# SHARP SERVICE MANUAL

CODE : 00ZAL1226/A1E

**AL-1217** 



# DIGITAL LASER COPIER/ DIGITAL MULTIFUNCTIONAL SYSTEM

MODEL AL-1226

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Parts marked with " $\triangle$ " are important for maintaining the safety of the machine. Be sure to replace these parts with the replacement parts specified to maintain the safety and performance of the machine.

# SHARP CORPORATION

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

#### CAUTION

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

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

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

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

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



LASER WAVE – LENGTH : 770 ~ 795nm Pulse times :  $11.82\mu$ s/7mm Out put power :  $0.17mW \pm 0.01mW$ 

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.



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# [1] GENERAL

# 1. Major functions

## Configurations

Item Model	СРМ	SB/MB	2 Tray	SPF	R-SPF	Color Scanner	GDI printer	PCL printer	SOPM	Duplex	Memory	FAX
AL-1217	12CPM	SB	×	×	×	0	0	×	0	×	8M	×
AL-1226	12CPM	MB	×	0	X	0	0	X	0	×	8M	X

#### **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.
SPF:	Original feed unit
R-SPF:	Duplex original feed unit
Color scanner:	Color scanner function
GDI printer:	GDI printer function with USB.
PCL printer:	PCL printer function with USB.
SOPM:	Scan Once Print Many function (Many copies are made by one scan.)
Duplex:	Auto duplex copy function
Memory:	Standard page memory
FAX:	FAX function.

#### Descriptions of table

- O: Standard provision
- $\times$ : No function or no option available





# [2] SPECIFICATIONS

# 1. Basic Specifications

Item					
Туре		Desktop			
Copy system		Dry, electrostatic			
Segment (class)		Digital personal copier			
Copier dimensions	AL-1217	20.4"(W)X18.2"(D)X11.6"(H) (518mm(W)X462.5r	nm(D)X295.6mm(H))		
AL-1226		20.4"(W)X19.4"(D)X15.0"(H) (518mm(W)X492.5mm(D)X380.4mm(H))			
Weight	AL-1217	35.3lbs.(17Kg)	TD and drum cartridges included		
(Approximately)	AL-1226	41.9lbs.(20Kg)			

# 2. Operation specifications

Section, item		em	Details	
Paper feed	Paper feed		AL-1217	1 tray (250 sheet) + single bypass
section	system		AL-1226	1 tray (250 sheet) + multi bypass (50 sheet)
	AB system	Tray paper feed	Paper size	A4, B5, A5 (Landscape)
		section	Paper weight	56 - 80g/m <sup>2</sup> (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	Paper size	A4, B5, A5, B6, A6 (Landscape)
		feed section	Paper weight	52 - 128g/m <sup>2</sup> (14 - 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
		Single bypass paper	Paper size	A4, B5, A5, B6, A6 (Landscape)
		feed section	Paper weight	52 - 128g/m <sup>2</sup> (14 - 34.5 lbs.)
			Paper feed capacity	1 sheet
			Kinds	Standard paper, specified paper, recycled paper, OHP, Label, Postal card, Envelop, Post card (Including double postal without fold line)
			Remark	User adjustment of paper guide available
	Inch system	Tray paper feed section	Paper size	8-1/2" x 14", 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	8-1/2" x 14", 8-1/2 x 11", 8-1/2" x 5-1/2", 3-1/2" x 5-1/2" (Landscape)
			Paper weight	14 - 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
		Single bypass paper	Paper size	8-1/2" x 14", 8-1/2 x 11", 8-1/2" x 5-1/2" (Landscape)
		feed section	Paper weight	14 - 34.5 lbs.
			Paper feed capacity	1 sheet
			Kinds	Standard paper, specified paper, recycled paper, OHP, Label, Envelop
			Remark	User adjustment of paper guide available
Paper exit sectio	n	Exit way		Face down
		Capacity of output tray		100 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

Section, item		Deta	ils			
Optical section	Scanning	Scanning system			3 CCDs (RGB) sensor scanning by lighting white lamp	
	section	CCD sensor	Resolution		600 dpi	
		Lighting lamp	Туре		CCFL	
			Voltage		560Vrms	
			Power consumption	า	2.8W	
		Output data			R, G, B 1 or 8 bits/pixel / A/D 16bit	
	Writing	Writing system			Writing to OPC drum by the semiconductor laser	
	section	Laser unit	Resolution		600 dpi	
Image forming		Photoconductor	type		OPC (30ø)	
			Life		18k	
		Charger	Charging system		Saw -tooth charging with a grid, / (-) scorotron discharge (+) DC scorotron system	
			Transfer system			
			Separation system		(-) DC scorotron system	
		Developing	Developing system		Dry, 2-component magnetic brush development system	
		Cleaning	Cleaning system		Counter blade system (Counter to rotation)	
Fusing section		Fusing system	type		Heat roller system	
		Upper heat roller			Teflon roller	
		Lower heat roller	type		Silicon rubber roller	
		Heater lamp	type		Halogen lamp	
			Voltage		230V	
			Power consumption		800W	
Electrical section	n	Power source	Voltage		100V, 110V, 120/127V, 230V, 240V	
			Frequency		Common use for 50 and 60Hz	
		Power consumption	Max.		Less than 1000W	
			Average	AL-1217	300 Wh/H *1)	
			(during copying)	AL-1226	300 Wh/H *1)	
			Average (stand-by)		~ 127V 80Wh/H *1), 230V, 240V 75Wh/H *1)	
			Pre-heat mode		~ 127V 16.5Wh/H *1), 230V, 240V 18Wh/H *1)	
			Auto power shut-off mode		~ 127V 3.7Wh/H *1), 230V, 240V 4.5Wh/H *1)	

\*1) May fluctuate due to environmental conditions and the input voltage.

# 3. Copy performance

	Section, item		Details	AL-1217	AL-1226	
Copy magnificatic	n	Fixed magnification ratios		3 Reduction + 2 Enlargement (AB system : 25, 70, 86, 100, 141, 400%) (Inch system : 25, 64, 78, 100, 129, 400%)		
		Zooming magnification ratios		25 - 400% (376 steps in 1% increments)		
Manual steps (manual, photo)			5 steps			
Copy speed		First copy time	Tray paper feed	9.6 sec. (Pre-heat mode:25 sec. / A A4 or Letter/100%/Auto Exposure	uto power-shut-off mode : 40 sec.)	
	AB system	Copy speed	Same size	12	12	
	A4	(CPM)	Enlargement	12	12	
	(Landscape)		Reduction	12	12	
	AB system	Copy speed	Same size	12	12	
	B5	(CPM)	Enlargement	12	12	
	(Landscape)		Reduction	12	12	
	Inch system	Copy speed (CPM)	Same size	12	12	
	8-1/2" x 14"		Enlargement	12	12	
	(Landscape)		Reduction	12	12	
	Inch system	m Copy speed	Same size	12	12	
	8-1/2" x 11"	(CPM)	Enlargement	12	12	
	(Landscape)		Reduction	12	12	
Max. continuous of	copy quantity			99		
Void		Void area	leading edge	1 - 4mm		
			Trailing edge	4mm or less, 6mm or less (Duplex copying/both image)		
			Side edge void area	0.5mm or more (per side) 4.5mm or less (total of both sides)		
		Image loss	leading edge	same size: 3.0mm or less (OC) / 4mm or less (SPF/R-SPF/Duplex) Enlarge: 2mm or less (OC) / 3mm or less (SPF/R-SPF/Duplex) Reduction (50%): 6.0mm or less (OC) / 8mm or less (SPF/R-SPF/ Duplex)		
Warm-up time				0 sec.		
Power save mode	e reset time			0 sec.		
Paper jam recove	Paper jam recovery time			0 sec.		

# 4. GDI Printer

Print speed	Max. 12ppm (A4, 8.5" x 11") (Mono CW chart / Pentium III 733Mhz / 128MB / Win 98)	
First print time	9.6 sec. (without data transfer time)	
Duplex	Yes	
CPU	None	
Memory	8MB (Duplex model: 16MB)	
Interface	IEEE1284 / USB 1.1	
Emulation	GDI	
Resolution	600dpi *1	
Supported OS	Win 95 / 98 / Me / NT 4.0 / 2000 / XP	
WHQL support	Yes *2	

\*1: Engine Resolution

\*2: By running change

# 5. Scan function

Туре	Flat Bed Color Scanner
Scanning system	Original table/SPF/RSPF (Valid only in the single mode)
Light source	3 CCDs (RGB) sensor scanning by lighting white lamp (2 pcs of CCFL)
Resolution	Optical: 600 x 1200dpi Setting range: 50 - 9600dpi (Preview resolution is fixed at 75dpi)
Originals	Sheet type / Book type
Output data	R, G, B 1 or 8 bits/pixel / A/D 16bit
Scan range	OC / SPF: 8.52 (H) x 14.72 (V)" Original position: Left Center
Scan speed	OC / SPF: Max. 2.88ms/line (Color/Gray scale), Max. 0.96 ms/line (B & W)
Protocol	TWAIN / WIA (Only XP)* / STI
Interface	USB1.1
Scanner utility	Button Manager / Sharpdesk / Composer
Scan key/lamp	Yes
Duplex scan	No
Supported OS	Win 98 / Me / 2000 / XP
Void area	No (User settable by PC)
WHQL supported	Yes *

\* Since only XP is subject to WHQL, XP will be supported to obtain WHQL.

# 6. SPF

Original capacity	30 sheets (52 to 90g/m <sup>2</sup> )(14 to 23.9 lbs.)
Original size	A4 to A5/10" x 14" to 5-1/2" x 8-1/2"
Original replacement speed	12CPM(A4/8-1/2" x 11"Landscape)(15CPM model)
Original placement	Face up
Original weight	52 to 90g/m <sup>2</sup> (14 - 23.9lbs.)
Mixed feeding(Paper size)	Performance Degraded
Original which cannot	Thermal papers, originals with punch holes for files, be used folded paper, transparent originals such as OHP films, stapled or clip used originals with cover up liquid used, Originals with tape sealed, originals with high level frictional coefficient such as photos or catalogs.

# [3] CONSUMABLE PARTS

# 1. Supply system table

Common to all destinations

ſ	No.	Name	Content	Life	Product name	Package
ſ	1	Develop cartridge (Black) x 1	Toner/developer cartridge x 1	4K	AL-110TD	5
		(Except Europe)	(Toner: Net weight 124g) (Developer: Net weight 190g)	(5% document)		
	2	Drum cartridge	Drum cartridge	18K	AL-100DR	5

# 2. Environmental

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

#### (1) Normal operating condition

Temperature: 20 - 25°C Humidity: 65  $\pm$  5%RH

#### (2) Acceptable operating condition



# (4) Supply storage condition



#### (3) Optical condition



# 3. Production control number (lot No.) identification

# <Developing cartridge> Production month Production day Destination code (Dealer, distributor, OEM, etc.) Production place (SOCC: Fixed to B.) End digit of year Version No.

\* Destination

Division		
EX Destination	A same pack	G
	B same pack	Н
Option Destination	А	Р
	В	Q

#### <Drum cartridge>

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







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

#### <JAPAN production>



Division	No.
Ex production	1
Option	2
Same pack	3

# [4] EXTERNAL VIEWS AND INTERNAL STRUCTURES

# 1. Appearance



1	Original table	2	Operation panel	3	Front cover
4	Paper tray	5	Side cover	6	Side cover open button
7	Bypass paper guides	8	Multi-bypass tray	9	Document feeder tray
10	SPF exit area	11	Original guides	12	Feeding roller cover
13	Original cover	14	Paper output tray	15	Paper output tray extension
16	Power switch	17	Handle	18	Power cord socket

# 2. Internal



1	Front cover	2	TD cartridge	3	Drum cartridge
4	Side cover	5	Fusing unit release lever	6	Transfer charger
7	Charger cleaner				

# 3. Operation panel



1	<b>Exposure mode selector key and indicators</b> Use to sequentially select the exposure modes: AUTO, MANUAL or PHOTO. Selected mode is shown by a lit indicator.	2	Light and dark keys and exposure indicators Use to adjust the MANUAL or PHOTO exposure level. Selected exposure level is shown by a lit indicator.
3	Alarm indicators  Drum replacement required indicator *1  N Misfeed indicator  TD cartridge replacement required indicator *2	4	SPF indicator (AL-1226)
5	SPF misfeed indicator (AL-1226)	6	<b>Copy ratio selector key and copy ratio indicators</b> Use to sequentially select preset reduction/enlargement copy ratios. Selected copy ratio is shown by a lit indicator.
7	Copy ratio display (%) key	8	<b>Display</b> Displays the specified copy quantity, zoom copy ratio, user program code, and error code.
9	SCANNER key and indicator *3, *4	10	ONLINE key / indicator Lights up when the machine is used as a printer and scanner. *3
11	<b>Power save indicator</b> Lights up when the copier is in a power save mode.	12	Paper feed location indicators Light up to show the selected paper feed station.
13	Tray select key (AL-1226) Use to select a paper feed station (paper tray or bypass tray).	14	<b>Zoom keys / indicator</b> Use to select any reduction or enlargement copy ratio from 25% to 400% in 1% increments.
15	<ul> <li>Copy quantity keys</li> <li>Use to select the desired copy quantity (1 to 99).</li> <li>Use to make user program entries.</li> </ul>	16	<ul> <li>Clear key</li> <li>Press to clear the display, or press during a copy run to terminate copying.</li> <li>Press and hold down during standby to display the total number of copies made to date.</li> </ul>
17	<ul> <li>Print key and ready indicator</li> <li>Copying is possible when the indicator is on.</li> <li>Use to set a user program.</li> <li>Press to start copying</li> </ul>		

#### \*1. Photoreceptor Cartridge Replacement indicator

After making 17,000 copies, the indicator will be "ON", and after 1,000 copier more are made, the indicator starts blinking and machine will hard-stop (after current job) until a new cartridge is installed. End life of photoreceptor cartridge displays 3-digits x 2-line (total 6-digits) by pressing CLEAR key for five seconds in user simulation.

#### \*2. Toner Developer Cartridge Replacement

When toner density is lower than a specified level, the TONER DEVELOPER CARTRIDGE REPLACEMENT indicator lights up to warn the user. If the Toner Developer Cartridge is not replaced in that time, the Ready Lamp changes to blinking and then start to supply the toner after around 10 copies. (Cartridge replacement lamp continues to light.) If toner density is not back to specific level after two minutes, the READY indicator goes out and Toner Developer indicator starts blinking, and the copier stops.

#### \*3. Indicators on the operation panel

The ON LINE indicator and the start (

#### Start indicator

- On: Indicates the unit is ready for copying or scanning is being performed.
- Blinking: Indicates that an interrupt print job is in progress, or that the unit is initializing (the cover has been opened and closed or the power turned off and on).
- Off: Indicates copying or scanning is being performed or the unit is in the auto power shut-off mode.



#### **ON LINE indicator**

The ON LINE key is pressed and on line and off line are changed.

- On: Indicates the unit is ready for printing or scanning is being performed. (On line)
- Blinking: Printing or data is being received from a computer.
- Off: Copying is being performed. (Off line)

#### Power save indicator

On: Indicates the unit is in a power save mode.

#### Scanner indicator

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

#### \*4. Using the SCANNER key to begin scanning

This scanning method can only be used if the Button Manager has been installed using the installer. To scan using this method, you must first complete the settings in Button Manager in your computer. For more information on Button Manager, see the online manual or the help file for Button Manager.

#### Note:

- Scanning is not possible during a copy job.
- If the unit is used to begin a scan job during a print job using the parallel interface connection or the USB interface connection, the scan job will be stored and scanning will begin when the print job is completed.
- When scanning an original that has been placed in the SPF/ RSPF, only one original can be placed unless you are using Sharpdesk.
- Press the SCANNER (B) key. The unit enters scan mode.



2) Place the original you wish to scan on the original table/SPF/ RSPF.

For the procedure for placing the original, see "ORIGINAL PLACEMENT".

 Press the right copy quantity key to display the number of the application that you wish to use for scanning.

The application numbers are initially as follows.



The application numbers are initially as follows.

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

4) Press the start ( ) key.

The selected application launches and scanning begins.

# 4. Motors and solenoids



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	ТМ	Supplies toner.
4	Cooling fan motor	VFM	Cools the optical section.
5	Resist roller solenoid	RRS	Resist roller rotation control solenoid
6	Paper feed solenoid	CPFS1	Cassette Paper feed solenoid 1
7	Multi paper feed solenoid	MPFS	Multi manual pages feed solenoid
8	SPF motor	SPFM	Drives the single pass feeder
9	Duplex motor	DMT	Devices the duplex paper transport section
10	Original feed solenoid	SPUS	Original feed solenoid
11	Original resist roller solenoid	SRRC	Original resist roller solenoid
12	Original paper feed solenoid	SPFS	Original paper feed solenoid

# 5. Sensors and switches



No.	Name	Signal	Туре	Function	Output
1	Scanner unit home position	MHPS	Transmission sensor	Scanner unit home position detection	"H" at home position
	sensor				
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	"L" at cassette insertion
5	Manual feed detection switch	MFD	Transmission sensor	Manual feed paper detection (single only)	"L" at paper detection
6	PPD1 sensor	PPD1	Transmission sensor	Paper transport detection 1	"L" at paper pass
7	Door switch	DSW	Micro-switch	Door open/close detection (safety switch for 24V)	1 or 0V of 24V at door open
8	Drum reset switch	DRST	Micro-switch	New drum detection switch	Instantaneously "L" at insertion of new drum
9	SPF sensor	SPID/ SD SW	Transmission sensor	Paper entry detection Cover open/close detection	"L" at paper pass
10	SPPD sensor	SPPD	Transmission sensor	Paper transport detection	"L" at paper pass
11	SDOD sensor	SDOD	Transmission sensor	SPF open/close detection Book sensor	"L" at paper pass



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	Power PWB	AC power input, DC voltage control, 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	I/F PWB	Scanner/GDI Printer control (parallel I/F, USB I/F)

# 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	Pickup roller	Picks up documents.
15	Separation roller	Separates documents to feed properly.
16	PS roller	Feeds documents to the scanning section.
17	Paper exit roller	Discharges documents.

# [5] UNPACKING AND INSTALLATION

# 1. Copier installation

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

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

Do not install your copier in areas that are:

• damp, humid, or very dusty



· exposed to direct sunlight



· poorly ventilated



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



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

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

Also make certain the outlet is properly grounded.

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



# 2. Cautions on handling

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

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



Do not expose the drum cartridge to direct sunlight.

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



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

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

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

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

# 3. Checking packed components and accessories

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



# 4. Unpacking

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



# 5. Removing protective packing materials

1) Remove pieces of tape and protective cover. Then open the original cover and remove protective materials (a) and (b).



2) Release the scan head locking switch.



# 6. Installing the TD cartridge

The TD cartridge replacement required (...) indicator will light up when toner is needed. If copying is continued while the ... indicator is lit, copies will gradually become lighter until the copier stops and the indicator begins blinking. Replace the old TD cartridge by following the procedure given below.

Note:

- After the copier stops, it may be possible to make a few more copies by taking the TD cartridge out of the copier, shaking it horizontally, then reinstalling it. If copying is not possible after this operation, replace the TD cartridge.
- During long copy run of a dark original, the ready ((\$) indicator may blink, the indicator may light up, and the copier may stop, even though toner cartridge is not empty. The copier will feed toner up to 2 minutes and then the ready ((\$) indicator will light up. Press the print ((\$) key to restart copying.
- 1) Ensure that the bypass tray is open and then open the side cover by pressing the open button on the side cover.



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



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



 Remove the TD cartridge from the bag. Remove the protective paper. Hold the cartridge on both sides and shake it horizontally four or five times.



5) Hold the tab of the protective cover and pull the tab to remove the cover.



6) Gently insert the TD cartridge until it locks in place.



- 7) Close the front cover and then the side cover by pressing the round projections near the side cover open button. The  $(\hat{s})$  indicator will go out and the ready ( ... ) indicator will light up.
- Note: When closing the covers, be sure to close the front cover securely and then close the side cover. If the covers are closed in the wrong order, the covers may be damaged.



#### 7. Loading copy paper

- Note: This copier is equipped with two paper trays. Load copy paper into the two paper trays.
- 1) Raise the handle of the paper tray and pull the paper tray out until it stops.



- 2) Remove the pressure plate lock. Rotate the pressure plate lock in the direction of the arrow to remove it while pressing down the pressure plate of the paper tray.
- 3) Store the pressure plate lock that was removed in step 2 and the screw that was removed when unpacking the machine in the front of the paper tray. To store the pressure plate lock, rotate the lock to fix it on the relevant location.
- 4) Adjust the paper guides on the paper tray to the copy paper width and length.

Squeeze the lever of paper guide (A) and slide the guide to match with the width of the paper.

Move paper guide (B) to the appropriate slot as marked on the tray.



- 5) Fan the copy paper and insert it into the tray. Make sure the edges go under the corner hooks.
- Note: Do not load paper above the maximum height line (<u>vv</u>). Exceeding the line will cause a paper misfeed.



- 6) Gently push the paper tray back into the copier.
- Note: After loading copy paper, to cancel the blinking "H" without restarting copying, press the clear ( (c) ) key. The "P" in the display will go out and the ready (s) indicator will light up.



#### 8. 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.

#### 9. Software for the SHARP personal MFP series

The supplied CD-ROM includes software for this unit.

#### MFP driver

#### Scanner driver

Permits you to operate scanning function of this unit with TWAIN-compliant and WIA-compliant application.

