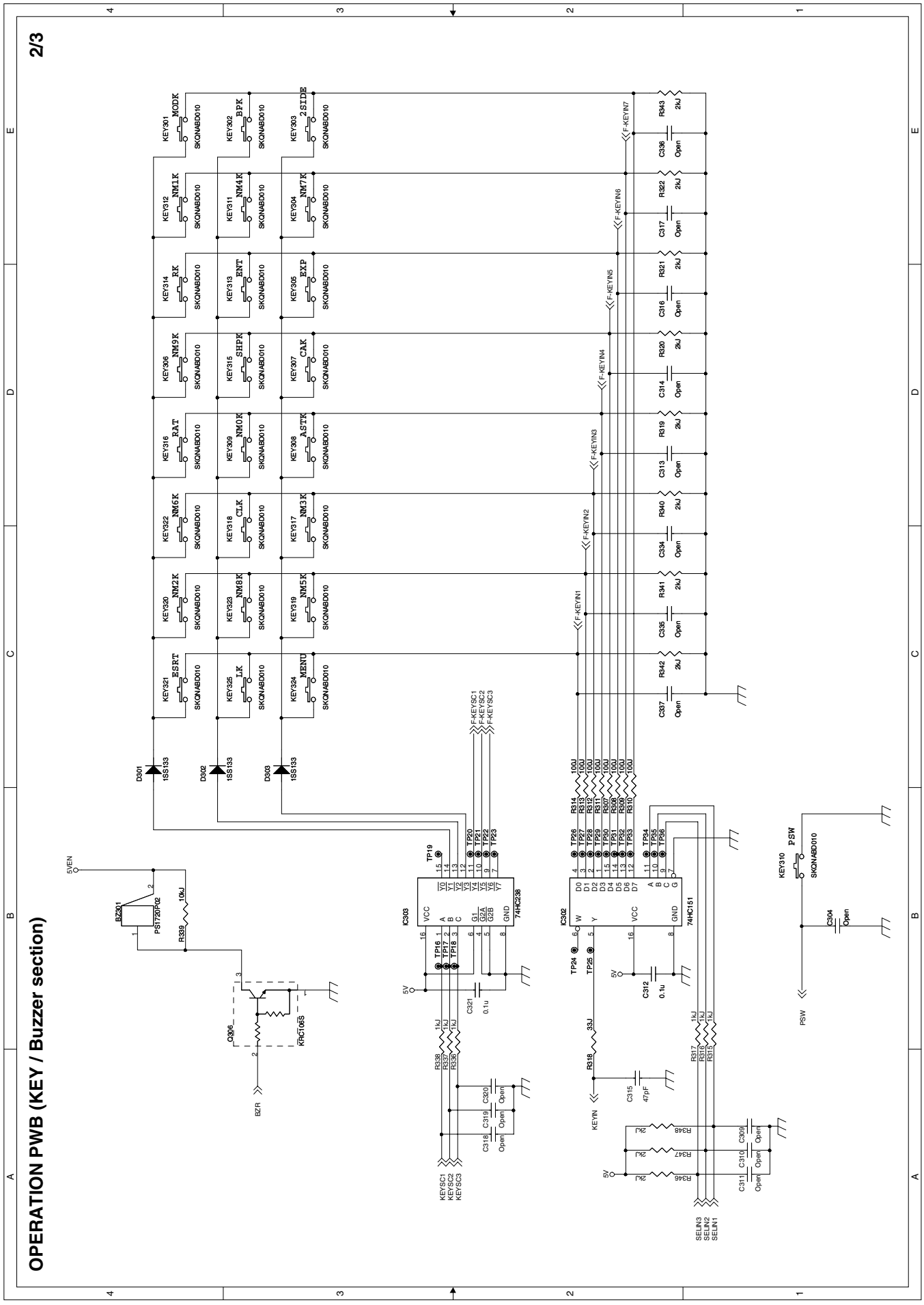

15/16
MCU PWB (NIC I/F section)
To NIC PWB
CN39
24PNH-BTK-A
EN5V
VCC3
TP906
TP905
CP20
CP19
L19
0J <1608>
L18
0J <1608>
0603SFF-150FM/32-2
BR54 3SJX4
BR55 3SJX4
R402
NM
TP672
TP673
TP674
TP675
TP676
TP678
TP679
TP680
TP717
C394
C393
C392
C390
C391
C389
C387
C388
12P
C106
0.1U
R026
1kJ
R027
NM
C343
C344
C345
C346
0.1U
/ACK_O
BUSY_O
PE_O
SLCT_O
/FAULT_O
/STB
/AUTOFD_I
/SLCTIN_I
/INIT_I
/REV_O
PARAD[7..0]
/NIC_RST
/RES_NIC

MCU PWB (CRUM I/F section)



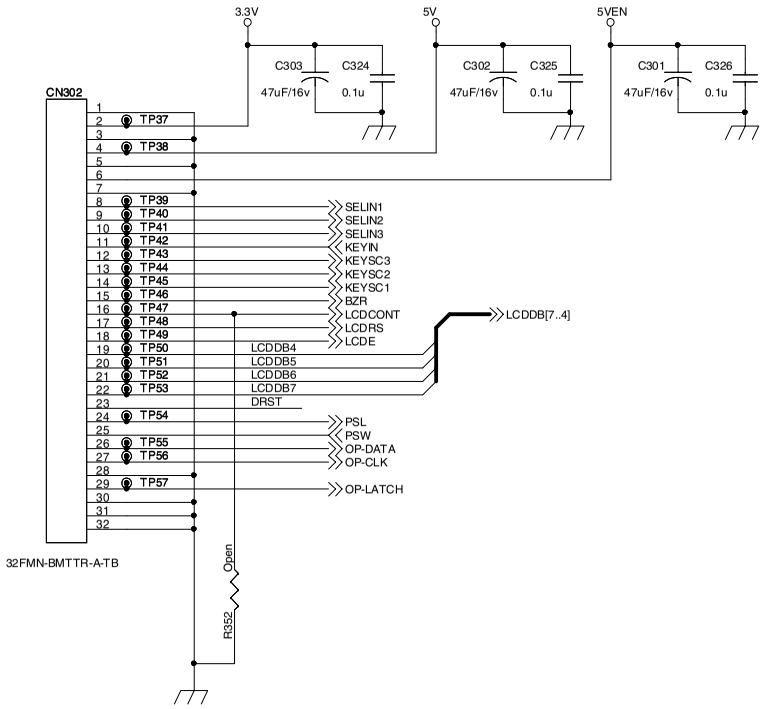
2. OPERATION PWB



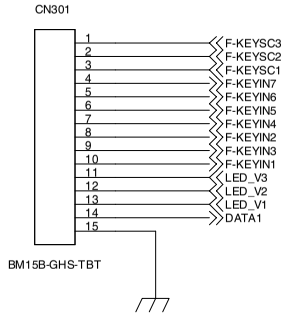

OPERATION PWB (KEY / Buzzer section)
2/3
5VEN
BZR231
PST720P02
R339
10kJ
Q306
KRC106S
BZR
D301
1SS133
D302
1SS133
D303
1SS133
KEY321 ESRT
KEY325 LK
KEY324 MENU
KEY320 NM2K
KEY323 NM8K
KEY319 NM5K
KEY322 NM6K
KEY318 CLK
KEY317 NM3K
KEY316 RAT
KEY309 NM0K
KEY308 ASTK
KEY306 NM9K
KEY315 SHPK
KEY307 CAK
KEY314 RK
KEY313 ENT
KEY305 EXP
KEY312 NM1K
KEY311 NM4K
KEY304 NM7K
KEY301 MODK
KEY302 BPK
KEY303 2SIDE
SKQNABD010
F-KEYIN1
F-KEYIN2
F-KEYIN3
F-KEYIN4
F-KEYIN5
F-KEYIN6
F-KEYIN7
F-KEYSC1
F-KEYSC2
F-KEYSC3
R342 2kJ
R341 2kJ
R340 2kJ
R319 2kJ
R320 2kJ
R321 2kJ
R322 2kJ
R343 2kJ
C337 Open
C335 Open
C334 Open
C313 Open
C314 Open
C316 Open
C317 Open
C336 Open
R314 100J
R313 100J
R312 100J
R311 100J
R307 100J
R308 100J
R309 100J
R310 100J
TP19
TP20
TP21
TP22
TP23
IC303
74HC238
TP16
TP17
TP18
R338 1kJ
R337 1kJ
R336 1kJ
C321 0.1u
C320 Open
C319 Open
C318 Open
KEYSC1
KEYSC2
KEYSC3
IC302
74HC151
TP24
TP25
TP26
TP27
TP28
TP29
TP30
TP31
TP32
TP33
TP34
TP35
TP36
R318 33J
C315 47pF
C312 0.1u
R317 1kJ
R316 1kJ
R315 1kJ
KEYIN
R348 2kJ
R347 2kJ
R346 2kJ
C309 Open
C310 Open
C311 Open
SELIN3
SELIN2
SELIN1
KEY310 PSW
C304 Open
PSW

