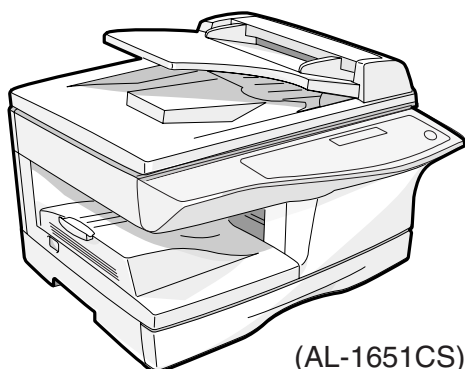


SHARP SERVICE MANUAL

CODE : 00ZAL1651CS1E



(AL-1651CS)

DIGITAL MULTIFUNCTIONAL SYSTEM

MODEL **AL-1651CS**

CONTENTS

[1] GENERAL	1 - 1
[2] SPECIFICATIONS	2 - 1
[3] CONSUMABLE PARTS	3 - 1
[4] EXTERNAL VIEWS AND INTERNAL STRUCTURES	4 - 1
[5] UNPACKING AND INSTALLATION	5 - 1
[6] COPY PROCESS	6 - 1
[7] OPERATIONAL DESCRIPTIONS	7 - 1
[8] DISASSEMBLY AND ASSEMBLY	8 - 1
[9] ADJUSTMENTS	9 - 1
[10] TEST COMMAND, TROUBLE CODES	10 - 1
[11] USER PROGRAMS	11 - 1
[12] ELECTRICAL SECTION	12 - 1
[13] CIRCUIT DIAGRAM	13 - 1
[14] FIRMWARE DOWNLOAD PROCEDURES	14 - 1

Parts marked with “△” 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.

CAUTION

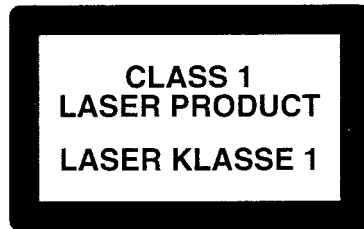
This product is a class 1 laser product that complies with 21CFR 1040 of the CDRH standard and IEC825. This means that this machine does not produce hazardous laser radiation. The use of controls, adjustments or performance of procedures other than those specified herein may result in hazardous radiation 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 : 11.82μs/7mm
Out put power : 0.15mW ± 0.01mW

CAUTION

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

VORSICHT

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

VARO !

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

ADVARSEL

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

VARNING !

OSYNLIG LASERSTRÅLNING NÅR 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

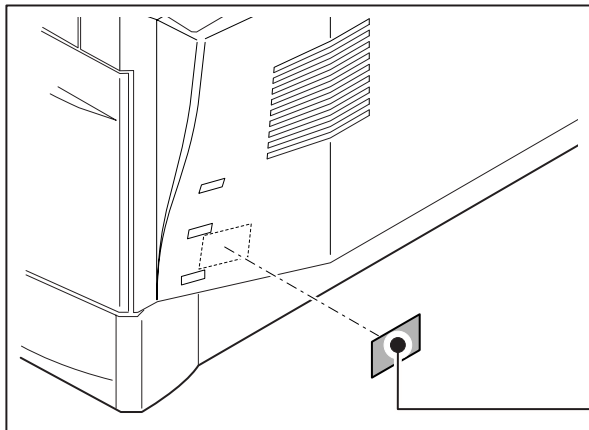
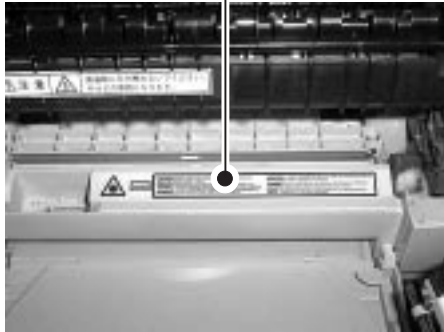
This product contains a low power laser device. To ensure continued safety do not remove any cover or attempt to gain access to the inside of the product. Refer all servicing to qualified personnel.



Laserstrahl

CAUTION INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATED.
AVOID EXPOSURE TO BEAM.
VORSICHT UNSICHTBARE LASERSTRAHLUNG WENN ABOECKUNG GEÖFFNET UND SICHERHEITSVERRIEGELUNG ÜBERRÜCKT. NICHT DEM STRAHL AUSSETZEN.
ADVARSEL USYNLIG LASERSTRÅLING VED ÅBNING, NÅR SIKKERHEDSABRYDERE ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.

ADVERSEL USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES OG SIKKERHEDSLÅS BRYTES.
UNNGÅ EKSPONERING FOR STRÅLEN.
VARNING OSYNLIG LASERSTRÅLING NÅR DENNA DEL ÄR ÖPPNAD OCH SPÄRRAR ÄR URKOPPLADE. STRÅLEN ÄR FARLIG. BETRakta EJ STRÅLEN.
VARO! AVATTASSA JA SUOJALUKITUS OHITETTAESSA OLET ALTITINA NÄKYMÄTÖNTÄ LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.



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

VAROITUS! LAITTEEN KÄYTTÄMINEN MUULLA KUIN TÄSSÄ KÄYTTÖOHJEESSA MAINITULLA TAVALLA SAATTA AALTISTAA KÄYTTÄJÄN TURVALLISUUSLUOKAN 1 YLITTÄVÄLLE NÄKYMÄTÖMÄLLE LASERSÄTEILYLLE.

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

**CLASS 1
LASER PRODUCT
LASER KLASSE 1**

LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT

CONTENTS

[1] GENERAL		
1. Major functions	1-1	
2. Note for servicing and handling	1-1	
[2] SPECIFICATIONS		
1. Basic Specifications	2-1	
2. Operation specifications	2-1	
3. Copy performance	2-2	
4. SPLC (JBIG GDI) printer	2-3	
5. Scan function	2-3	
6. RSPF	2-3	
[3] CONSUMABLE PARTS		
1. Supply system table	3-1	
2. Environmental	3-1	
3. Production control number(lot No.) identification	3-2	
[4] EXTERNAL VIEWS AND INTERNAL STRUCTURES		
1. Appearance	4-1	
2. Internal	4-1	
3. Operation panel	4-2	
4. Motors and solenoids	4-3	
5. Sensors and switches	4-4	
6. PWB unit	4-5	
7. Cross sectional view	4-6	
[5] UNPACKING AND INSTALLATION		
1. Copier installation	5-1	
2. Cautions on handling	5-1	
3. Checking packed components and accessories	5-1	
4. Unpacking	5-2	
5. Removing protective packing materials	5-2	
6. Installing the TD cartridge	5-2	
7. Loading the paper tray	5-3	
8. Power to copier	5-3	
9. Software for AL-1651CS	5-3	
A. Before installation	5-4	
B. Installing the software	5-4	
C. Setting up button manager	5-8	
10. Interface	5-10	
A. USB	5-10	
B. RJ45	5-10	
11. Moving	5-10	
[6] COPY PROCESS		
1. Functional diagram	6-1	
2. Outline of print process	6-2	
3. Actual print process	6-2	
[7] OPERATIONAL DESCRIPTIONS		
1. Outline of operation	7-1	
2. Scanner section	7-2	
A. Scanner unit	7-2	
B. Optical system	7-2	
C. Drive system	7-2	
3. Laser unit	7-3	
A. Basic structure	7-3	
B. Laser beam path	7-3	
C. Composition	7-3	
4. Fuser section	7-3	
A. General description	7-4	
5. Paper feed section and paper transport section	7-4	
A. Paper transport path and general operations	7-4	
6. Process unit new drum detection mechanism	7-7	
7. RSPF section	7-7	
A. Outline	7-7	
B. Document transport path and basic composition	7-7	
C. Operational descriptions	7-8	
D. Cases where a document jam is caused	7-8	
E. RSPF (SPF) open/close detection (book document detection)	7-8	
8. D-D (Duplex to Duplex) mode paper/document transport (Duplex model)	7-8	
A. Initial state	7-8	
B. Front copy	7-8	
C. Back copy	7-9	
9. Shifter	7-9	
[8] DISASSEMBLY AND ASSEMBLY		
1. High voltage section	8-1	
A. List	8-1	
B. Disassembly procedure	8-1	
C. Assembly procedure	8-1	
D. Charger wire cleaning	8-1	
E. Charger wire replacement	8-2	
2. Operation panel section	8-2	
A. List	8-2	
B. Disassembly procedure	8-2	
C. Assembly procedure	8-3	
3. Optical section	8-3	
A. List	8-3	
B. Disassembly procedure	8-3	
C. Assembly procedure	8-4	
4. Fusing section	8-5	
A. List	8-5	
B. Disassembly procedure	8-5	
C. Assembly procedure	8-7	
5. Tray paper feed/transport section	8-7	
A. List	8-7	
B. Disassembly procedure	8-7	
C. Assembly procedure	8-12	
6. Manual paper feed section	8-12	
A. List	8-12	
B. Disassembly procedure	8-12	
C. Assembly procedure	8-14	
D. Pressure plate holder attachment	8-14	
7. Rear frame section	8-14	
A. List	8-14	
B. Disassembly procedure	8-14	
C. Assembly procedure	8-15	
8. Power section	8-15	
A. List	8-15	
B. Disassembly procedure	8-15	
C. Assembly procedure	8-15	
9. Duplex motor section (RSPF model only)	8-15	
A. Remove the rear cabinet	8-15	
B. Remove the main PWB	8-15	
C. Remove the Duplex motor	8-16	
10. Reverse roller section (RSPF model only)	8-16	
A. Remove the reverse unit	8-16	
B. Remove the reverse roller	8-16	
11. RSPF section (RSPF model only)	8-17	
A. RSPF	8-17	
B. Intermediate tray	8-17	
C. Upper cover	8-17	
D. Pickup unit	8-17	
E. Upper cover of the pickup unit	8-18	
F. Sensor PWB	8-18	
G. Pickup solenoid	8-18	
H. Clutch	8-18	
I. Manual paper feed roller, pickup roller	8-19	
J. Transport unit removal	8-19	
K. Belt 1	8-20	
L. Belt 2	8-20	
M. SPF motor	8-20	
N. Solenoid	8-20	
O. Clutch	8-20	
P. Paper supply roller	8-21	
Q. Paper entry sensor	8-21	
R. Transport roller 1	8-21	
S. Paper exit roller	8-22	
T. Solenoid	8-23	
[9] ADJUSTMENTS		
1. Optical section	9-1	
A. Copy magnification ratio adjustment	9-1	
B. Image position adjustment	9-2	
2. Copy density adjustment	9-3	
A. Copy density adjustment timing	9-3	
B. Note for copy density adjustment	9-3	
C. Necessary tool for copy density adjustment	9-4	
D. Features of copy density adjustment	9-4	
E. Copy density adjustment procedure	9-4	
3. High voltage adjustment	9-5	
A. Main charger (Grid bias)	9-5	
B. DV bias check	9-5	
4. Duplex adjustment	9-5	
A. Adjusting the paper reverse position in memory for duplex copying	9-5	
B. Adjusting trailing edge void in duplex copy mode	9-6	
5. SPF (RSPF) scan position automatic adjustment	9-7	
6. RSPF (SPF) mode sub scanning direction magnification ratio adjustment	9-7	
7. Automatic black level correction	9-8	
[10] TEST COMMAND, TROUBLE CODES		
1. Entering the test command mode	10-1	
2. Key rule	10-1	
3. List of test commands	10-1	
4. Descriptions of various test commands	10-2	
5. Trouble codes	10-27	
A. Trouble codes list	10-27	
B. Details of trouble codes	10-27	
[11] USER PROGRAM		
1. User programs	11-1	
A. Copy mode	11-1	
B. Print mode	11-2	
2. Selecting a setting for a user program	11-2	
[12] ELECTRICAL SECTION		
1. Block diagram	12-1	
A. Overall block diagram	12-1	
2. Circuit descriptions	12-2	
A. Main PWB (MCU)	12-2	
B. DC power circuit	12-11	
[13] CIRCUIT DIAGRAM		
1. MCU PWB	13-1	
2. OPERATION PWB	13-26	
3. NIC PWB	13-29	
4. POWER SUPPLY	13-33	
5. ACTUAL WIRING DIAGRAM	13-35	
[14] FIRMWARE DOWNLOAD PROCEDURES		
1. Download procedures	14-1	
2. Version acquisition procedures	14-2	
3. EEPROM data acquisition procedure	14-3	
4. Serial number setting	14-4	
5. Installing procedures	14-4	

[1] GENERAL

1. Major functions

Configurations

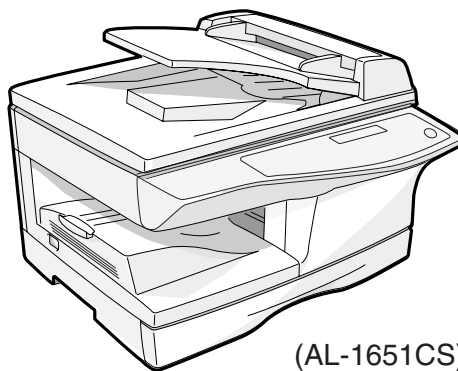
Item Model	CPM / PPM		SB/ MB	2 Tray	SPF	R-SPF	Color Scanner (push)	GDI printer	SPLC	E-SORT	Duplex	Shifter	FAX	Sharp desk	IEEE 1284	USB	RJ45	External NIC
	LT	A4																
AL-1651CS	16	15	MB	×	×	○	○	×	○	○	○	○	×	○	×	○ (2.0)	○ print only	×

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
SPLC:	SPLC printer function
E-SORT:	Electrical sort
Duplex:	Auto duplex copy function
Shifter:	Job separator function
FAX:	FAX function
Sharpdesk:	Scanner utilities
IEEE1284:	Interface port (parallel)
USB:	Interface port (USB)
RJ45:	Interface port (Network)
External NIC:	Interface port (Network)

Descriptions of table

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



(AL-1651CS)

2. Note for servicing and handling

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

<Countermeasure>

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

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

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

[2] SPECIFICATIONS

1. Basic Specifications

Item	
Type	Desktop
Copy system	Dry, electrostatic
Segment (class)	Digital personal copier
Copier dimensions	20.4" (W) x 19.8" (D) x 15.0" (H) (518mm (W) x 503mm (D) x 380mm (H))
Weight (Approximately)	44.1 lbs. (20kg) Not includes toner cartridge

2. Operation specifications

Section, item			Details		
Paper feed section	Paper feed system			1 tray (250 sheets) + multi bypass (50 sheets)	
	AB system	Tray paper feed section	Paper size	A4, B5, A5, 16K (Landscape)	
			Paper weight	56 - 80g/m ² (15 - 21 lbs.)	
			Paper feed capacity	250 sheets	
			Kinds	Standard paper, specified paper, recycled paper	
			Remark	User adjustment of front paper guide available	
		Multi bypass paper feed section	Paper size	A4, B5, A5, B6, A6 (Post card), 16K (Landscape)	
			Paper weight	52 - 128g/m ² (14 - 34.5 lbs.)	
			Paper feed capacity	50 sheets	
			Kinds	Standard paper, specified paper, recycled paper, envelope, OHP, Label (Single copy)	
			Remark	User adjustment of side 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 front 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 side paper guide available	
			Paper exit section		Exit way
			Capacity of output tray	200 sheets	
Originals		Original set	Center Registration (left edge)		
		Max. original size	A4 (8-1/2" x 14")		
		Original kinds	sheet, book		
		Original size detection	None		
Optical section	Scanning section	Scanning system		3 CCDs (RGB) sensor scanning by lighting white lamp	
		CCD sensor	Resolution	600 dpi	
		Lighting lamp	Type	CCFL	
			Voltage	560Vrms	
			Power consumption	2.8W	
		Output data		R, G, B 1 or 8 bits/pixel / A/D 16bit	
	Writing section	Writing system		Writing to OPC drum by the semiconductor laser	
		Laser unit	Resolution	600 dpi	
Image forming		Photoconductor	type	OPC (30ø)	
			Life	18k	
		Charger	Charging system	Saw -tooth charging with a grid, / (-) scorotron discharge	
			Transfer system	(+) DC scorotron 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)	

Section, item		Details	
Fusing section	Fusing system		Heat roller system
	Upper heat roller	type	Teflon roller
	Lower heat roller	type	Silicon rubber roller
	Heater lamp	type	Halogen lamp
		Voltage	120V
Electrical section	Power source	Power consumption	800W
		Voltage	120V
		Frequency	60Hz
	Power consumption	Rated current	8A
		Max.	Less than 1000W
		Average (during copying)	350 Wh/H *1)
		Average (stand-by)	80Wh/H *1)
		Pre-heat mode	25Wh/H *1)
		Auto power shut-off mode	8.8Wh/H *1)

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

3. Copy performance

Section, item		Details		
Copy magnification	Fixed magnification ratios		4 Reduction + 3 Enlargement (AB system : 25, 50, 70, 86, 100, 141, 200, 400%) (Inch system : 25, 50, 64, 78, 100, 129, 200, 400%)	
	Zooming magnification ratios		OC: 25 - 400%, RSPF 50 - 200% (376 steps in 1% increments)	
Manual steps (text, photo)			5 steps	
Copy speed	First copy time	Tray paper feed	9.6 sec. (Pre-heat mode:25 sec. / Auto power-shut-off mode : 40 sec.) A4 or Letter/100%/Auto Exposure	
	AB system A4 (Landscape)	Copy speed (CPM)	Same size	15
			Enlargement	15
			Reduction	15
	AB system B5 (Landscape)	Copy speed (CPM)	Same size	15
			Enlargement	15
			Reduction	15
	Inch system 8-1/2" x 14" (Landscape)	Copy speed (CPM)	Same size	12
			Enlargement	12
			Reduction	12
	Inch system 8-1/2" x 11" (Landscape)	Copy speed (CPM)	Same size	16
			Enlargement	16
			Reduction	16
Max. continuous copy quantity			99	
Void	Void area	leading edge	1 - 4mm	
		Trailing edge	4mm or less, 6mm or less (Duplex copying/both image)	
		Side 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) / 4.0mm or less (SPF/R-SPF/Duplex) Enlarge: 1.5mm or less (OC) / 3.0mm or less (SPF/R-SPF/Duplex) Reduction (50%): 6.0mm or less (OC) / 8.0mm or less (SPF/R-SPF/Duplex)	
	Warm-up time			0 sec.
Power save mode reset time			0 sec.	
Paper jam recovery time			0 sec.	

4. SPLC (JBIG GDI) printer

Print speed	Max. 15ppm (A4 / with ROPM) / 16ppm (Letter / with ROPM)
First print time	9.6 sec. (without data transfer time)
Duplex	Yes
ROPM	Yes
CPU	None
Memory	Share the memory with E-SORT function
Interface	RJ45 (10 base) / USB 2.0
Network	Internal NIC
Emulation	SPLC (JBIG GDI)
MIB support	No
Resolution	600dpi *1
Supported OS	Win 95 / 98 / Me / NT 4.0 / 2000 / XP
WHQL support	Yes *2
Application	Status window

*1: Engine Resolution

*2: Running change

5. Scan function

Type	Flat Bed Color Scanner
Scanning system	Document glass/RSPF
Light source	3 CCDs (RGB) sensor scanning by lighting white lamp (2 pcs of CCFL)
Resolution	Optical: 600 x 1200dpi Setting range: 50 - 9600dpi (Preview resolution is fixed at 75dpi)
Originals	Sheet type / Book type
Output data	R, G, B 1 or 8 bits/pixel / A/D 16bit
Scan range	OC / RSPF: 8.5" (297mm) (L) x 14" (431mm) (W) Original position: Platen: Left center / SPF: Right 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
Support file format	RAW / JPEG
Interface	USB2.0
Scanner utility	Button Manager / Sharpdesk
Scan key/lamp	Yes
Duplex scan	No
Supported OS	Win 98 / Me / 2000 / XP
Void area	No (User settable by PC)
WHQL supported	Yes *1

*1: Running change

6. RSPF

Original capacity		30 sheets (52 to 90g/m ²) (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)	
Job speed (Tray1,Landscape)	Single copy	S to S	12CPM
		S to D	5.6CPM
		D to S	5.5CPM
		D to D	5.2CPM
	Multi copy	S to S	16CPM
		D to S	16CPM
Original placement		Face up	
Original weight		52 to 90g/m ² (14 - 23.9lbs.)	
Mixed feeding		No	
Original which cannot		Thermal papers, originals with punch holes for files, be used folded paper, transparent originals such as OHP films, stapled or clip used originals with cover up liquid used, Originals with tape sealed, originals with high level frictional coefficient such as photos or catalogs.	

[3] CONSUMABLE PARTS

1. Supply system table

Common to all destinations

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

2. Environmental

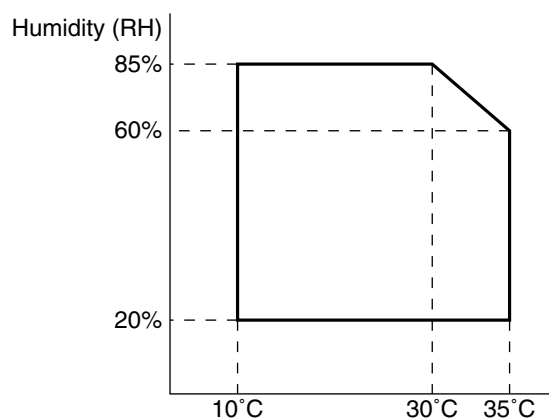
The environmental conditions for assuring the copy quality and the machine operations are as follows:

(1) Normal operating condition

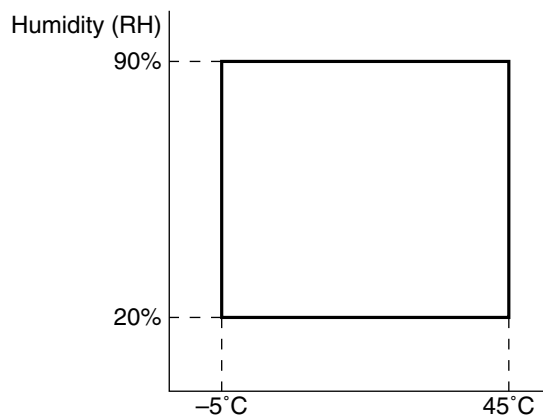
Temperature: 20 - 25°C

Humidity: 65 ± 5%RH

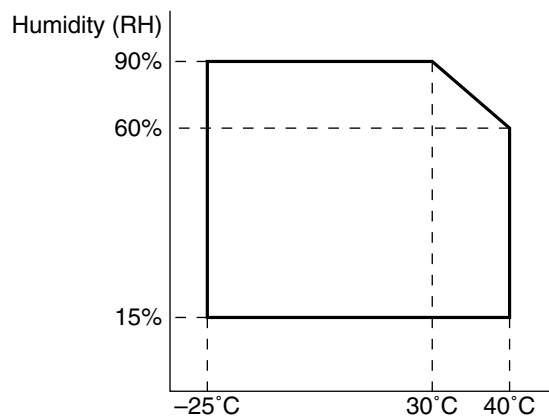
(2) Acceptable operating condition



(4) Supply storage condition

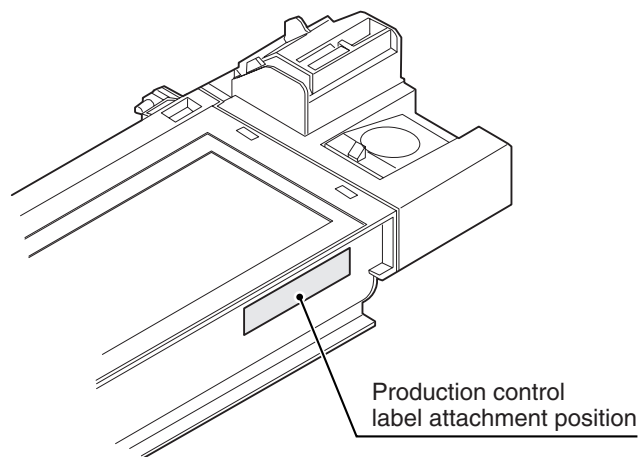
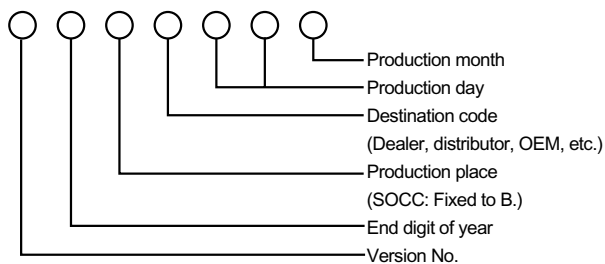


(3) Optical condition



3. Production control number(lot No.) identification

<Developing cartridge>

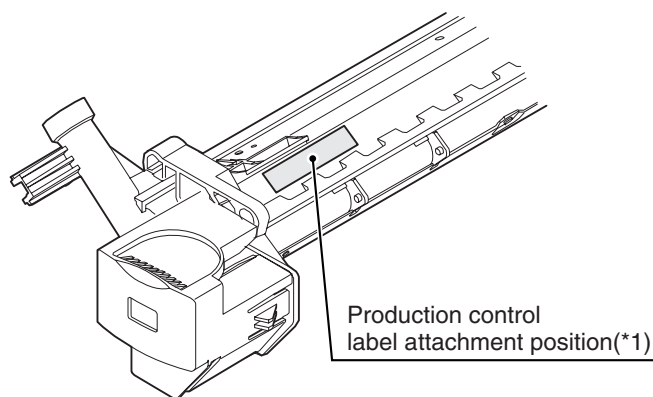
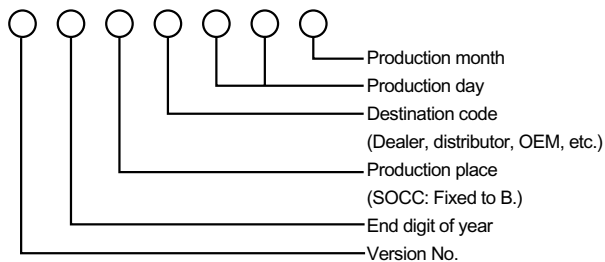


* Destination

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

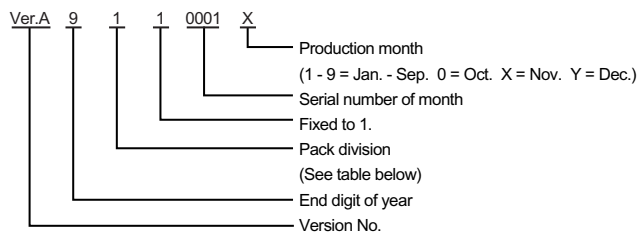
<Drum cartridge>

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



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

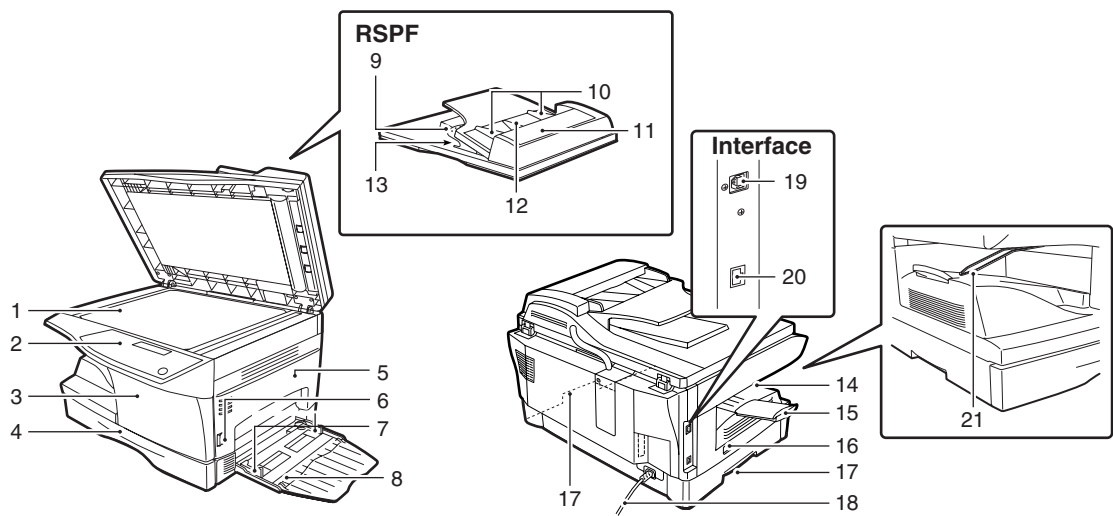
<JAPAN production>



Division	No.
Ex production	1
Option	2
Same pack	3

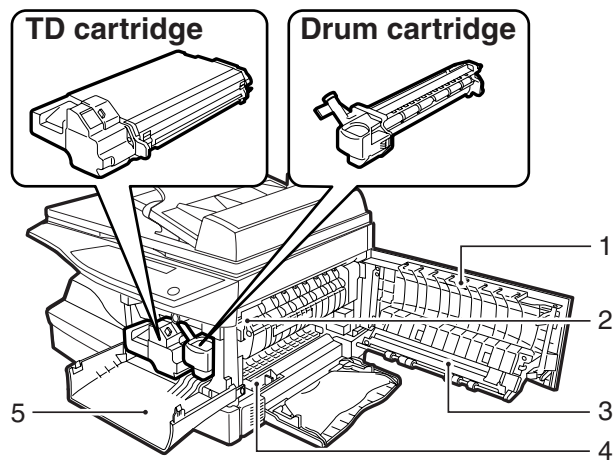
[4] EXTERNAL VIEWS AND INTERNAL STRUCTURES