#### Printer driver

Enables you to use the printer function of this unit with your computer. Print Status Window

The print state and information on current printing are displayed on the status monitor window.

#### Sharpdesk

An integrated software environment that makes it easy to manage document and image files and launch applications.

#### **Button Manager**

Button Manager enabling the SCANNER key located on the unit.

#### (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 USB1.1 <sup>*1</sup> or bi-directional parallel interface (IEEE 1284)
Operating system <sup>*2</sup>	Windows 95, Windows 98, Windows Me, Windows NT Workstation 4.0 (ServicePack 5 or later) <sup>*3</sup> , Windows 2000 Professional, Windows XP Professional <sup>*3</sup> , Windows XP Home Edition <sup>*3</sup>
Display	800 x 600dots (SVGA) display with 256 colors (or better)
Hard disk free space	150MB or more
Other requirement for hardware	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 or Windows XP Home Edition preinstalled model with USB interface equipped as standard.
- \*2: Printing is unavailable in MS-DOS mode.
- \*3: The administrator's authorization is required to install this software using this installer.

#### (Before installation)

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

	MFP D	Driver		
	Printer driver/ Print Status Window	Scanner driver	Button Manager	Sharpdesk
Users of Windows 98/Me/2000/XP who will use the USB interface connection		Available	Available	Available
Users of Windows 98/Me/2000/XP who will use the parallel interface connection Windows 95/NT 4.0 users	Available*1	Not Available	Not Available	Available*2

- \*1: When the unit is connected through the parallel port, the Print Status Window can only be used when the parallel port is set to ECP mode. To set the parallel port mode, refer to your computer manual or ask the manufacturer of your computer.
- \*2: Sharpdesk can be installed when using a parallel interface connection, however, the unit's scanner function cannot be used.
- If you are using some of your computer's memory as a RAM drive, the printer driver may not be allocated the correct amount of memory. In such a case, reduce the size of your RAM disk, or do not use the RAM disk. Please refer to your Windows documentation for further information.
- Is there another GDI printer driver or a Windows Printing System printer driver already installed? If installed, change the printer port setting. For the change of the printer port setting, see "USING OTHER INSTALLED DRIVERS".

#### (Flow of installation)

Refer to the following table and then begin installation

Operating system	Interface	Reference pages for how to install
Windows XP	USB/ Parallel	Installing onto Windows XP (USB/parallel interface)
Windows 08	USB	Installing onto Windows 98/Me/2000 (USB interface)
Windows 98	Parallel	Installing onto Windows 95/98/Me/NT4.0/ 2000 (Parallel interface)
Mindawa Ma	USB	Installing onto Windows 98/Me/2000 (USB interface)
windows we	Parallel	Installing onto Windows 95/98/Me/NT4.0/ 2000 (Parallel interface)
Windows	USB	Installing onto Windows 98/Me/2000 (USB interface)
2000	Parallel	Installing onto Windows 95/98/Me/NT4.0/ 2000 (Parallel interface)
Windows 95/ NT 4.0	Parallel	Installing onto Windows 95/98/Me/NT4.0/ 2000 (Parallel interface)

#### (Installing the software)

The following term is used in this section.

#### MFP

Means the unit as a printer and scanner.

- For this description, it is assumed that the mouse is configured for right hand operation.
- To print or scan, the MFP must be in the online state.
- The scanner feature only works when using a USB interface cable.
- If any error message appears, solve the problem following the instructions on the screen. After your problem is solved, the installing procedure will be continued. Depending on your problem, you may have to exit the installer. In this case, click the "Cancel" button to exit the installer. After solving your problem, reinstall the software from the beginning.

#### A. Windows XP (USB/parallel interface)

Before starting the installation, make sure the USB or parallel interface cable is not connected to the MFP.

- 1) Insert the supplied CD-ROM into your CD-ROM drive.
- Click the "start" button, click "My Computer", and then double-click the CD-ROM icon.
  - When any of "Found New Hardware Wizard" messages appear during the software installation, be sure to click the "Cancel" button.
- 3) Double-click the "Setup" icon.

If the language selection screen appears after you double click the "Setup" icon, select the language you wish to use and click the "Next" button. (Normally, the correct language is selected automatically.)

 Select the software packages to be installed, and then click the "Next" button.

The software packages with checkmark on the list on the screen will be installed.

Click the "Display README" button to show the information on the selected package.

Package				
Ni Bu Sh	me P Driver ton Manager irpdesk			
Display	BEADME	]		

- If you are using the parallel interface connection, do not select the Button Manager checkbox because this feature is not supported with the parallel interface.
- If the following screen appears, click the "OK" button. Review the contents in "BEFORE INSTALLATION", and then select only appropriate the software packages to be installed.

Integrat	ed Installer 🛛 🛛 🗙
(į)	The Scanner feature only works when using a USB Interface Cable. Only printing is supported when using a parallel interface cable.
	CK 1

5) Review the software packages to be installed on the screen, and then click the "Start" button.

The software packages to be installed will be displayed on the screen. If inappropriate packages are displayed, click the "Back" button to select appropriate packages again.



- 6) Copying files for MFP driver installation and parallel interface setup (This step will start if it was selected in step 4).
  - 1. After confirming the message in the "Welcome" window, click the "Next" button.
  - A dialog box appears asking you to verify that the USB or parallel interface cable is not connected to the MFP. Make sure that the interface cable is not connected and click the "Next" button.
  - 3. Click the "Next" button in the dialog box to install the MFP driver or Cancel to quit the installation.

The setup program will start to copy the files.

If the following screen appears while the files are being copied (the message may appear more than once), click "Continue Anyway".



4. When the "The MFP driver installation is complete." dialog box appears, click the "OK" button.

The Button Manager installer will start.

- 7) Begin installation of the Button Manager (This step will start if it was selected in step 4).
  - 1. After confirming the message in the "Welcome" window, click the "Next" button.
  - 2. Read the message in the "Please read the following information." window, and then click the "Next" button.
  - 3. When a message appears that lets you specify the location for the software to be installed, click the "Next" button.
  - If the program displays, "Do you want the Button Manager added to Windows Startup?", check "Yes" and click the "OK" button.

The setup program will start to copy the files.

5. Click the "Finish" button when the message informs you that setup is successful.

The Sharpdesk installer will start.

- 8) Begin installation of the Sharpdesk (This step will start if it was selected in step 4).
  - 1. After confirming the message in the "Welcome to Sharpdesk installation" window, click the "Next" button.
  - 2. Read the message in the "Information" window, and then click the "Next" button.
  - 3. When the "Choose Destination Location" window appears, click the "Next" button.
  - 4. When the "Select Program Folder" window appears, click the "Next" button.

The setup program will start to copy the files.

If the dialog box asking "If you have TIFF files saved using Photo-Shop or Imaging for Windows you should hit Skip" appears. Answer the question to continue the Sharpdesk installation.



- 5. Click the "Finish" button when the message informs you that Setup is complete.
- 9) Click the "Close" button when the message informs you that "Setup has finished". When the "Now connect the MFP interface cable to the PC" dialog box appears, click the "OK" button.
  - After the installation, a message to restart your computer may be displayed. In this case, click the "Yes" button to restart your computer.
  - For parallel interface connection ensure that your computer and MFP are turned off before connecting the cable.

V UEP Down	
≪ Butten Hanger ≪ Shapdesk	

 Connect the USB interface cable or parallel interface cable (see page 5-8).

Windows will detect the MFP and the Plug and Play screen will appear. If you are using Windows XP with the parallel interface, go to step 12.

- 11) Begin installation of the scanner driver.
  - "SHARP AL-xxxx" (where xxxx is the model name of your MFP) will appear in the "Found New Hardware Wizard" dialog box. Select "Install the software automatically (Recommended)" and click the "Next" button.
  - 2. The "Install hardware" dialog box will appear. Click the "Continue Anyway" button.
  - 3. When installation of the driver is completed, click the "Finish" button to finish the scanner driver installation.
- 12) Begin installation of the printer driver.
  - "SHARP AL-xxxx" (where xxxx is the model name of your MFP) will appear in the "Found New Hardware Wizard" dialog box. Select "Install the software automatically (Recommended)" and click the "Next" button.
  - 2. The "Hardware Installation" dialog box will appear. Click the "Continue Anyway" button.
  - 3. When installation of the driver is completed, click the "Finish" button to finish the printer driver installation.

You have completed the installation of all the software.

#### B. Windows 98/Me/2000 (USB interface)

Before starting the installation, make sure the USB interface cable is not connected to the MFP.

- 1) Insert the supplied CD-ROM into your CD-ROM drive.
- 2) Double-click "My Computer", and then double-click the CD-ROM icon.
  - When any of "Hardware Found", or "Found New Hardware Wizard" messages appear during the software installation, be sure to click the "Cancel" button.
- 3) Double-click the "Setup" icon.
  - If the language selection screen appears after you double click the "Setup" icon, select the language you wish to use and click the "Next" button. (Normally, the correct language is selected automatically.)
- 4) Select the software packages to be installed, and then click the "Next" button.

The software packages with checkmark on the list on the screen will be installed. Click the "Display README" button to show the information on the selected package.



• If the following screen appears, click the "OK" button. Review the contents in "BEFORE INSTALLATION", and then select the appropriate driver software packages to be installed.

Integrated Installer						
٩	The Scanner feature only works when using a USB Interface Cable. Only printing is supported when using a parallel interface cable.					
	OK 1					

5) Review the software packages to be installed on the screen, and then click the "Start" button.

The software packages to be installed will be displayed on the screen. If inappropriate packages are displayed, click the "Back" button to select appropriate packages again.

- 6) Copying files for MFP driver installation.
  - 1. After confirming the message in the "Welcome" window, click the "Next" button.
  - 2. A dialog box appears asking you to verify that the interface cable is not connected to the MFP. Make sure that the interface cable is not connected and click the "Next" button.
  - 3. Click the "Next" button in the dialog box showing the files to be copied for installation of the MFP driver.

The setup program will start to copy the files.

In Windows 2000, if the following screen appears while the files are being copied (the message may appear more than once), click "Yes" in Windows 2000.



4. The following screen appears when all of the files for the USB interface connection have been copied. If you are not using a parallel interface cable for connection to the MFP, please click the "No" button.



5. When the "The MFP driver installation is complete." dialog box appears, click the "OK" button.

The Button Manager installer will start.

- 7) Begin installation of the Button Manager (This step will start if it was selected in step 4).
  - 1. After confirming the message in the "Welcome" window, click the "Next" button.
  - 2. Read the message in the "Please read the following information." window, and then click the "Next" button.
  - 3. When a message appears that lets you specify the location for the software to be installed, click the "Next" button.
  - If the program displays, "Do you want to add Button Manager to Startup program?", check "Yes" and click the "OK" button. The setup program will start to copy the files.
  - Click the "Finish" button when the message to inform you of the completion of the installation appears.

The Sharpdesk installer will start.

- 8) Begin installation of the Sharpdesk (This step will start if it was selected in step 4).
  - 1. After confirming the message in the "Welcome to Sharpdesk installation" window, click the "Next" button.
  - 2. Read the message in the "Information" window, and then click the "Next" button.
  - 3. When the "Choose Destination Location" window appears, click the "Next" button.
  - 4. When the "Select Program Folder" window appears, click the "Next" button.

The setup program will start to copy the files.

If the dialog box asking "If you have TIFF files saved using Photo-Shop or Imaging for Windows you should hit Skip" appears. Answer the question to continue the Sharpdesk installation.



5. Click the "Finish" button when the message to inform you of the completion of the installation appears.

9) Click the "Close" button when the message to inform you of the completion of the installation appears. When the "Now connect the MFP interface cable to the PC. This will finalize the drivers installation and settings." dialog box appears, click the "OK" button.



- After the installation, a message to restart your computer may be displayed. In this case, click the "Yes" button to restart your computer.
- Connect the USB interface cable (see page 5-8).
   Windows will detect the MFP and the Plug and Play screen will appear.
- 11) Follow the instructions in the Plug and Play screen that appears in your version of Windows to begin the installation.You have completed the installation of the software.

#### C. Windows 95/98/Me/NT4.0/2000 (Parallel interface)

Before starting the installation, make sure the USB or parallel interface cable is not connected to the MFP.

- 1) Insert the supplied CD-ROM into your CD-ROM drive.
- 2) Double-click "My Computer", and then double-click the CD-ROM icon.
  - When any of "Hardware Found", or "Found New Hardware Wizard" messages appear during the software installation, be sure to click the "Cancel" button.
- 3) Double-click the "Setup" icon.
  - If the language selection screen appears after you double click the "Setup" icon, select the language you wish to use and click the "Next" button. (Normally, the correct language is selected automatically.)
- Select the software packages to be installed, and then click the "Next" button.

The software packages with checkmark on the list on the screen will be installed.

Click the "Display README" button to show the information on the selected package.



- In Windows 95/NT 4.0, "Button Manager" does not appear. In Windows 98/Me/2000, do not select the "Button Manager" checkbox. because this is not supported when using the parallel interface.
- 5) The next screen appears. Make sure that the parallel interface cable is not connected, and click "OK".



6) Check the contents of the package on the screen, and then click the "Start" button.

The software packages to be installed will be displayed on the screen. If inappropriate packages are displayed, click the "Back" button to select only appropriate software packages.

- 7) Copying files for MFP driver installation and parallel interface setup (This step will start if it was selected in step 4).
  - 1. After confirming the message in the "Welcome" window, click the "Next" button.
  - A dialog box appears asking you to verify that the USB or parallel interface cable is not connected to the MFP. Make sure that the interface cable is not connected and click the "Next" button.
  - 3. Click the "Next" button in the dialog box to install the MFP driver or Cancel to quit the installation.

The setup program will start to copy the files.

In Windows 2000, if the following screen appears while the files are being copied (the message may appear more than once), click "Yes" in Windows 2000.



4. The following screen appears. Click the "Yes" button, and then the Model screen will appear. Select the model number that is the same as the model name of your MFP and click the "Next" button.

Be sure to select the displayed model number that is the same as the MFP's model name. If they are not the same, the driver will not be installed correctly.



- 5. Establish the printer settings and click the "Next" button.
  - Select "LPT1" for the port to be used. If "LPT1" does not appear, it is likely that another printer or peripheral device is using "LPT1". Check your other printers and peripheral devices, and change the port setting as needed so no device is using "LPT1". If you wish the MFP to be your default printer, select "Yes". If not, select "No".



- When the "Setup has completed gathering all necessary installation information" dialog box appears, click the "Yes" button. The parallel interface driver is installed.
- 7. When the "The MFP driver installation is complete." dialog box appears, click the "OK" button.

The Sharpdesk installer will start.

- Begin installation of the Sharpdesk (This step will start if it was selected in step 4).
  - 1. After confirming the message in the "Welcome to Sharpdesk installation" window, click the "Next" button.
  - 2. Read the message in the "Information" window, and then click the "Next" button.
  - 3. When the "Choose Destination Location" window appears, click the "Next" button.

4. When the "Select Program Folder" window appears, click the "Next" button.

The setup program will start to copy the files.

If the dialog box asking "If you have TIFF files saved using Photo-Shop or Imaging for Windows you should hit Skip" appears. Answer the question to continue the Sharpdesk installation.



- 5. Click the "Finish" button when the message to inform you of the completion of the installation appears.
- Click the "Close" button when the message to inform you of the completion of the installation appears.



- After the installation, a message to restart your computer may be displayed. In this case, click the "Yes" button to restart your computer.
- 10) Connect the parallel interface cable.

You have completed the installation of all the software.

 For parallel interface connection ensure that your computer and MFP are turned off before connecting the cable (see page 5-8).

# 10. Connecting the interface cable

This unit includes both USB and parallel interface connectors. Interface cables for connecting the unit to your computer are not included with this unit.

Caution:

- If you intend to use the unit as a scanner, it must be connected to your computer with a USB interface cable. The scanner function cannot be used if the unit is connected with a parallel cable.
- USB is available with a PC/AT compatible computer that was originally equipped with USB and had Windows 98, Windows Me, Windows 2000 Professional, Windows XP Professional or Windows XP Home Edition preinstalled.

• Do not connect the interface cable before installing the MFP driver. The interface cable should be connected during installa-tion of the MFP driver.

#### Connecting the USB interface cable

- 1) Obtain a shielded USB interface cable.
- 2) Insert the cable into the USB interface connector located on the rear of the unit.



 Insert the other end of the cable into the interface connector of your computer, or the USB hub connected to your computer.

#### Connecting the parallel interface cable

- 1) Obtain an IEEE1284 shielded parallel interface cable.
- 2) Ensure that your computer and unit are turned off.
- 3) Insert the cable into the parallel interface connector located on the rear of the unit, and fasten with clasps.



4) Insert the other end of the cable into the interface connector of your computer.

# 11. Parallel interface

This printer uses a bi-directional parallel interface. Use the supplied interface cable.

#### Connector

36-pin ACON RBE42-36K1153 female connector or equivalent connector

#### Cable

Shielded type bi-directional parallel interface For best results, use a printer interface cable which is IEEE1284 compliant.

#### Pin configuration

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



Pin		Pin	<u>Girmal name</u>
No.	Signal name	No.	Signal name
1	STB	19	GND (STB RET)
2	DATA1	20	GND (DATA1 RET)
3	DATA2	21	GND (DATA2 RET)
4	DATA3	22	GND (DATA3 RET)
5	DATA4	23	GND (DATA4 RET)
6	DATA5	24	GND (DATA5 RET)
7	DATA6	25	GND (DATA6 RET)
8	DATA7	26	GND (DATA7 RET)
9	DATA8	27	GND (DATA8 RET)
10	ACKNLG	28	GND (ACKNLG RET)
11	BUSY	29	GND (BUSY RET)
12	PE (Paper End)	30	GND (PE RET)
13	SLTC	31	INPRM
14	AUTO LF	32	FAULT
15	(NC)	33	(NC)
16	GND (0 V)	34	(NC)
17	FG	35	+5 V
18	+5 V	36	SLTC IN

# 12. USB interface

#### 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	



# 13. Moving

#### **Moving instructions**

When moving the unit, follow the procedure below.

- Note: When moving this unit, be sure to remove the TD cartridge in advance.
- 1) Turn the power switch off and remove the power cord from the outlet.
- 2) Open the side cover and front cover, in that order. Remove the TD cartridge and close the front cover and side cover, in that order. To open and close the side cover and front cover, and to remove the TD cartridge, see "TD CARTRIDGE REPLACEMENT".
- 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. See "PREPARING THE UNIT FOR INSTALLATION".
- Pack the unit into the carton. See "CHECKING PACKED COMPO-NENTS AND ACCESSORIES".

# [6] COPY PROCESS



#### 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 connected to ground.

#### Step-6: Cleaning

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



#### Step-7: Optical discharge (Semiconductor laser)

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

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



#### Charge by the Scorotron charger

#### Function

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

#### **Basic function**

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

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

#### Process controlling

#### Function

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

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

#### **Basic function**

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



#### Start

- 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.
- Developing bias (-400V) is applied when the photoconductor potential is switched from LOW to HIGH.
- Once developing bias (-400V) is applied and the photo conductor potential rises to HIGH, toner will not be attracted to the drum.

#### Stop

The reverse sequence takes place. Retaining developing bias at an abnormal occurrence

#### Function

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

#### **Basic function**

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

# [7] OPERATIONAL DESCRIPTIONS

# 1. Outline of operation

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

#### (Basic configuration)



# (Outline of copy operation)

#### Setting conditions

1) Set copy conditions such as the copy quantity and the copy density with the operation section, and press the 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

 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

- 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).
- Meanwhile the paper is fed to the image transfer section in synchronization with the image lead edge.
- 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 5 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)

#### 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.



(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



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

#### 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  $f\theta$  lens, etc.

The laser beams are passed through the collimator lens, the cylindrical lens, the polygon mirror, the f $\theta$  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	Polygon mirror, polygon motor	Reflects laser beams at a constant rpm.
4	BD (Mirror, lens, PWB)	Detects start timing of laser scanning.
5	f0 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: 0.17 ±0.01mW (Laser wavelength 770 - 795nm) Polygon motor section: Brushless motor 20.787rpm No. of mirror surfaces: 6 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

 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.



- The surface temperature of the upper heat roller is set to 165 -190℃. The surface temperature during the power save mode is set to 100℃.
- 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  $^{\circ}\text{C}$  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

 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.



 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 pickup 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.





 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.





 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

а	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.
С	POD jam	POD does not turn on within 2.9 sec after turning on the resist roller.
		POD does not turn off within 1.5 sec - 2.7 sec after turning off PPD2.

# 6. Process unit new drum detection mechanism

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





 When the detection gear 38T turns one rotation, there is no gear any more and it stops. The latch section of the 38T gear is latched and fixed with the

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



### 7. SPF section

### A. Outline

The SPF (Single Path Feeder) is installed to the AL-1225 as a standard provision, and it automatically copies up to 30 sheets of documents of a same size. (Only one set of copies)

### B. Document transport path and basic composition



1	Pickup roller	2	Sheet of document for
			paper feed
3	Set detection ACT	4	Paper stopper
5	Document feed roller	6	Separation sheet
7	Paper entry sensor	8	PS roller D
9	Transport follower roller	10	Paper exit roller
11	Paper exit follower roller	12	Document tray

#### C. Operational descriptions



scanning direction (paper transport direction) is adjusted by changing the document transport speed.