OPERATION PWB (Connector section)

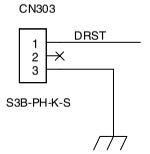
To MCU PWB



To FAX Key PWB

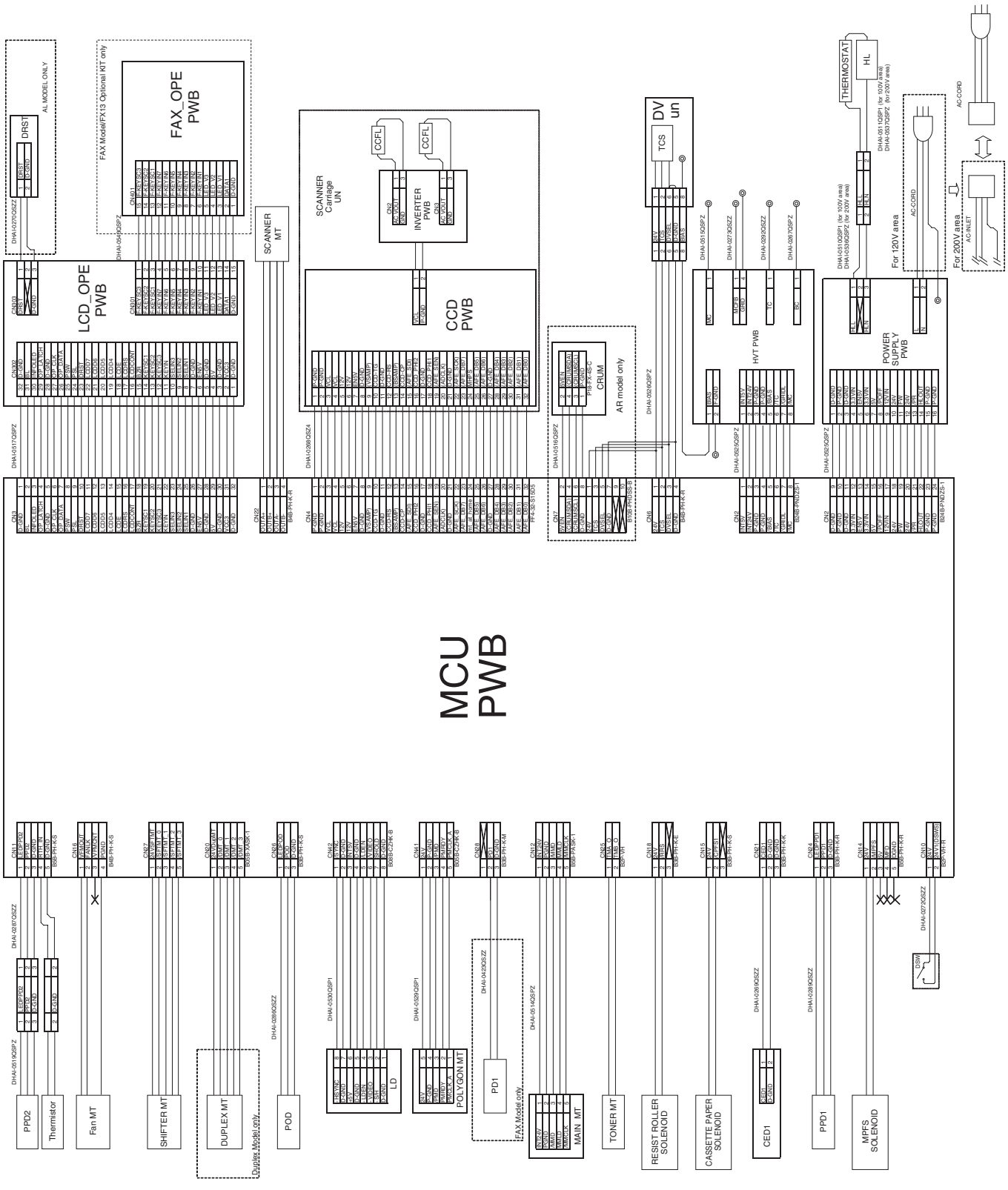


To Drum Initial Detector

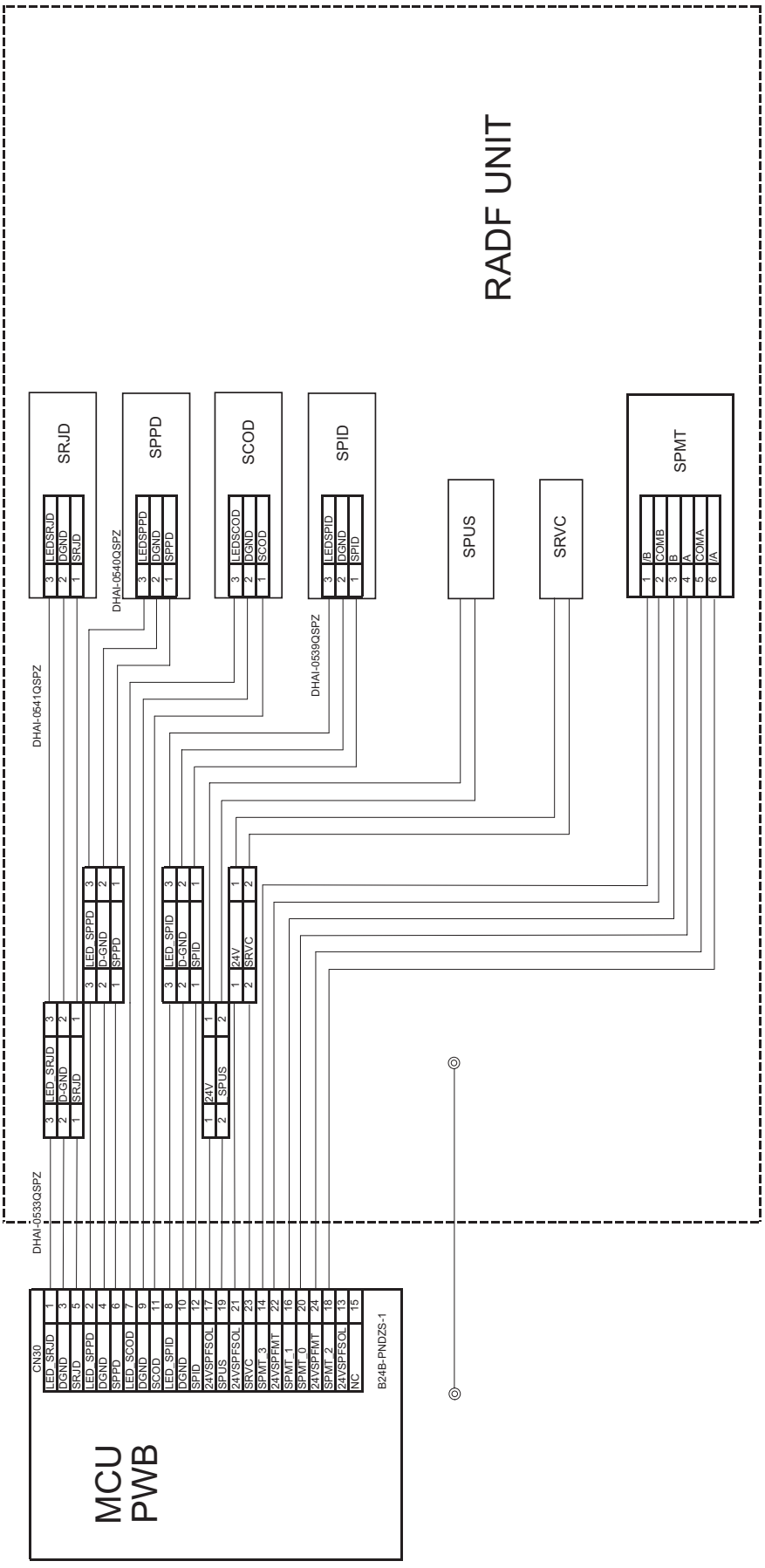


3. ACTUAL WIRING DIAGRAM

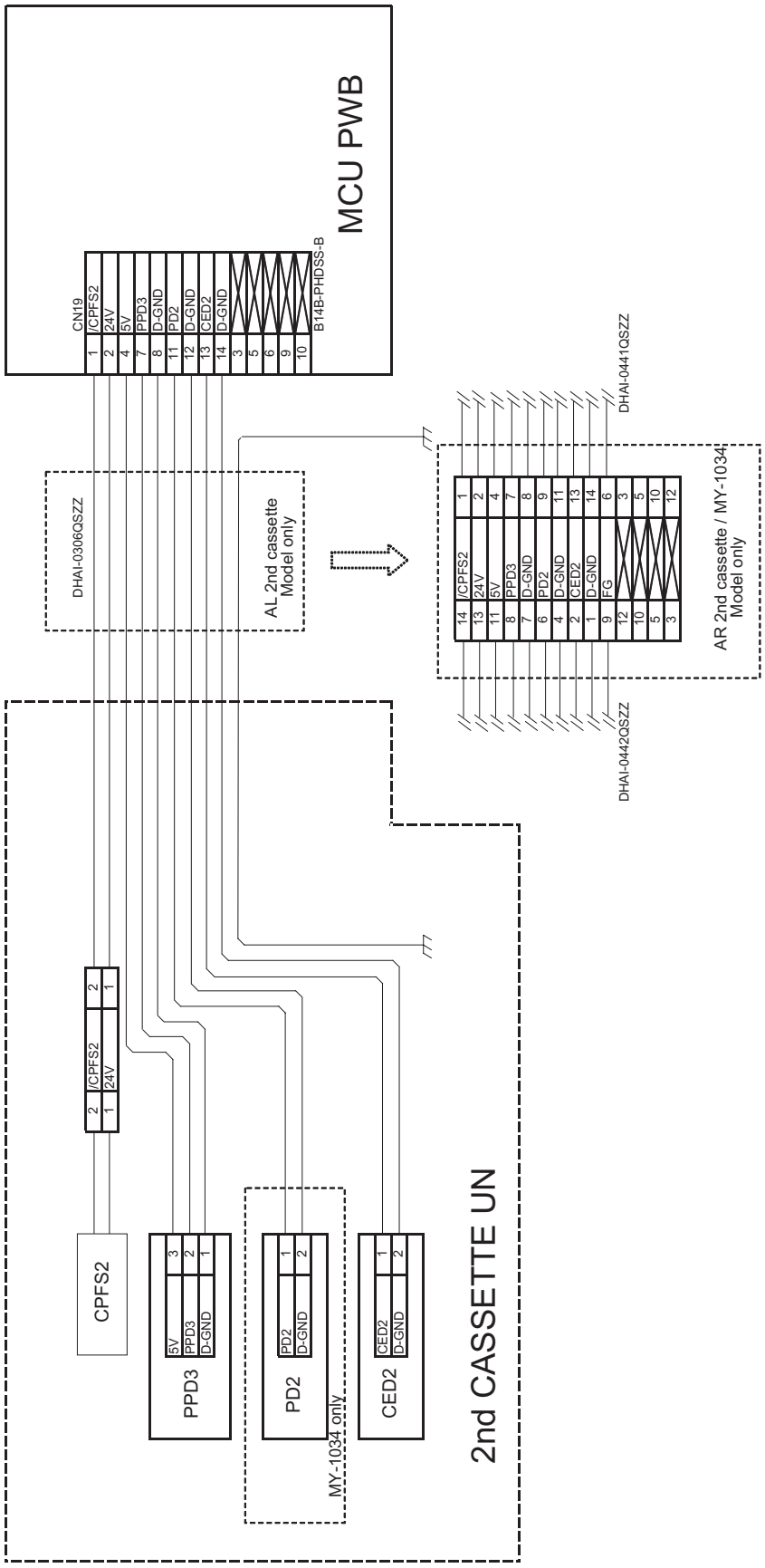
(1) MCU section (1/3)



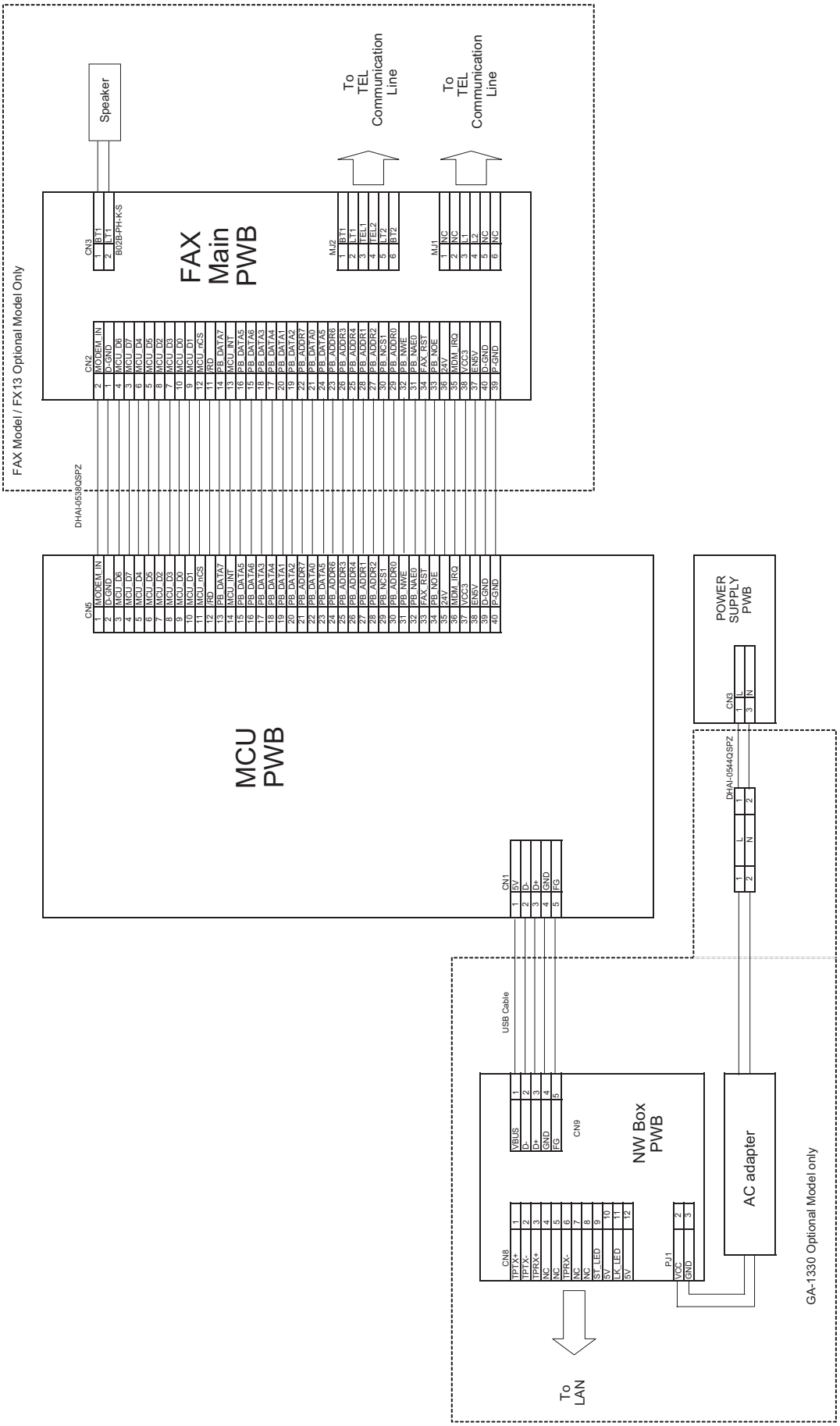
(2) RADF section (2/3)



(3) 2nd cassette section (Optional)



(4) Network box and FAX section (Optional)



[15] FIRMWARE DOWNLOAD PROCEDURES

[Preparation]

Write the download data (extension .dwl) into the main unit.

A USB port is required for the PC.

Create "MaintenanceTool " flooder in the PC, and copy the following files to the folder.

Necessary for program download

- Maintenance.exe (← Tool program)
- ProcModelQ.fmt
- ProcModelQ.mdl

Driver