1. Appearance



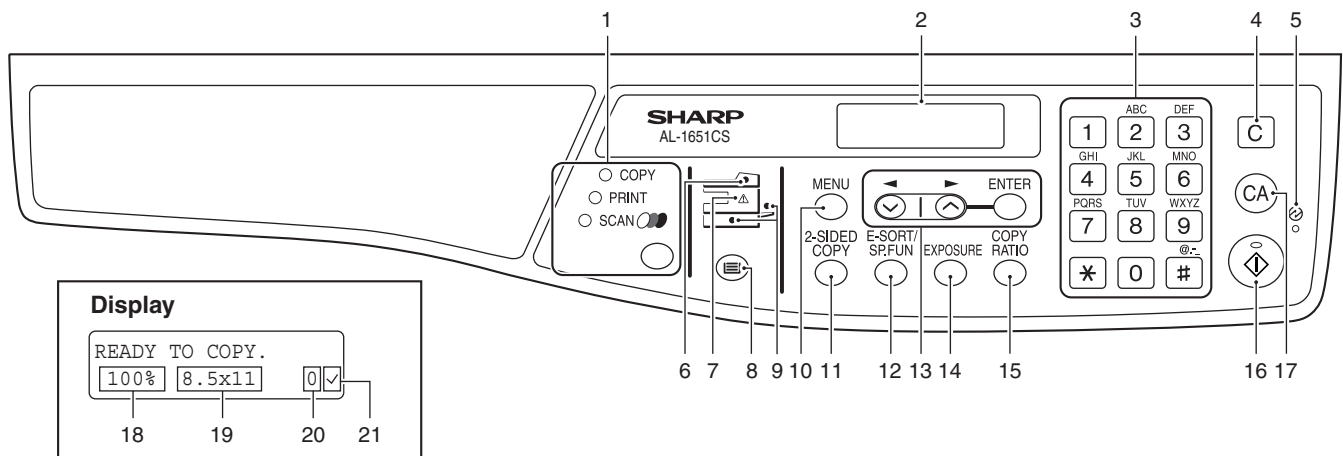
1	Document glass	2	Operation panel	3	Front cover
4	Paper tray	5	Side cover	6	Side cover open button
7	Bypass tray paper guides	8	Bypass tray	9	Reversing tray
10	Original guides	11	Document feeder cover	12	Document feeder tray
13	Exit area	14	Paper output tray	15	Paper output tray extension
16	Power switch	17	Handles	18	Power cord
19	USB port	20	LAN port	21	Paper holding arm

2. Internal



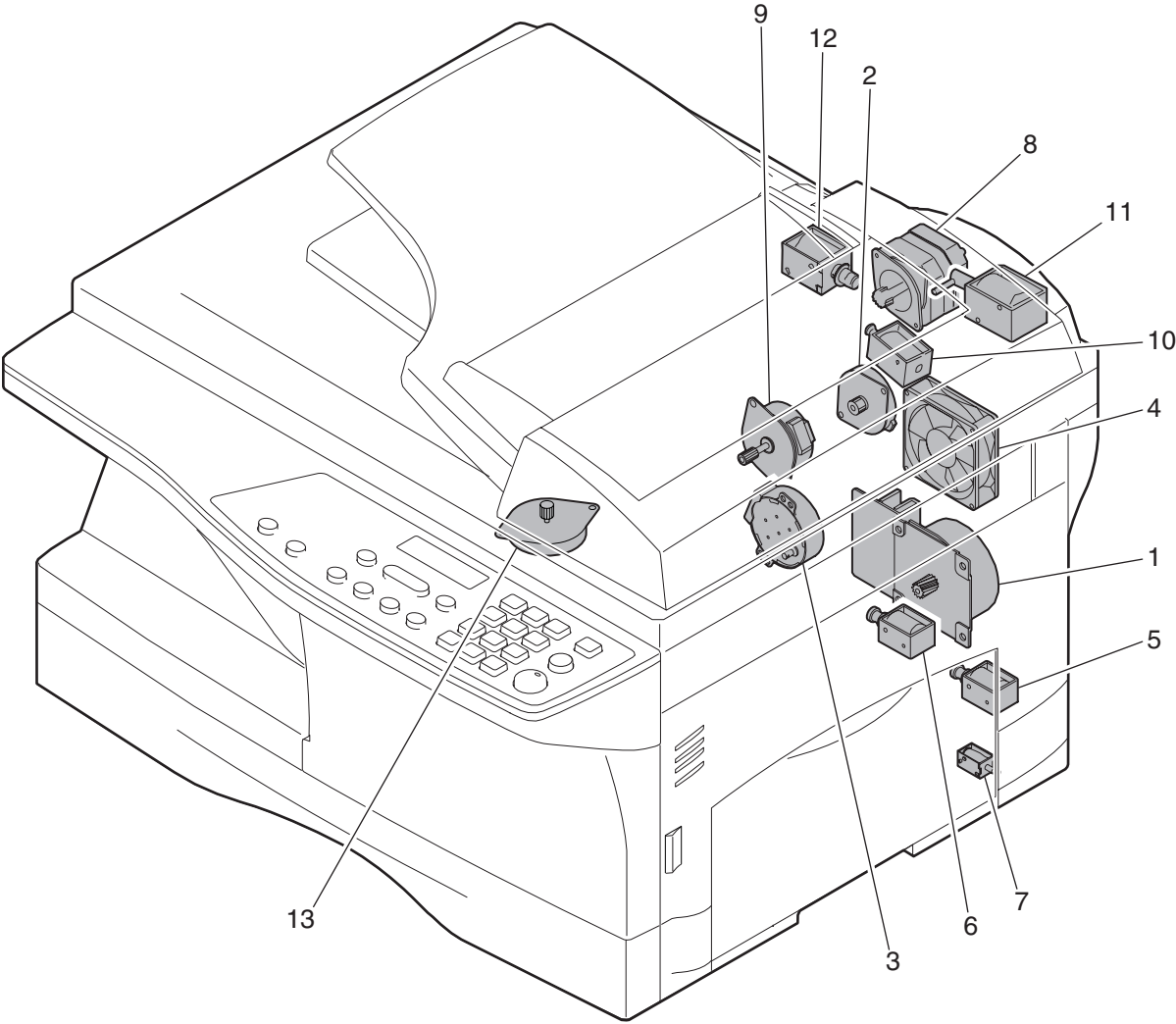
1	Side cover	2	Fusing unit release lever	3	Transfer charger
4	Charger cleaner	5	Front cover		

3. Operation panel



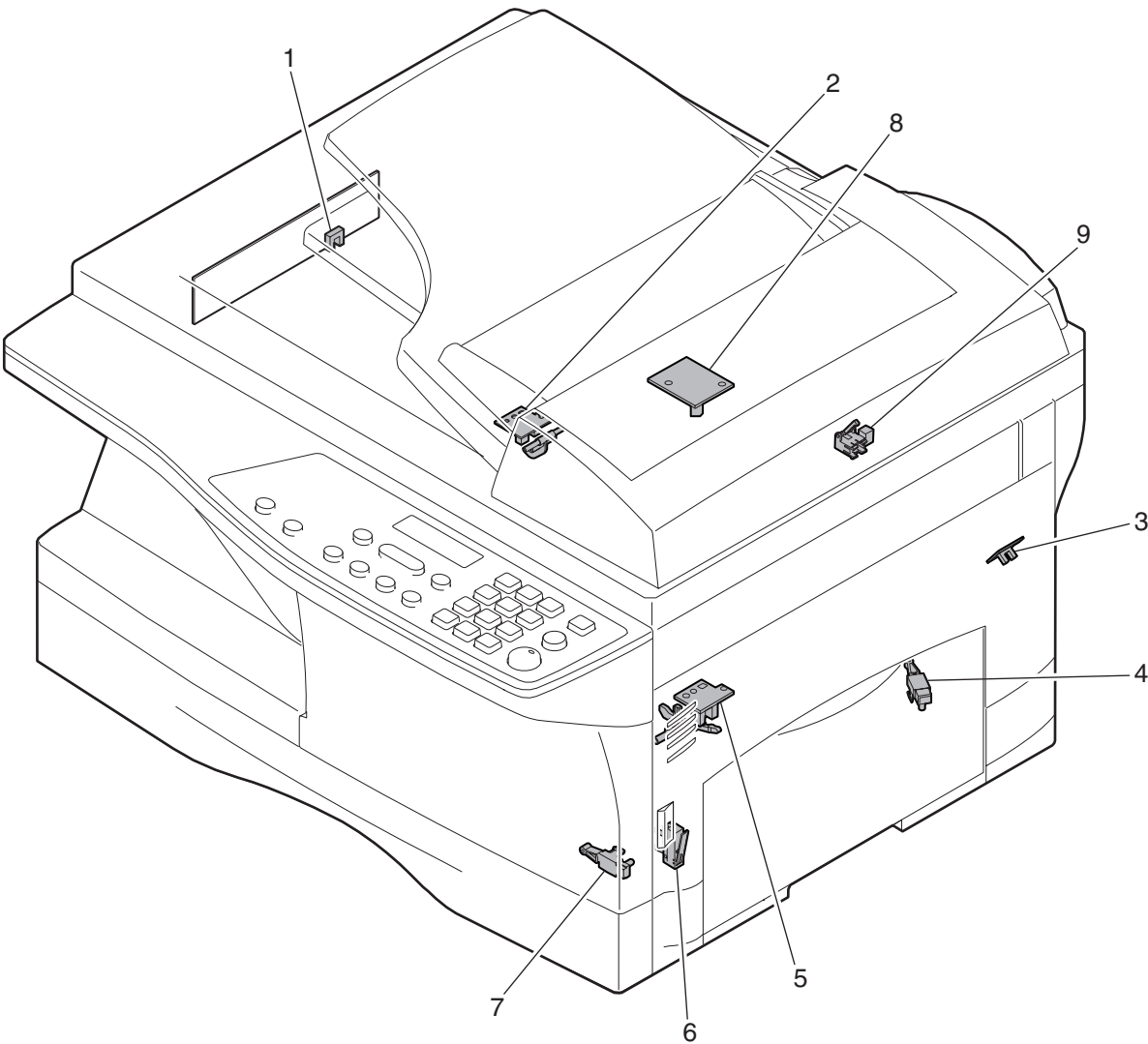
1	[MODE SELECT] key / Mode indicators Press this key to select the mode. The indicator of the selected mode lights (copy, printer, scanner).	2	Display This shows messages indicating the machine status and any problems that occur, as well as user programs and function setting menus.
3	Numeric keys Use these to enter the number of copies and other numerical settings. The keys can also be used to select items in function setting menus.	4	[CLEAR] key (C) Use this to clear the set number of copies, as well as cancel a job that is in progress. When a setting menu appears, use this key to move back to the previous menu level.
5	Power save indicator This lights up when the power save function is activated.	6	RSPF indicator This lights up when an original is placed in the RSPF.
7	Error indicator This lights steadily or blinks when a paper misfeed or other error occurs.	8	[TRAY SELECT] key (≡) Use to select the paper tray that has the desired paper for copying.
9	Tray location indicator Indicates the selected paper tray. The indicator blinks when the tray is out of paper or is not closed.	10	[MENU] key Press this key to select the paper size for copying, to configure a user program or to display the total count.
11	[2-SIDED COPY] key Use to copy both sides of an original.	12	[E-SORT/SP.FUN] key Press to select the sort function, 2 in 1 copy function, or margin shift function.
13	[◀] key (◁), [▶] key (▷), [ENTER] key Press the [◀] key (◁) or [▶] key (▷) to select an item in a function setting menu. Press the [ENTER] key to enter a selection.	14	[EXPOSURE] key Use to switch from auto exposure adjustment to text mode or photo mode.
15	[COPY RATIO] key Press to select an enlargement or reduction ratio. To select a preset ratio setting, press the [COPY RATIO] key and select the desired preset ratio. To select a ratio that is not preset, press the [COPY RATIO] key, select the preset ratio that is closest to the desired ratio, and then press the [◀] key (◁) or [▶] key (▷) to increase or decrease the ratio in increments of 1%.	16	[START] key (Ⓢ) / Ready indicator The ready indicator lights up when copying or scanning is possible. To begin copying, press the [START] key (Ⓢ). The [START] key (Ⓢ) is also pressed to return to normal operation from auto power shut-off mode.
17	[CLEAR ALL] key (CA) This returns all functions to the default settings. When pressed in a setting menu, this returns the settings and display to the initial state.	18	Shows the current copy ratio.
19	Shows the selected paper size.	20	Shows the number of copies that has been entered with the numeric keys.
21	A checkmark "✓" appears when the exposure has been changed, or when two-sided copying, sort, 2 IN 1, or margin shift is selected.		

4. Motors and solenoids



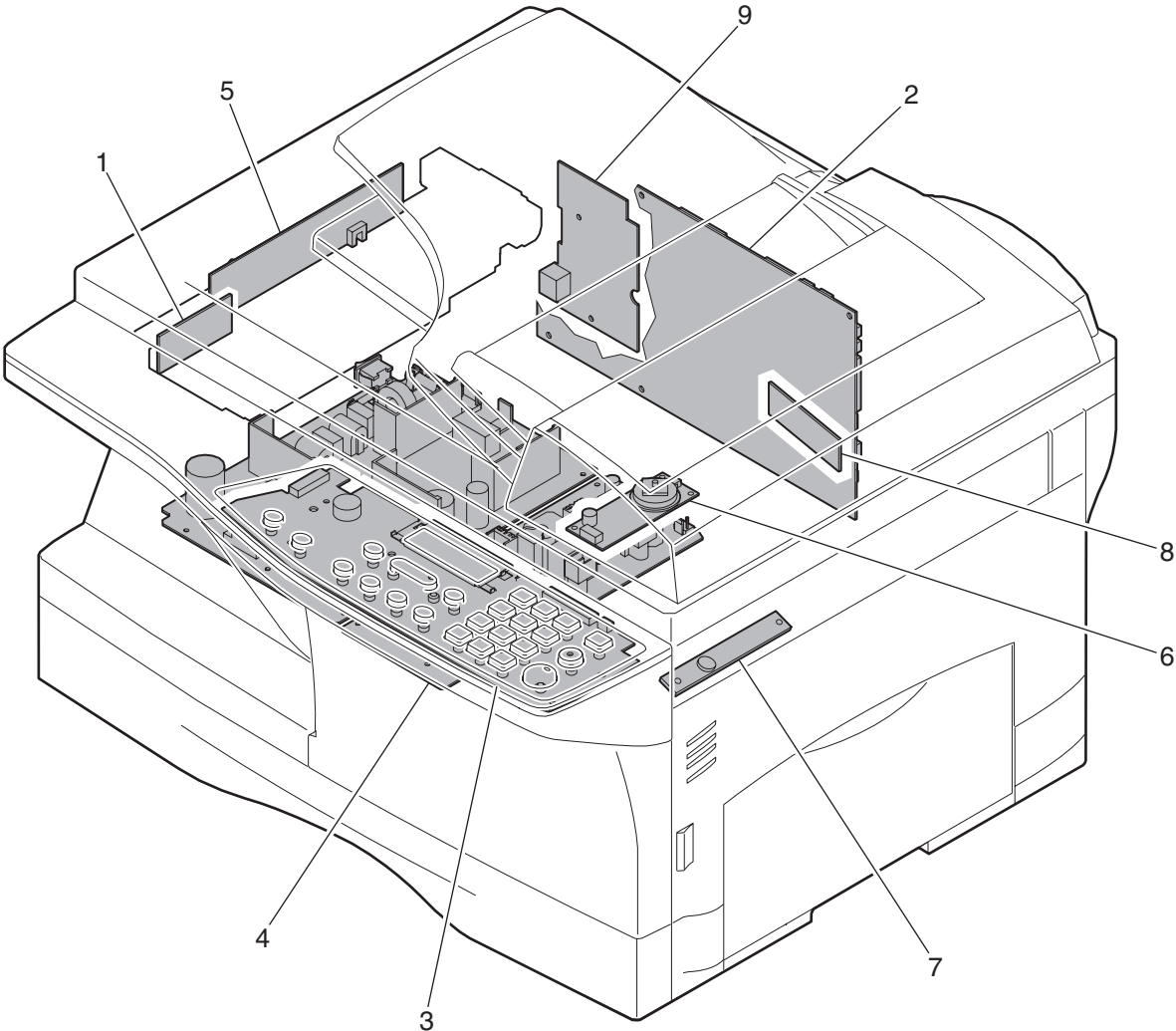
No.	Part name	Control signal	Function / Operation
1	Main motor	MM	Drives the copier.
2	Scanner motor	MRMT	Drives the optical mirror base (scanner unit).
3	Toner motor	TM	Supplies toner.
4	Cooling fan motor	VFM	Cools the optical section.
5	Resist roller solenoid	RRS	Resist roller rotation control solenoid
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 pick up solenoid
11	SPF paper feed solenoid	SPFS	Original feed solenoid
12	SPF gate solenoid	SGS	Controls the document reverse gate.
13	Shifter motor	SFTM	Drives the shifter.

5. Sensors and switches



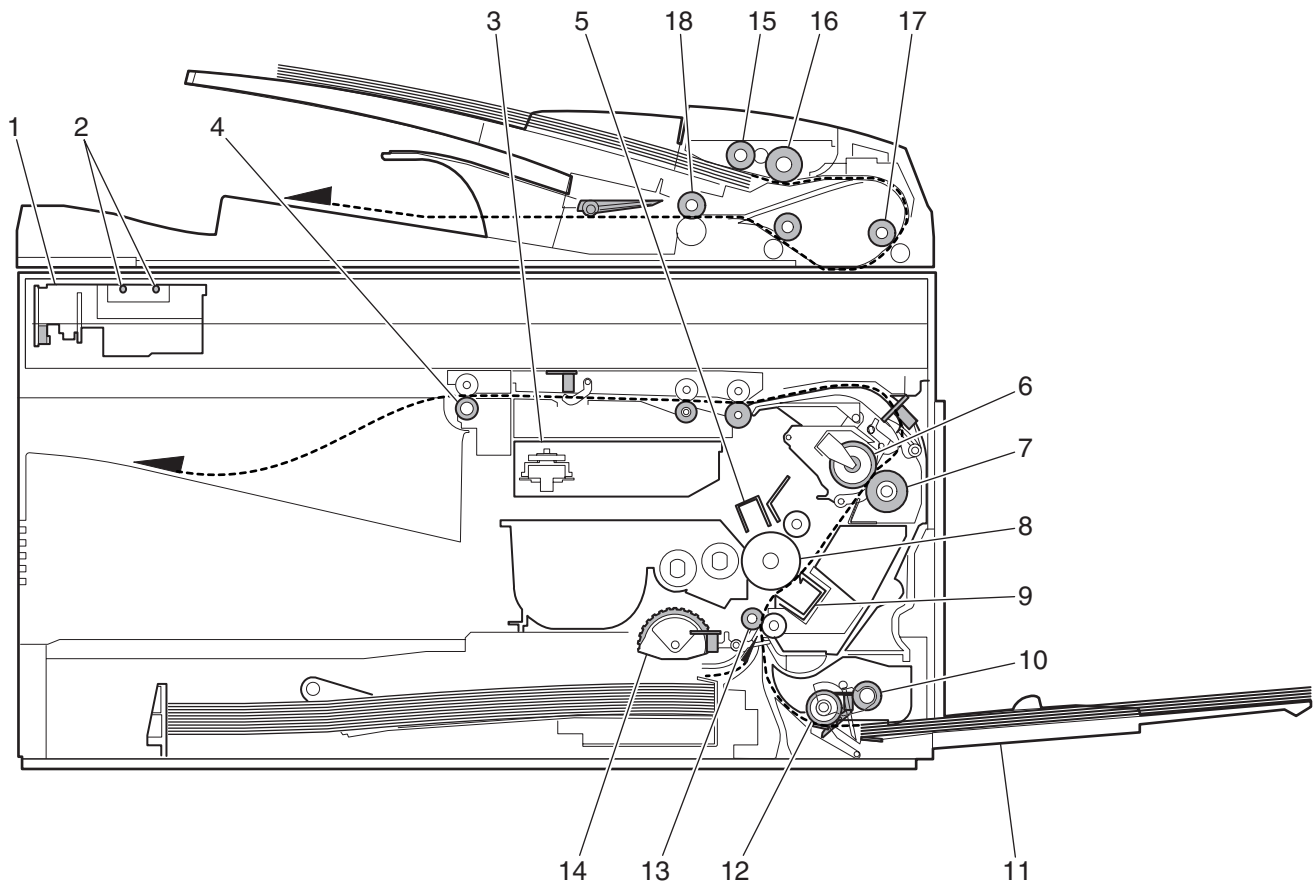
No.	Name	Signal	Type	Function	Output
1	Scanner unit home position sensor	MHPS	Transmission sensor	Scanner unit home position detection	"H" at home position
2	POD sensor	POD	Transmission sensor	Paper exit detection	"H" at paper pass
3	PPD2 sensor	PPD2	Transmission sensor	Paper transport detection 2	"L"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

6. PWB unit



No.	Name	Function
1	Exposure lamp inverter 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 (In the LSU)
7	TCS PWB	For toner sensor control
8	LSU PWB	For laser control (In the LSU)
9	NIC PWB	10 BASE-T Network 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	Paper feed roller	Picks up a sheet of paper from the cassette.
15	Pickup roller	Picks up documents.
16	Separation roller	Separates documents to feed properly.
17	PS roller	Feeds documents to the scanning section.
18	Paper exit roller	Discharges documents.

[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.

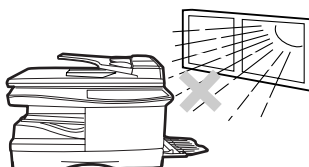
Leave the copier at room temperature for at least 2 hours before use.

Do not install your copier in areas that are:

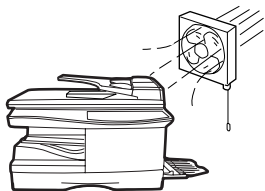
- damp, humid, or very dusty



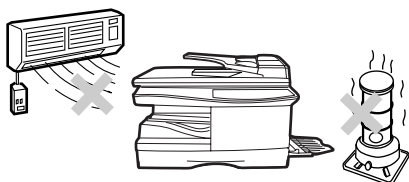
- exposed to direct sunlight



- poorly ventilated



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

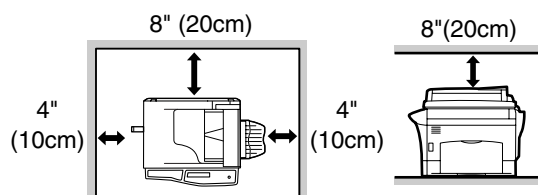


The copier should be installed near an accessible power outlet for easy connection.

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.

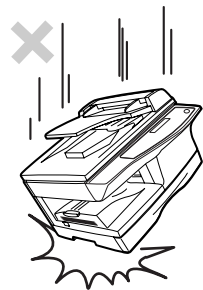
Be sure to allow the required space around the machine for servicing and proper ventilation.



2. Cautions on handling

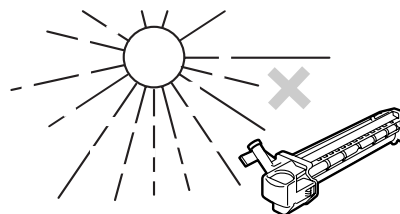
Be careful in handling the copier as follows to maintain the performance of this copier.

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.

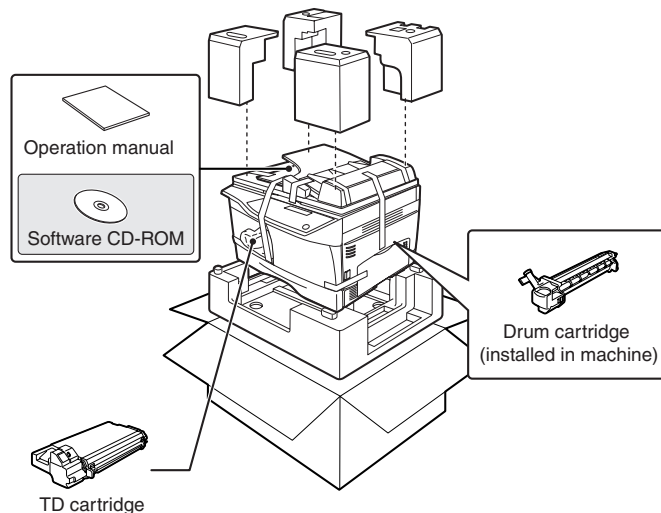
If they are exposed to direct sunlight, poor print quality may result.

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

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

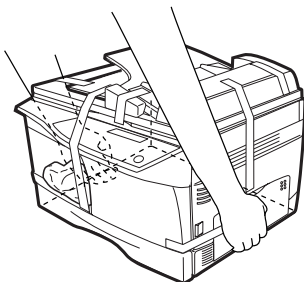
3. Checking packed components and accessories

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



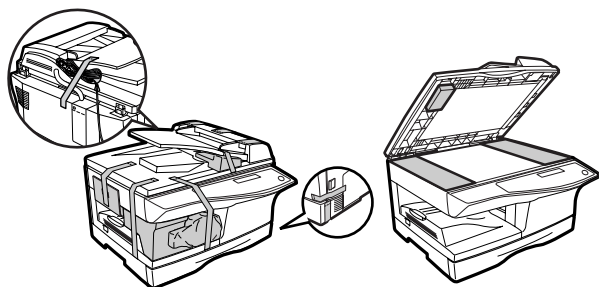
4. Unpacking

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

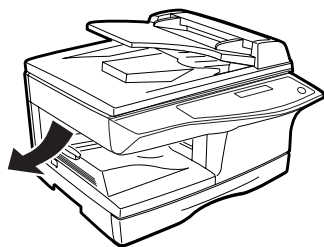
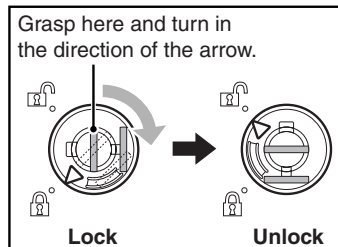


5. Removing protective packing materials

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

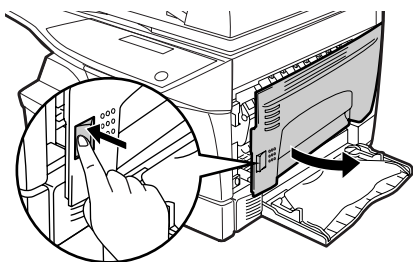


- 2) Release the scan head locking switch.

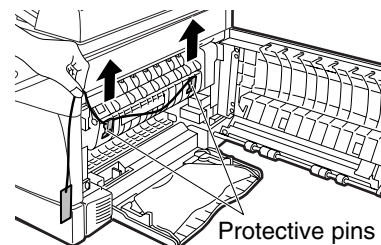
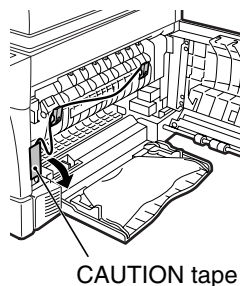


6. Installing the TD cartridge

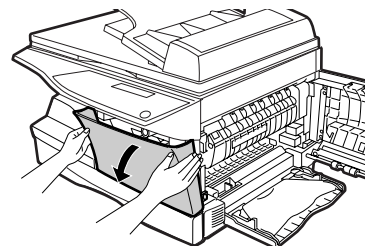
- 1) Open the bypass tray, and then open the side cover.



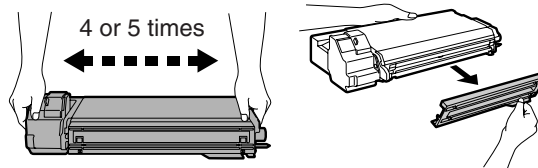
- 2) Remove the CAUTION tape from the front cover and remove the two protective pins from the fusing machine by pulling the strings upward one at a time.



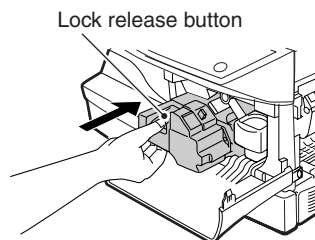
- 3) Press gently on both sides of the front cover to open the cover.



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

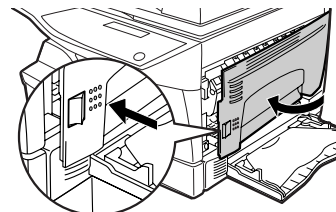
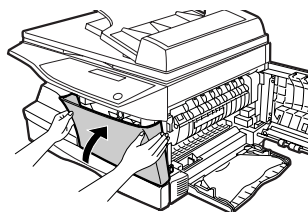


- 5) While pushing the lock release button, gently insert the TD cartridge until it locks into place.



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

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.

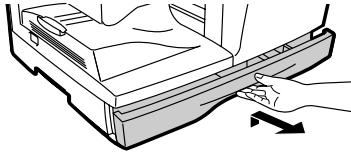


- 7) Ensure that the power switch of the machine is in the OFF position. Plug the other end of the power cord into the nearest outlet.

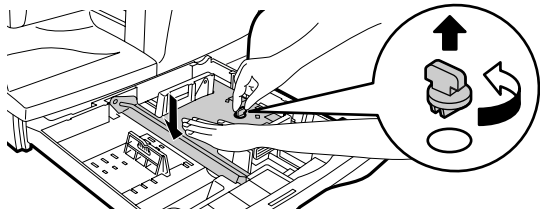
7. Loading the paper tray

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

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

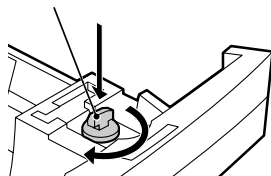


- 2) Remove the pressure plate lock. Rotate the pressure plate lock in the direction of the arrow to remove it while pressing down on the pressure plate of the paper tray.

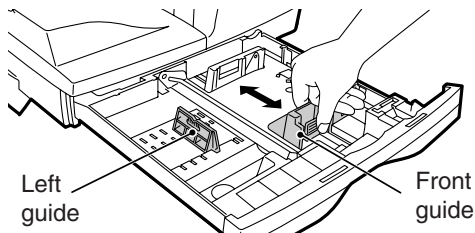


- 3) Store the pressure plate lock which has been removed in step 2. To store the pressure plate lock, rotate the lock to secure it as shown below.

Pressure plate lock




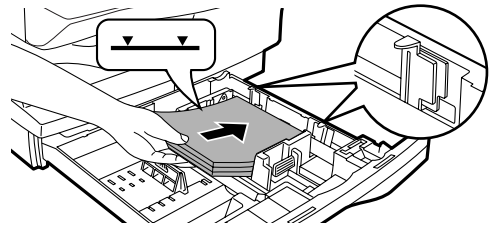
- 4) Squeeze the lock lever of the front guide and slide the front guide to match the width of the paper, and move the left guide to the appropriate slot as marked on the tray.



- The front guide is a slide-type guide. Grasp the locking knob on the guide and slide the guide to the indicator line of the paper to be loaded.
 - The left guide is an insert-type guide. Remove it and then insert it at the indicator line of the paper to be loaded.
- 5) Fan the paper and insert it into the tray. Make sure that the edges go under the corner hooks.