PSW - MIRR M - SPF M - CL - SPUS - SPPD - SCANST -		
MAIN M -		
CPFS1 -	┟──────	
RRS - PPD1 -	L	
PPD2 -		
POD -		

### D. Cases where a document jam is caused

- 1) When SPPD is ON (document remaining) when the power is turned on.
- 2) When SPPD is not turned ON within about 1.5 sec (at 100% copy) after starting the document feed operation.
- 3) When SPPD is not turned on within about 4.7 sec (at 100% copy) after turning on SPPD.
- 4) When the SPF document jam release door or the OC cover is opened during document transport (SPF motor rotating).

# [8] DISASSEMBLY AND ASSEMBLY

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

- 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: CN119) 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. SPF section

# 1. High voltage section

### A. List

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

### B. Disassembly procedure

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



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



### C. Assembly procedure

For assembly, reverse the disassembly procedure.

### D. Charger wire cleaning

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



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



### E. Charger wire replacement

- 1) Remove the TC cover and remove the screw.
- 2) Remove the spring and remove the charger wire.
- 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.



### 2. Operation panel section

### A. List

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

### **B.** Disassembly procedure

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



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



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



### 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 SPF unit.



- 3) Remove the four screws, remove the operation unit, and disconnect the connector.
- 4) Remove the right cabinet.
- 5) Remove the left cabinet.
- 6) Remove the screw, and 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.



### C. Assembly procedure

#### CCD core

- 1) Pass the core through the CCD-MCU harness.
- 2) Insert the CCD-MCU harness into the CCD PWB connector of the carriage unit.
- 3) Move the core which was passed through the CCD-MCU harness near the CCD PWB connector as shown in the figure below, and fix it with a filament tape (19mm wide, 40mm long). For the attachment reference, refer to the figure below. Clean and remove oil from the attachment section.
- Attach the CCD-MCU harness to the duplex tape on the back of the carriage unit.
- 5) Attach the PWB holder to the position specified in the figure below.
- 6) Pass the core through the FFC and the PWB holder, and fix the core.





### 4. Fusing section

### A. List

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

### B. Disassembly procedure

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



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



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



#### Pressure roller section disassembly

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



6) Remove the screw and remove the PPD2 sensor.



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



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



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



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



11) Remove the pressure roller, the pressure bearing, and the spring. Note: Apply grease to the sections specified with an asterisk (\*).



#### 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.





8) Remove two screws and remove the thermo unit.



### C. Assembly procedure

For assembly, reverse the disassembly procedure.

### 5. Tray paper feed/transport section

### A. List

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

### **B.** Disassembly procedure

- 1) Remove two screws, and remove the hinge guide R.
- 2) Disconnect three positions of the connectors.
- 3) Remove six screws, and remove the scanner unit.
- 4) Remove the fan duct.



4) Remove each connector and three screws, and remove the MCU PWB.



5) Remove the PWB insulation mylar and remove the paper transport detection sensor (PPD2).



6) Remove two screws and remove the toner motor.



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



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



- 9) Pull out the paper exit roller knob and remove the belt.
- 10) Release the belt pulley (a) lock and remove the belt pulley bearing.



11) Remove the paper exit roller.



12) Remove the harness guide.



13) Remove five screws and remove the main drive plate and the belt.



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



15) Remove six screws and remove the LSU unit.



The scan inclination classification is indicated on the right or the left of the LSU production number label according to the classification.

When replacing the LSU, add the spacer according to the scan inclination classification. (The spacer is packed together with every LSU.)

Scan inclination classification check

Scan inclination classification 1: +0.26 - +0.5 (White marking on the right of the production number label)

Scan inclination classification 2: -0.25 - +0.25 (White marking)

Scan inclination classification 3: -0.5 – -0.26 (White marking on the left of the production number label)



#### Addition of the spacer

Scan inclination classification 1: Add the LSU spacer to the rear side of the machine.

Scan inclination classification 2: No need to add the spacer.

Scan inclination classification 3: Add the LSU spacer to the front side of the machine.

<Machine rear side> Fit the holes and attach. Insert into the positioning boss. <Machine front side>



Machine front side

#### [Note for assembling the LSU]

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

Observe the following sequence of fixing screws.



16) Remove each pawl, and remove the paper exit tray.



- 17) Remove two screws and remove the fusing connector.
- Remove five screws and the connector, and lift the intermediate frame unit to remove.



- 19) Remove the screw and the E-ring, and remove the PS semi-circular earth plate and the PS roller unit.
- 20) Remove the E-ring and remove the spring clutch from the PS roller unit.



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



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



- 23) Remove two E-rings and remove the paper feed roller.
- 24) Remove three E-rings and remove the clutch unit.



### C. Assembly procedure

For assembly, reverse the disassembly procedure.

### 6. Manual paper feed section

### A. List

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

### **B.** Disassembly procedure

### Single unit

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



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





3) Remove three screws and remove the single manual feed upper frame.



4) Remove the PPD1 sensor PWB.



5) Remove the E-ring and remove the manual paper feed transport roller.



6) Remove the cassette detection switch.





### 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.





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	Mirror motor
2	Main motor
3	Exhaust fan motor

### **B.** Disassembly procedure

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



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



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



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



C. Assembly procedure

For assembly, reverse the disassembly procedure.

### 8. Power section

### A. List

No.	Part name Ref.
1	Noise filter PWB
2	Power PWB

### B. Disassembly procedure

### Noise filter PWB

- 1) Disconnect the connector at two positions.
- 2) Remove the screw, and remove the noise filter PWB unit.



#### Power PWB

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



### C. Assembly procedure

For assembly, reverse the disassembly procedure.

### 9. SPF section (SPF model only)

No.	Part name Ref.
Α	Sensor PWB
В	Pickup solenoid
С	Clutch
D	Manual paper feed roller, pickup roller
Е	Belt
F	SPF motor
G	Paper entry sensor
Н	PS roller
I	Paper exit roller

#### Pickup unit removal

- 1) Remove three fixing pawls from the bottom of the machine.
- 2) Remove the front cover and the rear cover.



- 1) Remove the belt, the paper feed frame Spring, and two harnesses.
- 2) Remove the pickup unit.



\* When installing the parts, be careful of the hole position of the paper frame Spring.

### A. Sensor PWB

- 1) Remove two screws from the bottom of the pickup unit.
- 2) Remove the upper cover.



- 1) Remove two screws.
- 2) Remove the sensor PWB.
- 3) Remove the harness.



### B. Pickup solenoid

- 1) Remove two screws.
- 2) Remove the pickup solenoid



\* When installing, hang iron core A on the solenoid arm.

### C. Clutch

- 1) Remove the E-ring.
- 2) Remove the pulley and bush.
- 3) Slide the bush in the arrow direction.
- 4) Lift the clutch, and 5) remove the clutch.



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



### D. Manual paper feed roller, pickup roller

- 1) Lift the paper stopper.
- 2) Slide the take-up roller unit.
- 3) Slide the bushing in the direction of the arrow.
- 4) Remove the take-up roller unit.



- \* When installing the take-up roller, hang the projection of the take-up roller unit on the solenoid arm.
- 1) Remove the parts.
- 2) Remove the manual paper feed roller.
- 3) Remove the pickup roller.
- 4) Remove the parts.



### Transport unit removal

- 1) Remove two screws.
- 2) Remove the document tray unit.
- 3) Remove five screws.
- 4) Remove the transport unit.



### E. Belt

1) Remove the belt.



### F. SPF motor

- 1) Remove the harness.
- 2) Remove four screws.
- 3) Remove the drive unit.
- 4) Remove the belt.
- 5) Remove two screws.
- 6) Remove the SPF motor.



### G. Paper entry sensor

- 1) Loosen the screw.
- 2) Open the paper exit paper guide.
- 3) Remove the paper entry sensor.
- 4) Remove the harness.



### H. PS roller

- 1) Remove the parts.
- 2) Remove the paper supply roller.



- I. Paper exit roller
- 1) Remove the parts.
- 2) Remove the paper exit roller.



# [9] ADJUSTMENTS

### 1. Optical section

### A. Copy magnification ratio adjustment

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

### (1) Outline

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

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

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

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

#### (2) Main scanning direction magnification ratio adjustment

- a. Cases when the adjustment is required
- 1) When the main PWB is replaced.
- 2) When the EEPROM in the main PWB is replaced.
- 3) When "U2" trouble occurs.
- 4) When repairing or replacing the optical section.

#### b. Necessary tools

- Screwdriver (+)
- Scale

#### c. Adjustment procedure

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



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

- Calculate the main scanning direction magnification ratio. Main scanning direction magnification ratio
  - = <u>Copy image dimensions</u> X 100 (%)





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

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

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

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

Adjustment mode	Lighting lamp
Main scanning direction auto copy magnification ratio adjustment	Auto exposure lamp ON
Main scanning direction manual copy magnification ratio adjustment	Manual exposure lamp ON
Sub scanning direction copy magnification ratio adjustment	Photo exposure lamp ON
SPF mode scanning direction magnification ratio adjustment	Auto, Manual, Photo lamp ON

- 8) Set the adjustment mode to Manual with the copy mode select key.
- Enter the new set value of main scanning direction copy magnification ratio with the copy quantity set key, and press the COPY button.
- 10) Change the set value and repeat the adjustment until the ratio is within the specified range.When the set value is changed by 1, the magnification ratio is changed by 0.1%.

#### (3) Sub scanning direction copy magnification ratio

#### a. Cases when the adjustment is required

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

#### b. Necessary tools

Scale

#### c. Adjustment procedure

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



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



- Check that the actual copy magnification ratio is within the specified range. (100 ± 1.0%).
   If it is not within the specified range, perform the following procedures.
- 7) Execute SIM 48-1 to select the sub scanning direction copy magnification ratio adjustment mode. To select the adjustment mode, use the copy mode select key. (Photo exposure lamp ON)
   2) Enter the new set value of sub scanning direction copy.
- Enter the new set value of sub scanning direction copy magnification ratio with the copy quantity set key, and press the COPY button.

Repeat procedures 1) - 8) until the sub scanning direction actual copy magnification ratio in 100% copying is within the specified range. When the set value is changed by 1, the magnification ration is changed by 0.1%.

#### B. Image position adjustment

There are following five kinds of image position adjustments, which are made by laser control except for the image scan start position adjustment. For the adjustments, SIM 50 - 01, 50 - 10, 50 - 18 and SIM 50 - 19 are used.

No.	Adjustment item	Simulation
1	Print start position	50 - 01
2	Image lead edge void amount	50 - 01
3	Image scan start position	50 - 01
4	Image rear edge void amount	50 - 01
5	SPF image scan start position	50 - 01
6	Center offset	50 - 10
7	Memory reverse position adjustment in	50 - 18
	duplex copy	

To select the adjustment mode with SIM 50 - 01, use the copy mode select key.

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

	Adjustment mode	Lamp ON
	Print start position (Main cassette paper feed)	AE, main cassette lamp
☆	Print start position (2nd cassette paper feed)	AE, 2nd cassette lamp
	Print start position (Manual paper feed)	AE, manual feed lamp
	Image lead edge void quantity	TEXT lamp
	Image scan start position	PHOTO lamp
	Image rear edge void quantity	AE, TEXT, PHOTO
		lamp
☆	SPF image scan start position	AE, TEXT lamp

 $\bigstar$  : Supported for the installing model and skipped for non-installing mode.

To select the adjustment mode with SIM 50 - 10, use the copy mode select key.

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

#### Machine with the multi manual paper feed unit

Adjustment mode	Lamp ON
Print center offset (Main cassette paper feed)	AE, main cassette lamp
Print center offset (Manual paper feed)	AE, manual paper feed lamp
OC/document center offset	AE, TEXT lamp

#### Machine with the single manual paper feed unit

Adjustment mode	Lamp ON
Print center offset (Main cassette paper feed)	AE, main cassette lamp
Print center offset (Manual paper feed)	AE, manual paper feed lamp
OC/document center offset	AE, TEXT lamp

#### (1) Lead edge adjustment

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



- 2) Execute SIM 50 01
- Set the print start position (AE lamp ON) (A), the lead edge void amount (TEXT lamp ON) (B), and the scan start position (PHOTO lamp ON) (C) to 0, and make a copy of a scale at 100%.
- 4) Measure the image loss amount (R mm) of the scale image. Set C = 10 X R (mm). (Example: Set the value of C to 30.) When the value of C is increased by 10, the image loss is decreased by 1mm. (Default: 50)
- Measure the distance (H mm) between the paper lead edge and the image print start position.
   Set A = 10 X H (mm). (Example: Set the value of A to 50.)

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

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

(Example)



### (2) Image rear edge void amount adjustment

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



2) Execute SIM 50 - 01 to select the image rear edge void amount adjustment mode.

The set adjustment value is displayed on the copy quantity display.

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

Void amount (Standard value: 2 3mm)



- If the measurement value is out of the specified range, change the set value and repeat the adjustment procedure. The default value is 50.
- Note: The rear edge void cannot be checked with the first sheet after entering the simulation mode, the first sheet after turning off/on the power, or the first sheet after inserting the cassette. Use the second or later sheet to check the rear edge void.

#### (3) Center offset adjustment

- 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.



 Execute SIM 50 - 10 to select the print center offset (cassette paper feed) adjustment mode.

The set adjustment value is displayed on the copy quantity display.

 Make a copy and check that the copied center line is properly positioned.

The standard value is 0 ±2mm from the paper center.



4) If the measured value is out of the specified range, change the set value and repeat the adjustment procedure.

When the set value is increased by 1, the copy image is shifted by 0.1mm toward the rear frame.

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

### 2. Copy density adjustment

### A. Copy density adjustment timing

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

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

#### B. Note for copy density adjustment

1) Arrangement before execution of the copy density adjustment

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

#### C. Necessary tool for copy density adjustment

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



#### Test chart comparison table

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

### D. Features of copy density adjustment

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

#### List of the adjustment modes

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

#### E. Copy density adjustment procedure

Use SIM 46 - 01 to set the copy density for each copy mode. For selection of modes, use the copy mode select key.

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

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



#### (2) Perform the adjustment in each mode.

- 1) Execute SIM 46-1.
- Select the mode to be adjusted with the exposure mode select key. Set the exposure level to 3 for all adjustment. (Except for the auto mode.)



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

#### 3) Make a copy.

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



(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  $10M\Omega$  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.
- Set the positive side of the test rod to the connector CN11-3 (GRID) of high voltage section of the power PWB and set the negative side to the frame ground (power frame).
- 3) Execute SIM 8-3. (The main charger output is supplied for 30 sec in the grid voltage LOW output mode.)
- 4) Adjust the control volume (VRG2) so that the output voltage is  $-390 \pm 20V$ .
- 5) Execute SIM 8-2. (The main charger output is supplied for 30 sec in the grid voltage HIGH output mode.)
- Adjust the control volume (VRG1) so that the output voltage is 580 ±12V.



#### B. DV bias check

- Note: • A digital multi meter with internal resistance of  $1G\Omega$  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.
- Set the positive side of the test rod to the connector CN-10-1 (DV BIAS) and set the negative side to the frame ground (power frame).
- 3) Execute SIM 25-1 to output the developing bias for 30sec, and check that the output is  $-400 \pm 8V$ .



# [10] SIMULATION, TROUBLE CODES

### 1. Entering the simulation mode

To enter the serviceman simulation mode, press the keys as follows: Clear  $\rightarrow$  Density select  $\rightarrow$  Clear  $\rightarrow$  Density select

To cancel the simulation mode, press the clear key.

Flow chart of entering the simulation mode



## 2. List of simulations

Sim	Kind of	Sub	Operation
No.	main code	code	Operation
01	Optical system	01	Mirror scan operation
		06	Aging of mirror scanning
02	SPF Individual	02	SPF sensor status display
	load operation	03	Motor ON
		04	Paper feed solenoid ON
05	Lamp ON	01	Operation panel display check
	check	02	Fusing lamp, cooling fan operation check
		03	Copy lamp ON
06	Machine	01	Paper feed solenoid ON
	individual load operation	02	Resist solenoid ON
07	Aging	01	Warm-up display and aging with jam
		06	Intermittent aging
08	High voltage	01	Developing bias
	output check	02	Main charger (Grid high)
		03	Grid voltage (Low)
		06	Transfer charger
10	Other	None	Toner motor aging
14	Trouble reset	None	Cancel of troubles other than U2
16	U2 trouble reset	None	Cancel of U2 trouble
22	Counter	04	JAM total counter display
	display	05	Total counter display
		08	SPF counter display
		12	Drum counter display
		14	P-ROM version display
		17	Copy counter display
		18	Printer counter display
		19	Scanner mode counter display
		21	Scanner counter display
		22	SPF JAM counter display
24	Special	01	JAM total counter clear
	counter clear	04	SPF counter clear
		07	Drum counter clear
		08	Copy counter clear
		09	Printer counter clear
		13	Scanner counter clear
		14	SPF JAM total counter clear
		15	Scanner mode counter clear
25	Main motor ON	01	Main motor operation check (Cooling fan motor rotation check)
		10	Polygon motor ON

26       Various setup       01       Manual feed setup         02       (R) SPF setup       03       Second cassette setup         04       Machine duplex setup       06       Destination setup         07       Machine conditions check       20       Rear edge void setup         03       CE mark support control ON/OFF       38       Cancel of stop at drum life over         40       Polygon motor OFF time setup       (Time required for turning OFF after completion of printing)       42         143       Sensor       O1       Polygon motor OFF time setup       59F document rear edge read setup         30       Sensor       O1       Fan control select setup       59F document rear edge read setup         31       Fusing       O1       Fusing temperature setup (Normal copy)       59F document rear edge read setup         32       Sensor       O1       Paper sensor status display       63         343       Fusing       O1       Eusing temperature setup 2       50F         343       Fusing       O1       Copy density adjustment (300dpi)       60P         343       Fusing temperature setup 2       65       Fusing temperature setup 2       65         35       Fusing temperature setup 1       Copy density adjustment (300dpi)	Sim No.	Kind of main code	Sub code	Operation
48         Magnification ratio correction setup         01         Fusing second cassette setup           44         Machine duplex setup         06         Destination setup           06         Destination setup         06         Destination setup           07         Machine conditions check         20         Rear edge void setup           30         CE mark support control ON/OFF         38         Cancel of stop at drum life over           40         Polygon motor OFF time setup (Time required for turning OFF after completion of printing)         42         Transfer ON timing control setup           30         Sensor operation check (Standard provision)         01         Fusing temperature setup (Normal copy)           43         Fusing temperature setup         01         Fusing temperature setup 10 duplex copy           44         Exposure adjustment         01         Copy density adjustment (300dpi)           02         Setup of fusing control of postcard size paper         20           46         Exposure adjustment         01         Copy density adjustment (600dpi)           18         Magnification ratio correction         01         Forthrear (main scanning) direction and scan (sub	26	Various setup	01	Manual feed setup
48         Magnification ratio correction adjustment         01         Second cassette setup           04         Machine duplex setup         06         Destination setup           07         Machine conditions check         20         Rear edge void setup           00         CE mark support control ON/OFF         30         CE mark support control ON/OFF           30         Cencel of stop at drum life over         40         Polygon motor OFF time setup (Time required for turning OFF after completion of printing)           42         Transfer ON timing control setup         5ide void setup         5ide void setup           30         Sensor operation check (Standard provision)         01         Fusing temperature setup (Normal copy)           43         Fusing Fusing temperature setup (Normal copy)         01         Fusing temperature setup (Normal copy)           44         Prosting ontrol of postcard size paper         11         Copy density adjustment (300dpi)           43         Fusing temperature setup in duplex copy         09         Setup of fusing control of postcard size paper           46         Exposure adjustment         01         Copy density adjustment (300dpi)           19         table setup or AE operation mode setup         20           20         SPF exposure correction         Image contrast adjustment (600dpi) <td></td> <td></td> <td>02</td> <td>(R) SPF setup</td>			02	(R) SPF setup
4       Machine duplex setup         06       Destination setup         07       Machine conditions check         20       Rear edge void setup         30       CE mark support control ON/OFF         38       Cancel of stop at drum life over         39       Memory capacity check         40       Polygon motor OFF time setup (Time required for turning OFF after completion of printing)         41       SPF document rear edge read setup         62       Energy-save mode copy lamp setup         63       Fan control select setup         30       Sensor operation check (Standard provision)       01         43       Fusing temperature setup       01         43       Fusing temperature setup       01         64       Exposure adjustment       01         70       Setup of fusing control of postcard size paper         46       Exposure adjustment       01         65       Copy density adjustment (300dpi)         70       SPF exposure correction mage contrast adjustment (600dpi)         8       Magnification ratio correction       11         7       Yable setup or AE operation mode setup         20       SPF exposure correction magification ratio adjustment         8			03	Second cassette setup
48         Magnification adjustment         01         Copy density adjustment (Stopy density adjustment (Stopy density adjustment adjustment           48         Magnification ratio correction         01         Fortyreat (Stopy and scale)           48         Magnification ratio correction         01         Fortyreat (Stopy and scale)           48         Magnification ratio         01         Fortyreat (Stopy and scale)         Fortyreat (Stopy and scale)           48         Magnification ratio         01         Fortyreat (Stopy and scale)         Fortyreat (Stopy and scale)           48         Magnification ratio         01         Fortyreat (Stopy and scale)         Stopy and scale)           48         Magnification ratio         01         Fortyreat (Stopy and scale)         Stopy and scale)           49         01         Flash ROM program writing mode         6000pi)           49         01         Fortyreat (main scanning) direction and scan (sub scanning) direction and sc			04	Machine duplex setup
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48       Magnification         48       Magnification         48       Magnification         44       SPF exposite         45       Copier color reproduction setup         46       Exposure         47       Copier color reproduction setup         48       Magnification         49       Of page setup         44       SPF document rear edge read setup         50       Sensor         00       Sensor         01       Fusing temperature setup         130       Sensor         01       Fusing temperature setup         143       Fusing temperature setup (Normal copy)         143       Fusing temperature setup (Normal copy)         143       Fusing temperature setup 10         144       Setup 11         145       Fusing temperature setup 10         146       Exposure         147       Copy density adjustment (300dpi)         148       Magnification ratio adjustment         149       O1         148       Magnification ratio correction         149       O1         148       Magnification ratio adjustment         149       O1         <			07	Machine conditions check
48       Magnification adjustment       01       Cemark support control ON/OFF         39       CE mark support control ON/OFF         38       Cancel of stop at drum life over         39       Memory capacity check         40       Polygon motor OFF time setup (Time required for turning OFF after completion of printing)         41       Transfer ON timing control setup         30       Sensor operation check (Standard provision)       01         43       Fusing temperature setup       01         44       Fusing temperature setup (Normal copy)       99         45       Fusing temperature setup in duplex copy       99         46       Exposure adjustment       01       Copy density adjustment (300dpi) Copy density adjustment (300dpi)         47       Dage contrast adjustment (300dpi)       10       Copy density adjustment (300dpi)         48       Magnification ratio correction       01       For threar (main scanning) direction and scan (sub scanning) di			20	Bear edge void setun
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ratio correctionand scan (sub scanning) direction magnification ratio adjustment4901Flash ROM program writing mode50Lead edge adjustment01Lead edge image position Center offset adjustment51Timing adjustment02Resist quantity adjustment5308SPF scan position automatic adjustment61Laser system operation03Polygon motor check (HSYNC output check)63Shading01Shading check64Self print01Self print	48	Magnification	01	Front/rear (main scanning) direction
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53     08     SPF scan position automatic adjustment       61     Laser system operation     03     Polygon motor check (HSYNC output check)       63     Shading     01     Shading check       64     Self print     01     Self print	51	Timing adjustment	02	Resist quantity adjustment
61     Laser system operation     03     Polygon motor check (HSYNC output check)       63     Shading     01     Shading check       64     Self print     01     Self print	53		08	SPF scan position automatic adjustment
63     Shading     01     Shading check       64     Self print     01     Self print	61	Laser system operation	03	Polygon motor check (HSYNC output check)
64 Self print 01 Self print	63	Shading	01	Shading check
	64	Self print	01	Self print