- Drivers/Vista/Mainte.inf (For Windows Vista)
- Drivers/2kXP/Mainte.inf (For Windows XP/2000)
- Drivers/Win9xME/Mainte.inf (For Windows Me/98SE)
- Drivers/Win9xME/UsbScan.sys (For Windows Me/98SE)

Download file

- Download file (extension .dwl)

Note: Copy the download data file (extension .dwl) to the folder in which the maintenance program is included.

When making a folder for the maintenance tool in the PC, do not put a long folder name in the absolute path.

[Example]

Erroneous case: c:\Mainte nance Tool Download

Proper case: c:\MaintenanceTool

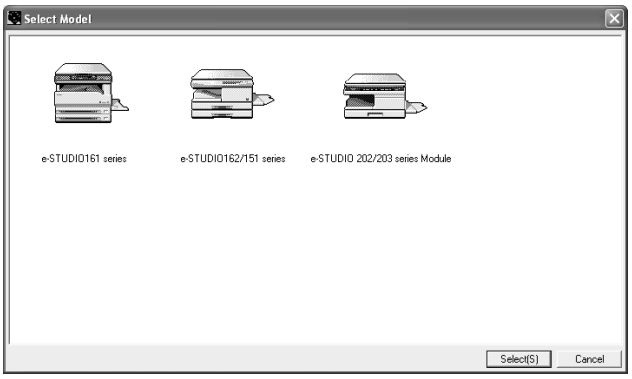
1. Initial setting (Serial number setting procedures)

The serial number is set to the PC which is used for downloading. Setting is required once only, and there is no need to set again when rebooting the program.