Note:

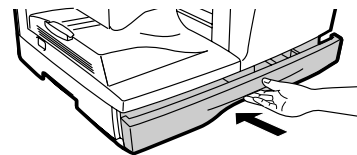
- Do not load paper above the maximum height line (). Exceeding the line will cause a paper misfeed.
- If the paper is not fanned, double-feeds or misfeeds may occur.
- Make sure the stack of paper is straight before loading it. When adding paper, take the remaining paper out and combine it into a single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



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

Note:

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



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 AL-1651CS

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

MFP driver

Printer driver

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

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

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

Scanner driver (USB only)

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

Sharpdesk (USB only)

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

Button Manager (USB only)

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

Note: The scanning feature can only be used with computers that are running Windows 98/Me/2000/XP and are connected to the machine by a USB cable. If you are running Windows 95/NT 4.0 or are connected to the machine by a LAN connection, only the printer function can be used.

A. Before installation

(1) 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 USB2.0*1/1.1*2 or 10Base-T LAN port
Operating system*3*4	Windows 95, Windows 98, Windows Me, Windows NT Workstation 4.0 (ServicePack 5 or later)*5, Windows 2000 Professional*5, Windows XP Professional*5, Windows XP Home Edition*5
Display	800 x 600 dots (SVGA) display with 256 colors (or better)
Hard disk free space	150MB or more
Other hardware requirements	An environment on which any of the operating systems listed above can fully operate

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

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

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

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

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

(2) Installation environment and usable software

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

Cable	Operating system	MFP Driver		Button Manager	Sharpdesk
		Printer driver	Scanner driver		
USB *1	Windows 98/Me/2000/XP	Available *2	Available		
LAN	Windows 95/98/Me/NT 4.0/2000/XP		Not Available		

*1 Windows 98/Me does not support USB 2.0. A USB 2.0 connection can be used in Windows 98/Me, however, the performance will be the same as USB 1.1. The print speed based on USB 2.0 specifications can only be attained if your computer is running Windows 2000/XP, you are using a cable that supports USB 2.0 (USB 1.1 or USB 2.0 certified), and the cable is connected to a USB 2.0 port on your computer. If the connection is made through a hub, the hub must support USB 2.0.

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

B. Installing the software

Note:

- If you need to use a different connection method after installing the software using a USB or network connection, you must first uninstall the software and then install it using the new connection method.
- In the following explanations it is assumed that the mouse is configured for right hand operation.
- The scanner feature only works when using a USB cable.

- If an error message appears, follow the instructions on the screen to solve the problem. After the problem is solved, the installation procedure will continue. Depending on the problem, you may have to click the "Cancel" button to exit the installer. In this case, reinstall the software from the beginning after solving the problem.
- When installing Sharpdesk, a minimal version of Internet Explorer 5.01 will be installed on your computer if your computer does not currently have Internet Explorer version 4.01 or later.

(1) Using the machine with a USB connection

- The USB cable must not be connected to the machine. Make sure that the cable is not connected before proceeding.

If the cable is connected, a Plug and Play window will appear. If this happens, click the "Cancel" button to close the window and disconnect the cable.

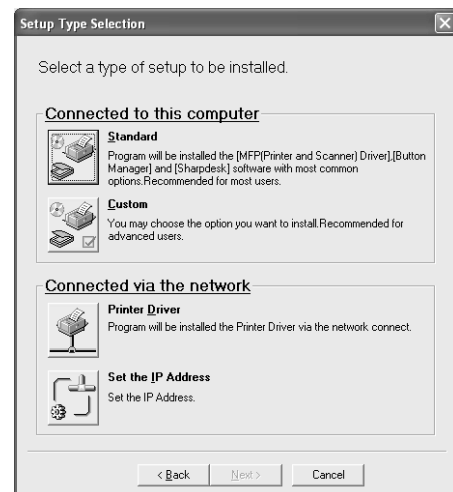
Note: The cable will be connected in step 15.

- Insert the CD-ROM into your computer's CD-ROM drive.
- Click the "start" button, click "My Computer", and then double-click the CD-ROM icon.
In Windows 98/Me/2000, double-click "My Computer", and then double-click the CD-ROM icon.

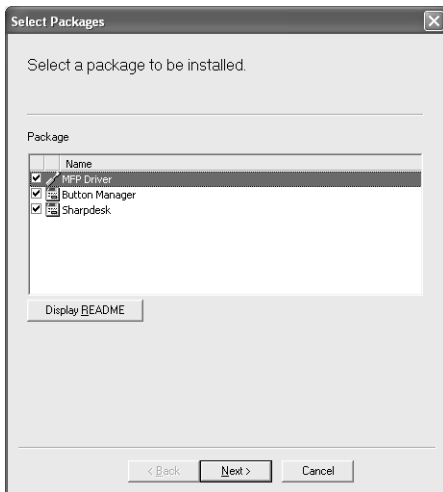
- Double-click the "setup" icon.

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

- The "SOFTWARE LICENCE" window will appear. Make sure that you understand the contents of the software licence, and then click the "Yes" button.
- Read the "Readme First" in the "Welcome" window and then click the "Next" button.
- To install all of the software, click the "Standard" button.
To install particular packages, click the "Custom" button.
If you selected "Custom", go to step 9.



- Read the message in the "Welcome" window and then click the "Next" button.
If you selected "Standard" in step 7, installation will begin.
Go to step 14.
- If you clicked the "Custom" button, select the checkboxes of the software packages to be installed and then click the "Next" button.
Click the "Display README" button to show information on packages that are selected.



- 10) Check the packages on the screen, and then click the "Start" button.

The software packages to be installed will be displayed on the screen. If an incorrect package is displayed, click the "Back" button and select the correct packages.

- 11) The files required for installation of the MFP driver are copied (if "MFP Driver" was selected).

Follow the on-screen instructions.

Caution: If you are running Windows 2000/XP and a warning message appears regarding the Windows logo test or digital signature, be sure to click "Continue Anyway" or "Yes".

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

- 12) Begin the installation of Button Manager (if "Button Manager" was selected).

Follow the on-screen instructions.

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

The Sharpdesk installer will start.

- 13) Begin the installation of Sharpdesk (if "Sharpdesk" was selected). Follow the on-screen instructions.

Click the "Finish" button when the message informs you that Setup is complete.

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



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

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

Imaging will overwrite Imaging for Windows.

- 14) When the "Finish" screen appears, click the "Close" button.

Caution: If you are running Windows 2000/XP and a warning message appears regarding the Windows logo test or digital signature, be sure to click "Continue Anyway" or "Yes".

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

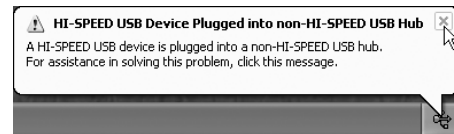
Note:

- If this is a "Standard" installation, the "Finish" screen will appear after several minutes.
- After the installation, a message prompting you to restart your computer may appear. In this case, click the "Yes" button to restart your computer.

- 15) Make sure that the power of the machine is turned on, and then connect the USB cable.

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

Caution: If the following message appears on your computer screen, close it.



A window regarding "HI-SPEED USB Device" will then appear. Close the window.

This message appears when the machine's USB 2.0 mode is not set to "HI-SPEED". For information on switching the USB 2.0 mode.

- 16) Begin installation of the scanner driver.

"SHARP AL-XXXXCS" will appear in the "Found New Hardware Wizard" dialog box. Select "Install the software automatically (Recommended)" and click the "Next" button. Follow the on-screen instructions.

Caution: If you are running Windows 2000/XP and a warning message appears regarding the Windows logo test or digital signature, be sure to click "Continue Anyway" or "Yes".

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

- 17) Begin installation of the printer driver.

"SHARP AL-XXXXCS" will appear in the "Found New Hardware Wizard" dialog box. Select "Install the software automatically (Recommended)" and click the "Next" button. Follow the on-screen instructions.

Caution: If you are running Windows 2000/XP and a warning message appears regarding the Windows logo test or digital signature, be sure to click "Continue Anyway" or "Yes".

- 18) Follow the instructions in the Plug and Play screen that appears in your version of Windows to begin the installation.

This completes the installation of the software.

- If you installed Button Manager, set up Button Manager as explained in "SETTING UP BUTTON MANAGER".

(2) Connecting a USB cable

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

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

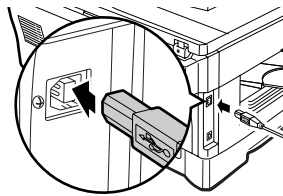
Caution:

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

Note:

- If the machine will be connected using a USB 2.0 port of your computer, please purchase a USB cable that supports USB 2.0.
- The machine's USB port will transfer data at the speed specified by the USB 2.0 (Hi-Speed) only if the Microsoft USB 2.0 driver is pre-installed in the computer, or if the USB 2.0 driver for Windows 2000 Professional/XP that Microsoft provides through its "Windows Update" Web page is installed.
- To obtain the fastest USB 2.0 data transfer speed, "USB2.0 MODE SWITCH" in the machine's user programs must be set to "HI-SPEED". For more information, see "USER PROGRAMS".
- Use the machine's "HI-SPEED" mode only when using a computer that is running Windows 2000/XP.
- Even when the Microsoft USB 2.0 driver is used, it may not be possible to obtain full USB 2.0 speed if a PC card supporting USB 2.0 is used. To obtain the latest driver (which may enable a higher speed), contact the manufacturer of your PC card.
- Connection is also possible using a USB 1.1 port on your computer. However, the specifications will be USB 1.1 specifications (Full-Speed).

- 1) Insert the cable into the USB port on the machine.



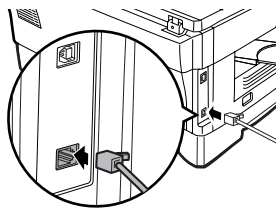
- 2) Insert the other end of the cable into your computer's USB port.

(3) Using the machine as a network printer

Note:

- Interface cables for connecting the machine to your computer are not included with the machine. Please purchase the appropriate cable for your computer.
- If you intend to use the machine as a scanner, it must be connected to your computer with a USB interface cable. The scanner function cannot be used if the machine is connected with a LAN cable.
- To install the software using a network connection in Windows 95, Internet Explorer version 4.01 or later must be installed on your computer. If this is not installed, double-click "My Computer" and then double-click the CD-ROM icon. Double-click the "ie501" folder, the "EN" folder, and then "ie5setup.exe".

- 1) Insert the LAN cable into the LAN port on the machine.
Use a network cable that is shielded.



- 2) Turn on the machine.
- 3) Insert the CD-ROM into your computer's CD-ROM drive.
- 4) Click the "start" button, click "My Computer", and then double-click the CD-ROM icon.
In Windows 95/98/Me/NT 4.0/2000, double-click "My Computer", and then double-click the CD-ROM icon.
- 5) Double-click the "setup" icon.

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

- 6) The "SOFTWARE LICENCE" window will appear. Make sure that you understand the contents of the software licence, and then click the "Yes" button.

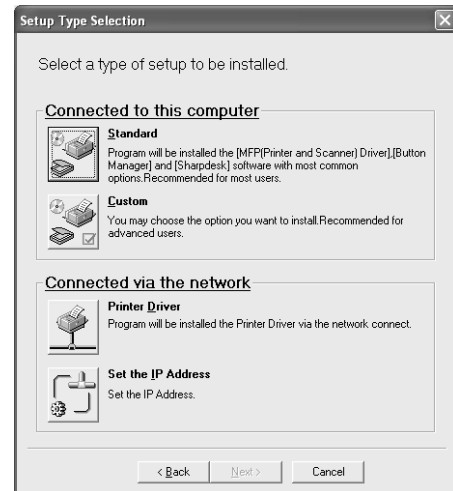
- 7) Read the "Readme First" in the "Welcome" window and then click the "Next" button.

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

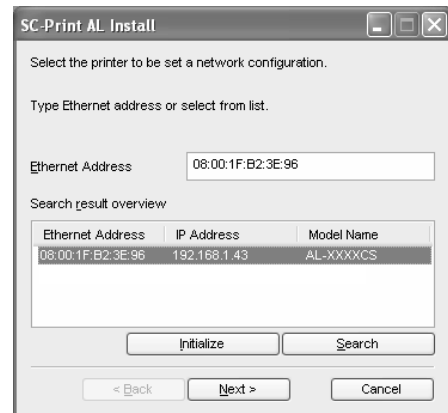
Set the IP Address

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

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



- 9) The printer or printers connected to the network will be detected. Click the printer to be configured (the machine) and click the "Next" button.



Note:

- The "Ethernet Address" is indicated on the left side of the machine near the LAN port.
- If the machine is used on a different network after the IP address is set, the machine will not be recognized. Enter the Ethernet Address and click the "Initialize" button to initialize the IP address. Follow the on-screen instructions to click the "OK" button and then the "Search" button.

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

The settings in the above window are examples.

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

SC-Print AL Install

Set a network configuration to the printer.

☐ Get IP Address Automatically

☐ Assign IP Address

IP Address: 192 . 168 . 1 . 43

Subnet Mask: 255 . 255 . 255 . 0

Gateway Address: 192 . 168 . 1 . 1

MEMO

If you select [Get IP Address Automatically], the DHCP server assigns an IP address to this printer. If a DHCP server is not available, please manually assign an IP address.

< Back Next > Cancel

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

- 11) Click the "Next" button.

- 12) Click the "Yes" button.

Go to step 11.

SC-Print AL Install

Setting the IP address was completed.
Do you want to continue installing the printer driver?

Yes No

LPR (TCP/IP) direct printing

After step 1-7.

- 8) Click the "Printer Driver" button.

If you have not set the IP Address, click the "Set the IP Address" button in first and go to step 8 on "Connecting a USB cable".

Setup Type Selection

Select a type of setup to be installed.

Connected to this computer

Standard
Program will be installed the [MFP(Printer and Scanner) Driver],[Button Manager] and [Sharpdesk] software with most common options. Recommended for most users.

Custom
You may choose the option you want to install. Recommended for advanced users.

Connected via the network

Printer Driver
Program will be installed the Printer Driver via the network connect.

Set the IP Address
Set the IP Address.

< Back Next > Cancel

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

- 10) Select "LPR (TCP/IP) direct printing" and click the "Next" button.

SHARP AL-1600 Series Printer Driver

Select an interface to be connected.

☒ LPR(TCP/IP) direct printing

☐ Shared Printer

< Back Next > Cancel

- 11) The printer or printers connected to the network will be detected. Click the printer to be configured (the machine) and click the "Next" button.

Add SC-Print AL Port Wizard

Please select the printer for which you want to add a port.
If the printer is on the different network, please click [Configuration] and register the proper broadcast address. Then click [Search].

IP Address or Printer Name: 192.168.1.43

IP Address	Ethernet Address	Model Name
192.168.1.43	08 00 1F B2 3E 96	AL-XXXXCS

Configuration... Search

< Back Next > Cancel

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

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

Add SC-Print AL Port Wizard

You can assign a name for the printer port. Port names that already exist (eg. LPT1:) can not be used.
If a printer port is not modified, the default printer port name will be used.

Printer Port Name: 192.168.1.43.lp

< Back Next > Cancel

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

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

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

Add SC-Print AL Port Wizard

After clicking the "Finish" button, the SC-Print AL Port will be registered as configured below.

Printing Destination Address: 192.168.1.43

Printer Port Name: 192.168.1.43.lp

< Back Finish Cancel

- 14) When the model selection window appears, select the model name of your machine and click the "Next" button.

For the model name of your machine, see the operation panel on the machine.

Note: A Welcome window may appear before this step. Read the message in the "Welcome" window and then click the "Next" button.

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

Caution: If you are running Windows 2000/XP and a warning message appears regarding the Windows logo test or digital signature, be sure to click "Continue Anyway" or "Yes".

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

- 17) When the "Finish" screen appears, click the "Close" button.

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

This completes the installation of the software.

(4) Sharing the printer using windows networking

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

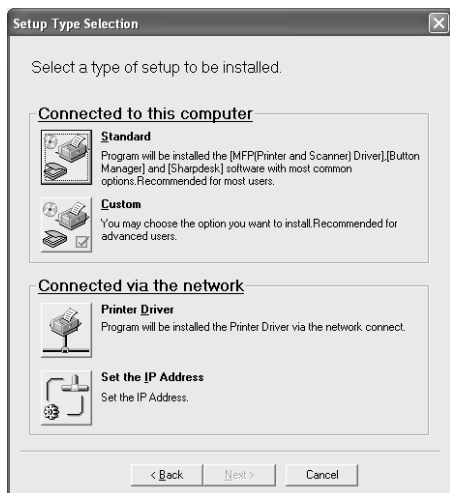
Note: To configure the appropriate settings in the print server, see the operation manual or help file of your operating system.

- 1) Insert the CD-ROM into your computer's CD-ROM drive.
- 2) Click the "start" button, click "My Computer", and then double-click the CD-ROM icon.
In Windows 95/98/Me/NT 4.0/2000, double-click "My Computer", and then double-click the CD-ROM icon.

- 3) Double-click the "setup" icon.

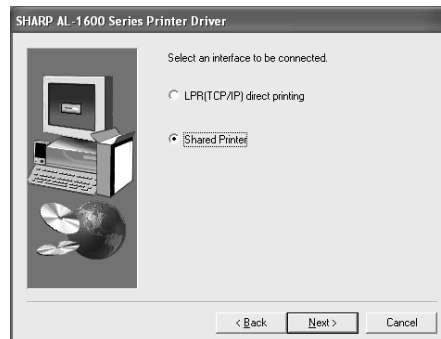
Note: If the language selection screen appears after you double click the "setup" icon, select the language that you wish to use and click the "Next" button. (Normally the correct language is selected automatically.)

- 4) The "SOFTWARE LICENCE" window will appear. Make sure that you understand the contents of the software licence, and then click the "Yes" button.
- 5) Click the "Printer Driver" button.



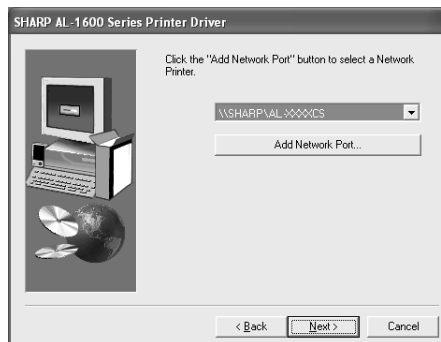
- 6) Read the message in the "Welcome" window and then click the "Next" button.

- 7) Select "Shared Printer" and click the "Next" button.



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

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



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

- 9) When the model selection window appears, select model name of your machine and click the "Next" button.
For the model name of your machine, see the operation panel on the machine.
- 10) Follow the on-screen instructions.
- 11) When the "Finish" screen appears, click the "Close" button.

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

This completes the installation of the software.

C. Setting up button manager

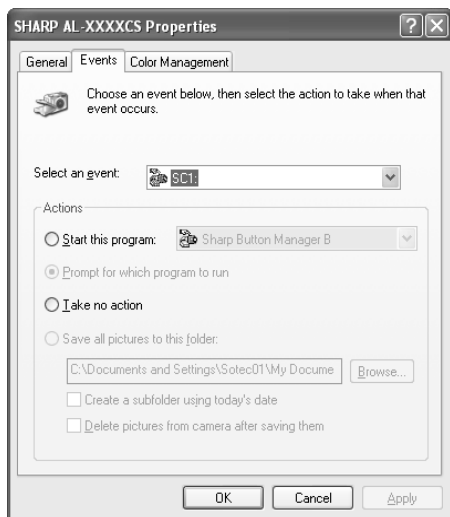
Button Manager is a software program that works with the scanner driver to enable scanning from the machine.

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

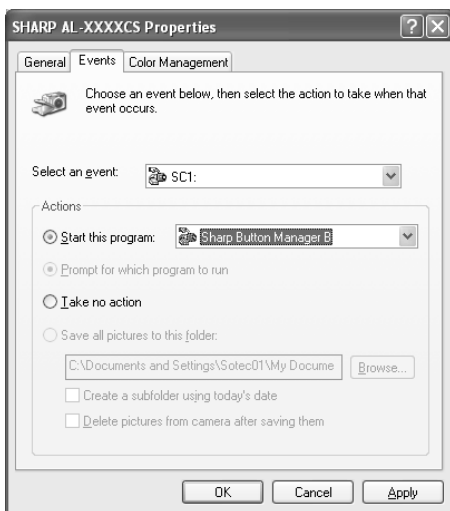
(1) Windows XP

- 1) Click the "start" button, click "Control Panel", click "Printers and Other Hardware", and then click "Scanners and Cameras".
- 2) Click the "SHARP AL-XXXXCS" icon and select "Properties" from the "File" menu.
- 3) In the "Properties" screen, click the "Events" tab.

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



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



- 6) Click the "Apply" button.
- 7) Repeat Steps 4 through 6 to link Button Manager to "SC2:" through "SC6:".

Select "SC2:" from the "Select an event" pull-down menu. Select "Start this program", select "Sharp Button Manager B" from the pull-down menu, and then click the "Apply" button. Do the same for each ScanMenu through "SC6:".

When the settings have been completed, click the "OK" button to close the screen.

Button Manager is now linked to the scan menu (1 through 6).

The scan settings for each of scan menu 1 through 6 can be changed with the setting window of Button Manager.

For the factory default settings of the scan menu. For the procedures for configuring Button Manager settings, see "Button Manager Settings" in the Online Manual.

(2) Windows 98/Me/2000

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

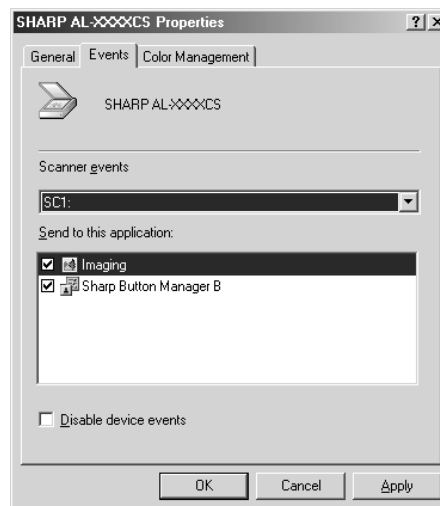
- 2) Double-click the "Scanners and Cameras" icon.

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

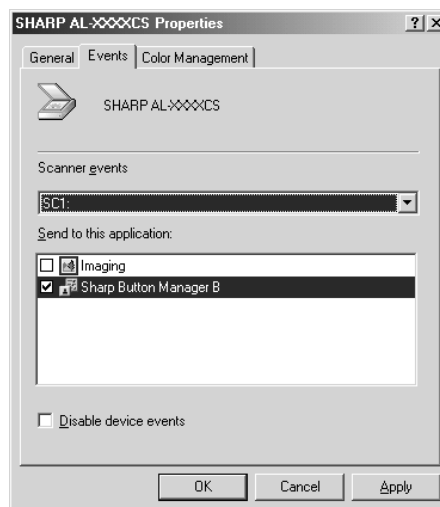
- 3) Select "SHARP AL-XXXXCS" and click the "Properties" button.

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

- 4) In the "Properties" screen, click the "Events" tab.
- 5) Select "SC1:" from the "Scanner events" pull-down menu.



- 6) Select "Sharp Button Manager B" in "Send to this application".



Note: If other applications are shown, deselect the checkboxes for the other applications and leave only the Button Manager checkbox selected.

- 7) Click the "Apply" button.
- 8) Repeat Steps 5 through 7 to link Button Manager to "SC2:" through "SC6:".

Select "SC2:" from the "Scanner events" pull-down menu. Select "Sharp Button Manager B" in "Send to this application" and click the "Apply" button. Do the same for each ScanMenu through "SC6:".

When the settings have been completed, click the "OK" button to close the screen.

Button Manager is now linked to the scan menu (1 through 6).

The scan settings for each of scan menus 1 through 6 can be changed with the setting window of Button Manager.

For the factory default settings of the scan menu. For the procedures for configuring Button Manager settings, see "Button Manager Settings" in the Online Manual.

10. Interface

A. USB

Connector

4-pin ACON UBR23-4K2200

Type-B connector

Cable

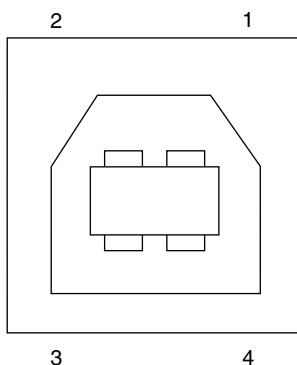
Shielded twisted pair cable

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

Pin configuration

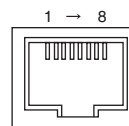
The pin numbers and signal names are listed in the following table.

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



B. RJ45

RJ-45 connector pin arrangement



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

11. Moving

Moving instructions

When moving the unit, follow the procedure below.

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

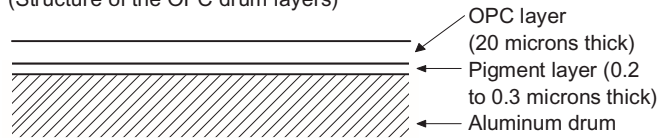
- 1) Turn the power switch off and remove the power cord from the outlet.
- 2) Open the side cover and front cover, in that order. Remove the TD cartridge and close the front cover and side cover, in that order.
To open and close the side cover and front cover, and to remove the TD cartridge.
- 3) Raise the handle of the paper tray and pull the paper tray out until it stops.
- 4) Push the center of the pressure plate down until it locks in place and lock the plate using the pressure plate lock which has been stored in the front of the paper tray.
- 5) Push the paper tray back into the unit.
- 6) Lock the scan head locking switch.

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

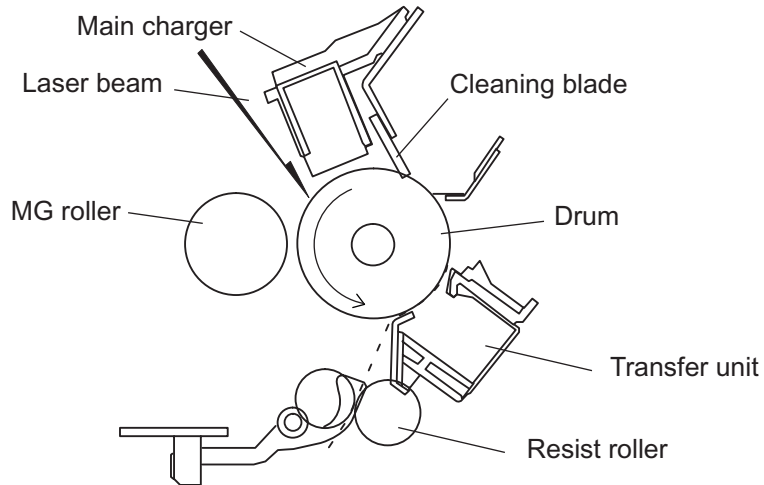
- 7) Close the multi-bypass tray and the paper output tray extension, and attach the packing materials and tape which were removed during installation of the unit.
- 8) Pack the unit into the carton.

[6] COPY PROCESS

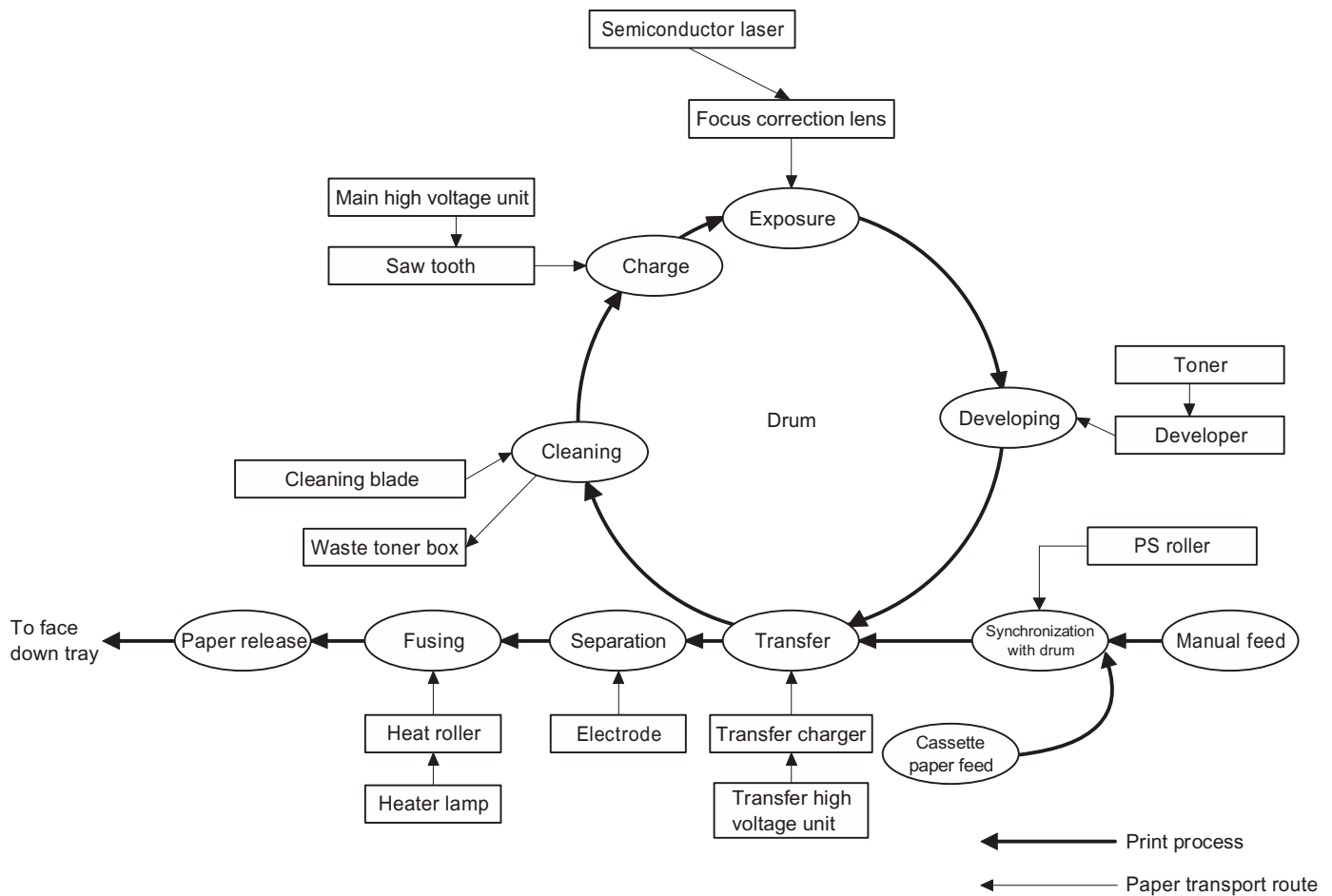
An OPC drum is used for the photoconductor.
(Structure of the OPC drum layers)



1. Functional diagram



(Basic operation cycle)



2. Outline of print process

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

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

Step-1: Charge

Step-2: Exposure

* Latent image is formed on the drum.