### 3. Contents of simulations

Input method: Clear key  $\rightarrow$  Exposure Select key  $\rightarrow$  Clear key  $\rightarrow$  Exposure Select key

Main code	Sub code	Content						
01	01	Mirror scan operation						
		(Operation/Procedure)						
		1. When this simulation is executed, the mirror home position is detected.						
		Sensor name		Display lamp				
		Mirror home position sensor	OPC drum c	artridge replacement lamp				
-		The copy magnification ratio can be arbi	itrarily set wit	the magnification ratio select key/zoom ke	entily set copy magnification ratio. ey.			
	06	Aging of mirror scanning When the PRINT switch is pressed, the mirr	or base porf	orms full scap at the speed of the set magni	fication ratio After 3 sec. the mirror			
		case performs full scan again. These proceed	dures are rep	beated until the clear key is pressed. (When	the PRINT switch is pressed once,			
		the ready lamp keeps OFF.)						
		The status of the mirror home position sens	or is displaye	ed with the photoconductor cartridge lamp. (	(The lamp is ON when the mirror is			
		at the nome position.)						
02	02	SPF sensor status display						
		ON/OFF of the sensors in the SPF can be c	checked with	the following lamps.				
		Display		Sensor				
		Developer cartridge replacement lamp		Document set detection (SPID)				
		Jam lamp		SPF document transport detection (SPPD)	)			
		Photoconductor cartridge replacement la	Imp	SPF cover open/close detection (SDOD)				
		SPF jam lamp		SPF open/close detection (SDSW)				
				FAX document size detection				
				Paper size detection				
	03	Motor ON						
		(Operation/Procedure)						
-	04	When the start key is pressed, the SPF mot	tor rotates to	r 10 sec at the speed corresponding to the c	currently set magnification ratio.			
	04	(Operation/Procedure)						
		When the start key is pressed, the SPF pap	er feed soler	noid repeats ON (500 ms) and OFF (500 ms	s) 20 times.			
05	01	Operation panel display check <ul> <li>When the PRINT switch is pressed, all LE</li> </ul>	EDs (includin	g 7-segment LEDs) on the operation panel	are lighted. (LED check mode)			
		• When 1Up key is pressed, the LEDs on the operation panel are lighted individually from the top left to the bottom right in sequence.						
		After completion of all individual lighting, all LEDs are lighted simultaneously. (The 7-segment LED lights the three-digit sections at						
		the same time.)						
		Individual lighting frequency ON: 300ms, OFF: 20ms						
		When the PRINT switch is pressed in the LED check mode, the machine enters the Key input check mode						
		"Key input check mode"						
		When the machine enters the Key input check mode, the value display section indicates "" Every time any key on the operat ion						
		panel is pressed, the entered value is added and displayed on the value display section. However, the keys that were pressed once are						
		<ul><li>not counted again.</li><li>When the PRINT switch is pressed, the entered value is added and displayed for 3 sec and all the LEDs are lighted. (LED lighting</li></ul>						
		check mode)						
		(Note for Key input check mode)						
		Press the PRINT switch at the end. (If it is	s pressed in t	the middle of the process, the entered value	e up to that moment is displayed for			
		Sec and the machine enters the LED lig     Multiple key inputs are ignored	пшпу спеск	mode. (ALL the LEDS are lighted.))				
	02	Fusing lamp, cooling fan operation check						
	02	When the PRINT switch is pressed, the fusing lamp repeats operations of 500ms-ON and 500ms-OFF 5 times. During that time, the cooling fan motor rotates						
-	03	Copy lamp ON						
		(Operation/Procedure)						
		When the START key is pressed, the copy	lamp is lighte	ed for 5 sec.				
06	01	Paper feed solenoid ON						
		(Operation/Procedure) When the START key is pressed, the paper	r feed soleno	id selected by the tray select key repeats $\Omega$	N (500ms) and OFE (500ms) 20			
		times.		a colocica by the tray select key repeats O				
	02	Resist solenoid ON						
		(Operation/Procedure)						
		When the START key is pressed, the resist	solenoid (RF	RS) repeats ON (500ms) and OFF (500ms)	20 times.			

Main code	Sub code	Content
07	01	Warm-up display and aging with jam
		<ul> <li>(Operation/Procedure)</li> <li>1. When the simulation is executed, warming up is started.</li> <li>2. Warm-up time is counted and displayed every second on the copy quantity display.</li> <li>3. After completion of warm-up, the time count is stopped and the ready lamp is lighted.</li> <li>4. Press the clear key to clear the warm-up time display, set the copy quantity, and press the START key, and the machine will copy the set quantity repeatedly.</li> </ul>
		This simulation is canceled by turning off the power or executing any simulation which performs hardware reset.
08	06	<ul> <li>Intermittent aging (Operation/Procedure) <ol> <li>When the simulation is executed, warming up is started.</li> <li>After completion of warm-up, the ready lamp is lighted.</li> <li>Set the copy quantity and press the START key, and the machine will copy the set quantity repeatedly.</li> <li>After 3 sec of the interval time from completion of copying the set quantity, the machine will resume copying.</li> <li>The above operation 4 is repeated.</li> </ol> This simulation is canceled by turning off the power or executing any simulation which performs hardware reset. Developing bias (Operation/Procedure)</li></ul>
		When the START key is pressed, the developing bias is outputted for 30 sec.
	02	Main charger (Grid high) (Operation/Procedure) When the START key is pressed, the main charger output is supplied for 30 sec in the grid voltage HIGH mode.
	03	Grid voltage (Low) (Operation/Procedure) When the START key is pressed, the main charger output is supplied for 30 sec in the grid voltage LOW mode.
	06	Transfer charger
		(Operation/Procedure) When the START key is pressed, the transfer charger output is supplied for 30 sec.
10	None	Toner motor aging (Operation/Procedure) When the START key is pressed, the toner motor output is supplied for 30 sec.
14	None	Cancel of troubles other than U2 (Operation/Procedure) After canceling the trouble, the simulation is also automatically canceled.
16 22	None 04	Cancel of U2 trouble (Operation/Procedure) 1. When the START key is pressed, the EEPROM total counter check sum is rewritten and the trouble is canceled. 2. After canceling the trouble, the simulation is also automatically canceled. JAM total counter display The display method is the same as the total count value display.
	05	Total counter display include is displayed in 3 digits X 2 times repeatedly. <display 12345="" example:=""> 012 <math>\rightarrow</math> Blank <math>\rightarrow</math> 345 <math>\rightarrow</math> Blank <math>\rightarrow</math> 012 0.70 <math>\rightarrow</math> 0.20 <math>\rightarrow</math> 0.70 <math>\rightarrow</math> 0.70</display>
	08	SPF counter display
	12	The display method is the same as the total count value display. Drum counter display
	14	The display method is the same as the total count value display. P-ROM version display The main code and the sub code of the P-ROM version is displayed on the value display section in 2 digits alternately.
	17	The display method is the same as the total count value display.
	17	The display method is the same as the total count value display.
	18	Printer counter display The display method is the same as the total count value display.
	19	Scanner mode counter display The display method is the same as the total count value display.
	21	Scanner counter display The display method is the same as the total count value display.
	22	SPF JAM counter display The display method is the same as the total count value display.

Main code	Sub code	Content					
24	01	JAM total counter clear When the PRINT switch is pressed, the JAM total count value is reset to 0.					
	04	SPF counter clear When the PRINT switch is pressed, the SPF count value is reset to 0.					
	07	Drum counter clear When the PRINT switch is pressed, the drum count value is reset to 0					
	08	Copy counter clear When the PRINT switch is pressed, the copy count value is reset to 0.					
	09	Printer counter clear When the PRINT switch is pressed, the printer count value is reset to 0					
	13	Scanner counter clear When the PRINT switch is pressed, the scanner count value is reset to 0					
	14	SPF JAM total counter clear When the PRINT switch is pressed, the SPF JAM total count value is reset to 0.					
	15 Scanner mode counter clear When the PRINT switch is pressed, the coopport mode counter is react to 0.						
25	01	Main motor operation check (Cooling fan motor rotation check) When the PRINT switch is pressed, the main motor (as well as the duplex motor in the duplex model) is operated for 30 sec. If the developing unit is installed at that time, the developing bias, the main charger, and the grid are outputted together in order to avoid toner consumption. Since, in this case, laser discharge is required when stopping the motor, the polygon motor is rotated at the same time. If the developing unit is not installed, the above high voltage is not outputted and only the motor is rotated. $\Rightarrow$ Do not execute this simulation by forcibly turning ON the door ON/OEE switch					
	10	Polygon motor ON (Operation/Procedure) When the START key is pressed, the polygon motor is operated for 30 sec.					
26	01	Manual feed setup (Operation/Procedure)         1. When this simulation is executed, the currently set bypass code number is displayed.         2. Enter the code number corresponding to the bypass and press the START key, and the setting will be changed.         Code number       Bypass         0       Single bypass         1       Multi bypass					
	02	(R) SPF setup When this simulation is executed, the current setup of the SPF code number is displayed. Enter the code number corresponding to the SPF and press the PRINT switch to enable the setup.					
		Code number SPF					
		0 SPF not installed					
		1     SPF installed       2     RSPF installed					
	03	<ul> <li>Second cassette setup (Operation/Procedure)</li> <li>1. When this simulation is executed, the currently set code number of the second cassette is displayed.</li> <li>2. Enter the code number and press the start key. The setting is changed.</li> </ul>					
		Code number Second cassette					
		1 With second cassette					
	04 Machine duplex setup (Operation/Procedure) 1. When this simulation is executed, the currently set duplex code number is displayed						
		2. Enter the code number corresponding to the duplex and press the ENTER key, and the setup will be changed.					
		Code number Duplex					
		0 Without Duplex					
		1 With Duplex					