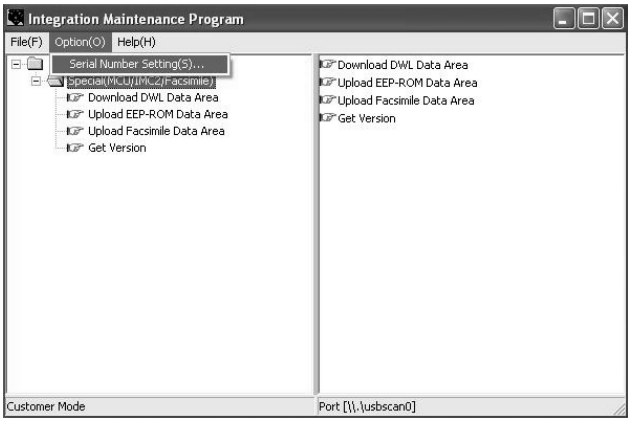
Note: This setting is required only when downloading the default data of E2PROM, and is not required when downloading firmware only.

1) PC side: Boot "Maintenance.exe" and select "e-STUDIO202/203 series Module" in the "Select Model" menu.

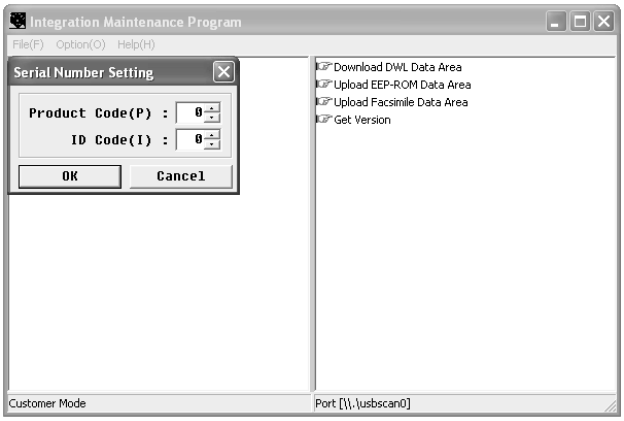
(Only to set the serial number, the PC should not be connected to the machine.)



2) Select "Option" → "Serial Number Setting" on the menu bar.



3) Set the serial number according to the following.



Product Code (P): Enter number (0 – 99)
Enter the product code of "3."

ID Code(I): Enter number (0 – 99)
Assign an individual code to each PC uses "Maintenance.exe."

After completion setting, press [OK] key.

4) The serial number has been assigned.

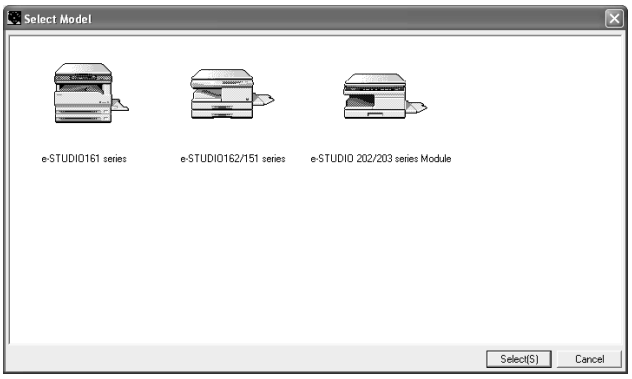
2. Download procedures

1) Main unit side: Execute Test command No. 49-01 (Flash ROM program write mode).

Check that "DOWNLOAD MODE" is displayed on the LCD of the operation panel. (Press and hold [C] key and [ZOOM DOWN] key (left key) together, and turn on the power simultaneously.)

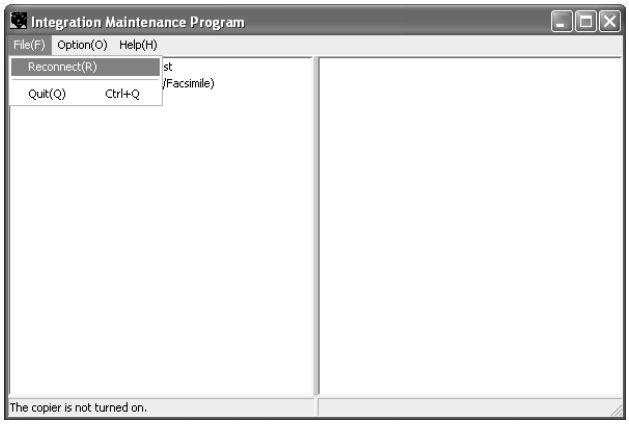
2) Connect machine and the PC with a USB cable. (Connect it to the USB port on the main unit without fail.

3) PC side: Boost "Maintenance.exe" and select "e-STUDIO202/203 series Module" in the Select Model menu.

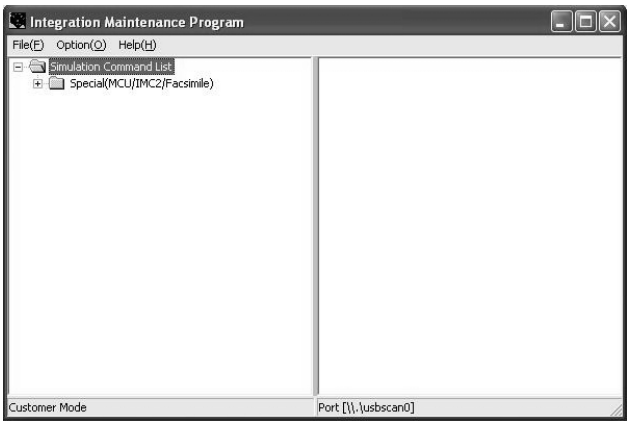


4) PC side: Check that the "Simulation Command List" tree is displayed on the integration maintenance program.

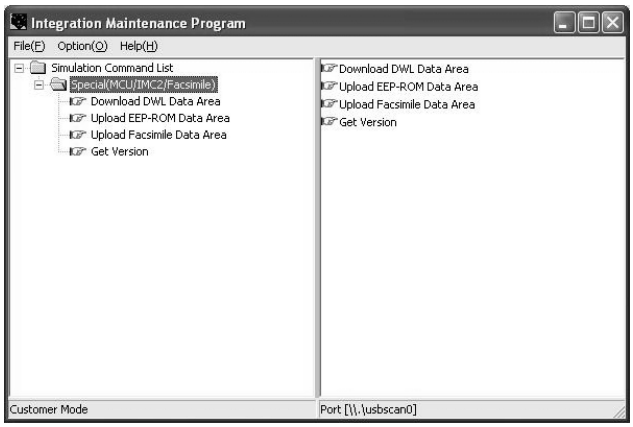
5) PC side: When the integration maintenance program is boosted and "The copier is not turned on." is displayed at the bottom of display, select "File" → "Reconnect" on the menu bar.



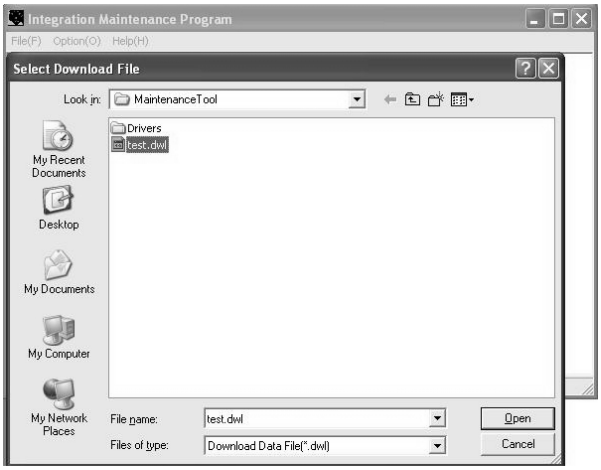
6) PC side: Check that trees are displayed in the "Special (MCU/IMC2/Facsimile)" folder in the integration maintenance program. (If trees are not displayed, check that the USB connector is connected, and select "Reconnect" in procedure 5) again.)



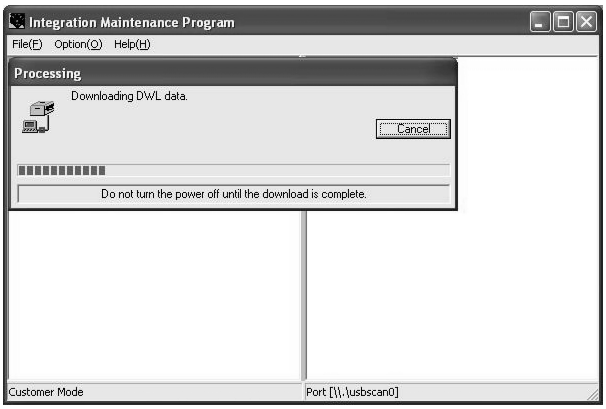
7) PC side: Double-click "Special (MCU/IMC2/Facsimile)" in the main tree to develop its sub trees, and double-click "Download DWL Data Area" in the sub trees.