Step-3: Developing

Latent image formed on the drum is then changed into visible image with toner.

Step-4: Transfer

The visible image (toner image) on the drum is transferred onto the print paper.

Step-5: Cleaning

Residual toner on the drum surface is removed and collected by the cleaning blade.

Step-6: Optical discharge

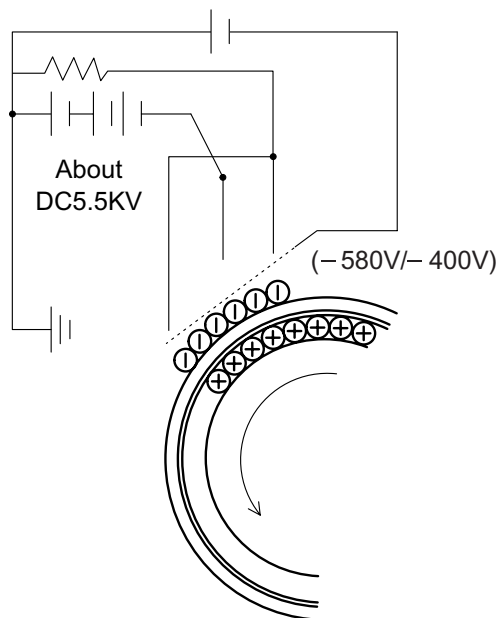
Residual charge on the drum surface is removed, by semiconductor laser beam.

3. Actual print process

Step-1: DC charge

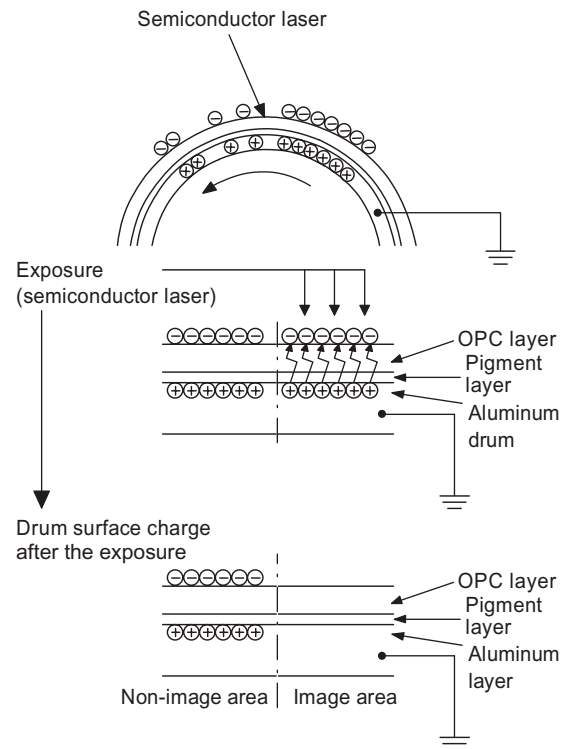
A uniform negative charge is applied over the OPC drum surface by the main charging unit. Stable potential is maintained by means of the Scorotron charger.

Positive charges are generated in the aluminum layer.



Step-2: Exposure (laser beam, lens)

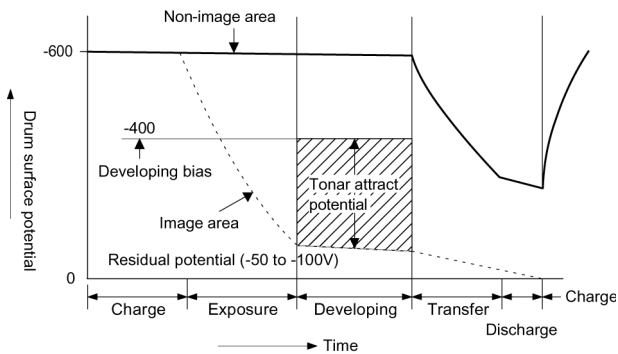
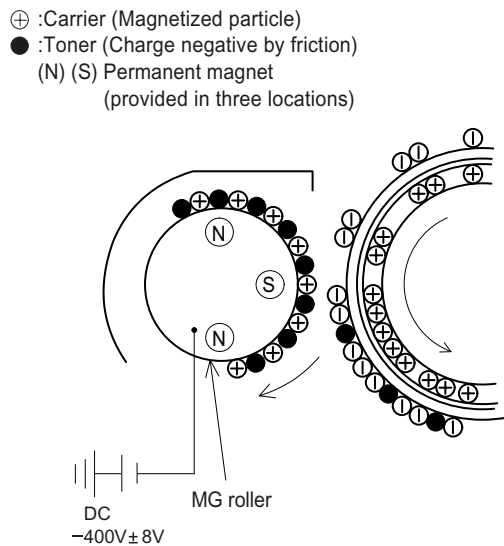
A Laser beam is generated from the semiconductor laser and controlled by the print pattern signal. The laser writes onto the OPC drum surface through the polygon mirrors and lens. The resistance of the OPC layer decreases for an area exposed by the laser beam (corresponding to the print pattern signal).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



Step-3: Developing (DC bias)

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

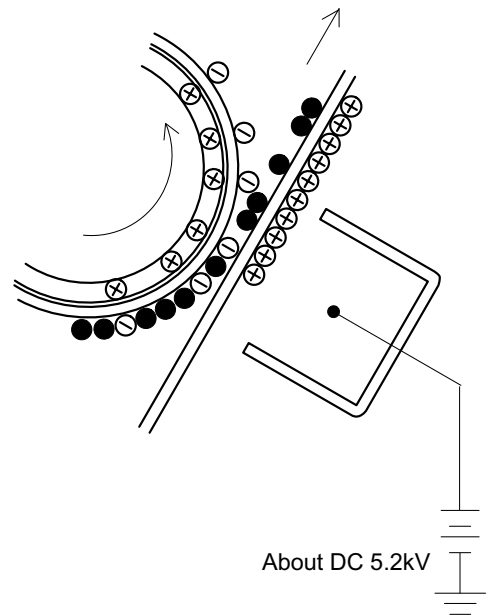
Non-image area of the drum surface charged with negative potential repel the toner, whereas the laser exposed portions where no negative charges exist, attract the toner. As a result, a visible image appears on the drum surface.



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

Step-4: Transfer

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

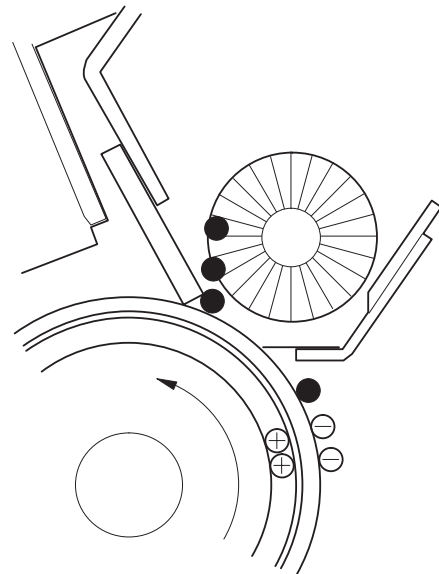


Step-5: Separation

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

Step-6: Cleaning

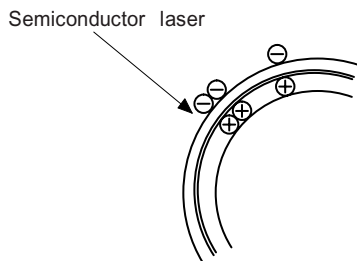
Toner remaining on the drum is removed and collected by the cleaning blade. It is transported to the waste toner collecting section in the cleaning unit by the waste toner transport roller.



Step-7: Optical discharge (Semiconductor laser)

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

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



Charge by the Scorotron charger

Function

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

Basic function

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

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

Process controlling

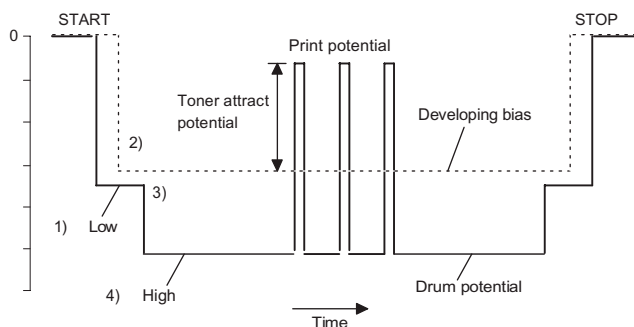
Function

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

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

Basic function

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



Start

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

Stop

The reverse sequence takes place.

Retaining developing bias at an abnormal occurrence

Function

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

Basic function

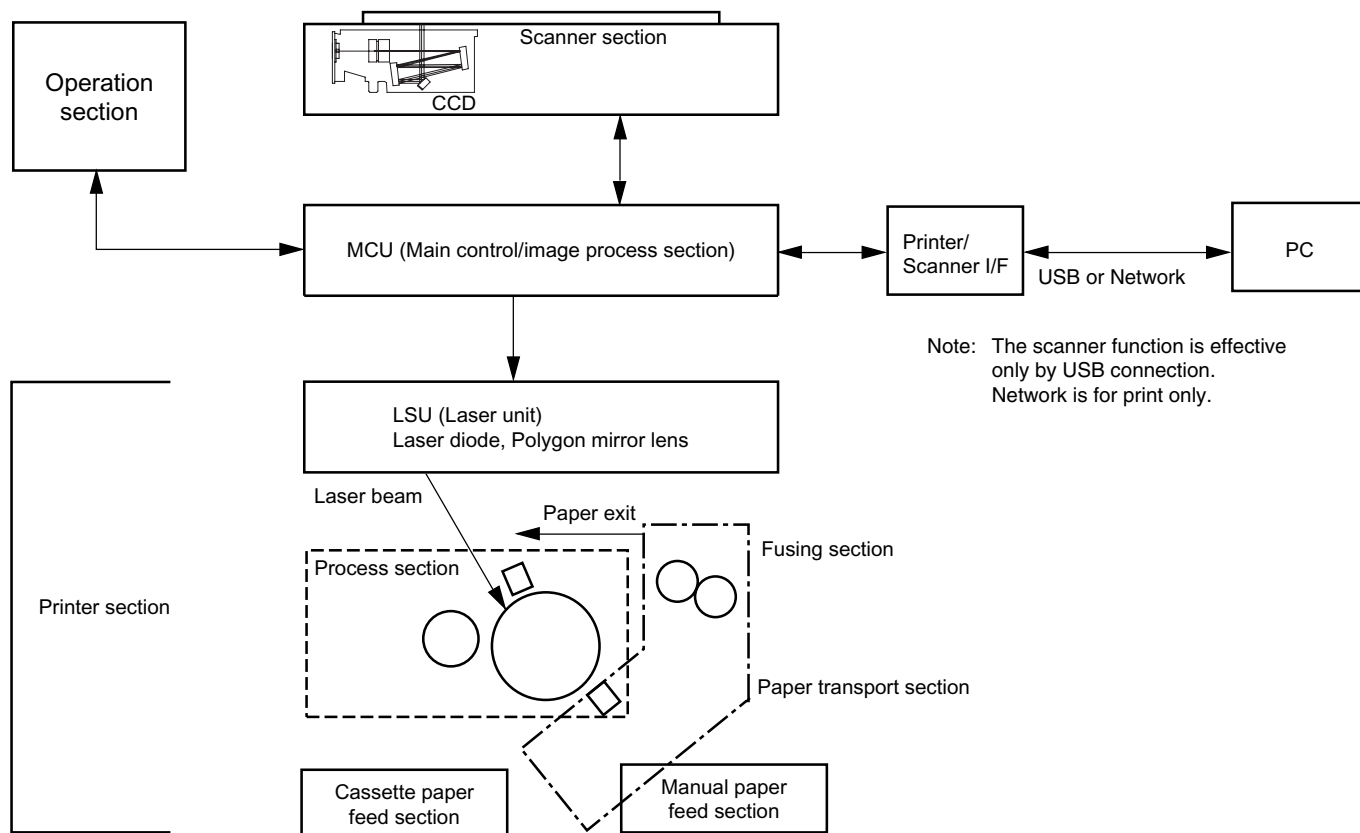
Normally, the developing bias voltage is retained for a certain time before the drum comes to a complete stop if the machine should stop before completing the normal print cycle. The developing bias can be added before resuming the operation after an abnormal interruption. Therefore, carrier will not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

[7] OPERATIONAL DESCRIPTIONS

1. Outline of operation

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

(Basic configuration)



(Outline of copy operation)

Setting conditions

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

Image scanning

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

Photo signal/Electric signal conversion

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

Image process

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

Electric signal/Photo signal (laser beam) conversion

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

Printing

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

(Outline of printer operation)

The print data sent from the PC are passed through the I/F and the MCU to the LSU. The procedures after that are the same as above 5) and later.

(Outline of scanner operation)

The scan data are passed through the MCU and the I/F to the PC according to the conditions requested by the PC or set by the operations with the operation panel.

2. Scanner section

A. Scanner unit

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

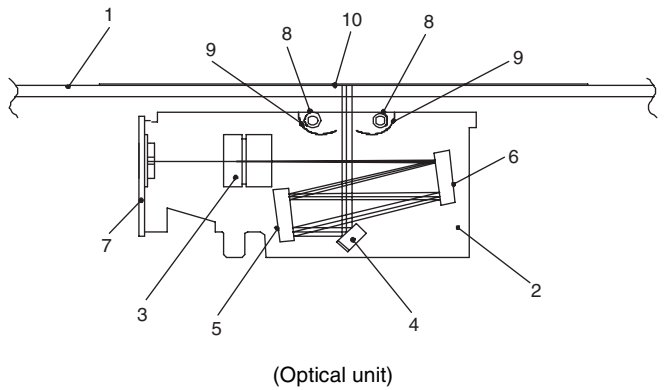
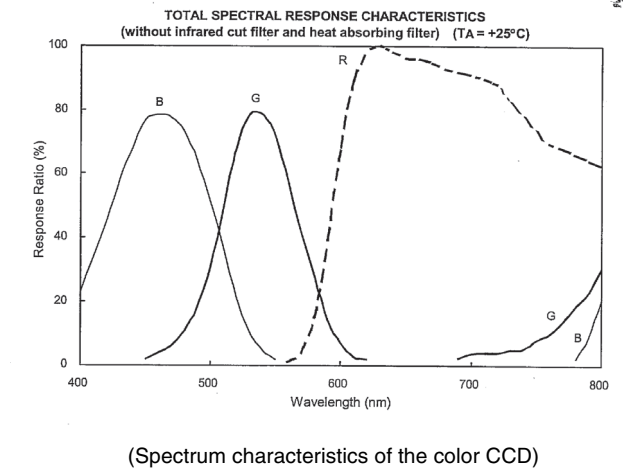
B. Optical system

Two white lamps are used as the light source. Light radiated from the light source is applied to the document on the document table. The reflected light from the document is reflected 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)

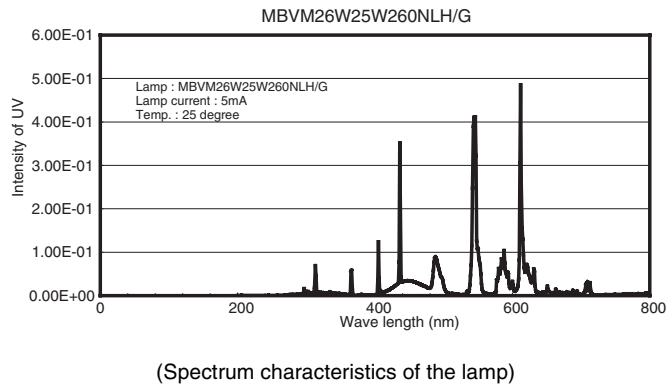
The resolution is 600dpi.

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 test command.

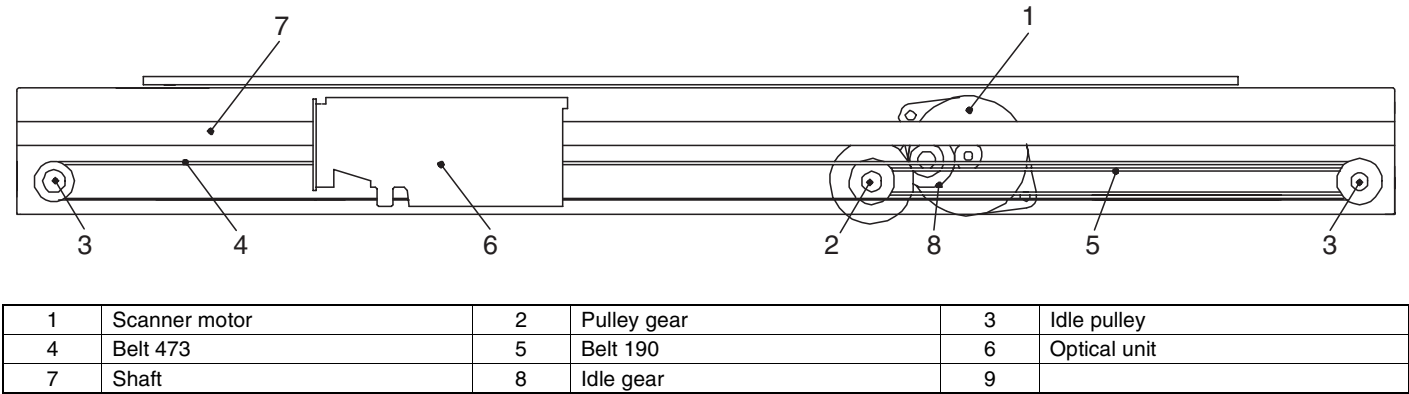


1	Table glass	2	Optical unit	3	Lens
4	Mirror 1	5	Mirror 2	6	Mirror 3
7	CCD PWB	8	Lamp	9	Reflector



C. Drive system

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



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

3. Laser unit

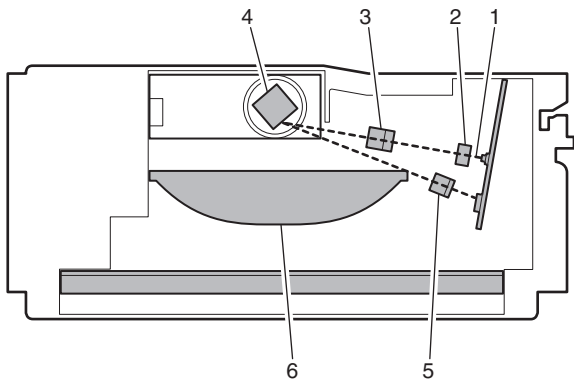
The image data sent from the MCU (image process circuit) is sent to the LSU (laser unit), where it is converted into laser beams.

A. Basic structure

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

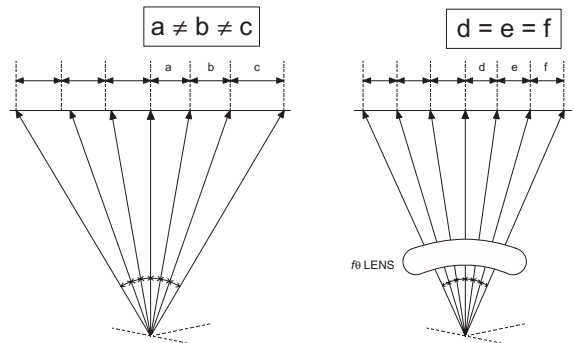
The semiconductor laser is used as the light source, and images are formed on the OPC drum by the polygon mirror and fθ lens, etc.

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

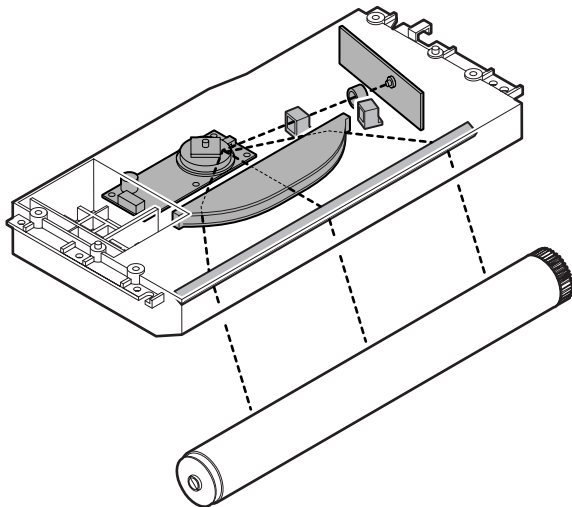


No	Component	Function
1	Semiconductor laser	Generates laser beams.
2	Collimator lens	Converges laser beams in parallel.
3	CY lens	Converges laser beams onto the polygon mirror surface.
4	Polygon mirror, polygon motor	Reflects laser beams at a constant rpm. (A four-surfaces polygon mirror is used.)
5	BD (Mirror, lens, PWB)	Detects start timing of laser scanning.
6	fθ lens	Converges laser beams at a spot on the drum. Makes the laser scanning speeds at both ends of the drum same as each other. (Refer to the figure below.)

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



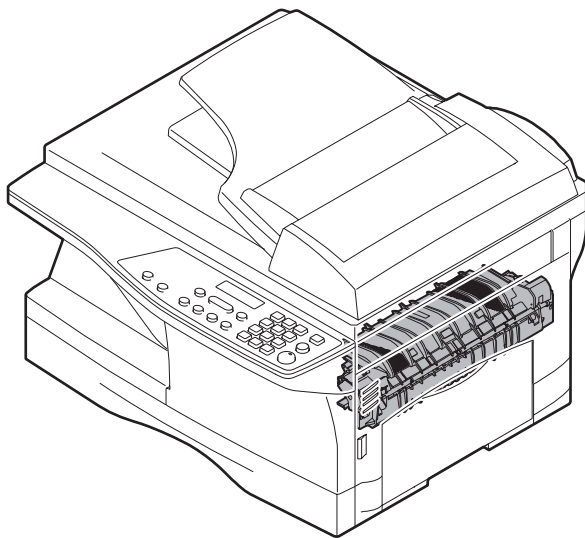
B. Laser beam path



C. Composition

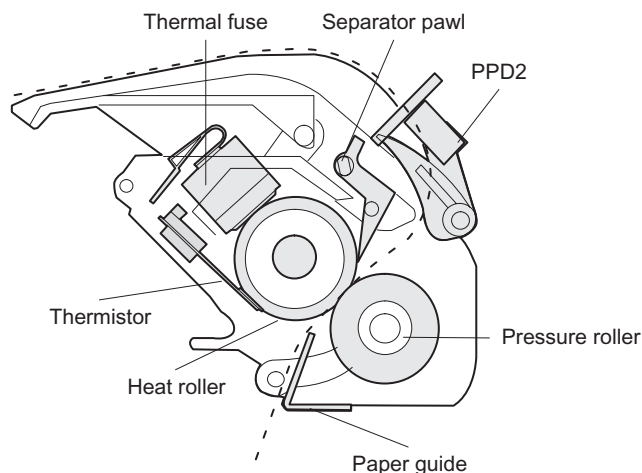
- Effective scanning width: 216mm (max.)
- Resolution: 600dpi
- Beam diameter: 75um in the main scanning direction, 80um in the sub scanning direction
- Image surface power: 0.17 ±0.01mW (Laser wavelength 770 - 795nm)
- Polygon motor section: Brushless motor 31,180rpm
- No. of mirror surfaces: 4 surfaces

4. Fuser section

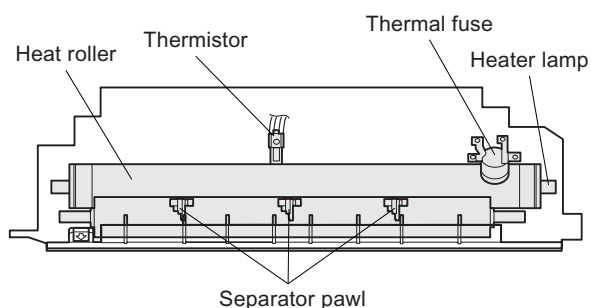


A. General description

General block diagram (cross section)



Top view



(1) Heat roller

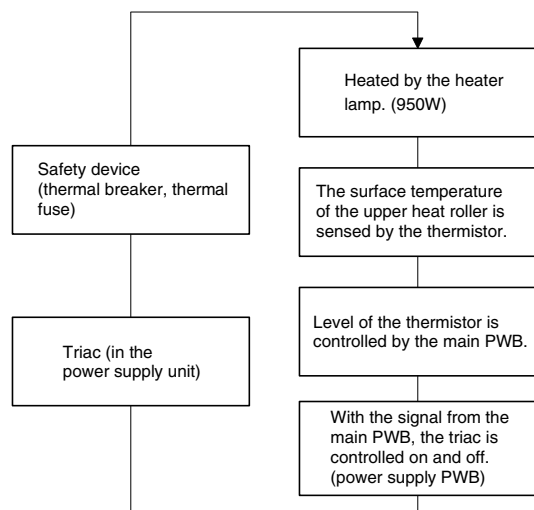
A Teflon roller is used for the heat roller and a silicone rubber roller is used for the lower heat roller for better toner fusing performance and paper separation.

(2) Separator pawl

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

(3) Thermal control

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



- 2) The surface temperature of the upper heat roller is set to 165 - 190°C. The surface temperature during the power save mode is set to 100°C.
- 3) The self-check function comes active when one of the following malfunctions occurs, and an "H" is displayed on the multicopy window.
 - a. When the heat roller surface temperature rises above 240°C.
 - b. When the heat roller surface temperature drops below 100°C during the copy cycle.
 - c. Open thermistor
 - d. Open thermal fuse
 - e. When the heat roller temperature does not reach 190°C within 27 second after supplying the power.

(4) Fusing resistor

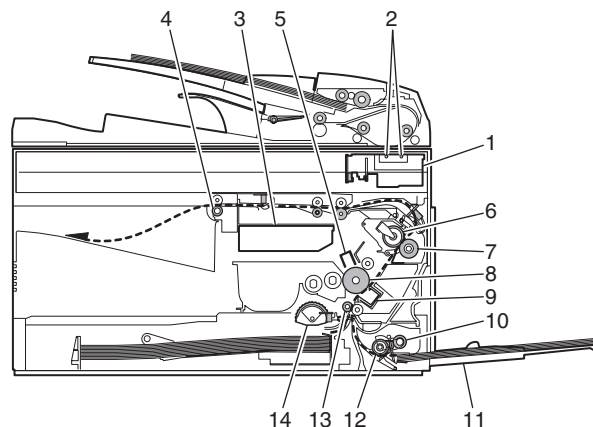
Fusing resistor

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

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

5. Paper feed section and paper transport section

A. Paper transport path and general operations



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

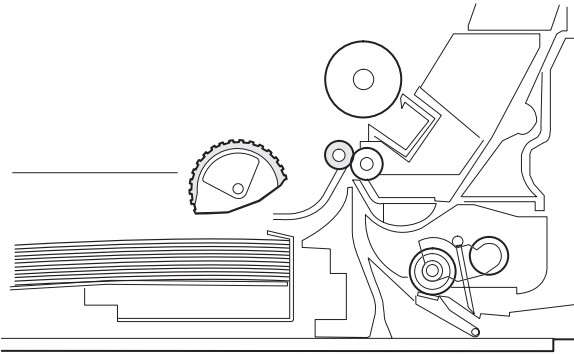
Paper feed is made in two ways; the tray paper feed and the manual paper feed. The tray is of universal-type, and has the capacity of 250 sheets.

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

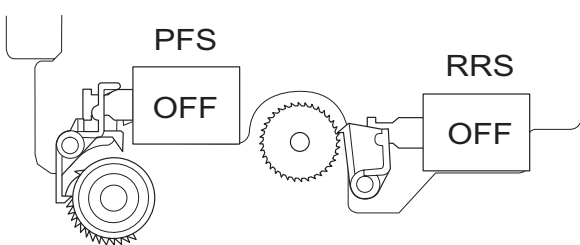
The general descriptions on the tray paper feed and the manual paper feed operation are given below.

(1) Cassette paper feed operation

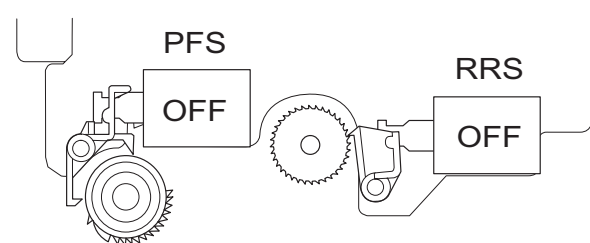
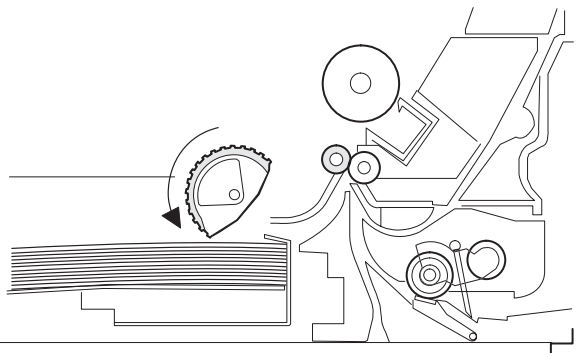
- 1) The figure below shows the positions of the pick-up roller, the paper feed clutch sleeve, and the paper feed latch in the initial state without pressing the COPY button after lighting the ready lamp.
The paper feed latch is in contact with the projection of the clutch sleeve.