26       06       Destination stup.         When this simulation is executed, the current setup of the destination code number is displayed. Enter the code number corresponding to the destination and press the PRINT switch to enable the setup.         Code number       0       Inch series         2       JAPAN AB series         2       JAPAN AB series         3       Ohma (EX JAPAN AB series + Chinese paper support)         07       Machine conditions check         When this simulation is executed, the current machine setup is displayed.         11       EX JAPAN AB series + Chinese paper support)         07       Machine conditions check         When this simulation is executed, the current machine setup is displayed.         11       Exp m         12       gpm         13       gpm         14       gpm         15       gpm         16       gpm         17       gar edge void exp (Del auther)         When this simulation is executed, the current setup of the four edge void and provided 'Default         1       Rear edge void exp (Del auther)         Code number       Error support control OMOFF         When this simulation is executed, the current setup of the Code number is displayed. Enter the code number corresponding to the CE mark support control ON	Main code	Sub code	Content					
When this simulation is executed, the current setup of the destination mode number is displayed. Enter the code number corresponding to the destination and press the PRINT switch to enable the setup.         0       Inclusion of the destination destination of the destination of the destin	26	26 06 Destination setup						
to the destination and press the PRINT avticit to enable the setup.			When this simulation is executed, the current setup of the destination code number is displayed. Enter the code number corresponding					
Image: Code number         Destination           0         Inch saries           1         Ic X, JAPAN AB series           2         JAPAN AB series           3         China (EX JAPAN AB series + Chinese paper support)           07         Machine conditions check           When this simulation is executed, the current machine setup is displayed.           1         Exp           10         Gorg quantity display           11         Exp           12         opin           13         opin           14         opin           15         opin           20         Rear edge void setup           When this simulation is executed, the current setup of the rear edge void code number is displayed. Enter the code number corresponding to the rear edge void setup           1         Rear edge void setup           1         Rear edge void setup           When this simulation is executed, the current setup of the rear edge void code number is displayed. Enter the code number corresponding to the rear edge void setup           1         Rear edge void provided 'D Balut           30         Cede number           1         Rear edge void provided 'D Balut           1         Rear edge void cotoriol OFF           When this simulation is execut			to the destination and press the PRINT switch to enable the setup.					
0         Inch series           1         EX.APRA NB series           2         JAPAN AB series           3         China (EX.JAPAN AB series + Chinese paper support)           07         Machine conditions check           When this simulation is executed, the current machine setup is displayed.           10         Copy quantity display 112 cpm           12         Rear edge void satup When this simulation is executed, the current setup of the rear edge void code number is displayed. Enter the code number corresponding to the rear edge void satup When this simulation is executed, the current setup of the rear edge void code number is displayed. Enter the code number corresponding to the rear edge void satup The rear edge void not provided 0 Februit 1           30         CE mark support control ONOFF           When this simulation is executed, the current setup of the CE mark support code number is displayed. Enter the code number corresponding to the CE mark support control ONOFF           31         Cen eark support control ONOFF           32         Cade number           33         Cade number           34         Cen mark support control ONOFF           35         Cate of stop at drum life over           36         Cen mark support control ONOFF           37         The default for CE-support 2004 setup is 1.1           38         Granel stop at drum life over           39			Code number	De	estination			
1       EX.JAPAN AB series         2       JAPAN AB series         3       China (EX.JAPAN AB series + Chinese paper support)         07       Machine conditions check         When this simulator is secured, the current machine setup is displayed.         12 cpm       10 cpm         13 cpm       11 dpm         14 cpm       14 dpm         15 cpm       15         20       Rear edge void setup         When this simulatori is executed, the current setup of the rear edge void code number is displayed. Enter the code number corresponding to the rear edge void and press the PRINT switch to enable the setup.         20       Cem ant support control ONOFF         When this simulation is executed, the current setup of the CE mark support code number is displayed. Enter the code number corresponding to the CE mark support control ONOFF         When this simulation is executed, the current setup of the CE mark support code number is displayed. Enter the code number corresponding to the CE mark support control ON CF         When this simulation is executed, the current setup of the CB mark support code number is displayed. Enter the code number corresponding to the CE mark support control ON CF         Code number       CE mark support control ON CF         Code number is displayed. Enter the code number is displayed.         Code number is displayed onter DF Profeault (100V series)         1       CE mark support control ON F<			0	Inch series				
2       JAPAN AB series         3       China (EX JAPAN B series + Chinese paper support)         07       Machine conditions check         When this simulation is executed, the current machine setup is displayed.         12(2 pm)       12(2 pm)         13(3 pm)       13(3 pm)         14(4 pm)       14(4 pm)         15(2 pm)       15(2 pm)         15(2 pm)       16(2 mark support setup         0       Rear edge void and previded "Default         1       Rear edge void not provided         0       Rear edge void provided 'Default         1       Rear edge void or previded 'Default         1       Rear edge void provided 'Default         1       Code number         code number       CE mark support control ON         When this simulation is executed, the current setup of the CE mark support code number is displayed. Enter the code number and press the PRINT switch to enable the setup.         <			1	EX JAPAN AB series				
Image: Second Secon			2	JAPAN AB series				
07       Machine conditions check         When this simulation is executed, the current machine setup is displayed.         20       Rear edge void setup         13 opm       13         14 dpm       14         15 cpm       15         When this simulation is executed, the current setup of the rear edge void code number is displayed. Enter the code number corresponding to the rear edge void and press the PRINT switch to enable the setup.         20       Rear edge void approved of the current setup of the rear edge void code number is displayed. Enter the code number corresponding to the rear edge void provided 10 efault         1       Rear edge void on oprovided         30       CE mark support control ON/OFF         When this simulation is executed, the current setup of the CE mark support code number is displayed. Enter the code number corresponding to the CE mark support control OFF * Default (100V series)         1       CE mark support control OFF * Default (100V series)         1       CE mark support control OFF * Default (100V series)         1       CE mark support control OFF * Default (100V series)         1       CE mark support control OFF * Default (100V series)         1       CE mark support control OFF * Default (100V series)         1       Code number         20       Rear edge void setup         When this simulation is executed, the current setup of the code number is			3	China (EX JAPAN AB series	s + Chinese paper support)			
When this simulation is executed, the current machine setup is displayed. <sup>10</sup> opm 10 <sup>10</sup> opm 12 <sup>10</sup> opm 12 <sup>11</sup> a opm 13 <sup>11</sup> a opm 13 <sup>11</sup> a opm 14 <sup>11</sup> a opm 16 <sup>11</sup> a opm 17 <sup>11</sup> a opm 18 <sup>11</sup> Rear edge void and press the PRINT switch to enable the setup. <sup>11</sup> Rear edge void not provided <sup>11</sup> Rear edge void opp 18 <sup>11</sup> Rear edge void opp 18 <sup>11</sup> Rear edge void opp 18 <sup>11</sup> CE mark support control ON/OFF <sup>11</sup> the default for CE-support 200V series is "1.* <sup>11</sup> CE mark support control ON <sup>11</sup> The default for CE-support 200V series is "1.* <sup>11</sup> CE mark support control ON <sup>11</sup> the default for CE-support 200V series is "1.* <sup>11</sup> Cancel of stop at drum life over When this simulation is executed, the current setup of the code number is displayed. Enter the code number and press the PRINT switch to enable the setup.	-	07	Machine conditions o	heck				
CPM         Copy quantity display 10 cpm         10           12 cpm         12           13 cpm         13           14 cpm         14           15 cpm         15           20         Rear edge void setup           When this simulation is executed, the current setup of the rear edge void code number is displayed. Enter the code number corresponding to the rear edge void and pross the PRINT switch to enable the setup.           20         Rear edge void not provided ' Default 1           30         CE mark support control ON/OFF When this simulation is executed, the current setup of the CE mark support code number is displayed. Enter the code number corresponding to the CE mark support setup and press the PRINT switch to enable the setup.           20         Code number         CE mark support setup and press the PRINT switch to enable the setup.           21         Care and support control ON OFF         When this simulation is executed, the current setup of the code number is displayed. Enter the code number corresponding to the CE mark support setup and press the PRINT switch to enable the setup.           26         Code number         Cemark support control ON           37         Cancel of stop at drum life over         Stop at drum life over           38         Cancel of stop at drum life over         Stop at drum life over           39         Memory capacity check         When this simulation is executed, the current setup of the code		07	When this simulation is executed, the current machine setup is displayed.					
Image: Second			СРМ	Copy quantity display	]			
12 cpm       12 13 cpm       13 14 cpm       13 14 cpm         20       Rear edge void stup       When this simulation is executed, the current setup of the rear edge void code number is displayed. Enter the code number corresponding to the rear edge void provided " Default 1       Rear edge void provided " Default 1       Rear edge void not provided         30       CE mark support control ON/OFF       When this simulation is executed, the current setup of the CE mark support code number is displayed. Enter the code number corresponding to the CE mark support setup and press the PRINT switch to enable the setup.         20       Cd number       CE mark support control ON/OFF         When this simulation is executed, the current setup of the CE mark support code number is displayed. Enter the code number corresponding to the CE mark support setup         20       Cd number       CE mark support control ON         1       CE mark support control ON         30       Cancel of stop at drum life over "Default (100V series)         31       Cancel of stop at drum life over "Default (AL mode)         1       Cancel of stop at drum life over "Default (AL mode)         1       Cancel of stop at drum life over "Default (AL mode)         32			10 cpm	10				
13 cpm       13         14 cpm       14         15 cpm       15         20       Rear edge void setup         When this simulation is executed, the current setup of the rear edge void code number is displayed. Enter the code number corresponding to the rear edge void and press the PRINT switch to enable the setup.         20       Rear edge void and press the PRINT switch to enable the setup.         20       Rear edge void not provided * Default         1       Default provided * Default         1       Default for CE-support control ON/OFF         When this simulation is executed, the current setup of the code number is displayed. Enter the code number and press the PRINT switch to enable the setup.         28       Cancel of stop at drum life over * Default (AL model)         1       Calce number			12 cpm	12				
Image: specific setup           20         Rear edge void setup           When this simulation is executed, the current setup of the rear edge void code number is displayed. Enter the code number corresponding to the rear edge void provided * Default           0         Rear edge void provided * Default           1         Rear edge void on to provided * Default           1         Rear edge void on to provided * Default           0         CE mark support control ON/OFF           When this simulation is executed, the current setup of the CE mark support code number is displayed. Enter the code number corresponding to the CE mark support setup and press the PRINT switch to enable the setup.           0         CE mark support control ON/OFF           0         DE mark support setup and press the PRINT switch to enable the setup.           1         Cede number           0         DE mark support control ON           The default for CE-support 200V series is *1.*           38         Cancel of stop at drum life over           39         Memory capacity check           When this simulation is executed, the current setup of the code number is displayed. Enter the code number and press the PRINT switch to enable the setup.           39         Memory capacity check           When this simulation is executed, the current memory capacity is displayed.           10         Code number			13 cpm	13				
15 cpm         15           20         Rear edge void setup When this simulation is executed, the current satup of the rear edge void code number is displayed. Enter the code number corresponding to the rear edge void and press the PRINT switch to enable the setup.           20         Cede number         Rear edge void setup 0         Rear edge void setup 0         Rear edge void setup 0         Rear edge void not provided * Default           30         CE mark support control ON/OFF         When this simulation is executed, the current setup of the CE mark support code number is displayed. Enter the code number corresponding to the CE mark support setup and press the PRINT switch to enable the setup.           20         Cde number         CE mark support control ON/OFF           When this simulation is executed, the current setup of the Cde mark support code number is displayed. Enter the code number corresponding to the CE support 200V series is *1."           38         Cancel of stop at drum life over           When this simulation is executed, the current setup of the code number is displayed. Enter the code number and press the PRINT switch to enable the setup.           20         Stop at drum life over *           39         Memory capacity check           When this simulation is executed, the current memory capacity is displayed.           20         Stop at drum life over *           39         Memory capacity check           When this simulation is executed, the current memory capacity is displayed. <th></th> <th></th> <th>14 cpm</th> <th>14</th> <th></th>			14 cpm	14				
20       Rear edge void setup         When this simulation is executed, the current setup of the rear edge void code number is displayed. Enter the code number corresponding to the rear edge void and press the PRINT switch to enable the setup.         20       Rear edge void and press the PRINT switch to enable the setup.         20       Rear edge void provided * Default         1       Rear edge void provided * Default         1       Rear edge void not provided         30       CE mark support control ON/OFF         When this simulation is executed, the current setup of the CE mark support code number is displayed. Enter the code number corresponding to the CE mark support setup         0       CE mark support control ON/OFF         When this simulation is executed, the current setup of the CE mark support code number is displayed. Enter the code number corresponding to the CE mark support control OVF * Default (100V series)         1       CE mark support control OVF * Default (100V series)         1       CE mark support control OVF * Default (100V series)         1       CE mark support control ON         The default for CE-support 200V series is *1.*       38         38       Cancel of stop at drum life over * Default (AL model)         1       Cancel of stop at drum life over * Default (AL model)         1       Cancel of stop at drum life over * Default (AL model)         29       Memory capacily check <th></th> <td></td> <td>15 cpm</td> <td>15</td> <td></td>			15 cpm	15				
20       Near edge void setup         20       When this simulation is executed, the current setup of the rear edge void code number is displayed. Enter the code number corresponding to the rear edge void and press the PRINT switch to enable the setup.         20       Code number       Rear edge void setup         1       Rear edge void not provided * Default         1       Rear edge void not provided * Default         1       Rear edge void not provided * Default         20       CE mark support control ON/OFF         When this simulation is executed, the current setup of the CE mark support code number is displayed. Enter the code number corresponding to the CE mark support control OFF * Default (100V series)         1       CE mark support control OF         1       CE mark support control OF * Default (100V series)         1       CE mark support control OF         2       Cancel of stop at drum life over         When this simulation is executed, the current setup of the code number is displayed. Enter the code number and press the PRINT switch to enable the setup.         39 <th>-</th> <th>00</th> <th>Deer edge void estur</th> <th></th> <th>-</th>	-	00	Deer edge void estur		-			
Image: Second		20	When this simulation	; is executed the current setur	in of the rear edge void code number is displayed. Enter the code number			
Image: Second secon			corresponding to the	rear edge void and press the	PRINT switch to enable the setup.			
Code number         Rear edge void setup           0         Rear edge void novided * Default           1         Rear edge void not provided           30         CE mark support control ON/OFF           When this simulation is executed, the current setup of the CE mark support code number is displayed. Enter the code number corresponding to the CE mark support setup and press the PRINT switch to enable the setup.           Code number         CE mark support control ON           The default for CE-support control ON         The default for CE-support control ON           The default for CE-support control ON         The default for CE-support control ON           38         Cancel of stop at drum life over           When this simulation is executed, the current setup of the code number is displayed. Enter the code number and press the PRINT switch to enable the setup.           Code number         Setup           0         Stop at drum life over ' Default (AL model)           1         Cancel of stop at drum life over ' Default (AL model)           1         Cancel of stop at drum life over ' Default (AL model)           1         Cancel of stop at drum life over ' Default (AL model)           1         Cancel of stop at drum life over ' Default (AL model)           1         Cancel of stop at drum life over ' Default (AL model)           1         Cancel of stop at drum life over ' Default (AL model) </th <th></th> <th></th> <th>g to the</th> <th></th> <th></th>			g to the					
0         Rear edge void provided ^ Default           1         Rear edge void not provided           30         CE mark support control ON/OFF           When this simulation is executed, the current setup of the CE mark support code number is displayed. Enter the code number corresponding to the CE mark support control OFF * Default (100V series)           0         CE mark support control OF * Default (100V series)           1         CE mark support control OF * Default (100V series)           1         CE mark support control ON           The default for CE-support control ON         The default for CE-support control ON           The default for CE-support control ON         The default for CE-support control ON           The default for CE-support control ON         The default for CE-support 200V series is "1."           38         Cancel of stop at drum life over           When this simulation is executed, the current setup of the code number is displayed. Enter the code number and press the PRINT switch to enable the setup.           Code number         Stop at drum life over * Default (AL model)           1         Cancel of stop at drum life over           39         Memory capacity check           When this simulation is executed, the current memory capacity is displayed.           40         Polygon motor OFF time setup (Time required for turning OFF after completion of printing)           When this simulation is execu			Code number	Rear edge void set	etup			
1       Rear edge void not provided         30       CE mark support control ON/OFF         When this simulation is executed, the current setup of the CE mark support code number is displayed. Enter the code number corresponding to the CE mark support setup         0       CE mark support control ON/OFF         0       CE mark support control OFF * Default (100V series)         1       Ce mark support control ON         The default for CE-support 200V series is "1."         38       Cancel of stop at drum life over         When this simulation is executed, the current setup of the code number is displayed. Enter the code number and press the PRINT switch to enable the setup.         Code number       Setup         0       Cancel of stop at drum life over * Default (AL model)         1       Cancel of stop at drum life over * Default (AL model)         1       Cancel of stop at drum life over * Default (AL model)         39       Memory capacity check         When this simulation is executed, the current memory capacity is displayed.         40       Polygon motor OFF time setup (Time required for turning OFF after completion of printing)         When this simulation is executed, the current setup of the code number is displayed. Enter the code number and press the PRINT switch to enable the setup.         2       60 sec         1       30 sec * Default         2			0	Rear edge void provided * D	Default			
30       CE mark support control ON/OFF When this simulation is executed, the current setup of the CE mark support code number is displayed. Enter the code number corresponding to the CE mark support setup         0       CE mark support control OFF * Default (100V series)         1       CE mark support control ON         The default for CE-support 200V series is *1.*         38       Cancel of stop at drum life over When this simulation is executed, the current setup of the code number is displayed. Enter the code number and press the PRINT switch to enable the setup.         Code number       Stop at drum life over * Default (AL model)         1       Cancel of stop at drum life over         39       Memory capacity check When this simulation is executed, the current memory capacity is displayed.         39       Memory capacity check When this simulation is executed, the current memory capacity is displayed.         1       Cancel of stop at drum life over         39       Memory capacity check When this simulation is executed, the current setup of the code number is displayed.         40       Polygon motor OFF time setup (Time required for turning OFF after completion of printing) When this simulation is executed, the current setup of the code number is displayed. Enter the code number and press the PRINT switch to enable the setup.         1       30 sec * Default 1         2       60 sec 1         3       90 sec			1	Rear edge void not provided	d			
corresponding to the CE mark support setup and press the PRINT switch to enable the setup.	-	30	CE mark support control ON/OFF When this simulation is executed, the current setup of the CE mark support code number is displayed. Enter the code number					
Code number         CE mark support setup           0         CE mark support control OFF * Default (100V series)           1         CE mark support control ON           The default for CE-support 200V series is "1."           38         Cancel of stop at drum life over           When this simulation is executed, the current setup of the code number is displayed. Enter the code number and press the PRINT switch to enable the setup.           Code number         Setup           0         Stop at drum life over * Default (AL model)           1         Cancel of stop at drum life over           When this simulation is executed, the current memory capacity is displayed.           Code number         Setup           0         Stop at drum life over           39         Memory capacity check           When this simulation is executed, the current memory capacity is displayed.           Code number         Setup           8         8 Mbyte           16         16 Mbyte           16         16 Mbyte           Vent this simulation is executed, the current setup of the code number is displayed. Enter the code number and press the PRINT switch to enable the setup.           Code number         Setup           0         0 sec           1         30 sec * Default           2         <			corresponding to the CE mark support setup and press the PRINT switch to enable the setup.					
0       CE mark support control OFF * Default (100V series)         1       CE mark support control ON         The default for CE-support 200V series is *1."         38       Cancel of stop at drum life over         When this simulation is executed, the current setup of the code number is displayed. Enter the code number and press the PRINT switch to enable the setup.         Code number       Setup         0       Stop at drum life over * Default (AL model)         1       Cancel of stop at drum life over *         39       Memory capacity check         When this simulation is executed, the current memory capacity is displayed.         Code number       Setup         8       8 Mbyte         16       16 Mbyte         40       Polygon motor OFF time setup.         Code number       Setup         0       0 sec         1       30 sec * Default         2       60 sec         1       30 sec * Default         2       60 sec         3       90 sec			Code number CE mark support setup					
1       CE mark support control ON         The default for CE-support 200V series is "1."         38       Cancel of stop at drum life over         When this simulation is executed, the current setup of the code number is displayed. Enter the code number and press the PRINT switch to enable the setup. <ul> <li>Code number</li> <li>Stop at drum life over * Default (AL model)</li> <li>1</li> <li>Cancel of stop at drum life over</li> </ul> 39       Memory capacity check         When this simulation is executed, the current memory capacity is displayed. <ul> <li>Code number</li> <li>Setup</li> <li>16</li> <li>16 Mbyte</li> </ul> 40       Polygon motor OFF time setup (Time required for turning OFF after completion of printing)         When this simulation is executed, the current setup of the code number is displayed. Enter the code number and press the PRINT switch to enable the setup. <ul> <li>Code number</li> <li>Setup</li> <li>16</li> <li>16 Mbyte</li> </ul> 40       Polygon motor OFF time setup (Time required for turning OFF after completion of printing)         When this simulation is executed, the current setup of the code number is displayed. Enter the code number and press the PRINT switch to enable the setup. <ul> <li>O</li> <li>O sec</li> <li>1</li> <li>3</li></ul>		0 CE mark support control OFF * Default (100V series)		FF * Default (100V series)				
The default for CE-support 200V series is "1."         38       Cancel of stop at drum life over When this simulation is executed, the current setup of the code number is displayed. Enter the code number and press the PRINT switch to enable the setup. <ul> <li>Code number</li> <li>Stop at drum life over * Default (AL model)</li> <li>1</li> <li>Cancel of stop at drum life over *</li> </ul> 39         Memory capacity check When this simulation is executed, the current memory capacity is displayed.           Code number         Setup           8         8 Mbyte           16         16 Mbyte           16         16 Mbyte           16         16 Mbyte           16         130 sec * Default         Code number is displayed. Enter the code number and press the PRINT switch to enable the setup.			1 CE mark support control ON		N			
38       Cancel of stop at drum life over When this simulation is executed, the current setup of the code number is displayed. Enter the code number and press the PRINT switch to enable the setup. <ul> <li></li></ul>			The default for CE	support 200V series is "1."				
When this simulation is executed, the current setup of the code number is displayed. Enter the code number and press the PRINT switch to enable the setup. <ul> <li></li></ul>	ŀ	38	38 Cancel of stop at drum life over					
switch to enable the setup.         Code number       Setup         0       Stop at drum life over * Default (AL model)         1       Cancel of stop at drum life over         39       Memory capacity check         When this simulation is executed, the current memory capacity is displayed.         Code number       Setup         8       8 Mbyte         16       16 Mbyte         40       Polygon motor OFF time setup (Time required for turning OFF after completion of printing)         When this simulation is executed, the current setup of the code number is displayed. Enter the code number and press the PRINT switch to enable the setup.          Code number         0       0 sec         1       30 sec * Default         2       60 sec         3       90 sec			When this simulation is executed, the current setup of the code number is displayed. Enter the code number and press the PRINT					
Code number       Setup         0       Stop at drum life over * Default (AL model)         1       Cancel of stop at drum life over         39       Memory capacity check         When this simulation is executed, the current memory capacity is displayed.         Code number       Setup         8       8 Mbyte         16       16 Mbyte         40       Polygon motor OFF time setup (Time required for turning OFF after completion of printing)         When this simulation is executed, the current setup of the code number is displayed. Enter the code number and press the PRINT switch to enable the setup.         Code number       Setup         0       0 sec         1       30 sec * Default         2       60 sec         3       90 sec			switch to enable the	setup.				
0       Stop at drum life over * Default (AL model)         1       Cancel of stop at drum life over         39       Memory capacity check         When this simulation is executed, the current memory capacity is displayed.			Cotup					
0       Stop at druin ne over       Default (AL model)         1       Cancel of stop at drum life over         39       Memory capacity check         When this simulation is executed, the current memory capacity is displayed.	Code number Setup		ault (Al model)					
39       Memory capacity check When this simulation is executed, the current memory capacity is displayed.			1	Cancel of stop at drum life of				
39       Memory capacity check When this simulation is executed, the current memory capacity is displayed. <ul> <li></li></ul>				Cancel of stop at druin me c				
When this simulation is executed, the current memory capacity is displayed.	Ī	39	Memory capacity che	eck				
Code number       Setup         8       8 Mbyte         16       16 Mbyte         40       Polygon motor OFF time setup (Time required for turning OFF after completion of printing) When this simulation is executed, the current setup of the code number is displayed. Enter the code number and press the PRINT switch to enable the setup. <u>Code number</u> Setup           0         0 sec           1         30 sec * Default           2         60 sec           3         90 sec			When this simulation is executed, the current memory capacity is displayed.					
8       8 Mbyte         16       16 Mbyte         40       Polygon motor OFF time setup (Time required for turning OFF after completion of printing) When this simulation is executed, the current setup of the code number is displayed. Enter the code number and press the PRINT switch to enable the setup.         Image: Code number is displayed. Enter the code number and press the PRINT switch to enable the setup.         Image: Code number is displayed. Enter the code number and press the PRINT switch to enable the setup.         Image: Code number is displayed. Enter the code number and press the PRINT switch to enable the setup.         Image: Code number is displayed. Enter the code number and press the PRINT switch to enable the setup.         Image: Code number is displayed. Enter the code number and press the PRINT switch to enable the setup.         Image: Code number is displayed. Enter the code number and press the PRINT switch to enable the setup.         Image: Code number is displayed. Enter the code number and press the PRINT switch to enable the setup.         Image: Code number is displayed. Enter the code number and press the PRINT switch to enable the setup.         Image: Code number is displayed. Enter the code number is displayed.         Image: Code number is displayed.         <			Code number	Setup				
0       0			8	8 Mhvte				
40       Polygon motor OFF time setup (Time required for turning OFF after completion of printing)         When this simulation is executed, the current setup of the code number is displayed. Enter the code number and press the PRINT switch to enable the setup. <ul> <li></li></ul>			16	16 Mbyte				
40       Polygon motor OFF time setup (Time required for turning OFF after completion of printing)         When this simulation is executed, the current setup of the code number is displayed. Enter the code number and press the PRINT switch to enable the setup.         Image: Code number is displayed. Enter the code number and press the PRINT switch to enable the setup.         Image: Code number is displayed. Enter the code number and press the PRINT switch to enable the setup.         Image: Code number is displayed. Enter the code number and press the PRINT setup is displayed. Enter the code number and press the PRINT setup is displayed. Enter the code number and press the PRINT setup.         Image: Code number is displayed. Enter the code number and press the PRINT setup.         Image: Code number is displayed. Enter the code number and press the PRINT setup.         Image: Code number is displayed. Enter the code number and press the PRINT setup.         Image: Code number is displayed. Enter the code number and press the PRINT setup.         Image: Code number is displayed. Enter the code number and press the PRINT setup.         Image: Code number is displayed. Enter the code number and press the PRINT setup.         Image: Code number is displayed. Enter the code number is displayed. Enter the code number and press the PRINT setup.         Image: Code number is displayed. Enter the code number is displayed. E	ļ							
When this simulation is executed, the current setup of the code number is displayed. Enter the code number and press the PHINT switch to enable the setup.         Code number       Setup         0       0 sec         1       30 sec * Default         2       60 sec         3       90 sec		40	Polygon motor OFF time setup (Time required for turning OFF after completion of printing)					
Code number         Setup           0         0 sec           1         30 sec * Default           2         60 sec           3         90 sec			when this simulation switch to enable the	is executed, the current setur setup.	p of the code number is displayed. Enter the code number and press the PRINI			
0         0 sec           1         30 sec * Default           2         60 sec           3         90 sec			Code number	Setun				
1         30 sec * Default           2         60 sec           3         90 sec			0	0 sec				
2 60 sec 3 90 sec			1	30 sec * Default				
3 90 sec			2	60 sec				
			3	90 sec				

Main code	Sub code	Content						
26	42	Transfer ON timing co	trol setup					
-	_	(Operation/Procedure)	(Operation/Procedure)					
		1. When this simulation	n is executed, the currently set code number	s displayed.				
		2. Enter the code nur	ber and press the START key, and the setting	will be changed. (For any number different from the following				
		ones, the default time is automatically set.)						
		Code number	Setting					
		0	Default (330 msec)					
		1	-40 msec					
		2	-30 msec					
		3	-20 msec					
		4	–10 msec					
		5	Default (330 msec)					
		6	+10 msec					
		7	+20 msec					
		8	+30 msec					
		9	+40 msec					
	12	Sido void sotup						
	40	Operation/Procedure						
		1. When this simulation	n is executed, the currently set code number	of the side void amount is displayed.				
		2. Enter the code nur	ber and press the start key. The setting is cha	inged.				
		Codo reversibility	O atting a					
		Code number	Setting					
		0	0 mm					
			0.5 mm					
		2	1.0 mm					
		3	1.5 mm					
		4	2.0 mm * Default					
		5	2.5 mm					
		6	3.0 mm					
		/	3.5 mm					
		8	4.0 mm					
		9	4.5 mm					
		10	5.0 mm					
	<ul> <li>SPF document rear edge read setup + Fax document rear edge scan setup.</li> <li>When this simulation is executed, the currently set code number is displayed. Enter the desired code number and press key, and the display will be changed. The document rear edge scanning area in SPF reduction (less than 100%) copy is The code number is changeable in the range of 0 –8.</li> <li>The default value is 4, and 2 mm of the document rear edge is cut.</li> <li>When the value is changed by 1, the area is changed by 1 mm.</li> </ul>							
	62	Energy-save mode co	y lamp setup					
		Used to set half-ON (5	0%)/OFF of the copy lamp in the pre-heat mo	de.				
		when this simulation i	executed, the current setup of the code num	per is displayed. Enter the code number and press the PRINT				
		switch to enable the setup.						
		Code number	Setup					
		0	Copy lamp half-ON (50%) * Default					
		1	Copy lamp OFF					
-	per is displayed. Enter the code number and press the PRINT							
Code number Setup								
	2 2-speed fan control ^ Default when starting mass production							
Main code	Sub code			Content				
--------------	-------------	--	--	---	--			
30	01	Paper sensor status of	lisplay					
		Indicates the paper se	ensor status using the lamps	on the operation panel.				
		S.	ansor name	Dieplay Jamp	]			
		Before-resist paper	r sensor (PPD1)	Developer cartridge replacement lamp				
		Eusing section paper	er sensor (PPD2)					
		Paper exit sensor (	(POD)	Photoconductor cartridge replacement lamp				
		2nd CS paper sens	sor (PPD3)	2nd cassette lamp				
		New drum cartridge	e sensor (PUIS)	Zoom lamp				
		Single manual feed	paper sensor (MFD)	AE lamp				
43	01	Fusing temperature so (Operation/Procedure 1. When this simulati 2. Enter the code number	etup (Normal copy) ) ion is executed, the currently mber and press the START	/ set code number is displayed. key, and the setting will be changed.				
				-				
		1	180	-				
		2	185	_				
		3	190	-				
		4	195 (* Default)					
		5	200					
-	~ ~ ~			—				
		Code number     O	by ion is executed, the currently mber and press the START Set temperature (°C)	y set code number is displayed. key, and the setting will be changed.				
		1	160					
		2	165					
		3	170 (* Default)					
		4	175					
		5	180					
	05	Fusing temperature s In duplex copy, this se of the code number is	etup in duplex copy etup value is added to the fu displayed. Enter the code n	sing temperature of single copy. When this simulation number and press the PRINT switch to enable the se	on is executed, the current setup etup.			
			$+0^{\circ}C * Default$	4				
		1	-8°C	-				
		2	-6°C	-				
		3	-4℃					
		4	-2°C					
		5	±0°C					
		6	+2℃					
		7	+4℃					
		8	+6℃					
		9	+8℃					
	09	Setup of fusing contro	ol of postcard size paper					
		Code number	Setup	]				
		0	Cancel * Default	1				
		1	Setup	1				
		The default for Japa	an model is "1."	-				