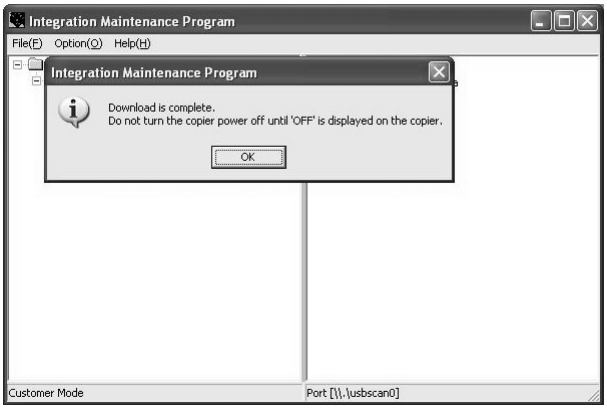
8) PC side: Specify the download file (*****.dwl) to be used.



9) PC side: When a download file is specified, downloading is performed automatically.



10) PC side: When download is completed, the following message is displayed.



Note: Since, however, the machine enters the download data write state, do not turn OFF the power of the machine at this moment.

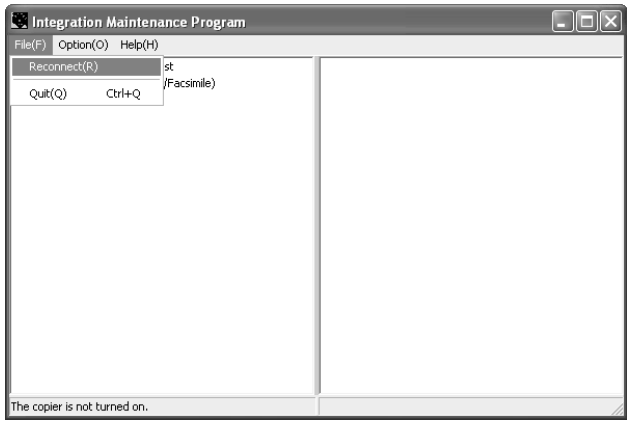
11) Main unit side: Wait until "DOWNLOAD COMPLETE!" is displayed on the LCD of the operation panel. When "DOWNLOAD COMPLETE!" is displayed, download is completed.

Turn OFF the power of the machine, and disconnect the USB cable.

12) Terminate the integration maintenance program, and turn ON the machine again.

Download is completed with the above procedures.

Note: When another machine is connected, connect the USB cable again and select "File" → "Reconnect" on the menu bar of the integration maintenance program. Repeat the above procedures from 5).



*** Inhibition during download (Important)**

If download is failed, the next download may not be executed. Use great care not to execute the following items during download.

- Never turn off the machine.
- Never disconnect the download cable (USB cable).

*** If the above inhibition item occurs during downloading, turn OFF/ON the power.**

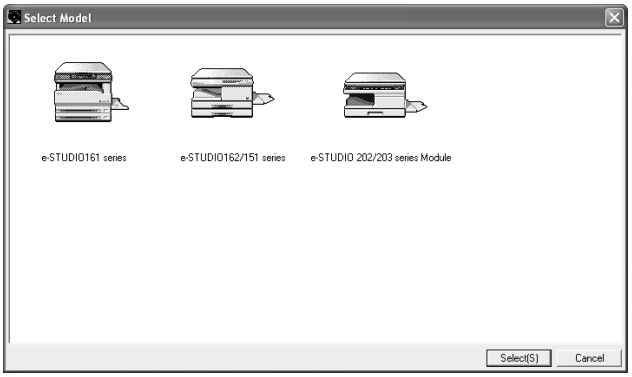
1) When "DOWNLOAD MODE" is displayed on the operation panel, execute the download procedure again.
2) If "DOWNLOAD MODE" is not displayed on the operation panel, turn OFF the power and press and hold [C] key and [ZOOM DOWN] key (left key) and turn ON the power. Check that "DOWNLOAD MODE" is displayed on the operation panel, and execute the download procedure again.

   If "DOWNLOAD MODE" is not still displayed, replace the MCU with a new one.

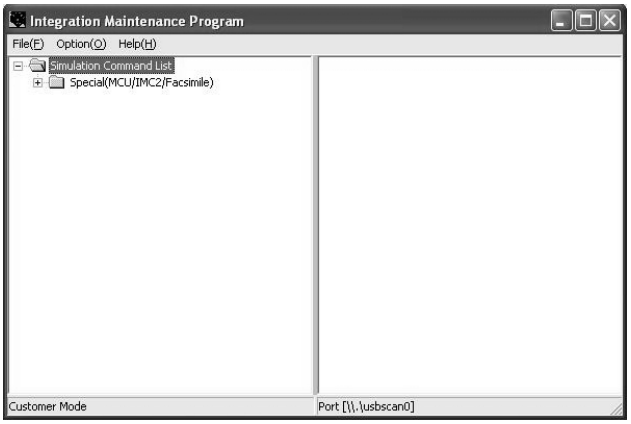
3. Version acquisition procedures

1) Main unit side: Execute Test command No. 49-01 (Flash ROM program write mode).

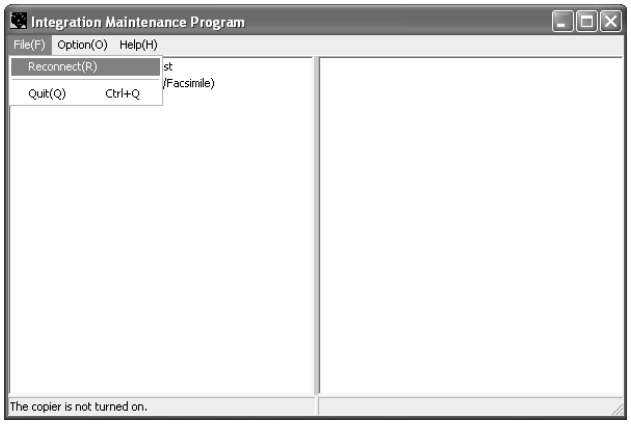
   Check that "DOWNLOAD MODE" is displayed on the operation panel of the main unit. (Press and hold [C] key and [ZOOM DOWN] key (left key) together, and turn on the power simultaneously.)
2) Connect the machine and the PC with a USB cable.
3) PC side: Boost "Maintenance.exe" and select "e-STUDIO202/203 series Module" in the "Select Model" menu.



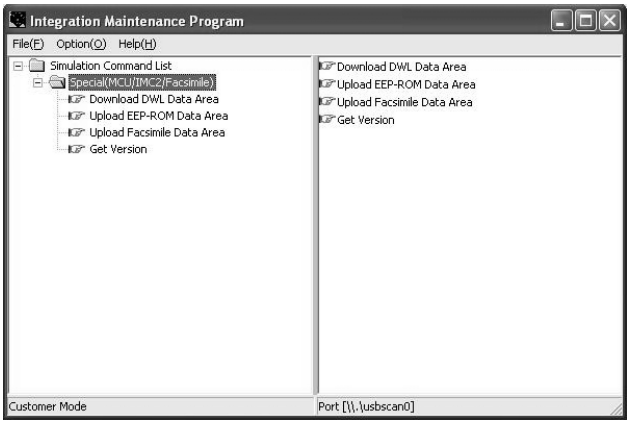
4) PC side: Check that the "Simulation Command List" tree on the integration maintenance program.



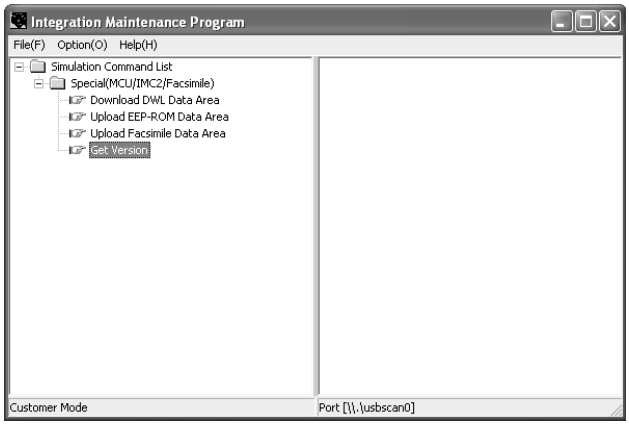
5) PC side: Boot the integration maintenance program. If "The copier is not turned on." is displayed, select "File" → "Reconnect" on the menu bar.