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

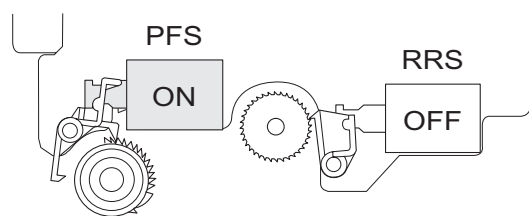
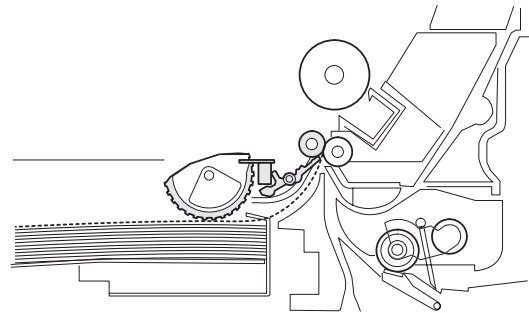


- 3) After about 0.1 sec from when the main motor start rotating, the tray paper feed solenoid (PFS) turns on for a moment.
This disengages the paper feed latch from the projection of the clutch sleeve, transmitting rotation of the pick-up drive gear to the paper feed roller shaft, rotating the pick-up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

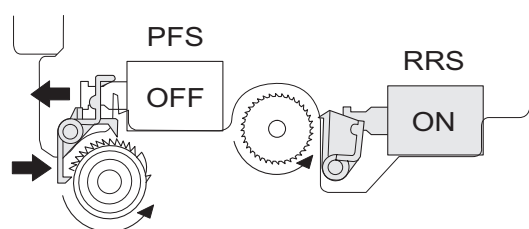
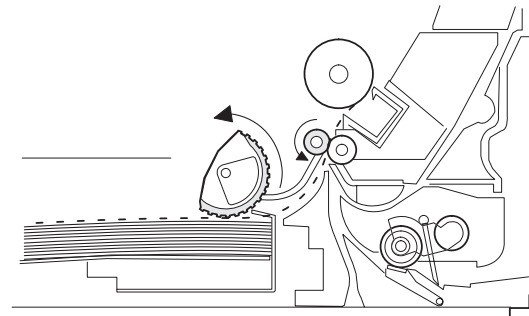


- 4) After more than half rotation of the pick-up roller, the paper feed latch is brought in contact with a notch on the clutch sleeve, stopping rotation of the pick-up roller.

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



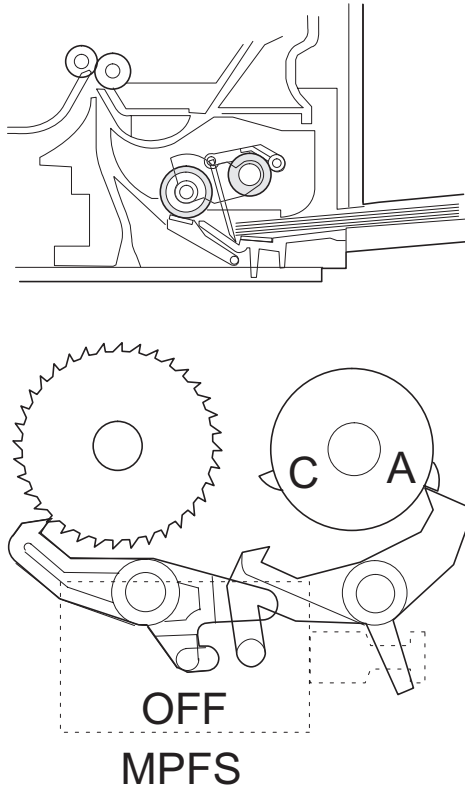
- 6) To release the resist roller, the tray paper feed solenoid and the resist solenoid are turned on by the paper start signal to disengage the resist start latch from the clutch sleeve, transmitting rotation of the resist drive gear to the resist roller shaft. Thus the paper is transported by the resist roller.
- 7) After the resist roller starts rotating, the paper is passed through the pre-transfer guide to the transfer section. Images are transferred on the paper, which is separated from the OPC drum by the drum curve and the separation section.



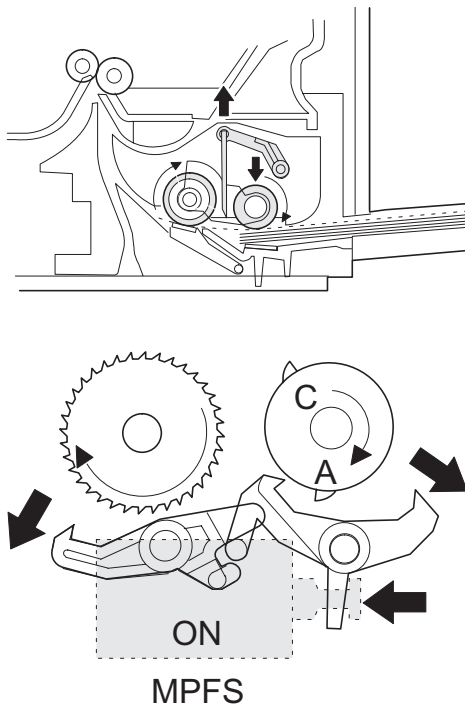
- 8) The paper separated from the drum is passed through the fusing paper guide, the heat roller (fusing section), POD (paper out detector) to the copy tray.

(2) Manual multi paper feed operation

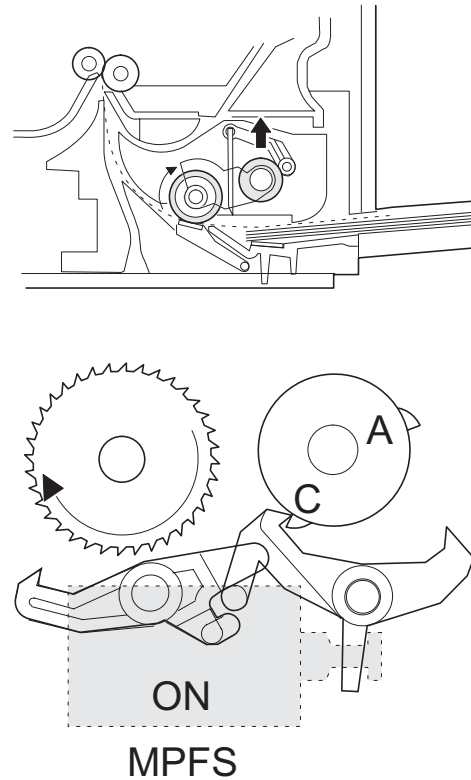
- 1) Before paper feed operation, the manual paper feed solenoid (MPFS) is turned OFF as shown in the figure below.



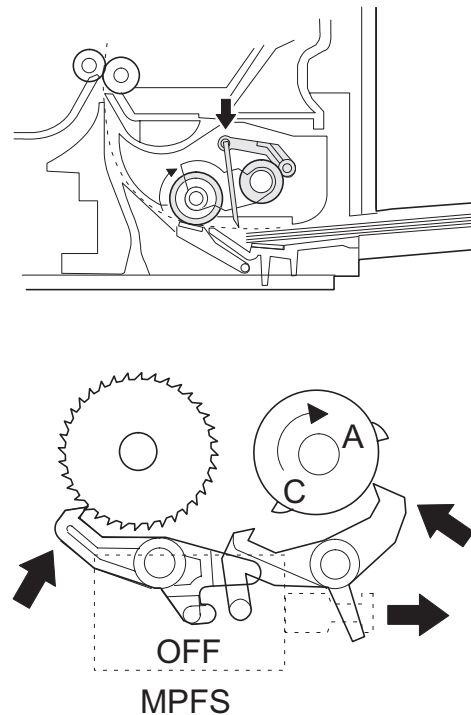
- 2) When the PRINT button is pressed, the manual paper feed solenoid (MPFS) turns on to disengage the manual paper feed latch. A from the manual paper feed clutch sleeve A, rotating the manual paper feed roller and the manual take-up roller. At the same time, the manual paper feed stopper opens and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



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



- 4) The lead edge of the transported paper is pressed on the resist roller by the transport roller. Then the paper is stopped temporarily to allow synchronization with the lead edge of the image on the OPC drum. From this point, the operation is the same as the paper feed operation from the tray. (Refer to A-5 - 8.)
- 5) The solenoid turns off to close the gate and return to the initial state.



(3) Conditions of occurrence of paper misfeed

a. When the power is turned on:

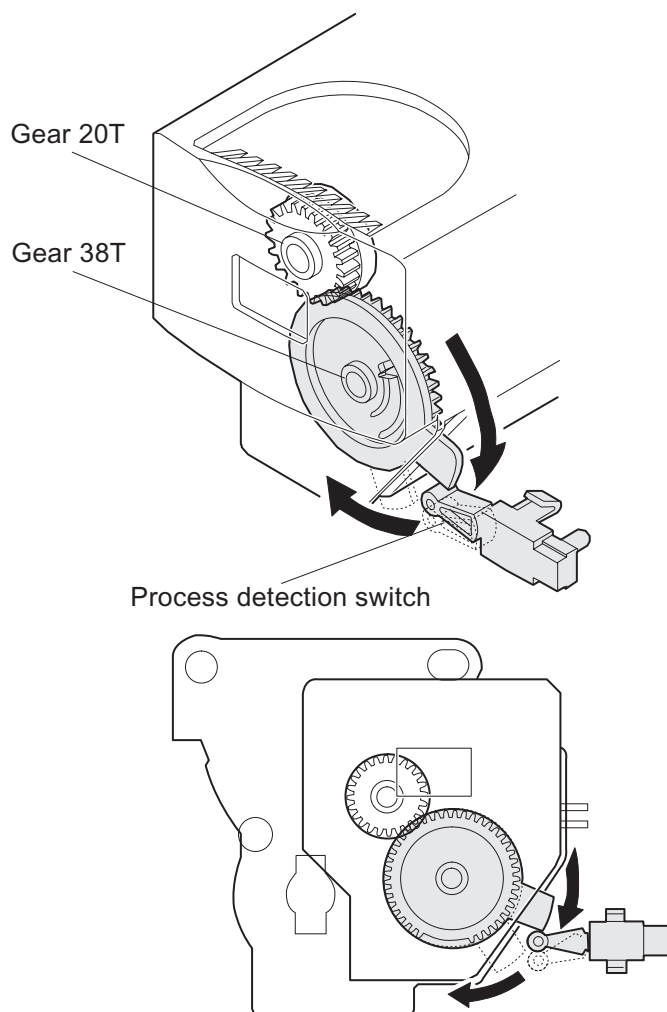
PPD or POD is ON when the power is turned on.

b. Copy operation

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

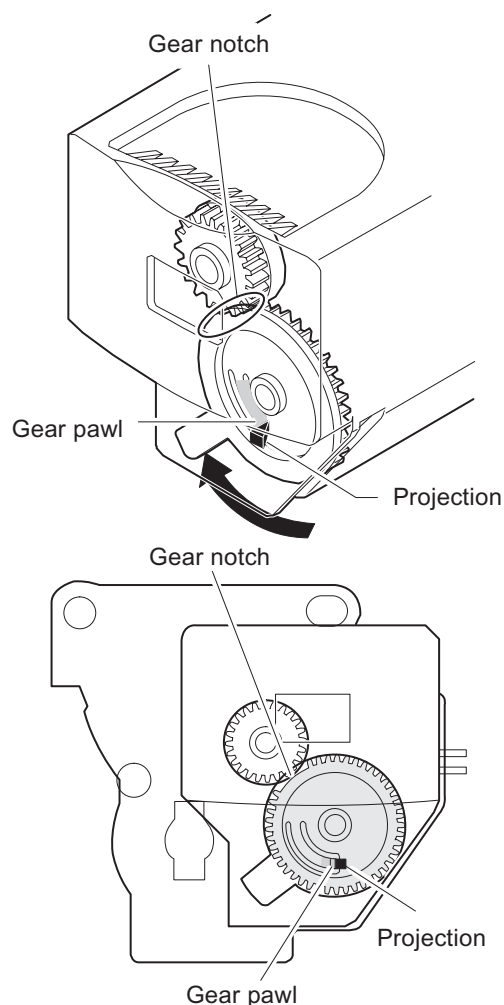
6. Process unit new drum detection mechanism

- When the power is turned on, the detection gear 38T is rotated in the arrow direction by the detection gear 20T to push the micro-switch (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 projection of the process cover.

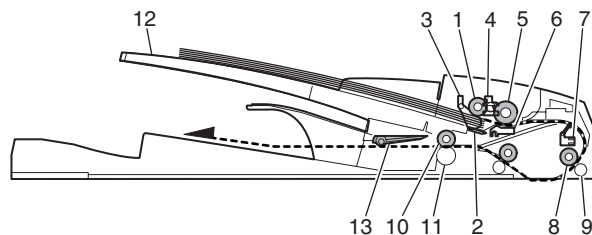


7. RSPF section

A. Outline

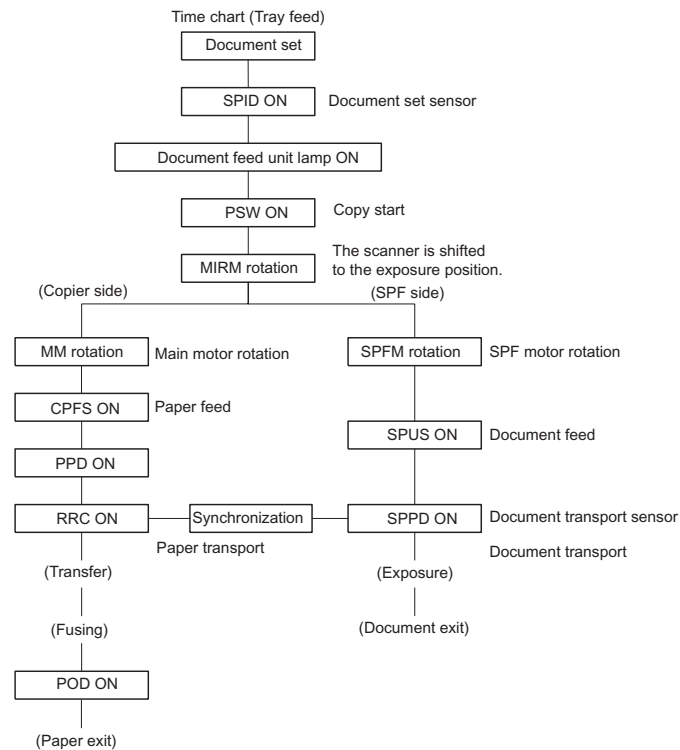
The RSPF (Reverse Single Path Feeder) is installed to the AL-1651CS as a standard provision, and it automatically copies up to 30 sheets of documents of a same size. (Only one set of copies)

B. Document transport path and basic composition

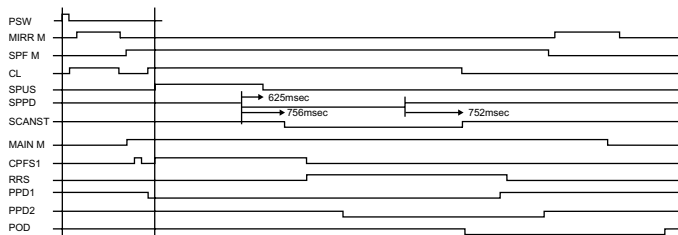


1	Pickup roller	2	Sheet of document for paper feed
3	Set detection ACT	4	Paper stopper
5	Document feed roller	6	Separation sheet
7	Paper entry sensor	8	PS roller D
9	Transport follower roller	10	Paper exit roller
11	Paper exit follower roller	12	Document tray
13	Switch gate		

C. Operational descriptions



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

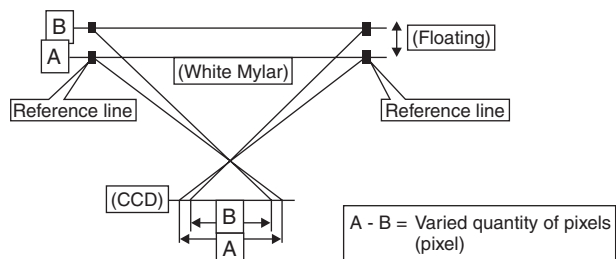


D. Cases where a document jam is caused

- 1) 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).

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

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



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

A. Initial state

Set duplex documents on the document tray.

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

B. Front copy

Document transport:

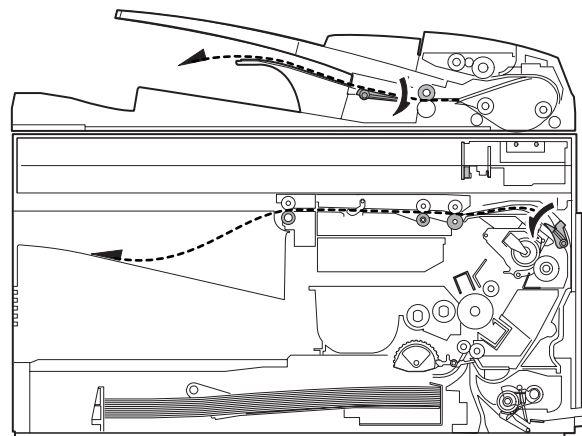
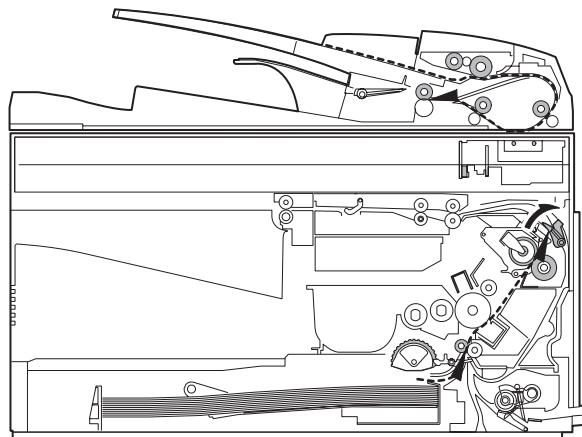
The document feed roller feeds the document from the paper feed roller to the PS roller.

- The document is exposed in the exposure section, and sent to the document exit section
- by the transport/paper exit roller.
- R-SPF gate solenoid ON
- The document is sent to the intermediate tray. (but not discharged completely.)
- The document is stopped once, then switchback operation is performed. (To the back copy)

Paper transport:

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

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



C. Back copy

Document transport:

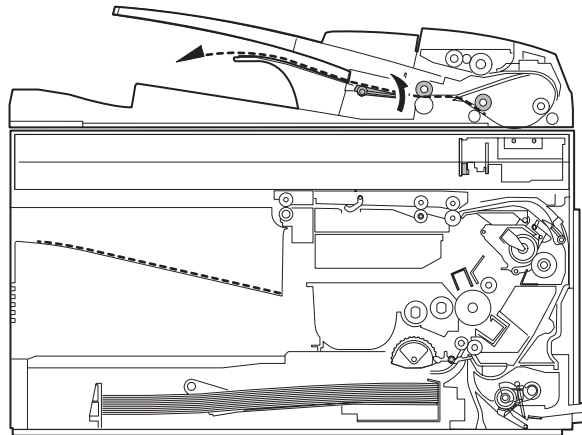
By switchback operation, the document is sent through the PS roller to the exposure section, where the back of the document is exposed.

- It is sent to the document exit section by the transport roller and the paper exit roller.
- R-SPF gate solenoid ON. The document is sent to the intermediate tray, (but not discharged completely.)
- It is stopped once and switchback operation is performed.
- It is sent through the PS roller and the exposure section (without exposure operation) to the document exit section.
- R-SPF gate solenoid OFF
- The document is discharged to the document exit tray.

Paper transport:

Switchback operation is performed.

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



Switchback operation is made after back copying in order to discharge documents according to the setting.

Set document Documents after discharge,

$\frac{1}{2}$	with empty feed	$\frac{4}{3}$	without empty feed	$\frac{3}{4}$
$\frac{3}{4}$		$\frac{2}{1}$		$\frac{1}{2}$

There are following job modes as well as D-D mode.

S - S (Simplex to Simplex)

S - D (Simplex to Duplex),

Rotation copy mode (The back images are rotated 180°C.)

S - D (Simplex to Duplex), Copy mode without rotation

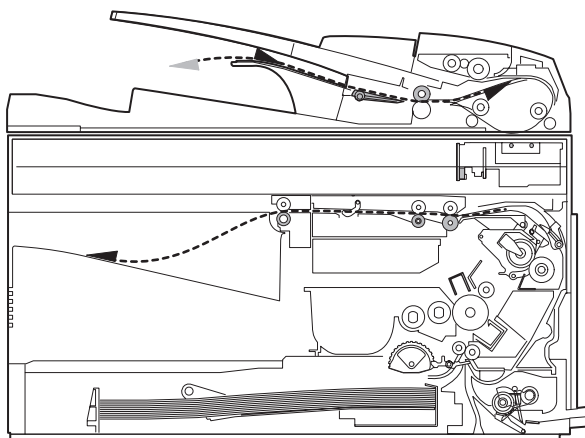
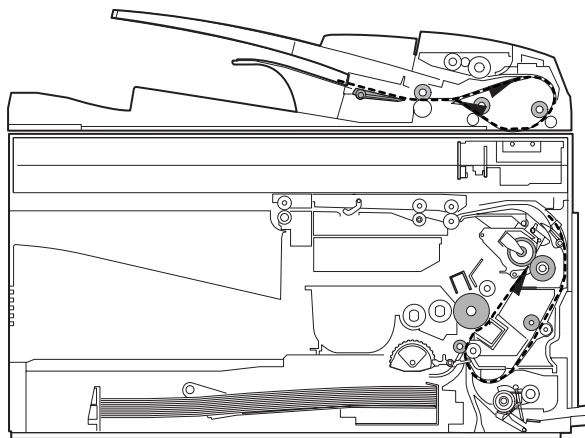
D - S (Duplex to Simplex)

Rotation copy mode:

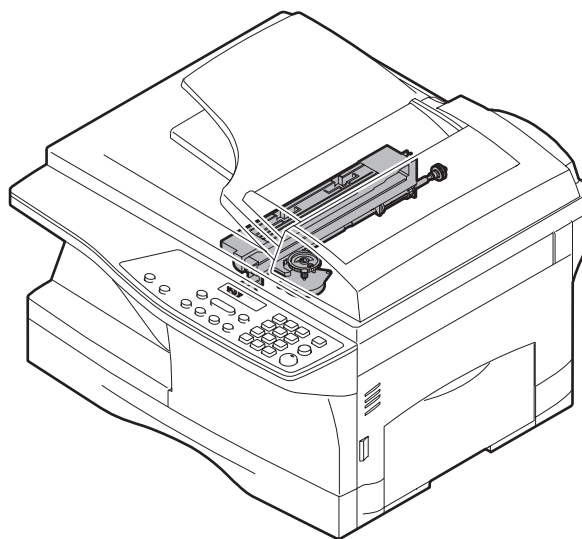
The front and the back are in upside down each other.

Copy mode without rotation:

The front and the back are not in upside down.



9. Shifter



Shift width: 2.5cm

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

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

[8] DISASSEMBLY AND ASSEMBLY

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

1. Do not disconnect or connect the connector and the harness during the machine is powered. Especially be careful not to disconnect or connect the harness between the MCU PWB and the LSU (MCU PWB: CN20) during the machine is powered. (If it is disconnected or connected during the machine is powered, the IC inside the LSU will be destroyed.)
2. To disconnect the harness after turning on the power, be sure to turn off the power and wait for at least 10 sec before disconnection. (Note that a voltage still remains immediately after turning off the power.)

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

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

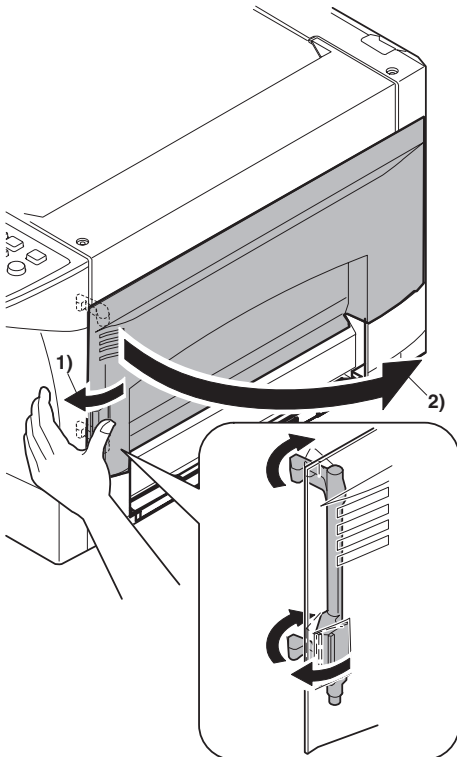
1. High voltage section

A. List

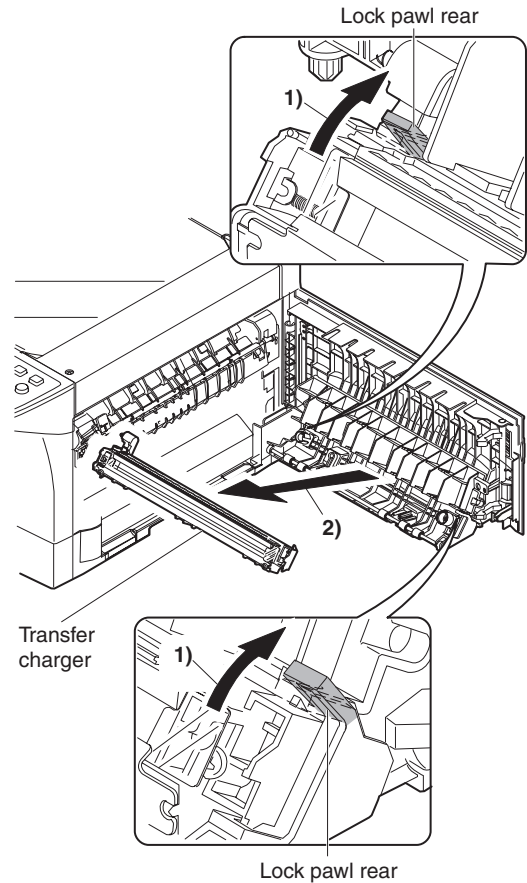
No.	Part name	Ref.
1	Transfer charger unit	
2	Charger wire	

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.

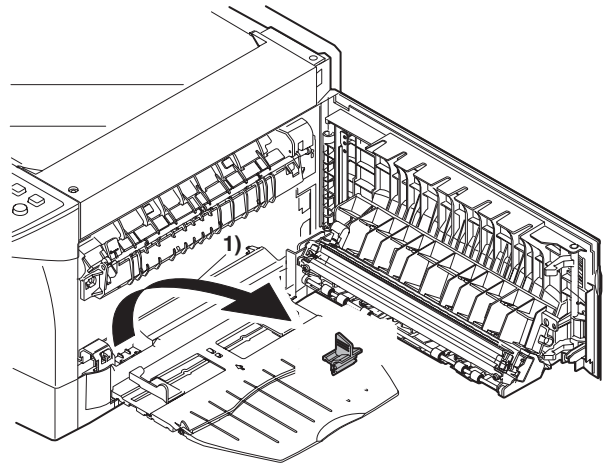


C. Assembly procedure

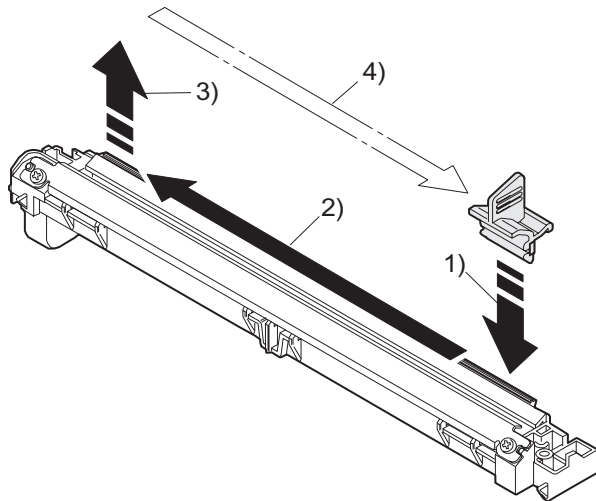
For assembly, reverse the disassembly procedure.

D. Charger wire cleaning

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



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



E. Charger wire replacement

- 1) Remove the TC cover and remove the screw.
 - 2) Remove the spring and remove the charger wire.
 - 3) Install a new charger wire by reversing the procedures (1) and (2).
At that time, be careful of the following items.
- The rest of the charger wire must be within 1.5mm. Refer to Fig.1
 - The spring hook section (charger wire winding section) must be in the range of the projection section.
 - Be careful not to twist the charger wire.