Main code	Sub code		Content			
46	01	Copy density adjustment (300d	pi)			
		Used to set the copy density in	each mode.			
		Operating procedure)				
		Vhen this simulation is executed, warm-up and shading operations are performed and the current setup is displayed in two digits				
		(default: 50).	a convigurantity keys. Press the PRINT switch and a convis made according to the new setur			
		The greater the setup value is.	the darker the copy is. The smaller the setup value is, the brighter the copy is. Only EXP.3 copy is made			
		in this simulation. When set to	a darker level, Exp.1 and Exp.5 copies also become darker. When set to a brighter level, Exp.1 and			
		Exp.5 copies also become brig	nter. Press the CLEAR key to save the setup and exit from the simulation mode.			
		Use the copy mode select key	o select a copy mode . The setup value of the selected copy mode is displayed on the copy quantity			
		display.				
		Copy mode	Display lamp			
		AE mode (300dpi)	AE mode lamp			
		TEXT mode (300dpi)	TEXT mode lamp			
		PHOTO mode	PHOTO mode lamp			
		TS mode (TEXT) (300dpi)	TEXT mode lamp & PHOTO mode lamp			
		TS mode (AE) (300dpi)	AE mode lamp & PHOTO mode lamp			
-	02	Copy density adjustment (600d	pi)			
		Used to set the copy density in	each mode.			
		(Operation/Procedure)				
		When this simulation is execute	ed, the machine performs warm-up and shading, and the current setup value is displayed in two digits.			
		(Default: 50)	ande the seturin value, and pross the PRINT switch to make a conviwith the new seturi			
		The greater the setup value is.	the darker the copy is, and vise versa. Only EXP 3 copy is made. If it is set to a darker density, EXP 1			
		and EXP.5 copies also become	darker. If it is set to a brighter density, they also become brighter.			
		When the CLEAR key is presse	d, the entered setup value is saved and the simulation is terminated.			
		Any copy mode can be selected	d with the copy mode select key. The setup value of the selected copy mode is displayed on the copy			
		quantity display.				
		(Setup range: 0 –99)				
		Copy mode	Display lamp			
		AE mode (600dpi) AE mode lamp				
		TEXT mode (600dpi)	TEXT mode lamp			
		PHOTO mode	PHOTO mode lamp			
		TS mode (TEXT) (600dpi)	TEXT mode lamp & PHOTO mode lamp			
		TS mode (AE) (600dpi) AE mode lamp & PHOTO mode lamp				
-	18	Image contrast adjustment (300	)dpi)			
		Used to set the image contrast	in each mode.			
		(Operating procedure)				
		When this simulation is execute	d, warm-up and shading operations are performed and the current setup value is displayed in two digits.			
		(Default: 50)	a convigurantity kova. Droco the DDINT quitch and a convie made according to the new actum. The			
		Change the setup value with the copy quantity keys. Press the PHINT switch and a copy is made according to the new setup. The				
		is made in this simulation, the contrast levels in EXP.1 and EXP.5 are also changed. Press the CI FAR key to save the setup and exit				
		from the simulation mode.				
		Use the copy mode select key to select a copy mode . The setup value of the selected copy mode is displayed on the copy quantity				
		display.				
		(adjustment range: 0 –99)				
		Copy mode	Display lamp			
		AE mode (300dpi)	AE mode lamp			
		TEXT mode (300dpi)	TEXT mode lamp			
		PHOTO mode	PHOTO mode lamp			
		TS mode (TEXT) (300dpi)	TEXT mode lamp & PHOTO mode lamp			
		TS mode (AE) (300dpi)	AE mode lamp & PHOTO mode lamp			

Main code	Sub code			Content	
46	19	$\gamma$ table setup or AE or	peration mo	e setup	
		When this simulation	is executed	the current setup of the gamma table code nu ling to desired gamma table, and press the P	umber is displayed. (Default: Japan = 1, EX Japan = 2) PRINT switch or the copy mode select key to enable the
		setup.			
		Code number	Code number v table		
		1	Image gu	ty priority mode	
		2	Toner cor	umption priority mode	
		When the copy mode	select kev	pressed during setup of the gamma table, the	e mode is switched to the AE operation setup mode and
		the current setup of th	of the AE operation mode code number is displayed. (Default: 0) Enter the code number corresponding to your		
		desired AE operation key is pressed, the m	mode, and press the PRINT switch or the copy mode select key to switch the setup. (When the copy mode se ode is returned to the gamma table setup mode.)		
Code number AE operation mode					
		0	0 Fixed process * Default		
		1	Real time	rocess	
	20	SPF exposure correct	tion		
		Used to adjust the exp (Operating procedure	posure cor	ction quantity in the SPF mode by adjusting the	he differential of Vref voltage for the OC mode.
		When this simulation	is executed	the current setup is displayed. Enter the adju	stment value with the 10-key and press the PRINT key
		to enable the setup a	nd make a	py. the entered value is saved and the simulation	n mode is terminated
		* The greater the val	ue is the da	ker the exposure is.	
		The smaller the val	ue is, the b	phter the exposure is.	
	29	Image contrast adjust	tment (600)	i) ode	
		(Operation/Procedure	e)	006.	
		When this simulation	is executed	the machine performs warm-up and shading,	and the current setup value is displayed in two digits.
		(Default: 50)			
		The greater the setup	value is. ti	greater the contrast is. and vise versa. Only	EXP.3 copy is made, however, EXP.1 contrast and
		EXP.5 contrast are al	so change	accordingly.	,, _,, _
		When the CLEAR key	/ is pressed	the entered setup value is saved and the sim	ulation is terminated.
		quantity display.	e selected	in the copy mode select key. The setup valu	e of the selected copy mode is displayed on the copy
		(Setup range: 0 -99)			
		Copy mod	e	Display lamp	7
		AE mode (600dpi)	-	E mode lamp	
		TEXT mode (600d	pi)	EXT mode lamp	
		PHOTO mode	000.1.1)	HOTO mode lamp	-
		TS mode (TEXT) (	600api) Odni)	EXT mode lamp & PHOTO mode lamp	-
			oupi)		<b>→</b>
	31	Image sharpness adju	ustment	ff of an image in each mode	
		(Operating procedure	)	n or an image in each mode.	
		When this simulation	is executed	warm-up and shading operations are perform	ed and the current setup value is displayed. (Default: 1)
		Change the setup value of the se	ue with the the entered	ppy quantity keys. Press the PRINT switch an etun value is saved and the simulation is terr	d a copy is made according to the new setup. When the minated
					initiated.
		Setup value Image quality			
		0 Shading off			
		2 Clear			
		Any desired convince can be selected with the convince select key. The code number of the colorted convince is disp		de number of the colocted convinced is displayed on	
		the copy quantity disp	olay.	ected with the copy mode select key. The co	de number of the selected copy mode is displayed of
		Copy mode		Display lamp	
		AE mode	AE m	de lamp	
		TEXT mode	TEXT	node lamp	
		PHOTO mode	PHO	) mode lamp	
		TS mode (TEXT)	TEXT	node lamp & PHOTO mode lamp	
		IS mode (AE)	AE m	ae lamp & PHO I O mode lamp	

code	Sub code	Content						
46	32	Copier color reproduction setup						
		Used to set color rep	roduction for ea	ich mode. Colo	ors which are e	easily copied or which	are not easily cop	bied are selected.
		Setup value	Easv-to	-copy colors	Diffic	ult-to-copy colors	7	
		0	Purple/Blue/F	led	Yellow/Gr	een/Light blue	-	
		1	Light blue/Gre	en/Blue	Purple/Re	ed/Yellow	_	
		2	Yellow/Red/G	reen	Blue/Ligh	t blue/Purple		
		* This setup does	not affect black	-and-white co	pies.			
		<ul> <li>(Operating procedure)</li> <li>When this simulation is executed, the current setup of the code number for each copy mode is displayed. (Default: 0)</li> <li>Change the setup value with the copy quantity keys and press the Print switch. A copy will be made according to the setup. At the color component used for copying is changed.</li> <li>When the clear key is pressed, the entered code number is saved and the simulation mode is terminated.</li> <li>Any desired copy mode can be selected with the copy mode select key. The selected copy mode is displayed on the copy quadratical display.</li> </ul>				I. (Default: 0) rding to the setup. At that time, d. layed on the copy quantity		
		Code number	Compone	nt of use				
		0	Green * Defa	ult				
		1	Red					
		2	Blue					
		Copy m	node	Displa	y lamp			
		AE mode (includin	ig TS)	AE mode lam	ip			
		TEXT mode (inclu	ding TS)	TEXT mode la	amp			
		PHOTO mode		PHOTO mode	e lamp			
<ul> <li>The OC/document center offset value and the image scan start position automatically set in this simulation, can be respective manual setup simulation for each adjustment shown below.</li> <li>OC/document center offset → Sim50-10 Center offset adjustment Image scan start position → Sim50-01 Lead edge image position</li> <li>(2) Front/rear direction magnification ratio manual correction: By key operations, the front/rear (main scanning) direction ratio is set by changing the setup value of the ZOOM DATA register to AISC.</li> <li>(3) Scan direction magnification ratio correction: The scan direction magnification ratio is set by changing the setup value of the ZOOM DATA register to AISC.</li> <li>(4) SPF mode scan direction magnification ratio correction: The SPF mode scan direction magnification ratio is set by scan speed.</li> <li>(Operating procedure)</li> <li>When this simulation is executed, the current setup value is displayed in two digits. (Center value: 50) Press the copy r to select each setup mode and the setup display will change accordingly. In the case of the front/rear direction automation when the PRINT switch is pressed, the mirror base unit moves to the shading white board, and the width of the referer scanned, and the correction value is calculated, and the value is saved.</li> <li>For manual adjustment, enter the adjustment value with the 10-key and press the PRINT switch, the set value will be saved.</li> </ul>				Inning) direction magnification s set by changing the scan ratio is set by changing the ress the copy mode select key rection automatic adjustment, n of the reference line is value will be saved and a copy erminated. (Increasing the				
		setup value by 1 incr	eases 0.1%.)					
			Adjustme	ent mode		Lam	np ON	
		Front/rear direction	n magnification	ratio automati	c correction	AE lamp		
		Front/rear direction	n magnification	ratio manual c	correction	TEXT lamp		
		SPF mode scan d	irection magnifi	correction	rrection		)TO lamos	
		In the front/rear direc	tion magnificati	on ratio autom	natic correction			1
		(1) when the calculat	ted value of the	scan correction	on value is with	in ±5%, "" is display	/ea. allation of the lens	unit etc
		(2) In case of a scan	error of the refe	erence line. the	e jam lamp ligh	ts up.		unit, 6t0.
		(Cause) CCD err	or, no white boa	ard installed.	,	r		
		* If the automatic co	rrection of the n	nagnification ra	atio cannot pro	vide a satisfactory res	sult, use the manu	al correction.

Main code	Sub code	Content					
49	01	Flash ROM progra	am writing mode				
_		(Operating proced	dure)				
		When this simulat	tion is executed, "d" is d	lisplayed on the di	splay and the machine ente	ers the Flash RO	OM program writing mode.
		Use the writing to	ol to write the program	from PC. During w	riting, the display indicates	as shown below	w. After completion of
		downloading, turn	OFF/ON the power to	reset.			
			Statuc	Dicplay	Pro host lamp	Poody lar	20
		Download data	reception	"d" ON			
		Data erase sta	rt	"d" ON	OFF		
		Data writing (B	not section)	"d" ON	Blink		
		Data writing (D	rogram section)	"d" ON	Blink	Blink	
		Sum check	ogram oootion)	"d" ON	ON	ON	
		Download com	plete	"0FF" ON	OFF	OFF	
		Error state	piero	"E *" ON	OFF	OFF	
		* "*" in an error	display indicates the e	rror position	011	011	
			Data reception error				
		2					
		3 F		at a action)			
		4 f		correspondence			
		5 6	CLASH HOW WITHING (FI	tion)			
			Sum check (Boot soctio	n)			
		8	Sum check (Program se	n) action)			
		0	Sam check (i Togram Se				
		50) Press the cop 10-key and press value and exit from	y mode select key to se the PRINT switch, and m the simulation mode	the setup value is the setup value with the setup value with the setup value with the adjustr	coy mode, and the display of ill be saved and a copy will nent is made for the main c	p value is displa will change. Ent be made. Press assette feed, al	ter the adjustment value with the s the clear key to save the setup II the adjustment values at all the
		paper feed ports I	pecome the same. (Incr	easing the setup v	value by 1 corresponds to a	bout 0.1mm shi	ift.)
			Adjustment mode		Lamp ON		
		Print start r	osition (Main cassette	naner feed)	AF main cassette lamp		
		$\Rightarrow$ Print start position (Main cassette		aper feed)	AE, 2nd cassette lamp		
		Print start p	osition (Manual paper f	ieed)	AE, manual feed lamp		
		Image lead	edge void guantity		TEXT lamp		
		Image scar	n start position		PHOTO lamp		
		Image rear	edge void quantity		AE, TEXT, PHOTO lamp		
		☆ SPF image	scan start position		AE, TEXT lamp		
		☆: Supported	if the model is installed	l and skipped if it is	s not installed.		
		(Adjustment proc	adura)				
			edule)				
			AE ON	[]	TEXT ON	PHOTO ON	I
		1. Set the print s	tart position (Å). the lea	d edge void guanti	ity (B) and the scan start po	sition (C) to 0.	and make a copy at 100%.
		2. Measure the in	mage loss quantity (R m	nm) of the scale.	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	(-,,	
		Set C = $10 \times F$	R (mm) (Example: Set 4	0.)		(Example)	Distance from the paper lead edge
		When the valu	e C is increased by 10,	the image loss is	decreased by 1mm.		to the image lead edge: H = 5mm
		(Default: 50)			to the factor of t	Γ	Image loss:
		3. Measure the d	listance (H mm) from th	e paper lead edge	to the image print		R = 4mm
		Start position. Set $A = 10 \lor F$	(mm) (Example: set (	50)			
		When the value	e A is increased by 1m	m, the image lead	edge is shifted to		5mm
		the paper lead	edge by 1mm. (Defaul	t: 50)			
		4. Set the lead e	dge void quantity to B =	50 (2.5mm). (Def	ault: 50)		
		When the valu	e B is increased by 10,	the void is increas	sed by about 1mm.		10mm
		(When set to 2	25 or less, the void beco	omes zero.)			
		* The SPF adjust	ment is performed by a	djusting the SPF ir	mage scan start position.		

Main code	Sub code	Content					
50	10	Center offset adjustment Used to adjust the copy image position on the copy paper and the center offset position when scanning a document. (Operating procedure) When this simulation is executed, the current setup value is displayed. Enter the adjustment value with the 10-key and press the PRINT					
		switch, and the enter and the simulation wi	witch, and the entered value will be saved and a copy will be made. When the clear key is pressed, the entered value will be saved and the simulation will be terminated. (When the setup value is increased by 1, shift is increased by 0.1mm.)				
			Adjustment mode		Lamp ON		
		Print center off	íset (Main cassette paper fe	ed)	AE, main cassette lamp		
		☆ Print center off	iset (2nd cassette paper fee	ed)	AE, 2nd cassette lamp		
		Print center off	iset (Manual paper feed)		AE, manual paper feed lamp		
		OC/document	center offset		AE, TEXT lamp		
		SPF/RSPF (fro	ont) document center offset		AE, TEXT, PHOTO lamp		
		Supported onl	ly for installing models, and	skipped for	not-installing models.		
		* When the setup va When the adjustme When the adjustme	lue is too great, outside of the internet of the is decreased, the is decreased, the internet of the internet	the shading mage is shil image is sh	area may be read, and black s fted to the left. ifted to the right.	streaks may be produced on the edges.	
51	02	Resist quantity adjust	tment				
		Used to adjust the co	ntact pressure of paper aga	ainst the ma	ichine resist roller and the RSF	PF resist roller.	
		When this simulation	is executed. the current set	tup value is	displayed.		
		Enter the adjustment	value with the 10-key and p	press the PI	RINT switch, the entered set va	alue will be saved and a copy will be made.	
		When the clear key is	s pressed, the entered value	e will be sav	ved and the machine will exit fr	om the simulation mode.	
		A	diustment mode		Lamp ON	1	
		Main cassette	paper feed	AE, r	nain cassette lamp		
		☆ 2nd cassette p	aper feed	AE, 2	2nd cassette lamp		
		Manual paper	feed	AE, r	nanual paper feed lamp		
		☆ RSPF docume	ent feed (front)	AE, 1	FEXT, PHOTO lamp		
		☆ RSPF docume	nt feed (back)	AE, 1	FEXT lamp		
		☆ duplex back		TEXT	Г, PHOTO lamp		
		☆ : Supported onl	ly for installing models, and	skipped for	not-installing models.		
53	08	SPF scan position automatic adjustment Place a black chart so that it covers the SPF scan glass and the OC glass, and execute the simulation with the OC cover open, the mirror unit scans from the home position to the SPF scan position to identify the SPF glass cover edge position by the difference in the CCD output levels of the SPF glass cover edge and the OC side document glass. Default is 50. Adjustment range is 0 – 99. Adjustment increment: 1 = about 0.127mm If this adjustment is performed properly, the adjustment value is displayed. If it is abnormal, the jam lamp lights up. If the adjustment is not made properly. "––" is displayed.					
61	03	Polygon motor check	(HSYNC output check)				
		When the START key	e) v is pressed_HSYNC is perf	formed and	the polygon motor is rotated fo	or 30 sec	
		At that time, the Zoon	n lamp is lit for 100msec for	r every 3 tin	nes that the HSYNC is detected	d.	
63	01	Shading check Used to display the detection level of the white board for shading. (Operating procedure) When the PRINT switch is pressed, the mirror base unit moves to the white board for shading to light the copy lamp. Under this state, the level of one pixel at the CCD center which is not corrected for 10sec in 1 sec, and the result is displayed on the value display section					
64	01	Self print					
		Print of one page is made regardless of the status of the optical system. (Operating procedure)					
		When this simulation select the cassette wi	is executed, warm-up is pe ith the cassette select key a of the selected pattern will I	erformed and and press th be made. P	d the ready lamp is lighted. En ne PRINT switch, and paper fee printing is in 1bv2 mode, or grid	ter the code number with the 10-key, and ed operation will be made from the selected I pattern.	
						P	
		Code number	Pattern				
		0	1by2				
			Grid pattern				
		* 2 – 99: print in 1by2.					

# 4. Trouble codes

# A. Trouble codes list

Main code	Sub code	Trouble content	Detail of trouble
E7	01	Duplex model memory setup error, memory not- detected error	The memory is not set properly or the memory capacity is not set to the duplex setup (6M). Cancel method: Set SIM 26-39 code number to 2.
	02	HSYNC not detected.	LSU (laser diode, reception element, APC circuit) trouble LSU drive circuit (ASIC) trouble
	10	CCD black level trouble	CCD drive circuit (CCD PWB, ASIC, harness) trouble
	11	CCD white level trouble	CCD drive circuit (CCD PWB, ASIC harness) trouble Copy lamp lighting trouble (Copy lamp, inverter PWB)
	12	Shading trouble (White correction)	Dirt on white plate for scanning white level
	16	Laser output trouble	LSU (laser diode, reception element, APC circuit) trouble LSU drive circuit (ASIC) trouble
F5	02	Copy lamp disconnection trouble	Copy lamp or copy lamp drive circuit (inverter PWB) trouble Copy lamp disconnection
H2	00	Thermistor open detection	The fusing thermistor is open.
H3	00	Heat roller abnormally high temperature	The fusing temperature rises above 240°C.
H4	00	Heat roller abnormally low temperature	The fusing temperature does not reach 185°C within 27 sec of turning on the power, or the fusing temperature keeps at 140°C.
L1	00	Feeding is not completed within the specified time after starting feeding. (The scan head locking switch is locked)	The white area and the black marking on the shading plate are used to obtain the difference in the CCD level values for judgment of lock. When the difference in the levels of which and black is small, it is judged that the black mark could not be scanned by lock and the trouble code "L1" is displayed.
L3	00	Return is not completed within the specified time.	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.
L4	01	Main motor lock	When the main motor encoder pulse is not detected for 100 msec.
L6	10	Polygon motor lock	The lock signal (specified rpm signal) does not return within a certain time (about 20 sec) from starting the polygon motor rotation
U2	01	Counter sum check error	When the counter check sum value stored in the EEPROM is abnormal.
	04	EEPROM serial communication error	When a communication trouble occurs with the EEPROM.