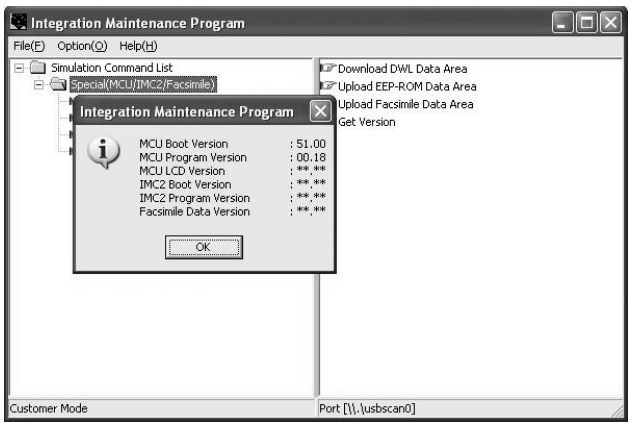
6) PC side: Check that trees are displayed on "Special (MCU/IMC2/Facsimile" in the integration maintenance program. (If trees are not displayed, check that the USB cable is connected and select "Reconnect" again in procedure 5).



7) PC side: Double-click "Special (MCU/IMC2/Facsimile)" in the main tree items to develop its sub trees. Select "Get Version" in the sub trees.



8) Check that the following display is shown.



With the above procedures, version acquisition is completed.

- The display of "**.**" means its version is not downloaded. The downloaded versions are displayed in a version number as shown in "MCU Boot Version" and "MCU program Version".

4. EEPROM data acquisition procedure

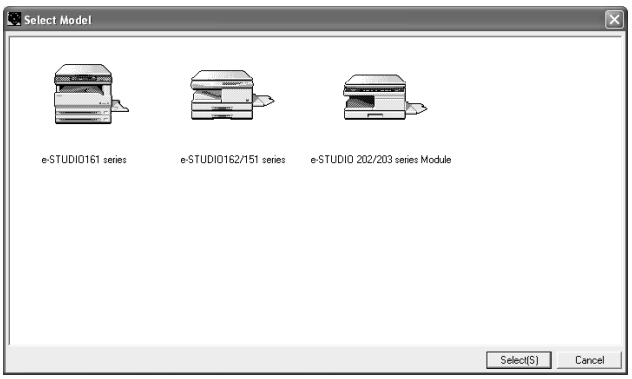
EEPROM data is acquired to the PC. Use this procedure as data maintenance of EEPROM.

1) Main unit side: Execute Test command No. 49-01 (Flash ROM program write mode).

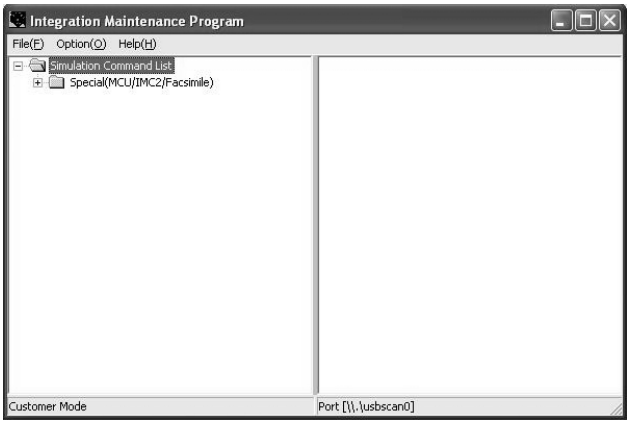
   Check that "DOWNLOAD MODE" is displayed on the operation panel of the main unit. (Press and hold [C] key and [ZOOM DOWN] key (left key) together, and turn on the power simultaneously.)

2) Connect the machine and the PC with a USB cable.

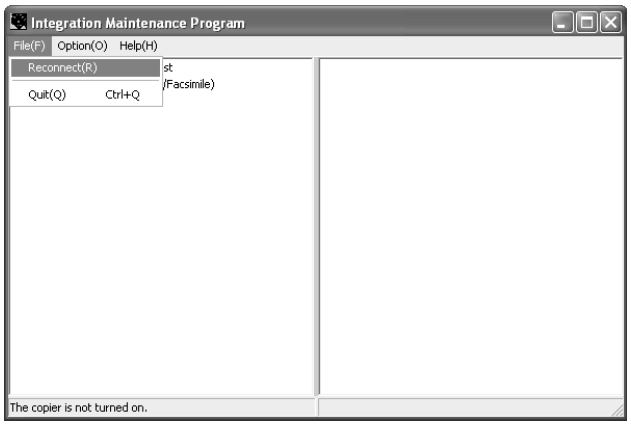
3) PC side: Boot "Maintenance.exe" and select "e-STUDIO202/203 series Module" in the "Select Model" menu.



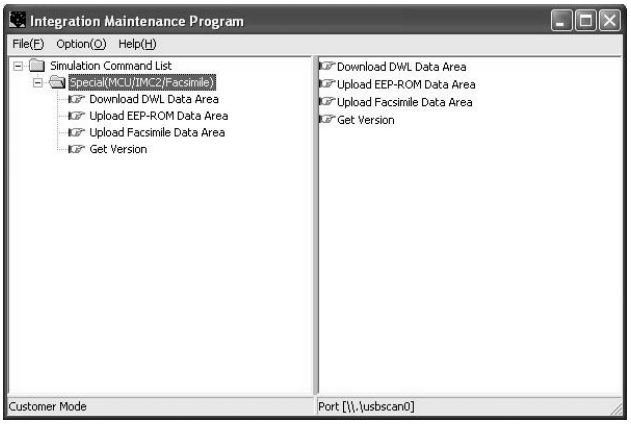
4) PC side: Check that "Simulation Command List" tree is displayed in the integration maintenance program.



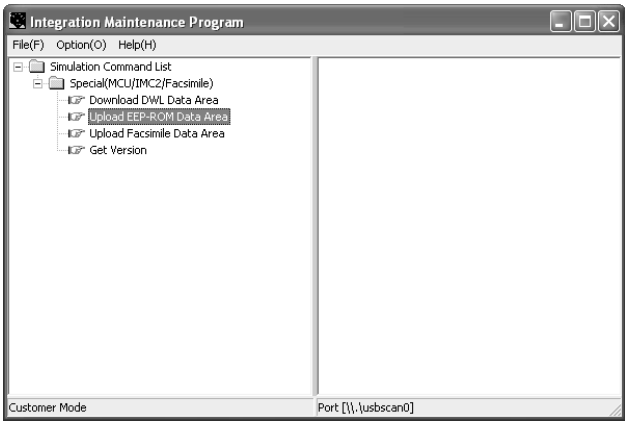
5) PC side: Boot the integration maintenance program. If "The copier is not turned on." is displayed on the lower side of the display, select "File" → "Reconnect" on the menu bar.



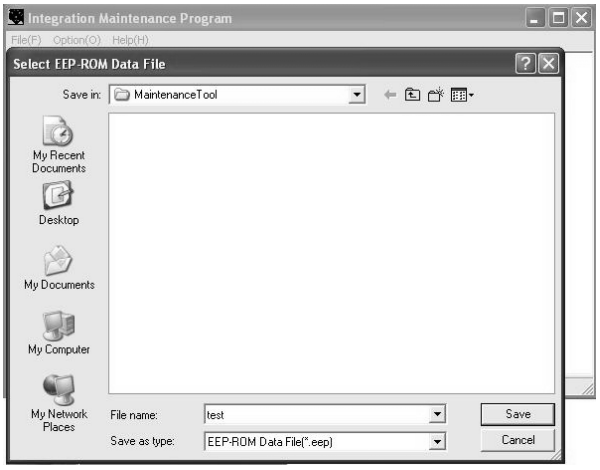
6) PC side: Check that trees are displayed on "Special (MCU/IMC2/Facsimile" in the integration maintenance program. (If trees are not displayed, check that the USB cable is connected and select "Reconnect" again in procedure 5).



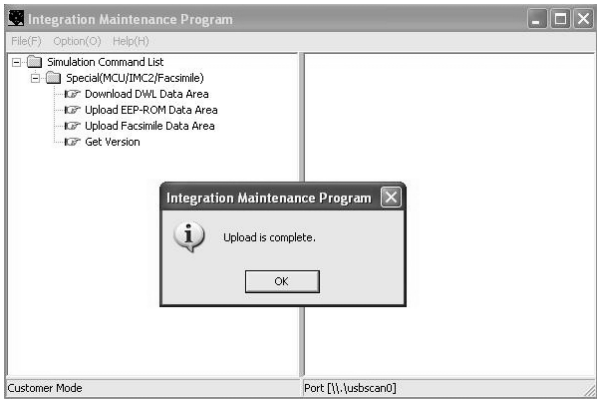
7) PC side: Double-click "Special (MCU/IMC2/Facsimile)" to develop its sub trees, and select "Upload EEPROM Data Area" in the sub trees.