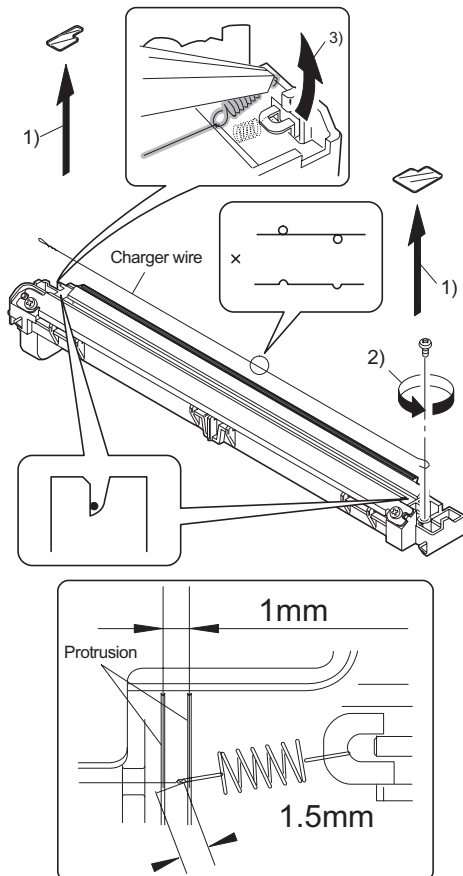


Fig.1

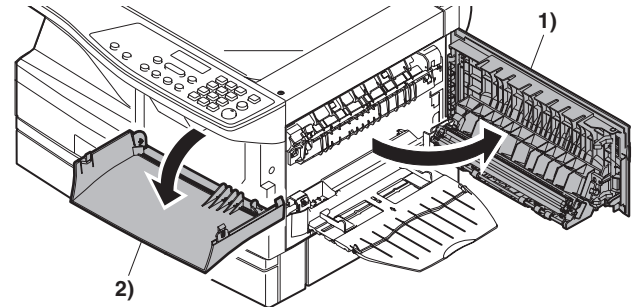
2. Operation panel section

A. List

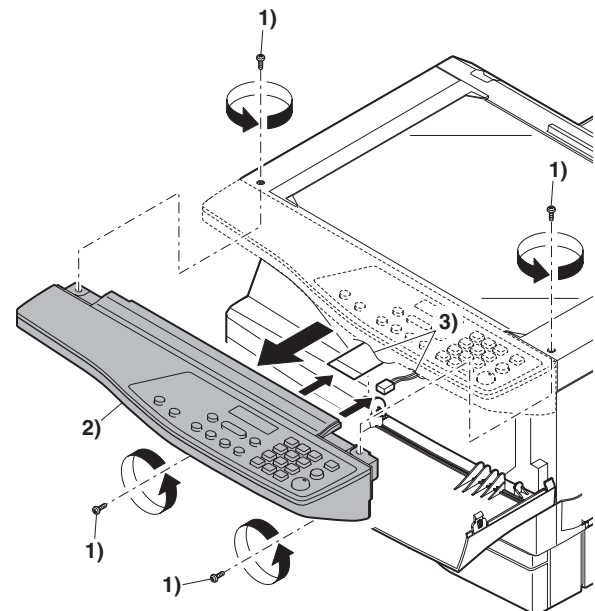
No.	Part name	Ref.
1	Operation panel unit	
2	Operation PWB	

B. Disassembly procedure

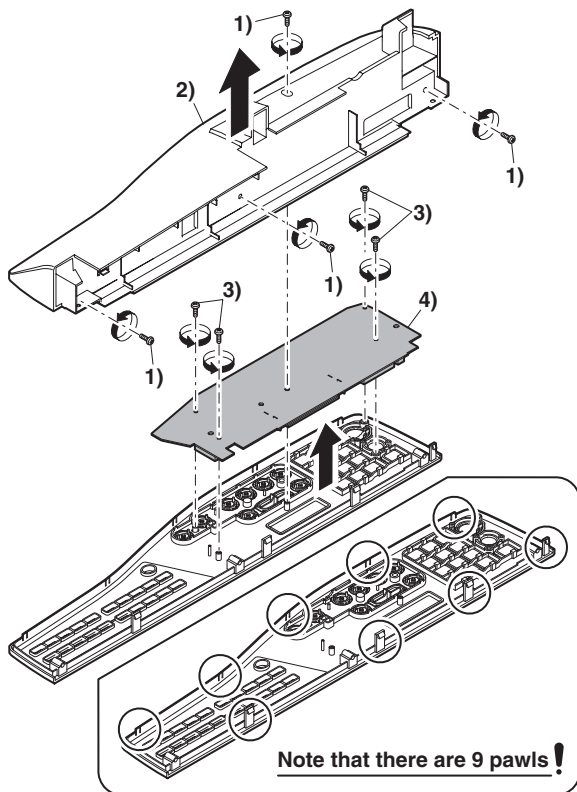
- 1) Open the side door, and Open the front cover.



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



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



C. Assembly procedure

For assembly, reverse the disassembly procedure

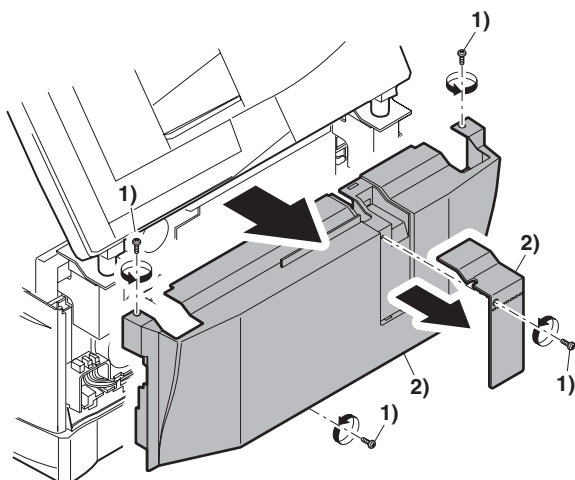
3. Optical section

A. List

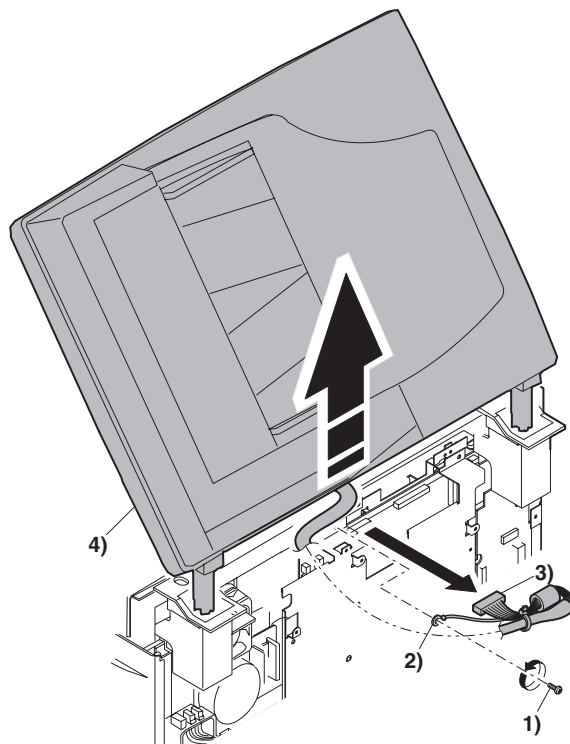
NO.	Part name	Ref.
1	Copy lamp unit	
2	Copy lamp	
3	Lens unit	

B. Disassembly procedure

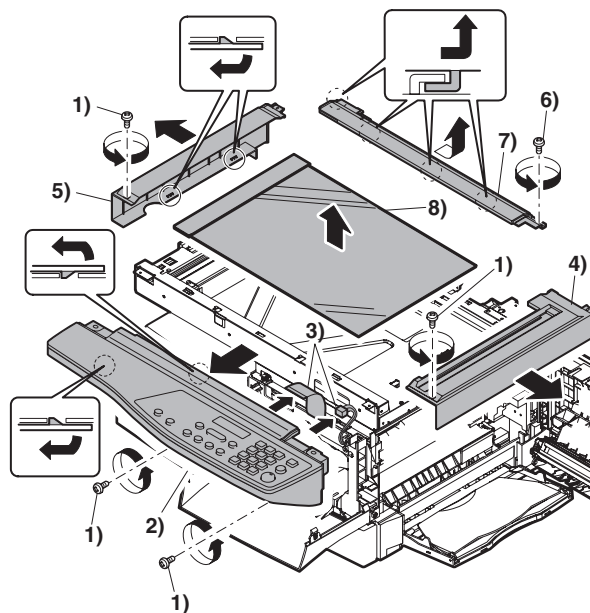
- 1) Remove four screws, and remove the rear cabinet and the rear cabinet cover.



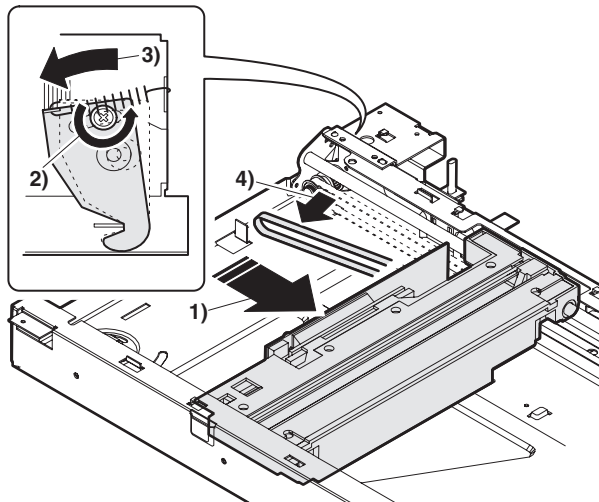
- 2) Remove the connector and the clamp, and remove the RSPF unit.



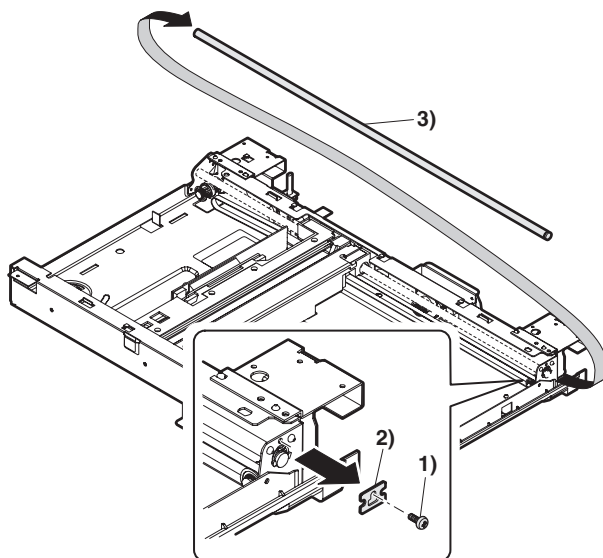
- 3) Remove the four screws, remove the operation unit, and disconnect the connector.
- 4) Remove the right cabinet.
- 5) Remove the left cabinet.
- 6) Remove the screw, and remove the rear cover.
- 7) Remove the table glass.



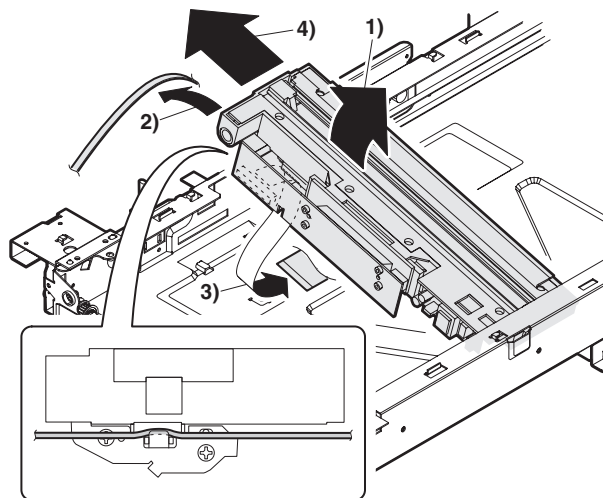
- 8) Move the carriage to the position indicated on the figure.
- 9) Loosen the screw which is fixing the tension plate.
- 10) Move the tension plate in the arrow direction to release the tension, and remove the belt.



- 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.

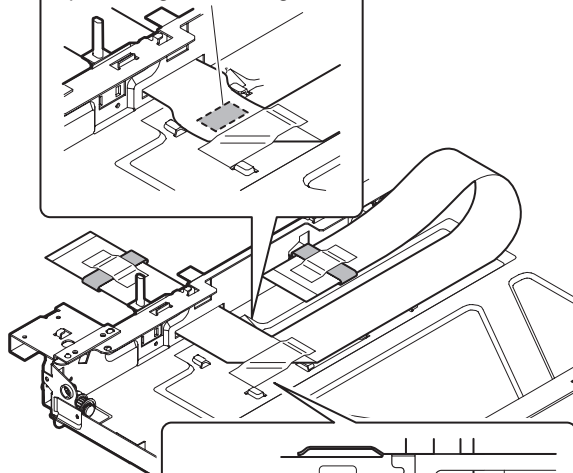


C. Assembly procedure

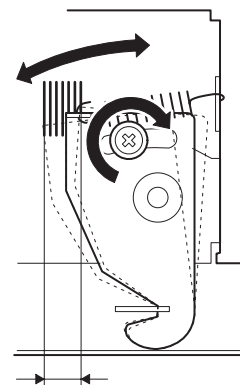
CCD core

- 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.
- 4) 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.

Note: Attach the FCC to the base plate securely with duplex tape to prevent against coming loose.



Note: Attach the FCC to fit with the marking line. Marking line.



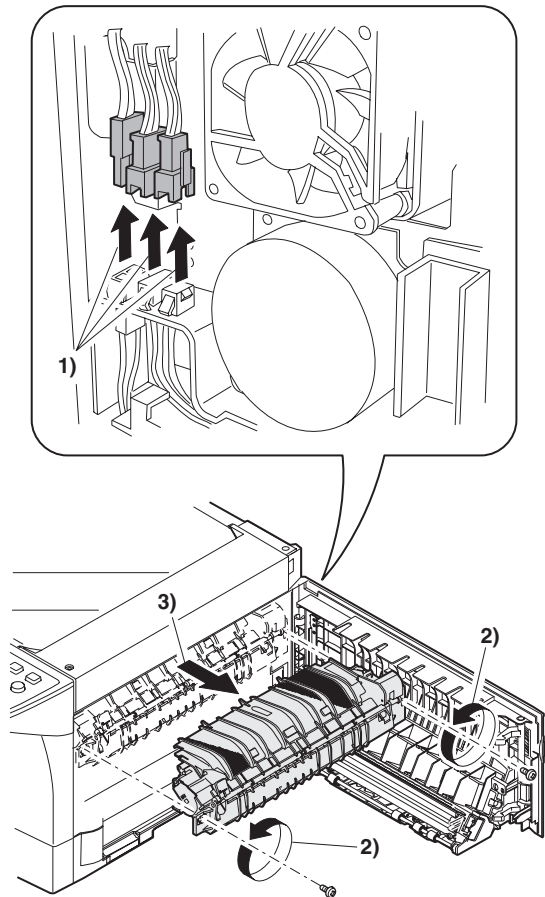
4. Fusing section

A. List

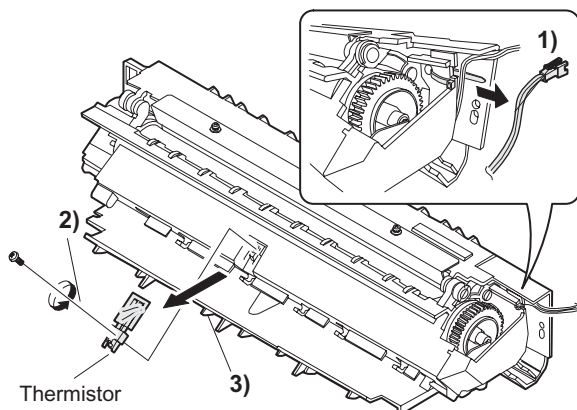
No.	Part name Ref.
1	Thermistor
2	PPD2 sensor
3	Heater lamp
4	Pressure roller
5	Heat roller

B. Disassembly procedure

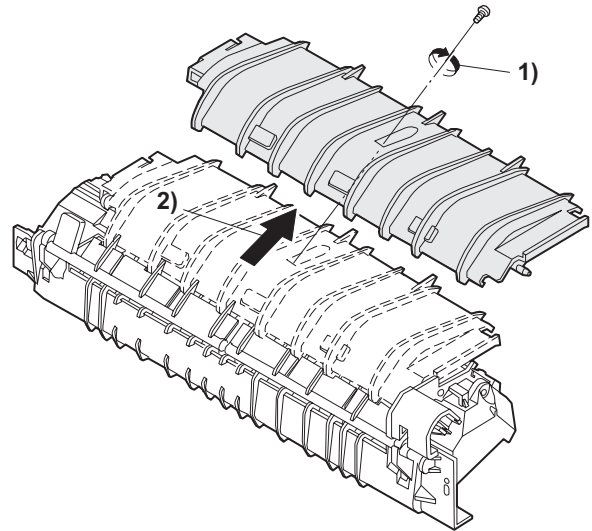
- 1) Remove the connectors (3 pcs.) of the rear cabinet.
- 2) Open the side cover, remove two screws, and remove the fusing unit.



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

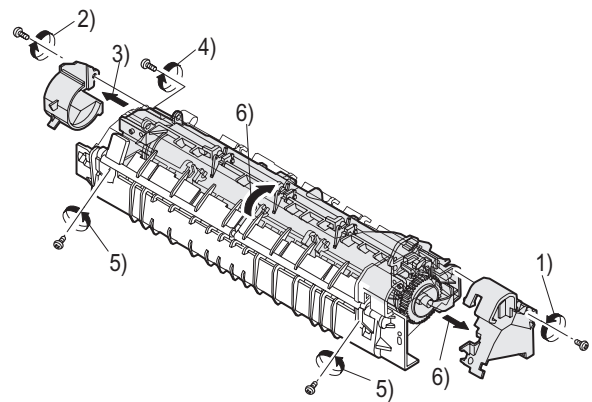


- 4) Remove the screw and remove the U-turn guide.

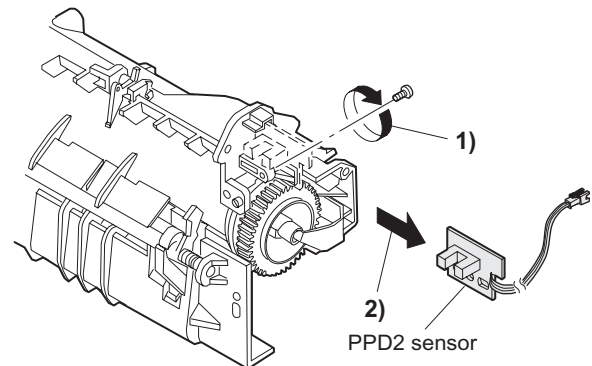


Pressure roller section disassembly

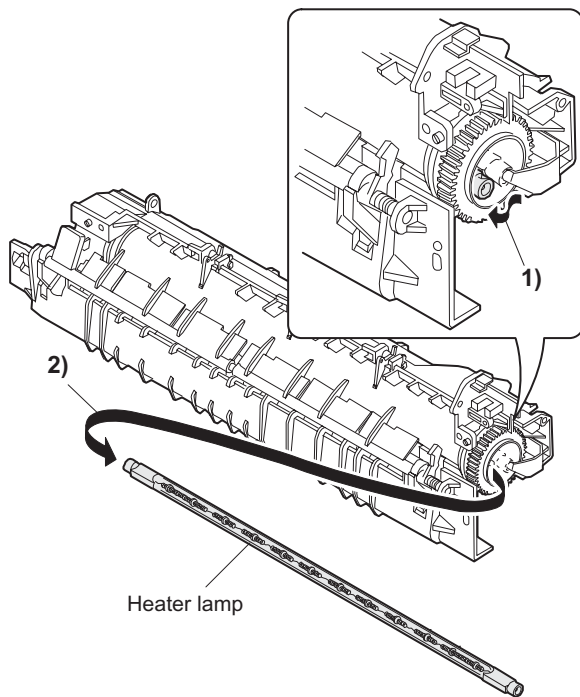
- 5) Remove the three screws, remove the fusing cover lower on the right side, and open the heat roller section.



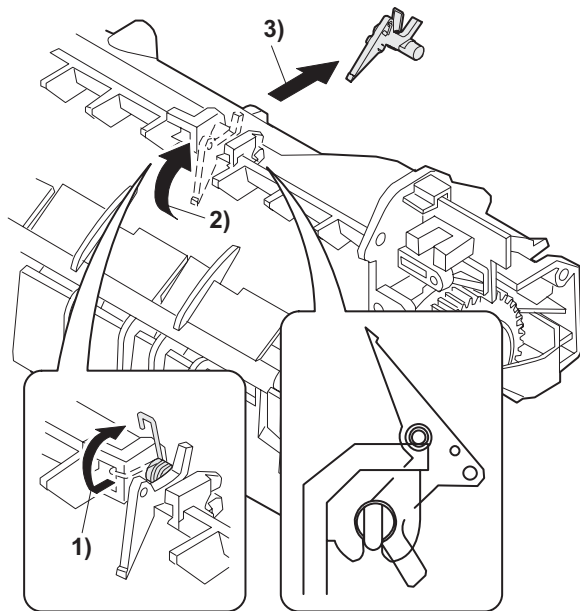
- 6) Remove the screw and remove the PPD2 sensor.



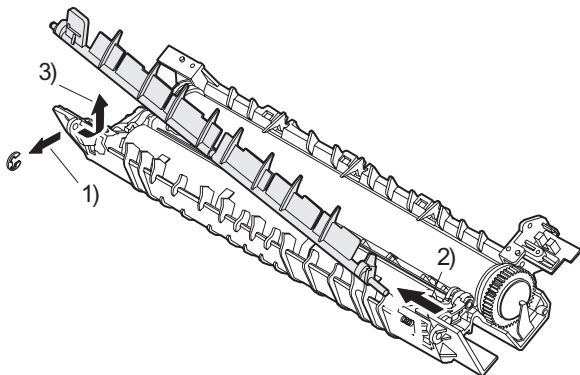
7) Remove the plate spring on the right and remove the heater lamp.



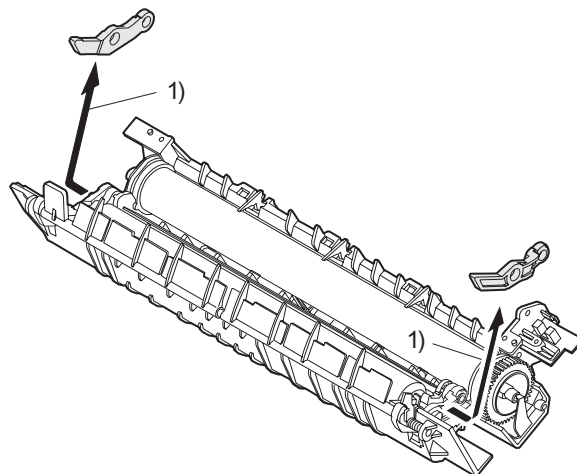
8) Remove the spring and remove the separation pawls (3 pcs.).



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

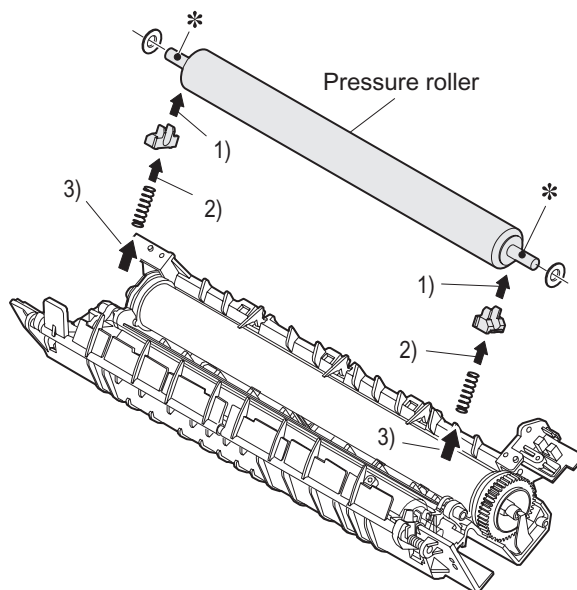


10) Remove the pressure release levers on the right and the left sides.



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

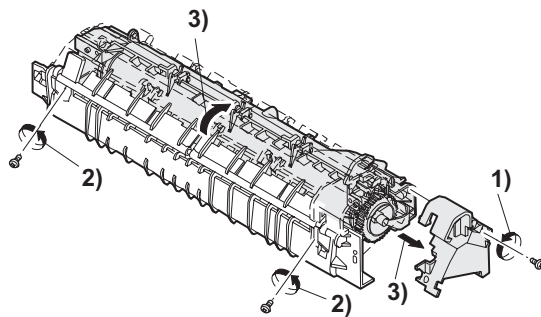
Note: Apply grease to the sections specified with an asterisk (*).
Grease: "JFE552" UKOG-0235FCZZ



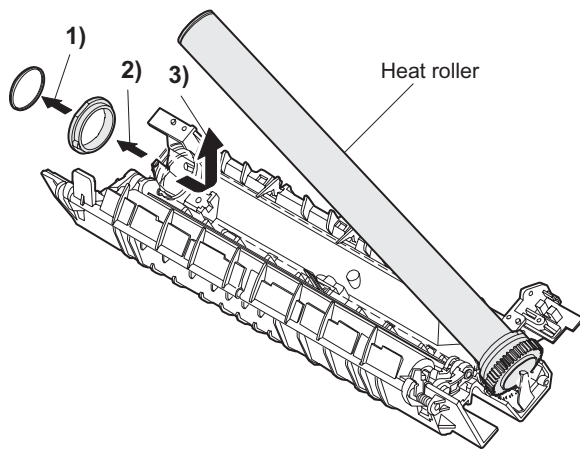
Heat roller disassembly

(Continued from procedure (4).)

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

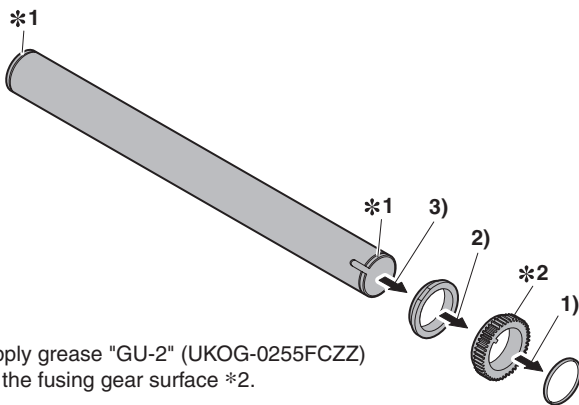


- 6) Remove the C-ring and the fusing bearing, and remove the heat roller.



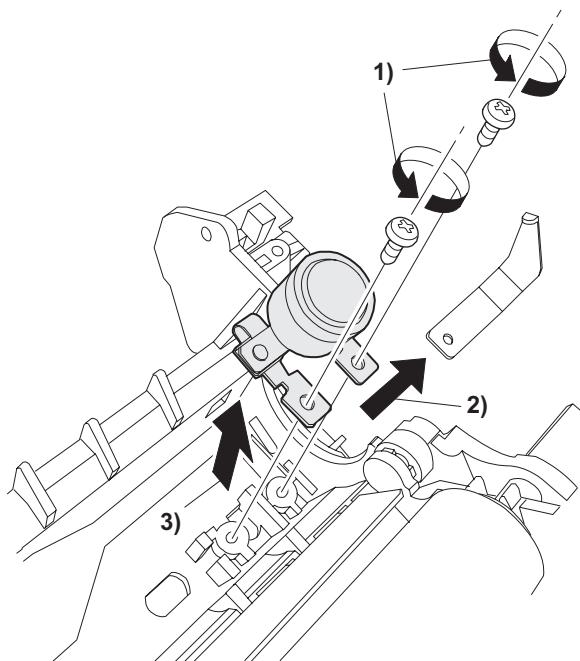
- 7) Remove the parts from the heat roller.

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



Apply grease "GU-2" (UKOG-0255FCZZ)
to the fusing gear surface *2.

- 8) Remove two screws and remove the thermo unit.



C. Assembly procedure

For assembly, reverse the disassembly procedure.

5. Tray paper feed/transport section

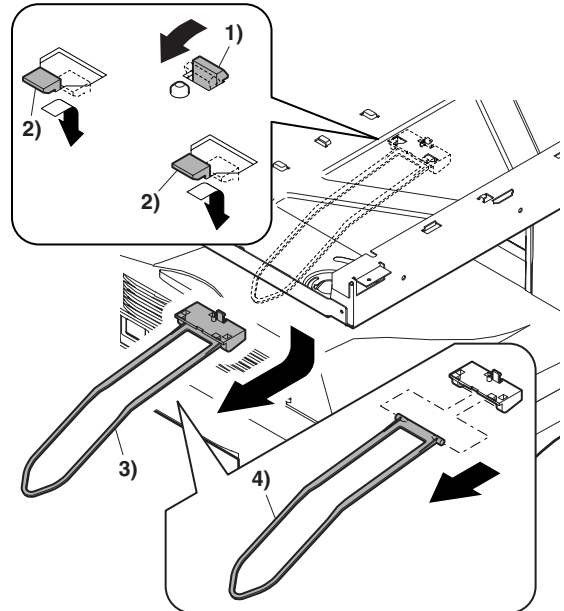
A. List

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

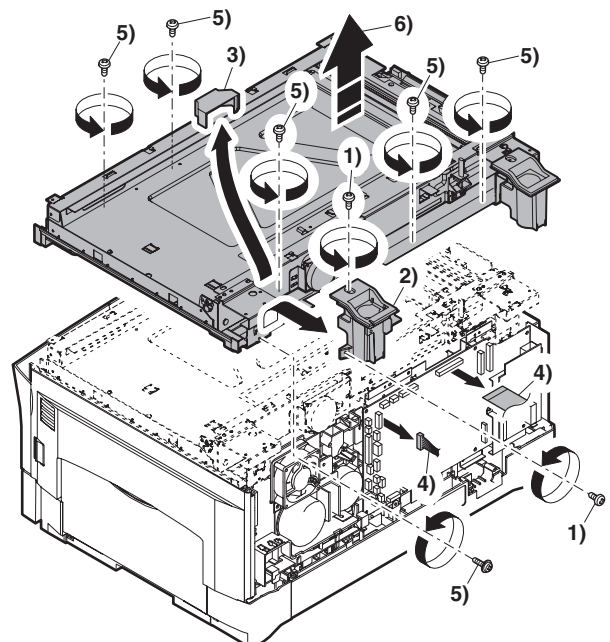
B. Disassembly procedure

- 1) Remove the paper holding arm.

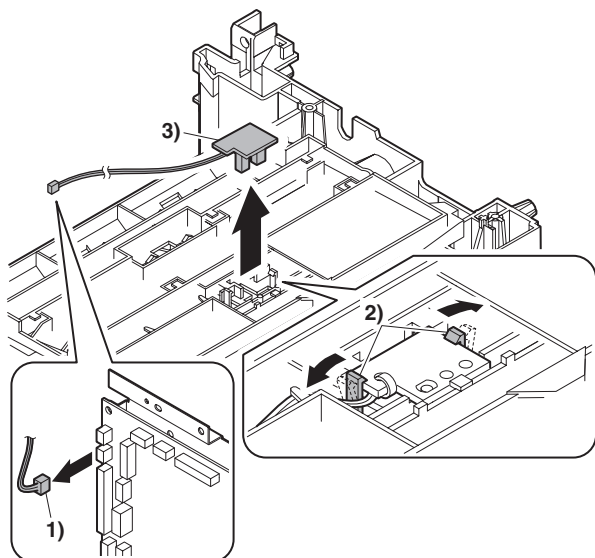
Remove the arm holder from the main unit, and remove the holder from the arm.