# [11] USER PROGRAMS

The conditions of factory setting can be changed according to the use conditions.

# 1. Functions that can be set with user programs

Function	Contents	Factory setting
Auto clear	• When a certain time is passed after completion of copying, this function returns to the initial state automatically. The time to reach the initial state can be set in the range of 30 sec to 120 sec by the unit of 30 sec. This function can be disabled.	60 sec
Pre-heat	<ul> <li>When the copier is left unused with the power ON, the power consumption is automatically reduced to about 40Wh/H (* Note). The time to start this function can be set in the range of 30 sec to 90 sec by the unit of 30 sec. This function cannot be disabled.</li> <li>When this function is operated, the pre-heat lamp on the operation panel lights up. To return to the initial state, press any key on the operation panel. (When the COPY button is pressed, a copy is made after returning to the initial state.)</li> </ul>	30 sec
Auto shut off passing time	<ul> <li>When the copier is left unused with the power ON, the power consumption is automatically reduced to about 18Wh/H (* Note). The time to start this function can be set in the range of 2 min to 120 min.</li> <li>When this function is operated, all the lamps except for the pre-heat lamp on the operation panel turn off. To return to the initial state, press the COPY button.</li> </ul>	5 min
Stream feeding	Only models with SPF	Set
Auto shut off setting	Used to set or cancel this function.	Set
Auto/Manual mode resolution setup	• Used to set the resolution in the auto/manual mode. The speed priority (300dpi) and the resolution priority (600dpi) are effective for fine text and ultra fine text.	300 dpi

\* Note: The power consumption values in pre-heat and auto shut off may be varied depending on the use conditions.

# 2. Change the setting

Example: Changing the time to operate the auto clear function (Change from 60 sec to 90 sec)

- Press the right and the left exposure adjustment keys simultaneously to start setting.
- Keep pressing the keys for 5 sec.
- Display lamps ( ), 84, ... ) blink simultaneously and " -- " is displayed on the copy quantity display.
- 2) Select the function code with the 10-digit key (copy quantity set key).
- The number of the selected function blinks on the digit of 10 on the copy quantity display.
- For auto clear, select " 1. "
- · For setting, refer to the following function codes.

Function name	Function code
Auto clear	1
Pre-heat	2
Auto shut off passing time	3
Stream feeding	4*
Auto shut off setting	5
Auto/Manual mode resolution setup	6

[Cancel] If a wrong code is entered, press the clear key and enter the correct function code.

- The number blinking on the digit of 10 of the copy quantity display is lighted.
- The number of the current set code blinks on the digit of 1.
- 4) Select the setting code with 1-digit key (copy quantity set key).
- To set to 90 sec, select " 4. "
- For setting, refer to the following set codes.

Function name	Set code
Auto clear	0 (OFF)
	1 (10 sec)
	2 (30 sec)
	*3 (60 sec)
	4 (90 sec)
	5 (120 sec)
Pre-heat	*0 (30 sec)
	1 (60 sec)
	2 (90 sec)
Auto shut off	0 (2 min)
	*1 (5 min)
	2 (15 min)
	3 (30 min)
	4 (60 min)
	5 (120 min)
Stream feeding	0 (Cancel)
	*1 (Setting)
Auto shut off setting	0 (Cancel)
	*1 (Setting)
Auto/Manual mode resolution setup	*0 (300 dpi)
	1 (600 dpi)

\* Factory setting

- The number blinking on the digit of 1 of the copy quantity display is lit up. This means the setting is completed.
- [Cancel] When a wrong number of the function code is set, press the clear key and perform the procedure again from step 2.
- 5) Press the COPY button.
- The number blinking on the digit of 1 of the copy quantity display is lit up. This means the setting is completed.
- Note: To set another function, press the clear key after completion of this operation and perform the procedure from step 2.
- Press either one of the exposure adjustment keys ( or ) to complete the setting.
- Display lamps ( , , , , ) go off and the copy quantity display returns to the normal state.

<sup>\*</sup> SPF only

<sup>3)</sup> Press the COPY button.

# 3. Density level adjustment

# A. AE level adjustment (OC mode)

## [Input procedure]

When the density select key is pressed and held for 5 sec after turning on the [PHOTO] mode lamp, the [AUTO] mode lamp blinks and the current setup of the density level is displayed.

# [Adjustment]

The adjustment is made in 5 steps by pressing the density adjustment key.

# [Terminating procedure]

When the density select key is pressed, the mode display is changed from blinking to lighting, and the AE level setup is completed.

- In the AE level adjustment mode, all the keys except for the [Density select] key, the [Density adjustment] keys ([>] key and [<] key) are disabled.
- In the AE level adjustment mode, the ready lamp and the online lamp are turned off.
- The auto mode level adjustment is applied only for the auto mode.
- When the machine enters the exposure adjustment mode of OC once, the adjustment mode is not changed though a document is set on the SPF until the setup is completed.

# B. AE level adjustment (SPF mode)

## [Input procedure]

With the SPF mode lamp ON, when the density select key is pressed and held for 5 sec after turning on the [PHOTO] mode lamp, the [AUTO] mode lamp blinks and the current setup of the density level is displayed.

## [Adjustment]

The adjustment is made in 5 steps by pressing the density adjustment key.

## [Terminating procedure]

When the mode select key is pressed, the mode display is changed from blinking to lighting, and the AE level setup is completed.

- During the AE level adjustment mode, all the keys except for the [Density select] key, the [Density adjustment] keys ([>] key and [<] key) are disabled.
- During the AE level adjustment mode, the ready lamp and the online lamp are turned off.
- The auto mode level adjustment is applied only for the auto mode.
- When the machine enters the SPF exposure adjustment mode once, the adjustment mode is not changed though a document is removed from the SPF until the setup is completed.
- This function is not available for the OC model.

# 4. Toner save mode setup and cancel

## [Input procedure]

When the density select key is pressed and held for 5 sec after turning on the [TEXT] mode lamp, the [PHOTO] mode lamp blinks and the current setup of the density level is displayed.

## [Setup/Cancel]

When the density adjustment key [<] is pressed, Level 1 is lighted and the toner save mode is set.

When the density adjustment key [>] is pressed, Level 5 is lighted and the toner save mode is canceled.

## [Terminating procedure]

When the density select key is pressed, the mode display is changed from blinking to lighting, and the setup is completed.

- During the toner save mode setup, all the keys except for the [Density select] key, the [Density adjustment] keys ([>] key and [<] key) are disabled.
- During the toner save mode setup, the ready lamp and the online lamp are turned off.
- The toner save mode is applied in the auto mode and the manual mode.

# [12] ELECTRICAL SECTION

# 1. Block diagram

A. Overall block diagram





# 2. Circuit descriptions

# A. Main PWB (MCU)

# (1) General

The MCU PWB is composed of:

- CPU peripheral sections which perform mechanical sequence control and function job management
- Image process ASIC which performs image process, CCD control, LSU control, and print control
- Motor control circuit
- Mechanical load, sensor I/O circuit

It controls the processes for copying, the transport loads, fusing, the optical system, the operation panel, and the option PWB.

# (2) CPU signal table (HD6412320F)

PIN	Signal code	Input/	Operating
110.	1001	Output	SPAM obin coloct
1	/031	Output	Shaw chip select
2	/CSU	Output	
3	GND		DGND
4	GND		DGND
5	Vcc		CPU3.3V
6	AO	Output	Address bus
7	A1	Output	Address bus
8	A2	Output	Address bus
9	A3	Output	Address bus
10	GND	-	DGND
11	A4	Output	Address bus
12	A5	Output	Address bus
13	A6	Output	Address bus
14	A7	Output	Address bus
15	A8	Output	Address bus
16	A9	Output	Address bus
17	A10	Output	Address bus
18	A11	Output	Address bus
19	GND		DGND
20	A12	Output	Address bus
21	A13	Output	Address bus
22	A14	Output	Address bus
23	A15	Output	Address bus
24	A16	Output	Address bus
25	A17	Output	Address bus
26	A18	Output	Address bus
27	A19	Output	Address bus
28	GND		DGND
29	A20		Pull-Up
30	PSW	Interruption	Print SW
		level input	
31	SPPD	Interruption	SPF paper sensor
		level input	
32	CCD_TG	Interruption	CCD horizontal sync signal
		level input	
33	Mt_at_home	Interruption	Mirror Home Position
		level input	
34	/CPUSYNC	Interruption	Horizontal sync (ASIC)
		level input	
35	GND		DGND
36	GND		DGND
37	FW	Interruption	Zero cross signal
		level input	5
38	ARB_INT	Interruption	ASIC interruption
		level input	
39	Vcc	· · · · ·	CPU3.3V
40	D0	Data I/O	Data bus
41	D1	Data I/O	Data bus
42	D2	Data I/O	Data bus
43	D3	Data I/O	Data bus
44	GND		DGND

PIN	Signal code	Input/	Operating
No.	D4	Output	Data hua
45	D4	Data I/O	Data bus
40	DS	Data I/O	Data bus
47	D7	Data I/O	Data bus
49	D8	Data I/O	Data bus
50	D9	Data I/O	Data bus
51	D10	Data I/O	Data bus
52	D11	Data I/O	Data bus
53	GND		DGND
54	D12	Data I/O	Data bus
55	D13	Data I/O	Data bus
56	D14	Data I/O	Data bus
57	D15	Data I/O	Data bus
58	Vcc		CPU3.3V
59	ONL	Output	Online LED control
60	TxD1	Output	For debug
61	D_CONT	Output	USB Pull-Up control
62	BEO	Output	OPE LED control
63	RESETOUT1	Output	ASIC Reset signal
64	CL_Reset	Output	Copy lamp control
65	GND		DGND
66	/DREQ0		Pull-Up
67	GND		DGND
68	GND		DGND
69	RY/BY	Input	Flash Busy signal
70	KIN1	Input	HC151 selector detection
71	KIN2	Input	HC151 selector detection
72		Output	Toner motor lock
73		Output	Shut off control
74	PUFF	Output	Bolygon clock
75		Output	Puplex Motor signal
70	DMT1	Output	Duplex Motor signal
78	DMT2	Output	Duplex Motor signal
79	DMT3	Output	Duplex Motor signal
80	WDTOVE	Output	NC Pull-Up
81	/RES	Input	Reset
82	NMI	Output	NC Pull-Up
83	STBY	Output	NC Pull-Up
84	Vcc		CPU3.3V
85	XTAL	Input	Clock
86	EXTAL	Output	Clock
87	GND		DGND
88	CPUCLK	Output	NC
89	Vcc		CPU3.3V
90	Reset OUT		NC
91	/HD	Output	Head signal
92		Output	write signal (High address)
93		Output	vvrite signal (Low address)
94	SELING	Output	
90		Output	
90 07	FAXSTS	Juipui	NC
97	FAXCMD		NC
99	GND		DGND
100	GND		DGND
101	SCL	Output	EEPROM clock
102	DSDA	Data I/O	EEPROM Data bus
103	AVcc		CPU3.3V
104	Vref		CPU3.3V
105	RTH	Analog	Fusing thermistor
		input	
106		Analog	NC Pull-Up
		input	
107	SIN1	Input	HC151 select detection
108	SIN2	Input	HC151 select detection
109	SIN3	Input	HC151 select detection

PIN	Signal codo	Input/	Operating
No.	Signal code	Output	Operating
110	USBIN	Input	IF PWB detection signal
111		Input	NC
112		Input	NC
113	Avss		DGND
114	GND		DGND
115	/SCANSP	Output	Scan STOP signal
116	/SCANST	Output	Scan START signal
117	/TRANSST	Output	ASIC transfer signal
118	/PRINTST	Output	Print Start signal
119	SPMT3	Output	SPF motor signal
120	SPMT2/MIRCNT	Output/	SPF motor signal/mirror
		Input	counter
121	SPMT1	Output	SPF motor signal
122	SPMT0	Output	SPF motor signal
123	GND		DGND
124	GND		DGND
125	Vcc		CPU3.3V
126	PSL	Output	Power save LED control
127			NC
128	/CS2	Output	ASIC chip select

# (3) Image process ASIC (HG73C119HF)

## a. General

The ASIC is composed of the three major blocks: the image process section, the print control section, and the  $\ensuremath{\mathsf{I/F}}$  section.

Image process section:

With image data from the CCD PWB in the operation mode determined by the register setup, shading, AE process, input  $\gamma$  correction, area separation, filter process, resolution conversion, zoom process, output  $\gamma$  correction, binary conversion (error diffusion, dither method, simple binary conversion) are performed.

Print control section:

When copying, the image-processed data are outputted to the LSU according to the LSU writing timing. When scanning, the image data are made into 8bit width and outputted to the I/F section (USB).

#### I/F section:

Controls the DRAM which is the image data buffer, and processes data send/receive between the USB I/F and the IEEE1284 I/F.

The ASIC is controlled by writing the operation mode and the necessary setup values of the operation mode into the ASIC control register before starting each operation. (For ASIC Pin configuration, refer to the table at the end of this document.)



#### b. ASIC (Signal table)

PIN No.	Signal Name	IN/OUT	Connected to	Description
1	cpu_ad7	IN	CPU	CPU address bus
2	cpu_ad6	IN	CPU	CPU address bus
3	cpu_ad5	IN	CPU	CPU address bus
4	cpu_ad4	IN	CPU	CPU address bus
5	VCC(CORE/DC) 3.3V	Power		
6	cpu_ad3	IN	CPU	CPU address bus
7	cpu_ad2	IN	CPU	CPU address bus
8	GND(CORE/DC)	Power		
9	cpu_ad1	IN	CPU	CPU address bus
10	sgs	OUT	Tr array IC	SPF/RSPF gate solenoid control signal "H":ON

PIN No.	Signal Name	IN/OUT	Connected to	Description
11	srrc	OUT	Tr array IC	SPF/RSPF resist roller clutch control signal "H":ON
12	spus	OUT	Tr array IC	SPF/RSPF document feed solenoid control signal "H":ON
13	spfs	OUT	Tr array IC	SPF/RSPF document transport solenoid control signal "H":ON
14	mrps1	OUT	Tr array IC	SPF/RSPF motor current control signal
15	mrps2	OUT	Tr array IC	SPF/RSPF motor current control signal

PIN No.	Signal Name	IN/OUT	Connected to	Description
16	ope_latch	OUT	Tr array IC	Operation circuit latch
				signal. Data take-in at
17	an data			"L"
17	op_data	001	Tr array IC	Signal
18	VCC(AC) 3.3V	Power		
19	op_clk	OUT	Tr array IC	Operation circuit clock
	-			signal
20	vfmcnt	OUT	Tr array IC	Ventilation fan rotation
				"H": High speed, "L":
				Low speed
21	GND(AC)	Power		
22	vfm	OUT	Tr array IC	Ventilation fan control
23	tc	OUT	Tr array IC	Transfer charger
20		001	in anay io	control signal. "H":ON
24	gridl	OUT	Tr array IC	Main charger grid
				control signal. "H": L
25	mc	OUT	Tr array IC	Main charger control
				signal. "H": ON
26	mrps3	OUT	Tr array IC	SPF/RSPF motor
07			Tr orrow IC	current control signal
27	mm_y3	001	Tr array IC	control signal
28	bias	OUT	Tr array IC	DV bias control signal.
			-	"H":ON
29	lden	OUT	Tr array IC	Laser circuit control
				signal. "H": Laser circuit ON
30	pmd	OUT	Tr array IC	Polygon motor control
			-	signal. "H": Polygon
01		Davian		motor ON
32	mmd	OUT	Tr array IC	Main motor control
02	lining	001	IT allay to	signal. "H": Main motor
				ON
33	GND(CORE/DC)	Power		
34	3 3V	Power		
35	mpfs	OUT	Tr array IC	Manual feed solenoid
	•		,	control signal. "H": ON
36	cpfs2	OUT	Tr array IC	Second cassette
				paper feed solenoid
37	cpfs1	OUT	Tr arrav IC	Cassette paper feed
				solenoid control
-				signal. "H":ON
38	pottr		Tr arroy IC	(Not used)
39	115	001	i i anay iC	control signal. "H":ON
40	pr	OUT	Tr array IC	Power relay control
			<b></b> · -	signal. "H":ON
41	ni	OUT	Ir array IC	Heater lamp control
42	TMON	OUT	Tr arrav IC	(Not used)
43	TM_	OUT	Buffer IC	Toner motor control
				signal
44	VCC(AC) 3.3V	Power	D	Tanan matura di t
45		001	Butter IC	i oner motor control
46	miron	OUT	Buffer IC	SPF scanner select
				signal
47	GND(AC)	Power		
48	spfon	OUT	Buffer IC	SPF ON signal

DIN	i		0	1
PIN No.	Signal Name	IN/OUT	to	Description
49	mircnt	OUT	Buffer IC	SPF scanner select signal
50	GND(AC)	Power		
51	pcl_s_print			(Not used)
52	fax_s_print			(Not used)
53	es_s_print			(Not used)
54	prareaen			(Not used)
55	d_s_ATDI_B			(Not used)
56 57	GND(CORE/DC)	Power		
57	GND) 3.3V			
58	pfclko			(Not used)
59	RESET	IN		ASIC reset signal
60	GND(CORE/DC)	Power		(8.1
61	ATRST	IN		(Not used)
62	ATCK			(Not used)
63	ATMS			(Not used)
64	VCC(AC) 3.3V	Power		
65	ie1284_stb	IN	I/F board	/STB signal
			connector	(IEEE1284
				communication port)
66	ie1284_autofd	IN	I/F board	/AUTOFD signal
			connector	(IEEE1284
0=				communication port)
67	ie1284_slctin	IN	I/⊢ board	/SLCTIN signal
			connector	(IEEE1284
	1.4004	18.1		communication port)
68	ie1284_init	IN	I/F board	/INIT signal
			connector	
60		Power		communication port)
09	3.3V	rower		
70	ie1284_slct	OUT	I/F board	SLCT signal
			connector	(IEEE1284
				communication port)
71	ie1284_pe	OUT	I/F board	PE signal (IEEE1284
=0		<b>D</b> -	connector	communication port)
72	GND(CORE/DC)	Power		BLIOV
73	le1284_busy	001	I/⊢ board	BUSY signal
			connector	
74	1.4004	OUT		communication port)
74	ie 1284_ack	001	I/F Doard	
			CONNECTOR	(IEEE I 204
75	ia128/ fault		I/E boord	
15	101204_18UIL	001	connector	
			CONTECTO	communication port)
76	ie1284 rev		I/E board	/BEV signal
10	101207_100	001	connector	
			3011100101	communication port)
77	ie1284 parad7		I/E board	DATA hus (IFFF1284
,,,		1,001	connector	communication port)
78	ie1284 narad6	IN/OUT	I/F board	DATA bus (IFFF1284
.0	parado		connector	communication port)
79	ie1284 parad5	IN/OUT	I/F board	DATA bus (IFFF1284
	parado		connector	communication port)
80	ie1284 parad4	IN/OUT	I/F board	DATA bus (IFFF1284
00	parady		connector	communication port)
81	ie1284 parad3	IN/OUT	I/F board	DATA bus (IFFF1284
	parado		connector	communication port)
82	VCC(AC) 3 3V			
83	ie1284_narad2	IN/OUT	I/F board	DATA bus (IFFF1284
00	parauz	1,001	connector	communication nort)
84	ie1284 parad1	IN/OUT	I/F board	DATA bus (IFFF1284
51	paraar		connector	communication port)
85	GND(AC)	Power		
	· · · /		1	1

PIN	Signal Name	IN/OUT	Connected	Description
96	io1294 parado		I/E board	
80	le1284_paradu		I/F Doard	DATA DUS (IEEE 1284
97	suspond			SUSPEND signal
07	suspenu	001	connector	(LISB communication
			connector	nort)
88	vmin	IN	I/E board	VMIN signal (LISB
00	VIIIII		connector	communication port)
89	vnin	IN	I/F board	VPIN signal (LISB
00	vpm		connector	communication port)
90	rcv	IN	I/E board	BCV signal (USB
			connector	communication port)
91	oen	OUT	I/E board	OFN signal (USB
•.			connector	communication port)
92	vmout	OUT	I/F board	VMOUT signal (USB
			connector	communication port)
93	vpout	OUT	I/F board	VPOUT signal (USB
	.bear		connector	communication port)
94	tm2 15m			(Not used)
95	VCC(PLL) 3.3V	Power		(,
96	GND(PLL)	Power		
97	VCC(PLL) 3 3V	Power		
98	GND(PLL)	Power		
90	nfclk	IN		Clock
100		Power		
100	3.3V	1 Ower		
101	GND(COBE/DC)	Power		
102	ram_data0		SDBAM	
102	Tam_datao	110/001	ODITAN	process page
				memory) data bus
103	ram data1	IN/OUT	SDBAM	SDBAM (Image
100	lam_data i	110/001	ODI # W	process page
				memory) data bus
104	ram data2	IN/OUT	SDRAM	SDRAM (Image
	_			process page
				memory) data bus
105	GND(AC)	Power		
106	ram_data3	IN/OUT	SDRAM	SDRAM (Image
				process page
				memory) data bus
107	ram_data4	IN/OUT	SDRAM	SDRAM (Image
				process page
				memory) data bus
108	VCC(AC) 3.3V	Power		
109	ram_data5	IN/OUT	SDRAM	SDRAM (Image
				process page
				memory) data bus
110	ram_data6	IN/OUT	SDRAM	SDRAM (Image
				process page
	01000000000	_		memory) data bus
111	GND(CORE/DC)	Power	0.05	
112	ram_data7	IN/OUT	SDRAM	SDRAM (Image
				process page
440				memory) data bus
113	ram_data15	IIN/OUT	SURAM	SURAM (Image
				process page
114	ram data14		SDDAM	SDDAM (Image
114	ram_uata14		SURAM	SURAIVI (III)age
				process paye memory) data bue
115		Power		
115	3.3V	i uwei		
116	ram data13		SDBAM	SDBAM (Image
		11/001		process page
				memory) data bus
117	ram data12	IN/OUT	SDRAM	SDRAM (Image
				process page
				memory) data bus
L	1	1	1	