8) PC side: Enter a desired file name, and select "Save."



9) PC side: When upload is completed, the complete message is displayed.



With the above procedure, the EEPROM data acquisition is completed.

Data acquired by the EEPROM data acquisition procedure are saved in a file with extension of .eep.

5. Installing procedures

<USB integration maintenance program installation>

Driver installation is made on plug-and-play.

<Installation on Windows Vista>

1) Main unit side: Execute Test command No. 49-01 (Flash ROM program write mode).

   Check that "d" is displayed on the LCD of the operation panel. (Press and hold [C] key and [ZOOM DOWN] key (left key) together, and turn on the power simultaneously.)

2) Connect the machine and the PC with a USB cable.

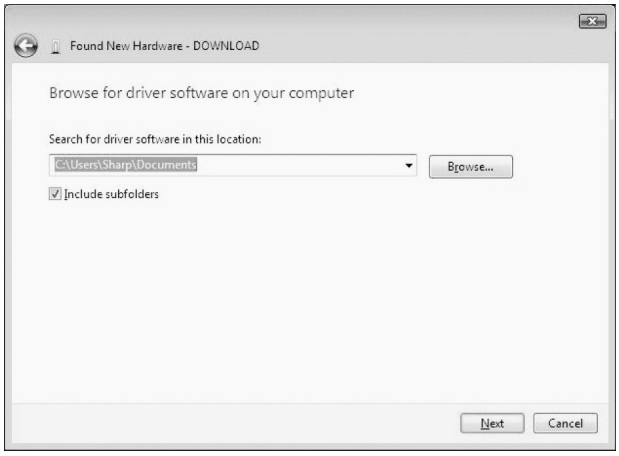
3) The [Found New Hardware] display is shown as below. Select [Locate and install driver software (recommended)].

Note: A message to confirm the administrator of the computer is displayed. Press [Agree] button.

4) The [Found New Hardware - DOWNLOAD] display is shown. Click [I don't have the disc. Show me other options.].

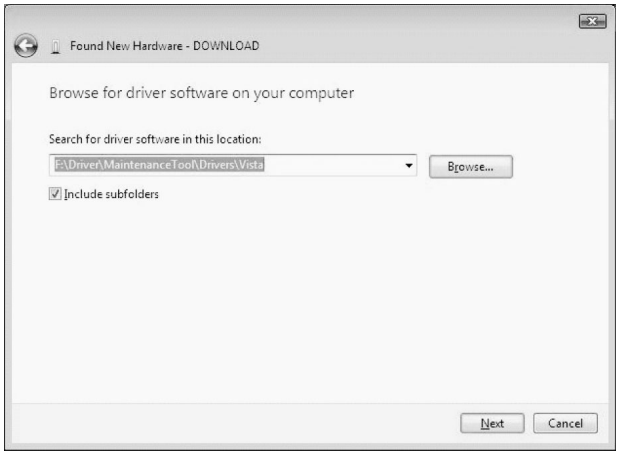
5) When the following display is shown, select [Browse my computer for driver software (advanced)].

6) The following display is shown.



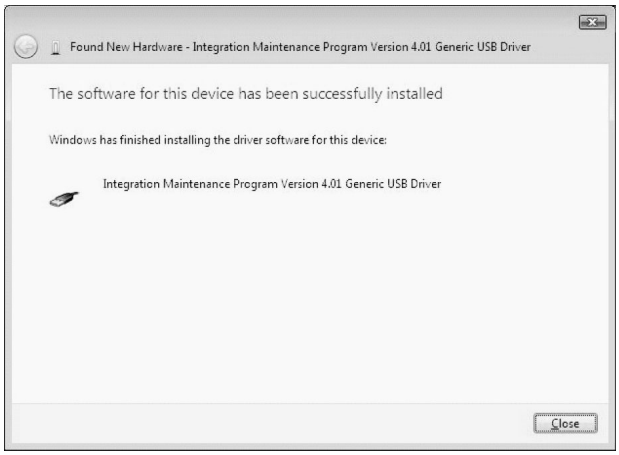
7) Press [Browse] button, specify the folder which includes the maintenance tool driver (Maintenance.inf), and press [OK] button.

8) The path to the folder which includes the maintenance tool driver (Maintenance.inf) is displayed. Press [Next] button.



9) When the following display is shown, select [Install this driver software anyway].

10) When the following display is shown, close [Close] button to complete installation.



<Installation on Windows XP>

1) Main unit side: Execute Test command No. 49-01 (Flash ROM program write mode).

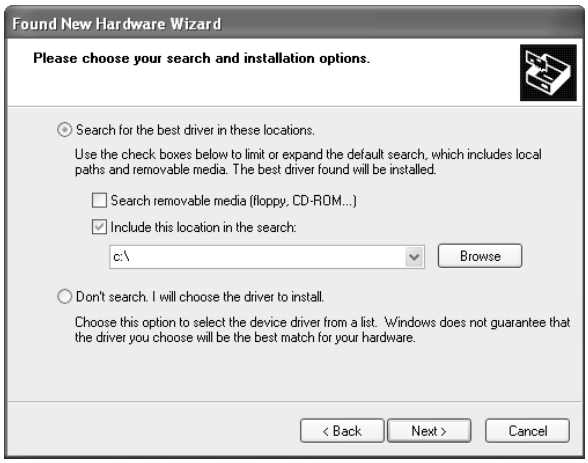
   Check that "DOWNLOAD MODE" is displayed on the LCD of the operation panel. (Press and hold [C] key and [ZOOM DOWN] key (left key) together, and turn on the power simultaneously.)

2) Connect the machine and the PC with a USB cable.

3) The following display is shown.

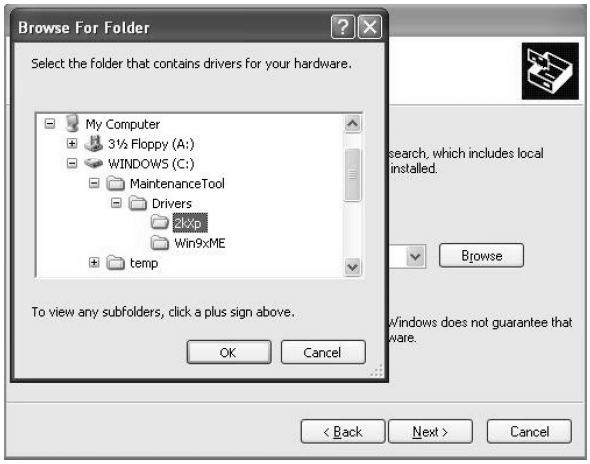
   Select [Install from a list or specific location] and press <Next> button.

4) Select [Include this location in the search;]. If the search location is not the folder which includes the maintenance tool driver (Mainte.inf), select <Browse>. If the search location is the folder which includes the maintenance tool driver, press <Next> button to go to procedure 7).

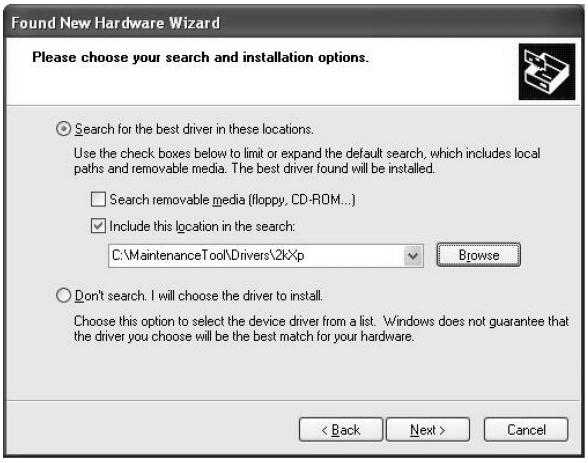


5) Select the folder which includes the maintenance tool driver (Mainte.inf) and press <OK> button.

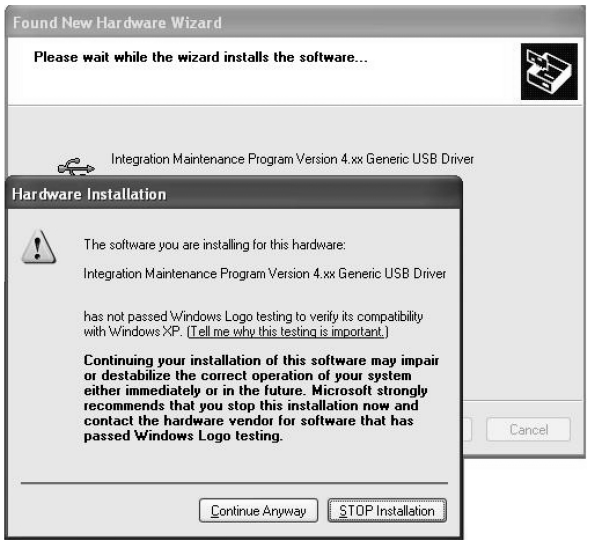
   (Suppose that the driver is included in C:\MaintenanceTool\Drivers\2kXp folder.)