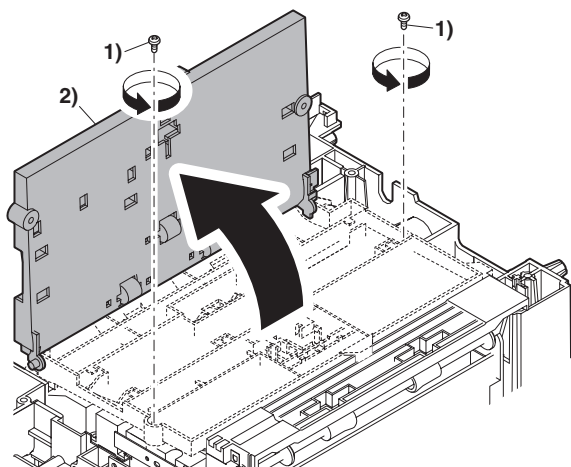
- 2) Remove the two screws, and remove the hinge guide R.
3) Remove the fan duct and disconnect the connector. (2 positions)
4) Remove the six screws, and remove the scanner unit.



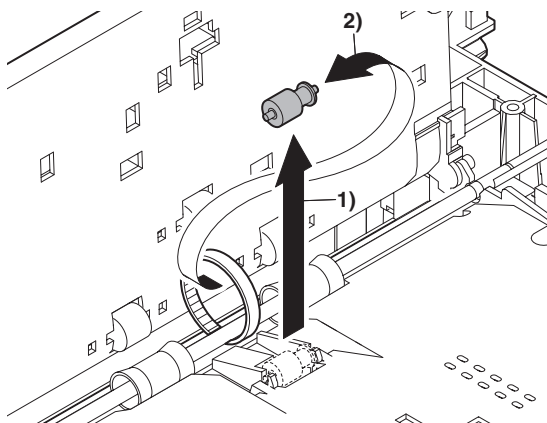
- 5) Disconnect the connector from the MCU PWB.
- 6) Disengage the pawls (2 positions), and remove the sensor PWB.



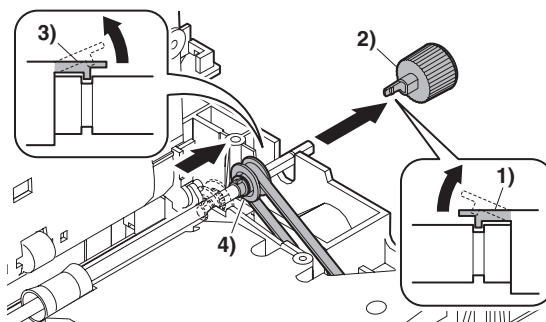
- 7) Remove the screw, and open the upper paper guide.



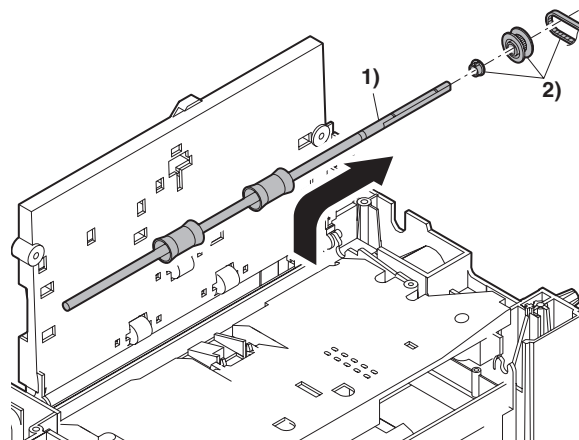
- 8) Remove the roller, and remove the belt.



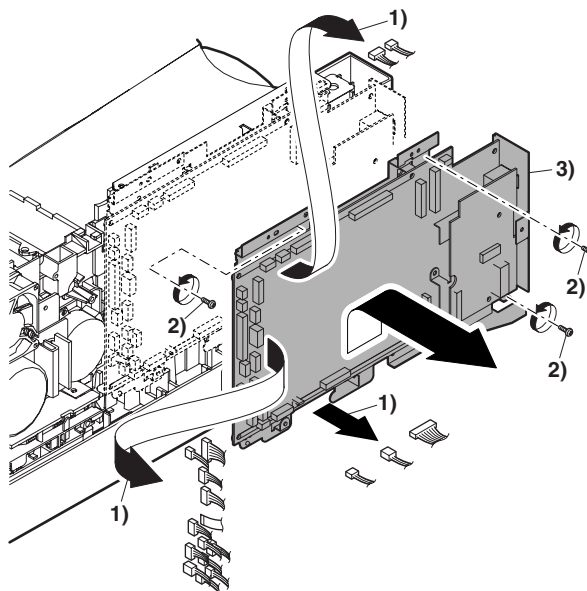
- 9) Disengage the pawl, and remove the roller knob.
- 10) Disengage the pawl, and shift the pulley and the bearing.



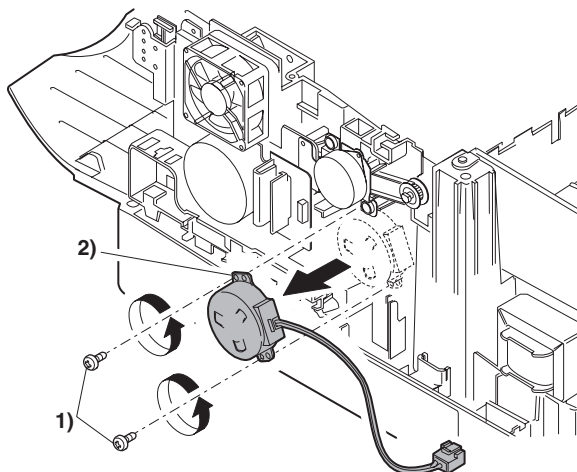
- 11) Remove the paper exit roller, and remove the belt, the pulley, and the bearing.



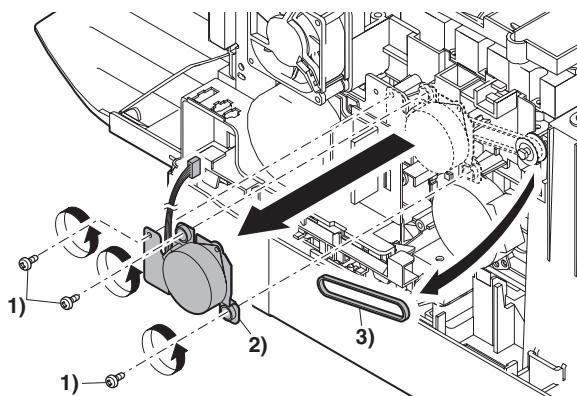
- 12) Disconnect the connectors.
- 13) Remove the three screws, and remove the MCU PWB.



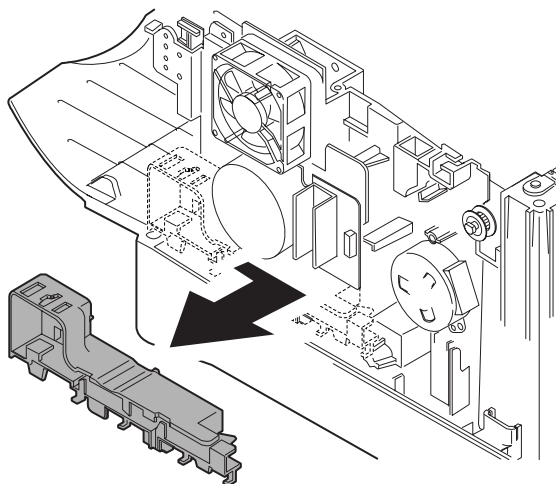
14) Remove two screws and remove the toner motor.



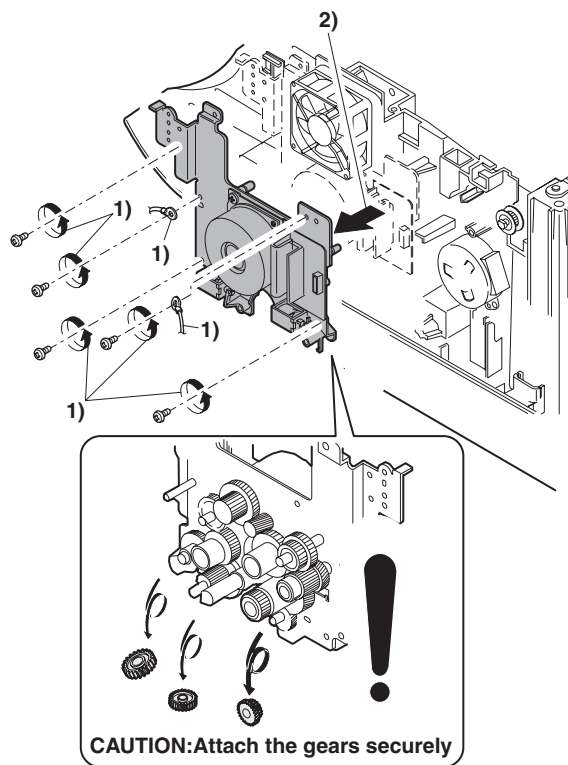
15) Remove the three screws, and remove the DUP motor unit and the belt.



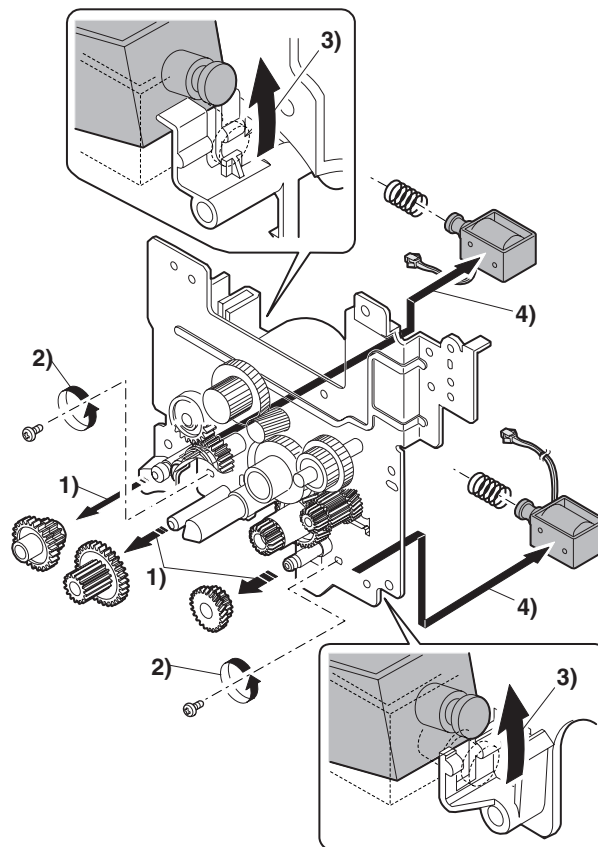
16) Remove the harness guide.



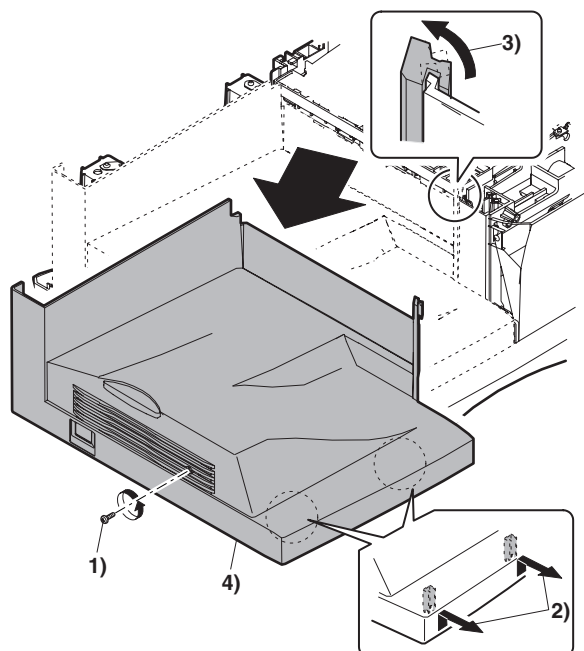
17) Remove the five screws and the grounding wire, and remove the main drive unit.



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

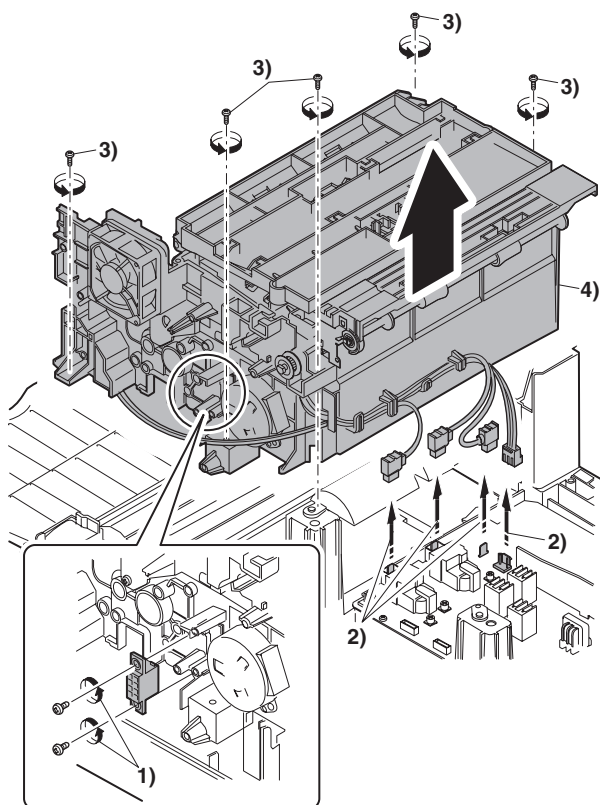


19) Remove each pawl, and remove the paper exit tray.



20) Remove two screws and remove the fusing connector.

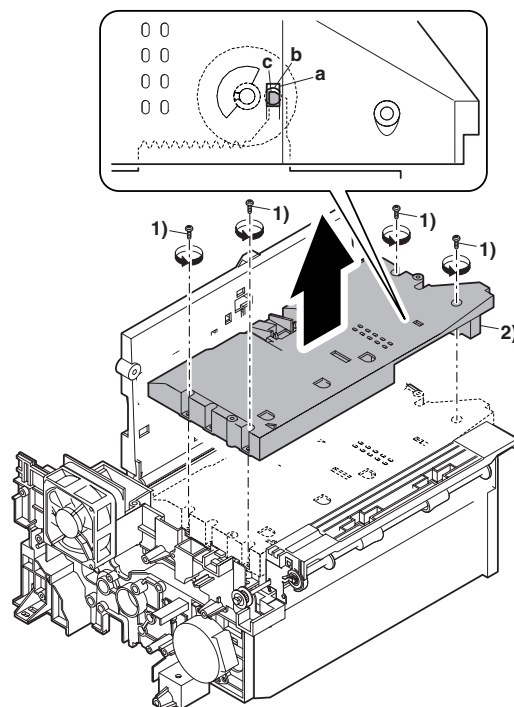
21) Remove five screws and the connector, and lift the intermediate frame unit to remove.



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

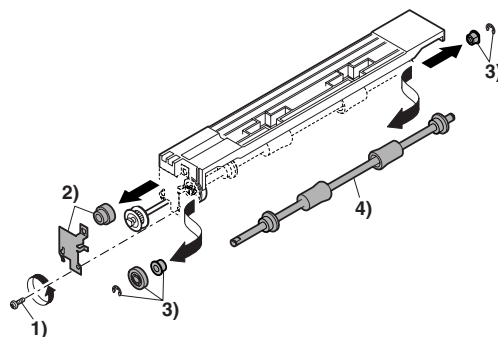
[Note for installation]

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



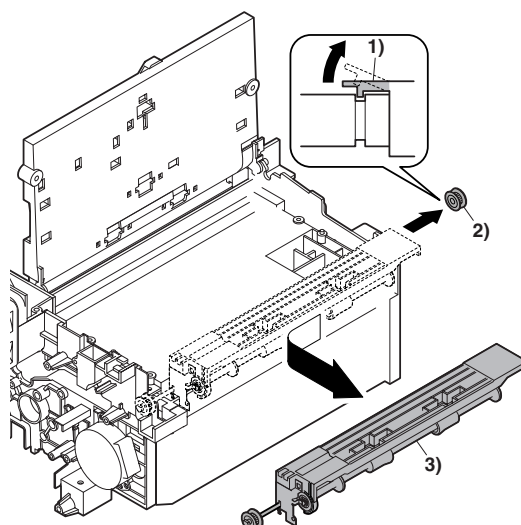
23) Disengage the pawl, and remove the pulley.

24) Shift and remove the shifter unit.

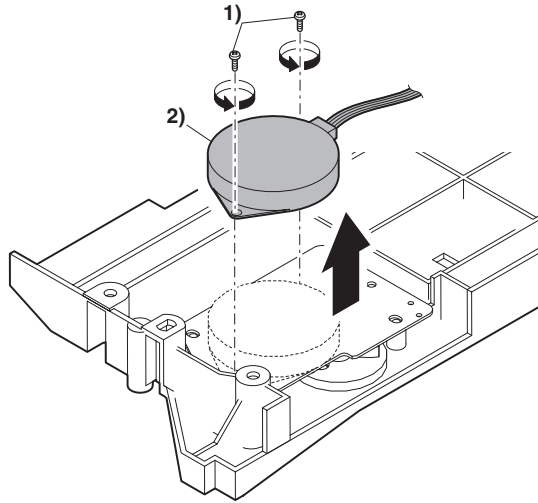


25) Remove the screw, and remove the grounding plate and the gear.

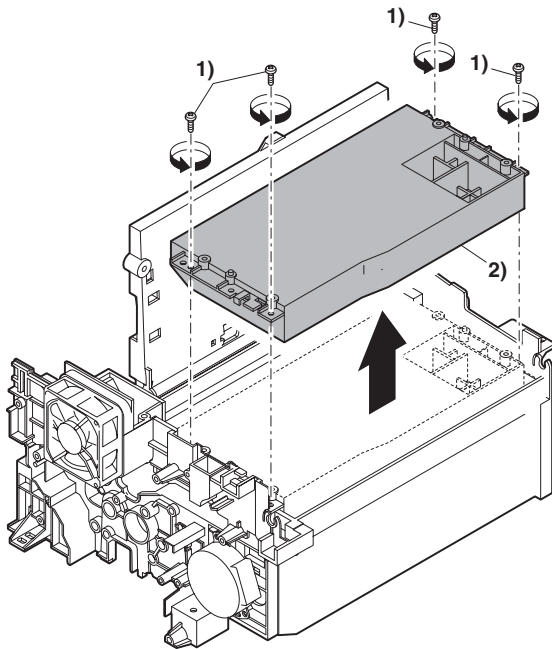
26) Remove the E-ring, the gear, and the bearing, and remove the shifter roller.



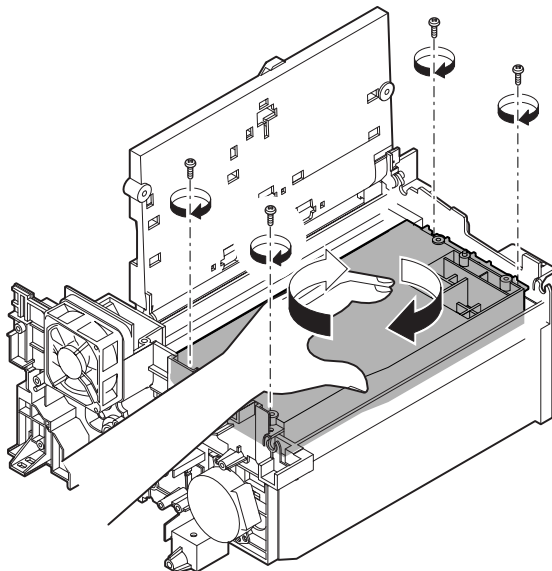
- 27) Put the lower paper guide unit upside down, remove the two screws, and remove the shifter motor.



- 28) Remove the four screws, and remove the LSU.

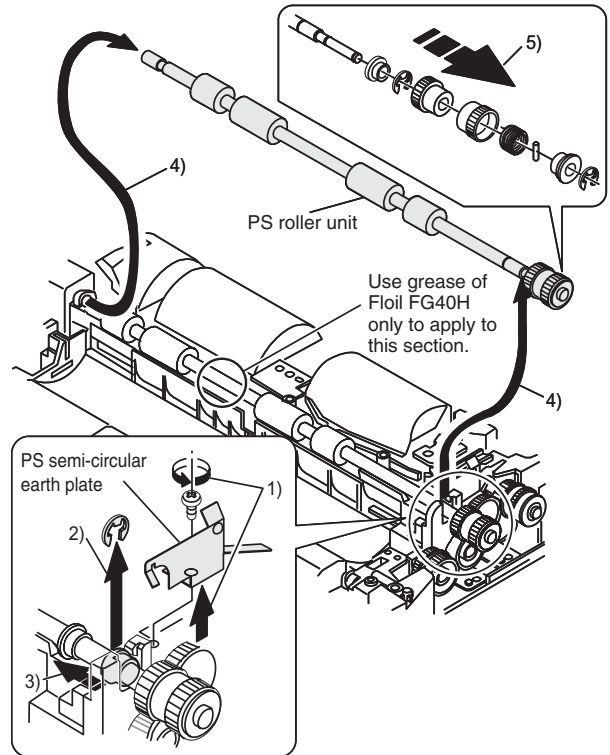


Note: When assembling, turn it to the right and attach.

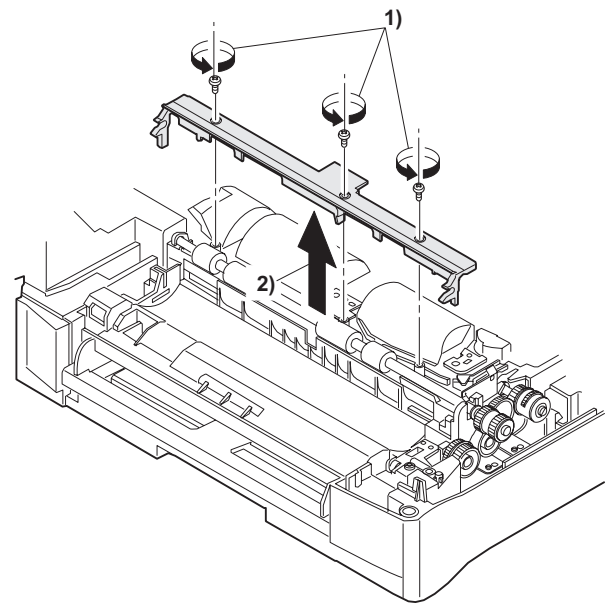


- 29) Remove the screw and the E-ring, and remove the PS semi-circular earth plate and the PS roller unit.

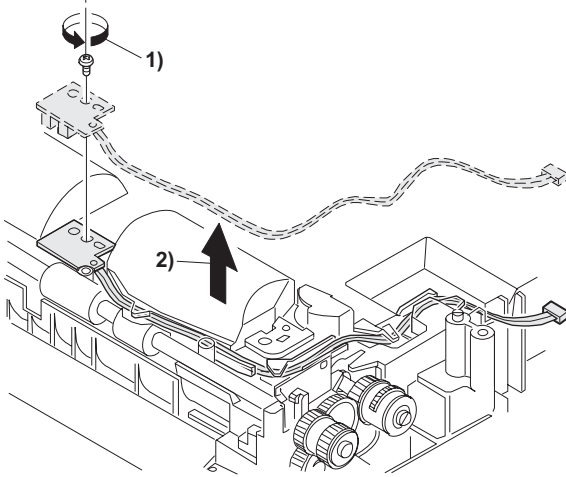
- 30) Remove the E-ring and remove the spring clutch from the PS roller unit.



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

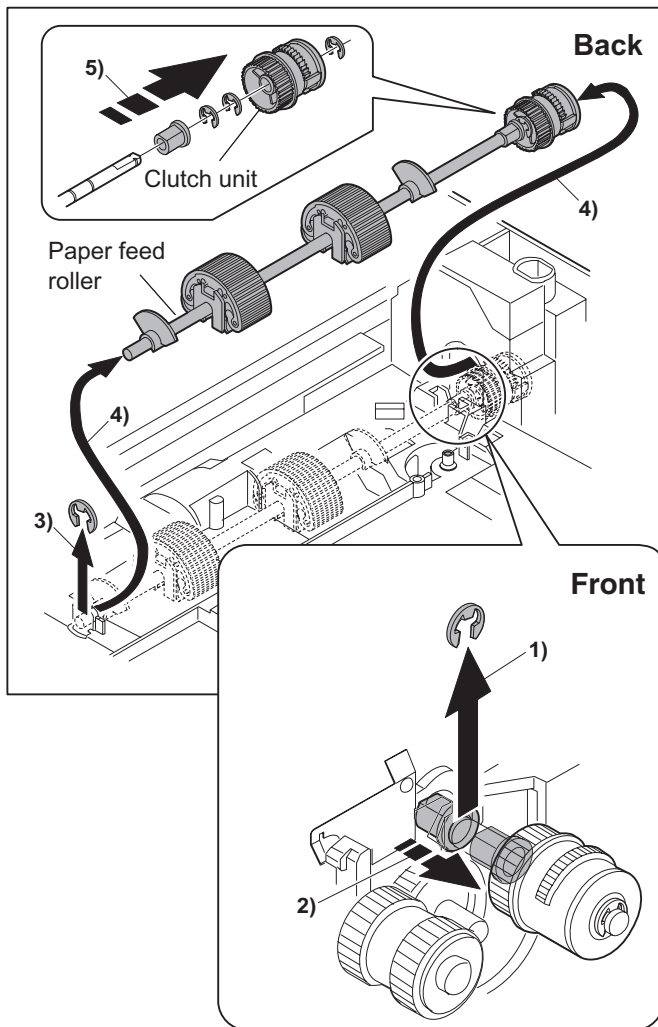


32) Remove the screw and the connector, and remove the PPD1 sensor PWB.



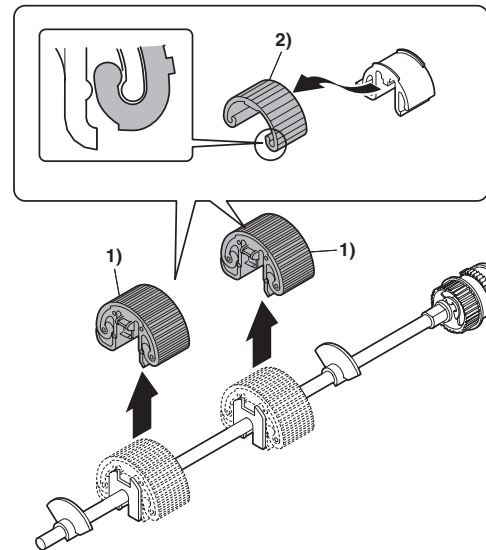
33) Remove two E-rings and remove the paper feed roller.

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



35) Remove the semi-circular roller unit.

36) Remove the semi-circular rubber.



C. Assembly procedure

For assembly, reverse the disassembly procedure.

6. Manual paper feed section

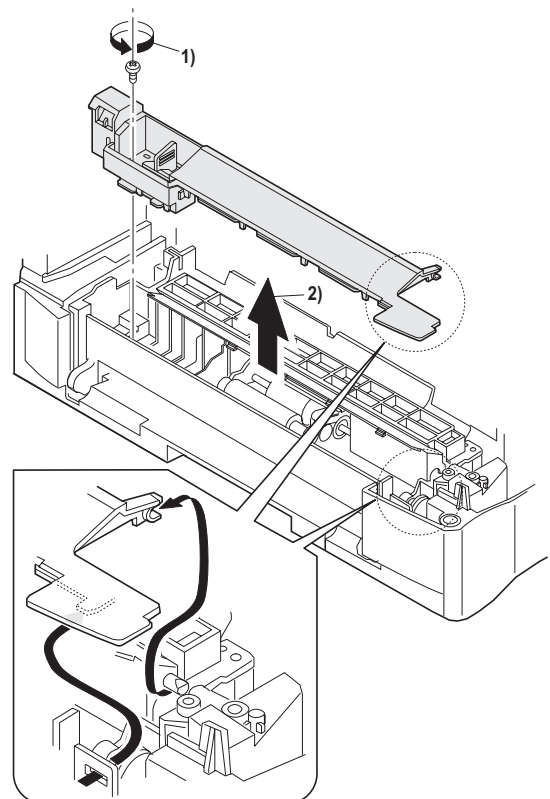
A. List

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

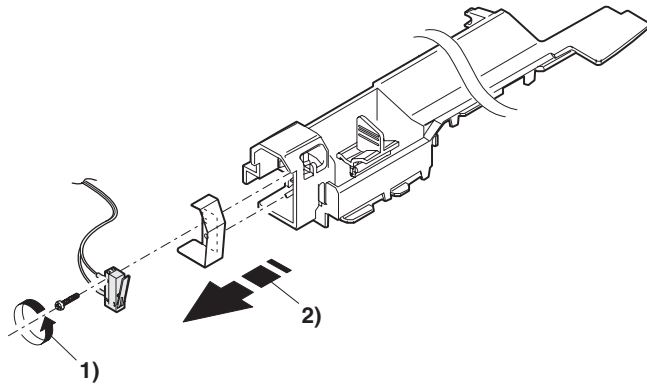
B. Disassembly procedure

Multi unit

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

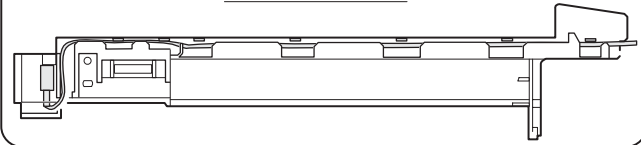


- 2) Remove the screw and remove the side door detection unit.