PIN	Signal Name		Connected	Description
No.		n.,001	to	Description
118	GND(CORE/DC)		SDBAM	
119	Tall_uala T	110/001	SURAM	process page
				memory) data bus
120	ram_data10	IN/OUT	SDRAM	SDRAM (Image
				process page
101				memory) data bus
121	3.3V			
122	ram_data9	IN/OUT	SDRAM	SDRAM (Image
				process page
100			0000414	memory) data bus
123	ram_data8	IN/OUT	SDRAM	SDRAM (Image
				memory) data bus
124	GND(AC)	Power		,,
125	ram_clk	OUT	SDRAM	SDRAM (Image
				process page
100	rom alco			memory) CLK signal
120	гат_ске	001	SURAM	SDRAM (Image
				memory) CKE signal
127	xram_wde	OUT	SDRAM	SDRAM (Image
				process page
100		D		memory) WDE signal
128	VCC(AC) 3.3V	Power		
129	Vram cas	OUT	SDRAM	
100	xram_cas	001	ODTIAM	process page
				memory) CAS signal
131	xram_ras	OUT	SDRAM	SDRAM (Image
				process page
132	vram cs			SDBAM (Image
102	Xiaiii_03	001		process page
				memory) CS signal
133	VCC(CORE/DC)	Power		
134	ram banks0	OUT	SDBAM	SDBAM (Image
			021.0.00	process page
				memory) BANK signal
135	ram_banks1	OUT	SDRAM	SDRAM (Image
				process page
136	GND(CORE/DC)	Power		memory BANK Signal
137	ram_dqm0	OUT	SDRAM	SDRAM (Image
				process page
		<u></u>		memory) DQM signal
138	ram_dqm1	OUT	SDRAM	SDRAM (Image
				memory) DQM signal
139	ram_mad12	OUT	SDRAM	SDRAM (Image
				process page
L		_		memory) address bus
140	VCC(CORE/DC)	Power		
141	ram_mad11	OUT	SDRAM	SDRAM (Image
		-		process page
				memory) address bus
142	ram_mad9	OUT	SDRAM	SDRAM (Image
				memory) address bus
143	GND(AC)			
144	ram_mad8	OUT	SDRAM	SDRAM (Image
1				process page
				memory) address bus

PIN	Signal Name	IN/OUT	Connected	Description
145	ram_mad7	OUT	SDBAM	SDBAM (Image
140	nam_maar	001	ODI I/ IIVI	process page
				memory) address bus
146	VCC(AC)			
147	ram_mad6	OUT	SDRAM	SDRAM (Image
				process page
				memory) address bus
148	ram_mad5	OUT	SDRAM	SDRAM (Image
				process page
1/10	GND(COBE/DC)			memory) address bus
150	ram mad4	OUT	SDBAM	SDBAM (Image
100	ium_maa i	001	0010.001	process page
				memory) address bus
151	ram_mad10	OUT	SDRAM	SDRAM (Image
				process page
450	10	0.UT	000444	memory) address bus
152	ram_mad0	001	SDRAM	SDRAM (Image
				process page memory) address bus
153	VCC(COBE/DC)			momory) addreed bab
154	ram_mad1	OUT	SDRAM	SDRAM (Image
	_			process page
				memory) address bus
155	ram_mad2	OUT	SDRAM	SDRAM (Image
				process page
156	rom mod?		SDBAM	SDRAM (Image
150	Tam_maus	001	SURAIN	process page
				memory) address bus
157	d_s_ATDO_B			(Not used)
158	cl	OUT	Logic IC	Copy lamp control
				signal
159	VCC(CORE/DC)	Power		
160	afp oeb			(Not used)
161	ccd ta	OUT	CCD PWB	CCD control signal
162	GND(CORE/DC)	Power		
163	afp_vsmp	OUT	CCD PWB	AFE control signal
164	ccdrs	OUT	CCD PWB	CCD control signal
165	ccdcp	OUT	CCD PWB	CCD control signal
166	VCC(AC) 3.3V	Power		
167	afp_bsmp	OUT	CCD PWB	AFE control signal
168	ccd_ph2	OUT	CCD PWB	CCD control signal
169	atp_atesdi	OUT	CCD PWB	AFE control signal
170	GND(AC)	Power		CCD control cignal
170		001	CCD PWB	COD CONTROL SIGNAL
173	afp_adcclk	OUT	CCD PWR	AFF control signal
174	afp afesen	OUT	CCD PWB	AFE control signal
175	GND(CORE/DC)	Power		
176	afp_afesck	OUT	CCD PWB	AFE control signal
177	mtr_at_home	IN	CCD PWB	Carriage home
				position signal
178	VCC(CORE/DC)	Power		
179	afp_data7	IN	CCD PWB	Image scan data
180	afp_data6	IN	CCD PWB	Image scan data
181	afp_data5	IN	CCD PWB	Image scan data
182	GND(CORE/DC)	Power		Income according to
183	arp_data4			Image scan data
184		IIN Power	CODEMR	image scan data
186	afn_data2	IN		Image scan data
187	afp_data1	IN	CCD PWB	Image scan data
188	GND(AC)	Power		

PIN	Signal Name	IN/OUT	Connected	Description
189	afn data0	IN		Image scan data
190	GND(CORE/DC)	Power	0001100	inage soun data
191	sfclk	IN		Clock
192	tm2_24m			(Not used)
193	GND(PLL)	Power		, ,
194	VCC(PLL) 3.3V	Power		
195	GND(PLL)	Power		
196	VCC(PLL) 3.3V	Power		
197	VCC(CORE/DC)	Power		
	3.3V			
198	mtr_y1	OUT	Tr array IC	Carriage motor current control signal
199	mtr_phase1	OUT	Motor driver	Carriage motor control signal
200	GND(CORE/DC)	Power		
201	mtr_i01	OUT	Motor	Carriage motor control
			driver	signal
202	mtr_i11	OUT	Motor	Carriage motor control
		<u></u>	driver	signal
203	mtr_i21	001	Motor	Carriage motor control
204	mtr. nhasa?		Motor	Signal
204	mu_pnasez	001	driver	signal
205	VCC(CORE/DC)	Power		- 3
	3.3V			
206	mtr_i02	OUT	Motor	Carriage motor control
			driver	signal
207	mtr_i12	OUT	Motor	Carriage motor control
			driver	signal
208	mtr_i22	OUT	Motor	Carriage motor control
209	mtr v2	OUT	Tr array IC	Carriage motor current
	,_		anay io	control signal
210	VCC(AC) 3.3V	Power		-
211	xsync	IN	LSU	Horizontal sync signal from LSLL (/SYNC)
212	xld	OUT	LSU	Laser drive signal
				(/VIDEO)
213	GND(AC)	Power		
214	xlend	OUT	LSU	Laser APC signal (/LEND)
215	xcpuwr	IN	CPU	CPU write signal
216	xcpurd	IN	CPU	CPU read signal
217	scanstop	IN	CPU	Scan stop signal
218	scanst	IN	CPU	Scan start signal
219	transst	IN	CPU	Data transfer start
200	printet	INI	CRU	signal Print stort signal
220	tmon	IN	CPU	Toner motor clock
221		11 N		enable signal
222	testpin4			(Not used)
223	VCC(CORE/DC)	Power		
204	J.JV			(Not used)
224	tmolk	IN		Toner motor clock
220				signal
226	GND(CORE/DC)	Power		- 3
227	testpin2			(Not used)
228	testpin1			(Not used)
229	testpin0			(Not used)
230	cpudata15	IN/OUT	CPU	CPU data bus
231	cpudata14	IN/OUT	CPU	CPU data bus
232	cpudata13	IN/OUT	CPU	CPU data bus
233	cpudata12	IN/OUT	CPU	CPU data bus
234	cpudata11	IN/OUT	CPU	CPU data bus

PIN	Signal Name	IN/OUT	Connected	Description
235	coudata10			CPI L data bus
236		Power	010	
200	opudata0		CPU	CPU data buc
207	cpudata9			CFU data bus
238			CPU	CPU dala bus
239	GND(CORE/DC)	Power		
240	cpudata7	IN/OUT	CPU	CPU data bus
241	cpudata6	IN/OUT	CPU	CPU data bus
242	cpudata5	IN/OUT	CPU	CPU data bus
243	cpudata4	IN/OUT	CPU	CPU data bus
244	VCC(CORE/DC)	Power		
	3.3V			
245	cpudata3	IN/OUT	CPU	CPU data bus
246	cpudata2	IN/OUT	CPU	CPU data bus
247	cpudata1	IN/OUT	CPU	CPU data bus
248	cpudata0	IN/OUT	CPU	CPU data bus
249	VCC(AC) 3.3V	Power		
250	xcpucs	IN	CPU	CS signal
251	mem_intr			(Not used)
252	GND(AC)	Power		
253	arb_intr	OUT	CPU	INTR signal
254	cpusync	OUT	CPU	CPU SYNC signal
255	cpu_ad9	IN	CPU	CPU address bus
256	cpu_ad8	IN	CPU	CPU address bus

## (4) Heater lamp control circuit

# a. Outline

The heater lamp control circuit detects the heat roller surface temperature and converts in into a voltage level. The converted voltage is inputted to the CPU analog input pin.

### (3) Reset circuit

This circuit detects ON/OFF of power to control start/stop of each circuit. The 3.3V voltage of the main PWB is detected by the reset IC to generate the reset signal.

When the power voltage reaches the specified level, the circuit operations are started. Before the power voltage falls below the specified level, the circuit operations are stopped to prevent against malfunctions.



The CPU converts the inputted analog voltage into a digital signal level and compares it with the set value of the simulation to control on/off the heater lamp according to the level, maintaining the heat roller surface temperature at a constant level.



The lower the heat roller surface temperature is, the greater the thermistor resistance is, and vise versa.

Therefore, the lower the heat roller surface temperature is, the higher the thermistor terminal voltage is, and vise versa. The thermistor terminal voltage is inputted to the CPU analog port.

The CPU controls ON/OFF of the heater lamp by this input voltage level.

### [High temperature protect circuit in case of CPU hung up]

For IC120 3pin (reference voltage), +3.3V is divided by the resistor. The thermistor terminal voltage is inputted to IC120 2pin.

When, the voltage at 2pin becomes lower than the voltage at 3pin (when the heat roller temperature is about  $220 - 230^{\circ}$ C), IC120 1pin becomes HIGH, and the HL signal is lowered to the GND potential through IC124, stopping generation of the heater lamp ON signal. (IC120 1pin is normal LOW.)

# [When the heat roller surface temperature is lower than the set level]

- 1) Since the thermistor terminal voltage is higher than the set level, the HL signal from the CPU becomes HIGH.
- The HL signal is turned to be the HLOUT signal through IC124 protect circuit, and inputted to the photo triac coupler on the power PWB.
- 3) When the internal triac turns on, a pulse is applied to the gate of the external triac. Consequently a current flow from the power source through the heater lamp to the triac, lighting the heater lamp.

# [When the heat roller surface temperature is higher than the set level]

- 1) Since the thermistor terminal voltage becomes lower than the set value, the HL signal from the CPU becomes LOW.
- 2) The HL turns LOW, the photo triac coupler on the power PWB turns OFF, the external triac turns OFF, and the heater lamp turns OFF.

#### [In case of the thermistor open]

The voltage at IC120 6pin over the voltage at 5pin to drive the output THOPEN at 7pin to LOW. This is passed to the CPU and the trouble code "H2" is displayed.

## (6) Toner supply motor drive circuit

The IC129 is the motor control IC, which generates the pseudo AC waveform with the pulse signals (TM, TM-) outputted from ASIC, driving the toner supply motor.

# (5) Driver circuit (Solenoid)

#### a. Outline

Since the load signal from the CPU or the ASIC cannot drive the load directly, it is passed through the driver IC to drive the load.

### b. Operation

The driver circuit forms a Darlington circuit with transistors. Therefore a large drive current is obtained from a small current (ASIC output current). When the driver input voltage (base resistance input) is HIGH (+3.3V), the transistor turns ON to flow a current in the arrow direction, operating the load. When the driver is ON, the driver output terminal voltage is 0V.





## (7) Main motor drive circuit

The main motor is driven by the MMD signal from ASIC. While the main motor is rotating, the MMD signal is driven to HIGH and passed through IC125 to the control circuit in the main motor to rotate the main motor. When the main motor speed reaches the specified rpm, the MMLD signal is turned LOW and passed through IC115 to the CPU.



#### (8) Mirror motor control circuit, Duplex motor control circuit

Stepping motors are employed for the mirror motor, the SPF motor, and the duplex motor. The driver for IC127 (for mirror motor) is the bipolar drive L6219DS, and the driver for IC128 (for SPF) is the unipolar drive IC MTD1361F. For control, the SPF outputs the drive signal from the CPU to the IC, and the mirror outputs the drive signal to the IC with the ASIC. They drive each motor in 1-2 phase excitement or 2-phase excitement.

Each motor switches the motor current value in each magnification ratio.

• SPF motor drive circuit



#### • Mirror motor drive circuit



# (9) Operation circuit

#### a. General

The operation circuit is composed of the key matrix circuit and the display matrix circuit.

#### b. Key matrix circuit

Select signals SELIN 1 - 3 are sent from the CPU of the MCU to the selector in the operation circuit.

The signals detecting OFF/ON of the key are sent to the CPU as KIN 1 -2.

#### c. Display circuit

The display is controlled by sending the data signal from the CPU of the MCU, the clock signals, and the latch signals from the ASIC to the LED driver in the operation circuit.

\* The basic circuitry is the same as that of Puma.

#### (10) I/F circuit

#### a. General

The I/F circuit is composed of the USB driver and the IEEE1284 driver, and performs hard interface with the ASIC (MCU PWB).

#### b. USB circuit

With the USB driver, the differential signals (analog) of USB are converted into digital signal, which are sent to the ASIC. In the reverse procedure, interface between the ASIC (engine) and the host is performed.



#### c. IEEE1284 circuit

The IEEE1284 driver is used to perform interface between the ASIC (engine) and the host.



## (11) Carriage unit

#### a. General

The carriage unit is provided with the CCD PWB, the inverter PWB, and the lamps. It scans documents and transfers AD-converted image data to the ASIC.

#### b. CCD PWB

The CCD on the CCD PWB employs the color image sensor uPD8861 of 5400 pixels x 3 lines, and scans documents in the main scanning direction in the resolution of 600dpi/US letter size.

Image data scanned by the CCD are inputted to the AFE (AD9826), and subject to CDS, amplification, and AD-conversion. Then digital data are outputted to the MCU PWB and to the ASIC, which performs image process of the digital data.

#### c. Lamp inverter PWB

The transformer is controlled by the lamp control signal from the MCU PWB. The transformer output controls lighting of the cool cathode ray tube.

## B. DC power circuit

The DC power circuit directly rectifies the AC power and performs switching-conversion with the DC/DC converter circuit, and rectifies and smoothes again to generate a DC voltage.

The constant voltage control circuit is of +5VEN. +24V and +12V are of the non-control system by winding from the +5VEN winding. As shown in fig (1), +24V, +12V, and +5V are provided with the ON/OFF function by external signals. +3.3V is outputted from +5VEN to the regulator IC. Refer to the block diagram, fig (1).



## (1) Noise filter circuit

The filter circuit is composed of L and C. It reduces common noises and normal mode noises generated from the AC line.

The common noise means that generated in each line for GND. Its noise component is delivered through C001, C003, and C007 to GND. The normal noise means that overlapped in the AC line or the output line. It is attenuated by C002, L001, C006, and L002. Refer to fig (2).



fig (2) Noise filter circuit

(2) Rush current prevention circuit and rectifying/ smoothing circuit



fig (3) Rush current prevention, rectifying/smoothing circuit Since the AC power is directly rectified, if there were not this rush current prevention resistor (TH001), an extremely large rush current would flow due to a charging current flowing through the smoothing capacitor C010 when turning on the power.

To prevent against this, the rush current prevention resistor TH001 is provided between the rectifying diode D002 and the smoothing diode C010, suppressing a rush current.

The rectifying/smoothing circuit rectifies a 50/60Hz AC voltage with the rectifying circuit, and smoothes it with the smoothing capacitor C010.

#### (3) Inverter and control circuit (Flyback converter system)



fig (4) Inverter and control circuit

This circuit is one-stone separate excitation DC-DC converter called flyback converter, as shown in fig (4).

When an electromotive voltage of IC is applied through D012, R005, and R006 to IC002, IC002 oscillates to conduct Q001.

As a result, a voltage is applied to the primary winding of the converter transformer (T001) and at the same time a voltage is generated in the driving winding of IC002 to operate IC002. Then IC002 turns ON/OFF Q001 at the frequency of about 70KHz determined by R016.

Under the ON state, the voltage in the secondary winding is reversed to the diode D103 and no current flows through the secondary winding of T001.

Under the OFF state, the current flowing through the primary winding is in the same direction as the primary winding, conducting D103 and transmitting energy to the secondary winding. Refer to fig (4).



fig (5) Operation waveform of the flyback converter

The control circuit is subject to negative feedback from the secondary side as shown in fig (4). A photo coupler (PC002) is employed to insulate between the primary side and the secondary side to feed back the control signal to the primary side.

When the output voltage is increased by energy transmission from T001, the voltage detected by R109 and R111 is compared with the reference voltage of IC102. When it exceeds the reference voltage, the current flowing through IC102 (that is, the photo diode current of PC002) is increased and transmitted to the primary side. Then the potential at the feedback pin (2 pin) of IC102 is decreased to control Q001. Therefore, the change in the output voltage on the secondary side is passed through IC102 and PC002 to control Q001, stabilizing the output voltage.

#### (4) Overcurrent protection circuit (Primary side)

The inverter circuit of the primary side is connected with the current detection resistor R102. When an overcurrent occurs in the secondary side, the current flowing through the primary side inverter Q001 is increased. The current is detected by R012, and passed through R013 to IC701 overcurrent restricting pin (3 pin) to turn OFF Q002, shutting off all power. To resupply the power, turn off and on the power. Refer to fig (4).

#### (5) Rectifying/smoothing circuit (+5V)



fig (6) Rectifying/smoothing circuit

The high frequency pulse generated by the inverter circuit is decreased by the converter transformer, rectified by the high frequency diode D103, and smoothed by C103 and C104.



fig (7) +5V rectifying/smoothing circuit voltage waveform























# 4. POWER SUPPLY





# 6. ACTUAL WIRING DIAGRAM

# **ACTUAL WIRING DIAGRAM 1/7**




## ACTUAL WIRING DIAGRAM 2/7 (POWER UNIT)



### ACTUAL WIRING DIAGRAM 3/7 (SCANNER UNIT)





### **ACTUAL WIRING DIAGRAM 4/7 (INTERFACE)**



### ACTUAL WIRING DIAGRAM 5/7 (SPF, R-SPF UNIT)



# ACTUAL WIRING DIAGRAM 6/7 (2ND PAPER FEEDING UNIT)

(The models with 2ND PAPER FEEDING UNIT attached only.)



## ACTUAL WIRING DIAGRAM 7/7 (MANUAL PAPER FEEDING UNIT)



#### CAUTION FOR BATTERY REPLACEMENT

(Danish) Lithium Le	ADVARSEL! batteri – Eksplosionsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. vér det brugte batteri tilbage til leverandoren.
(English) Dang Re Dispose of u	Caution ! er of explosion if battery is incorrectly replaced. eplace only with the same or equivalent type recommended by the manufacturer. sed 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) Il y a da de la bat même Mettre a	ATTENTION anger d'explosion s' il y a remplacement incorrect terie. Remplacer uniquement avec une batterie du e type ou d'un type équivalent recommandé par le constructeur. au rebut les batteries usagées conformément aux instructions du fabricant.
(Swedish) A typ	VARNING Explosionsfara vid felaktigt batteribyte. .nvänd samma batterityp eller en ekvivalent som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.
(German) Explos Als Ersatzl vom He Entsorg	Achtung ionsgefahr bei Verwendung inkorrekter Batterien. batterien dürfen nur Batterien vom gleichen Typ oder ersteller empfohlene Batterien verwendet werden. ung der gebrauchten Batterien nur nach den vom Hersteller angegebenen Anweisungen.

### - CAUTION FOR BATTERY DISPOSAL -----

(For USA,CANADA)

Contains lithium-ion battery. Must be disposed of properly. Remove the battery from the product and contact federal or state environmental agencies for information on recycling and disposal options.



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SHARP CORPORATION Digital Document System Group Products Quality Assurance Department Yamatokoriyama, Nara 639-1186, Japan 2002 July Printed in Japan