6) Check the path to the folder which includes the maintenance tool driver (Mainte.inf), and press <Next> button.



7) When the following display is shown, press [Continue Anyway] button.



8) When the following display is shown, installation is completed. Press <Finish> button.

With the above procedures, installation (on Windows XP) of the integration maintenance program is completed.

<Installation on Windows 2000>

1) Main unit side: Execute Test command No. 49-01 (Flash ROM program write mode).

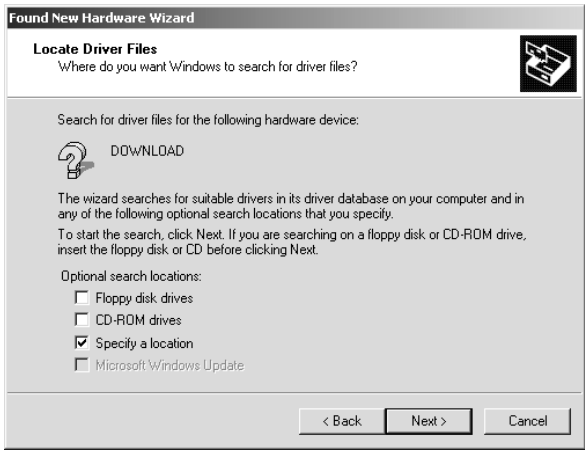
   Check that "DOWNLOAD MODE" is displayed on the LCD of the operation panel. (Press and hold [C] key and [ZOOM DOWN] key (left key) together, and turn on the power simultaneously.)

2) Connect the machine and the PC with a USB cable.

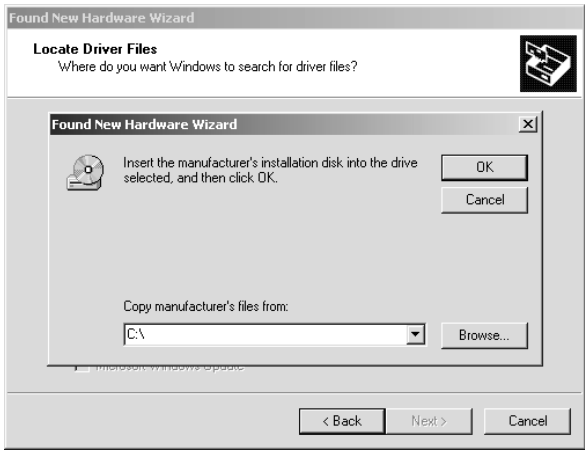
3) Check that the Found New Hardware Wizard is displayed, and press <Next> button.

4) Select [Search for a suitable driver for my device] and press <Next> button.

5) Select [Specify a location] and press <Next> button.



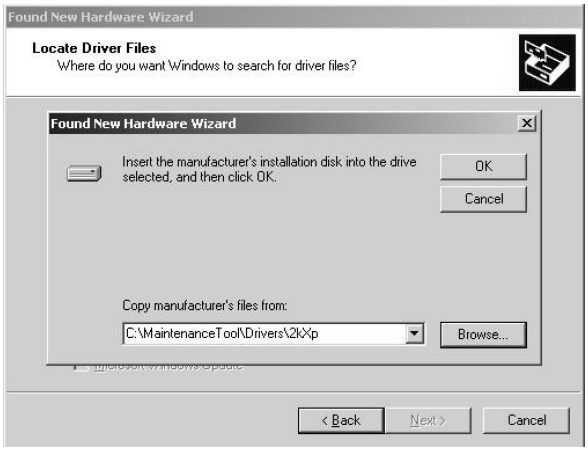
6) Select [Include this location in the search;]. If the search location is not the folder which includes the maintenance tool driver (Mainte.inf), select <Browse>. If the search location is the folder which includes the maintenance tool driver, press <Next> button to go to procedure 9).



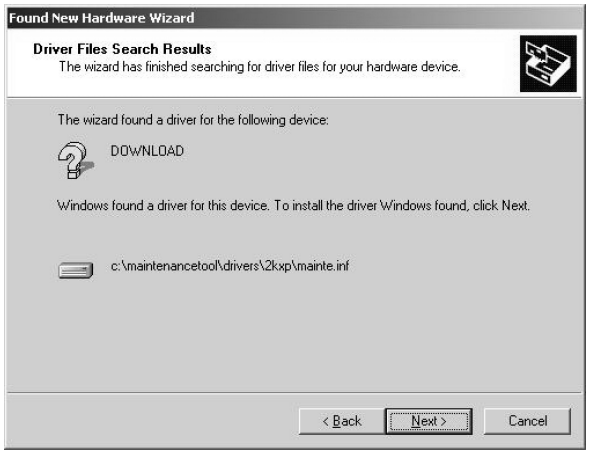
7) Specify the folder which includes the maintenance tool driver (Mainte.inf), and press <Open> button.

8) Check that the path to the folder which includes the maintenance tool driver (Mainte.inf) is displayed, and press <OK> button.

(Suppose that the maintenance tool driver is included in C:\MaintenanceTool\Drivers\2kXp folder.)



9) Press <Next> button to start installation.



10) When the following display is shown, installation is completed.
Press <Finish> button.

11) Restart the PC.

With the above procedures, installation (on Windows 2000) of the integration maintenance program is completed.

<Installation on Windows Me>

1) Main unit side: Execute Test command No. 49-01 (Flash ROM program write mode).

Check that "DOWNLOAD MODE" is displayed on the LCD of the operation panel. (Press and hold [C] key and [ZOOM DOWN] key (left key) together, and turn on the power simultaneously.)

2) Connect the machine and the PC with a USB cable.

3) The following display is shown on the PC side.

Select [Specify the location of the driver], and press <Next> button.

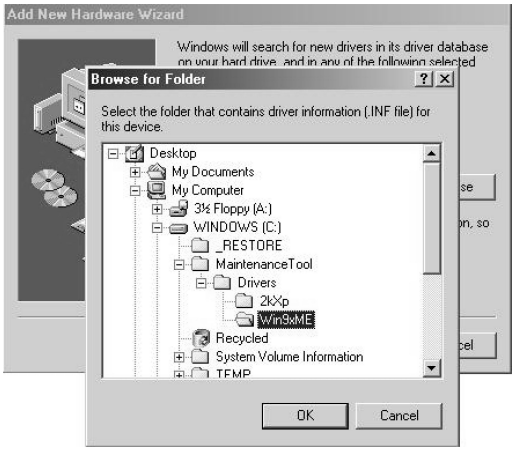
4) Select [Specify a location], specify the folder which includes the maintenance tool driver (Mainte.inf) as the search location, and press <Next> button.

If the search location does not include the maintenance tool driver (Mainte.inf), press <Browse> button to specify the folder which includes the maintenance tool driver (Mainte.inf).

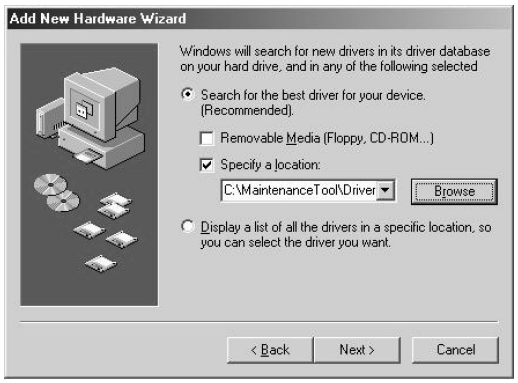
(Suppose that the maintenance tool driver is included in C:\MaintenanceTool\Drivers\Win9xMe folder.)

5) Select the folder which includes maintenance tool driver (Mainte.inf), and press <OK> button.

(Suppose that the driver is included in C:\MaintenanceTool\Drivers\Win9xMe folder.)



6) Check that the path to the folder which includes the maintenance tool driver (Mainte.inf) is displayed, and press <Next> button.



7) When the following display is shown, installation is completed.

Press <Finish> button.

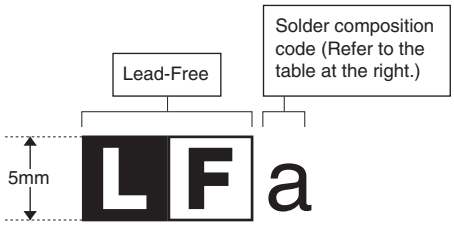
8) Restart the PC.

With the above procedures, installation (on Windows ME) of the integration maintenance program is completed.

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

"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.

TOSHIBA

TOSHIBA TEC CORPORATION

2-17-2, HIGASHIGOTANDA, SHINAGAWA-KU, TOKYO, 141-8664, JAPAN