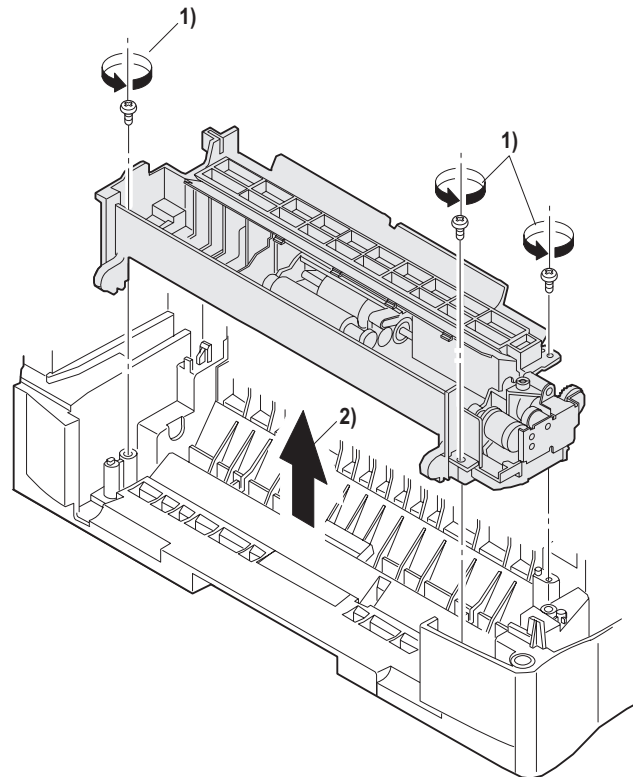


Back

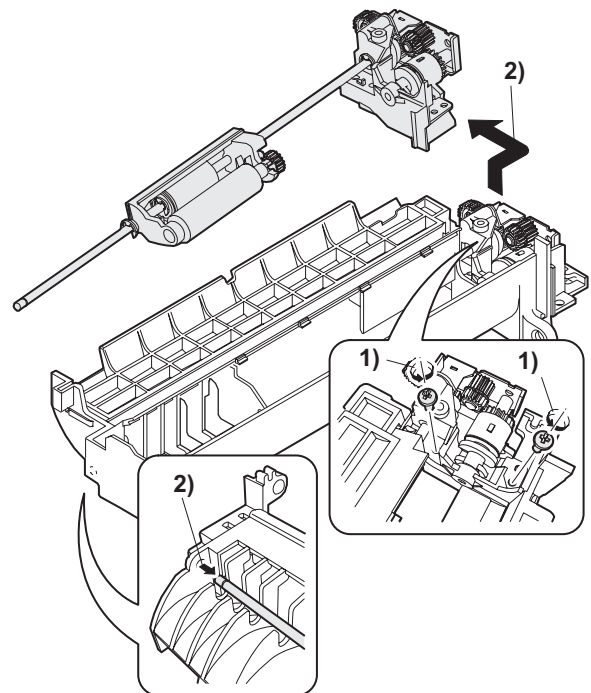
Wire treatment



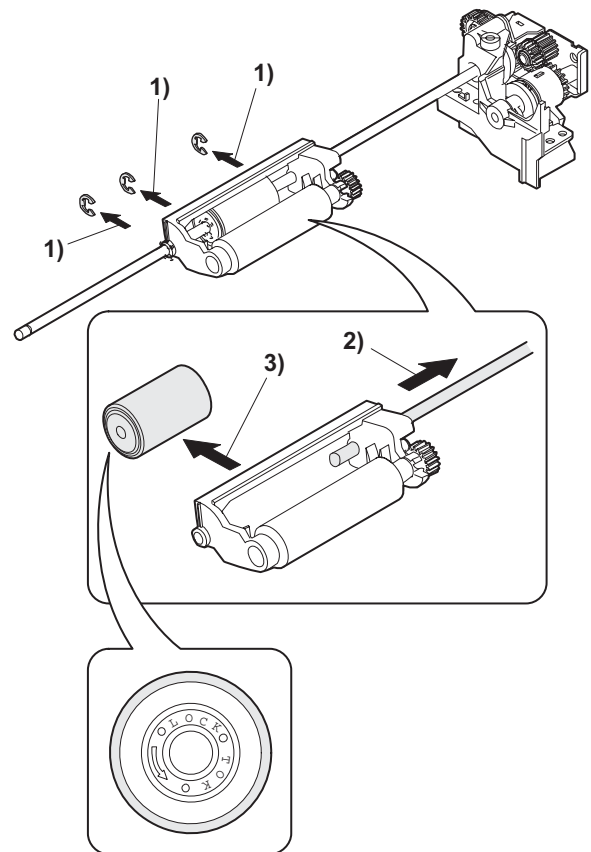
- 3) Remove three screws and remove the multi paper feed upper frame.



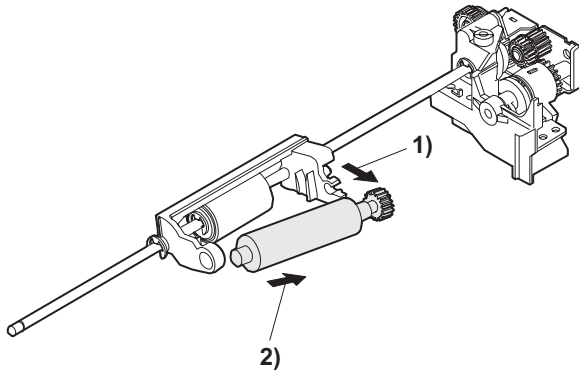
- 4) Remove two screws and remove the multi feed bracket unit from the multi paper feed upper frame.



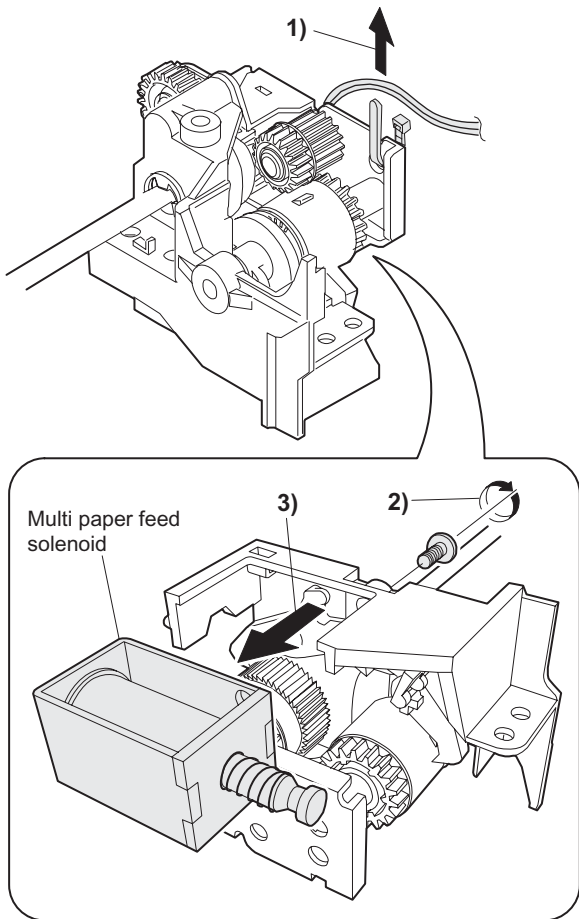
- 5) Remove three E-rings and remove the manual paper feed roller B9.



- 6) Remove the pick-up roller.



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

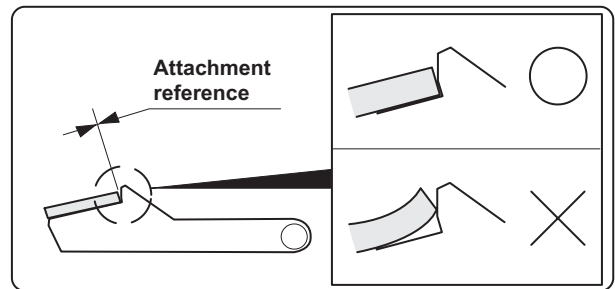
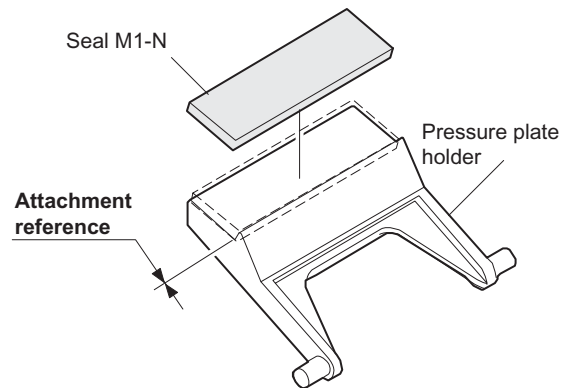


C. Assembly procedure

For assembly, reverse the disassembly procedure.

D. Pressure plate holder attachment

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



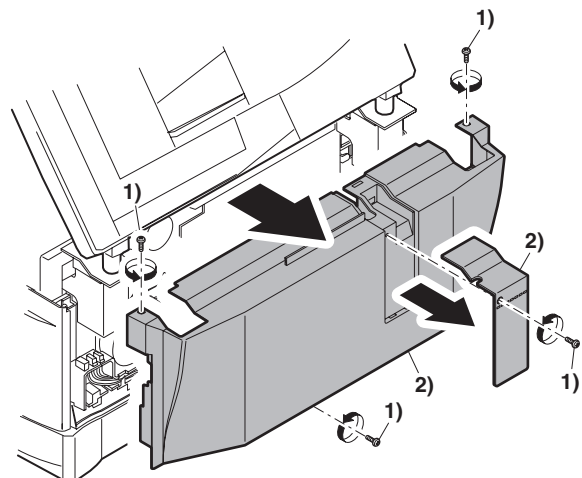
7. Rear frame section

A. List

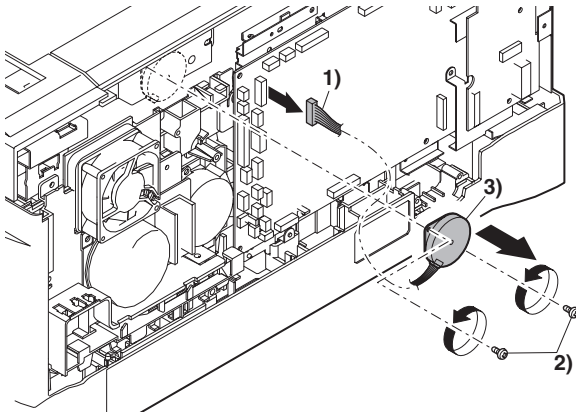
No.	Part name Ref.
1	Mirror motor
2	Main motor
3	Exhaust fan motor

B. Disassembly procedure

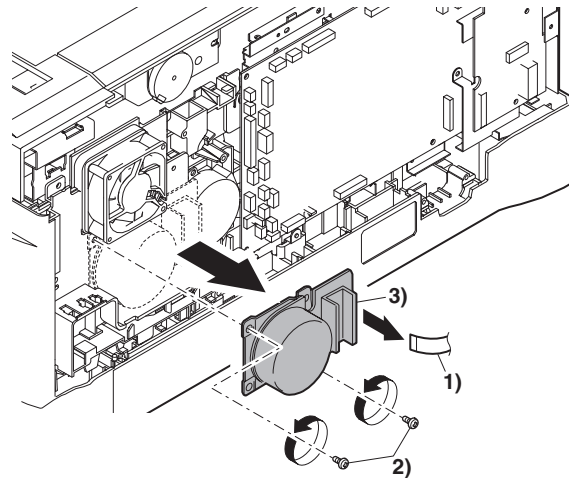
- 1) Remove four screws, and remove the rear cabinet and the rear cabinet cover.



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

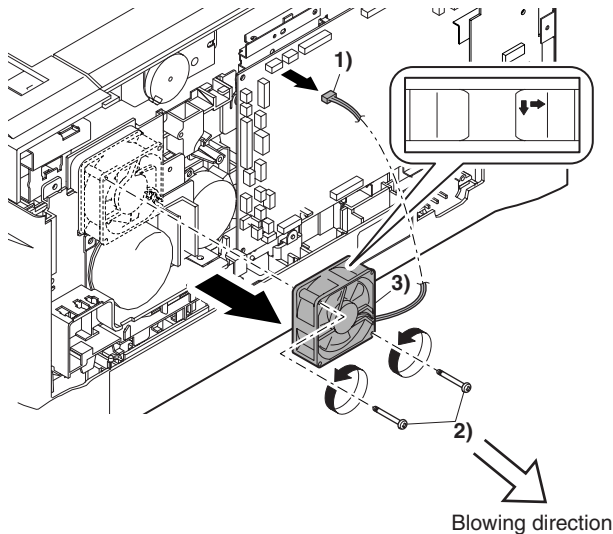


- 4) Remove two screws and one harness, and remove the main motor.



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

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



C. Assembly procedure

For assembly, reverse the disassembly procedure.

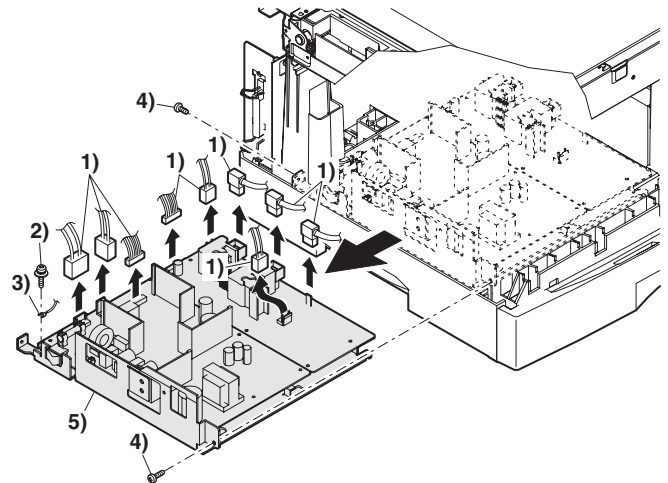
8. Power section

A. List

No.	Part name	Ref.
1	Power PWB	

B. Disassembly procedure

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



C. Assembly procedure

For assembly, reverse the disassembly procedure.

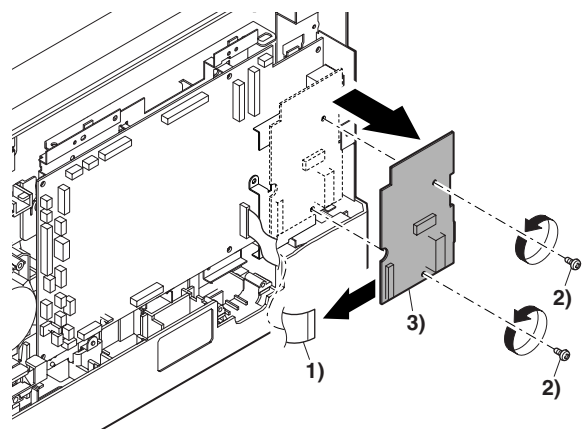
9. Duplex motor section (RSPF model only)

A. Remove the rear cabinet.

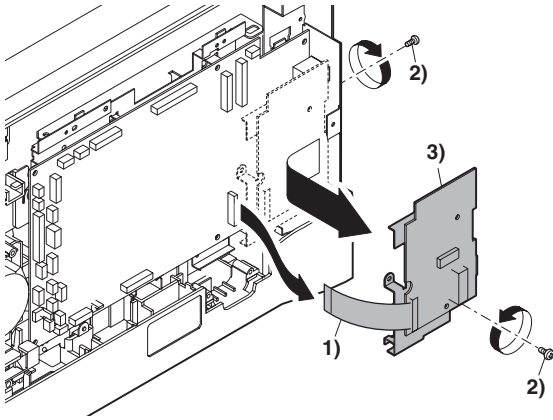
- 1) Remove four screws.
- 2) Remove the rear cabinet.

B. Remove the main PWB.

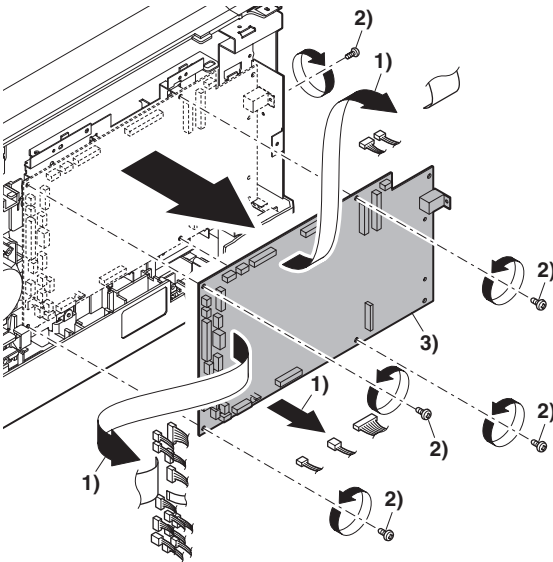
- 1) Disconnect the connector.
- 2) Remove the two screws, and remove the NIC PWB.



- 3) Disconnect the connector.
- 4) Remove the two screws, and remove the NIC PWB unit.

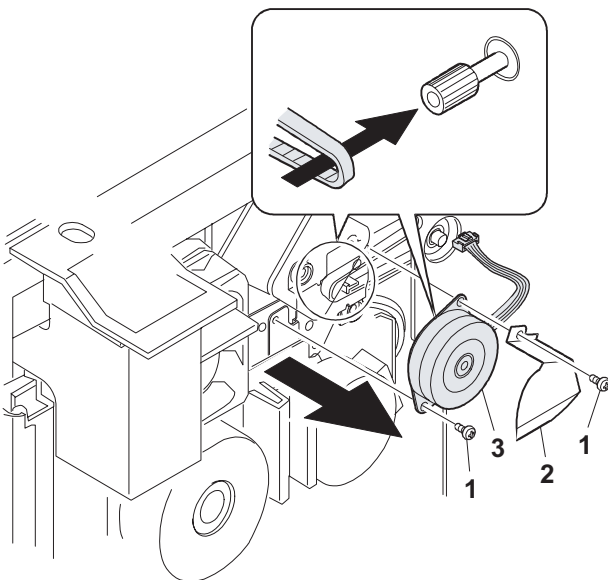


- 5) Disconnect the connectors.
- 6) Remove the five screws, and remove the MCU PWB.



C. Remove the Duplex motor.

- 1) Remove two screws.
- 2) Remove the Duplex motor cover.
- 3) Remove the Duplex motor.

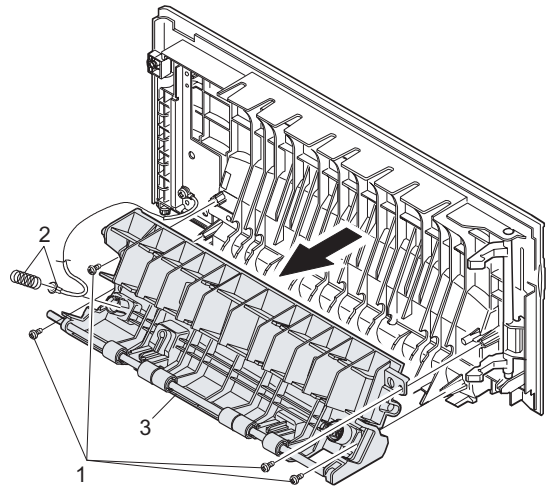


Note: When reassembling, be sure to engage the Duplex motor gear with the belt on the main body side.

10. Reverse roller section (RSPF model only)

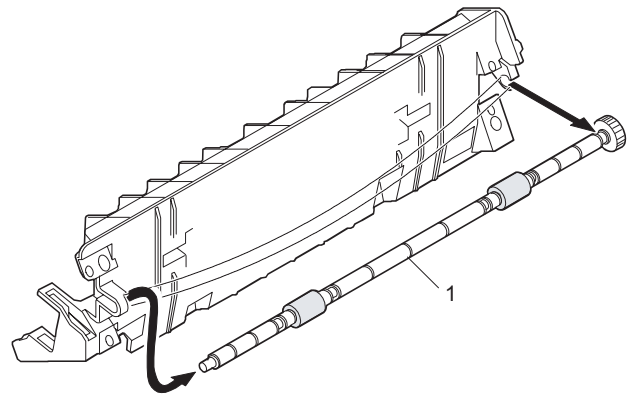
A. Remove the reverse unit.

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



B. Remove the reverse roller.

- 1) Bend the reverse roller and remove it.



11. RSPF section (RSPF model only)

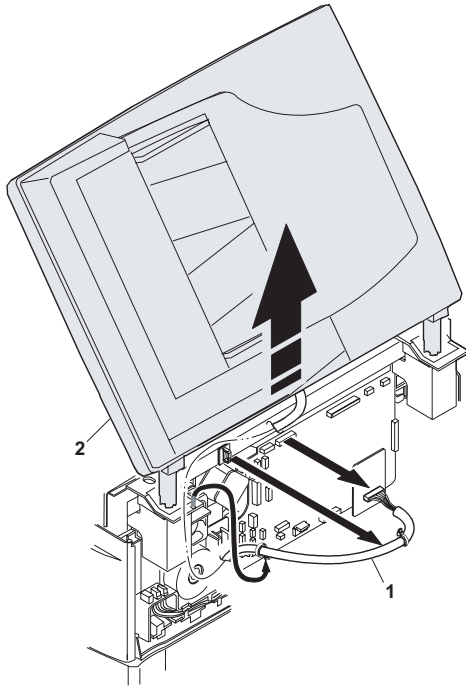
A. RSPF

(1) Remove the rear cabinet.

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

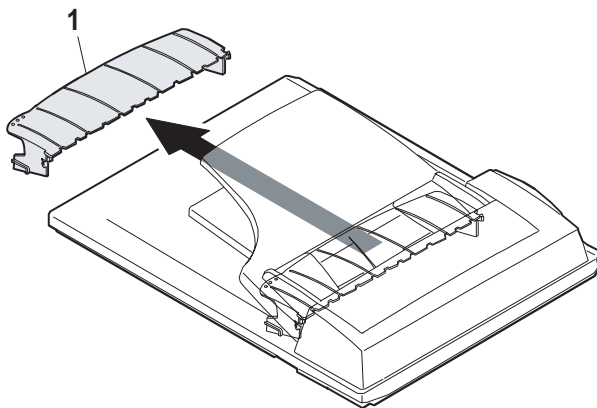
(2) Remove the RSPF.

- 1) Remove the connector and the cable.
- 2) Remove the RSPF.



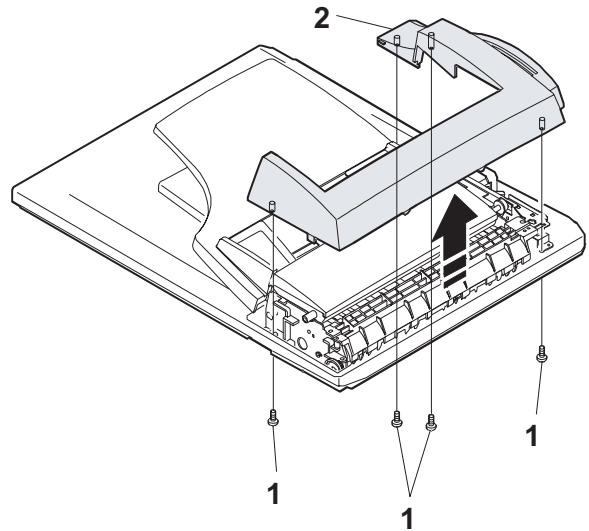
B. Intermediate tray

- 1) Remove the intermediate tray.



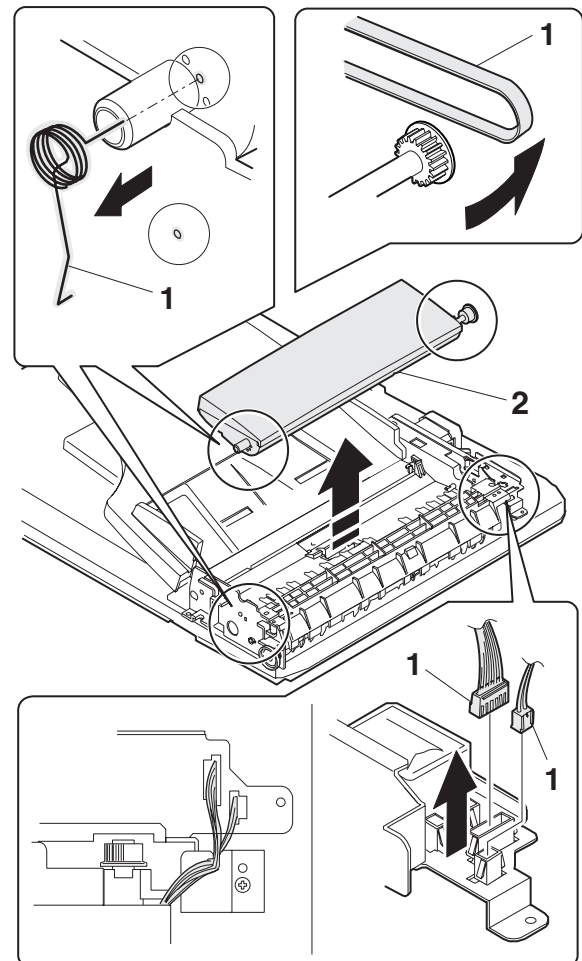
C. Upper cover

- 1) Remove four screws from the bottom of the main body.
- 2) Remove the upper cover.



D. Pickup unit

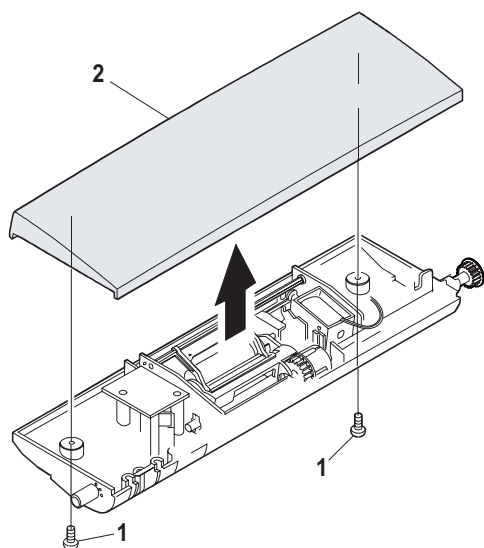
- 1) Remove the belt, the paper feed frame spring, and two harnesses.
- 2) Remove the pickup unit.



Note: When reassembling, be careful of the hole position for the paper feed frame spring.

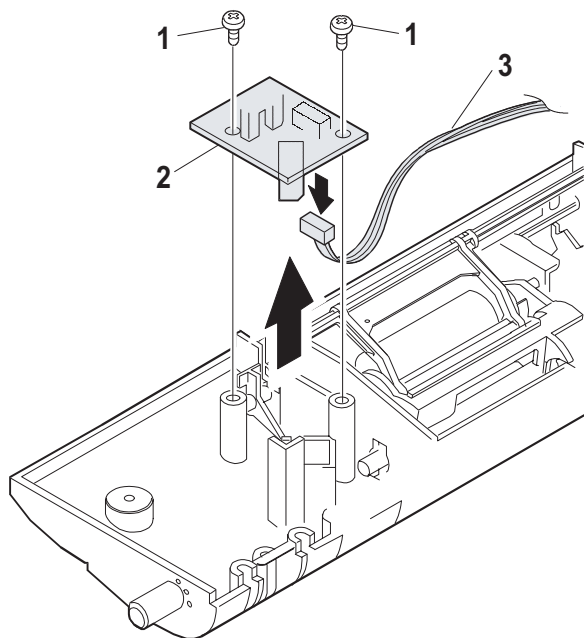
E. Upper cover of the pickup unit.

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



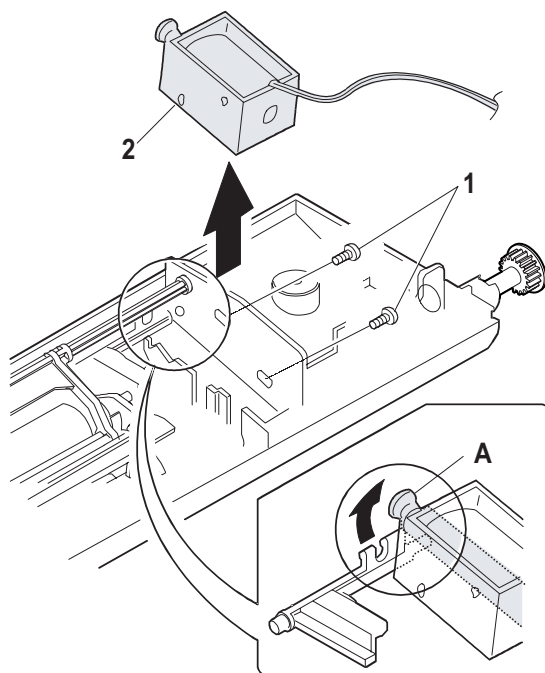
F. Sensor PWB

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



G. Pickup solenoid

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

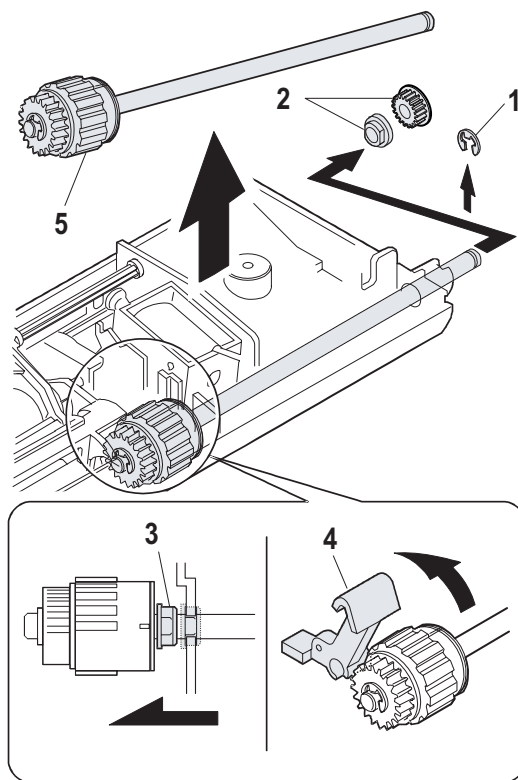


Note: When reassembling, hang the iron core on the solenoid arm.

H. Clutch

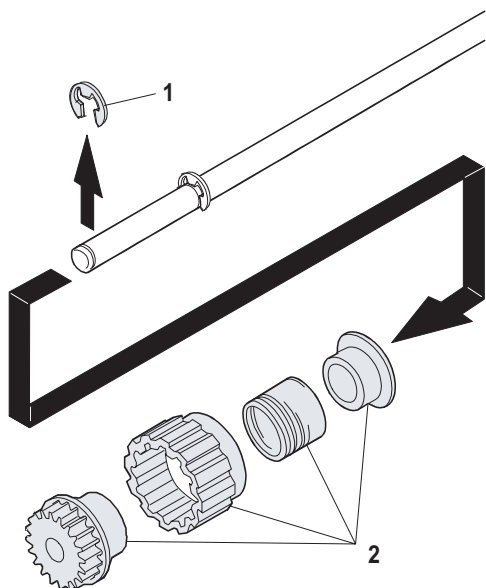
(1) Remove the clutch unit.

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



(2) Remove the clutch

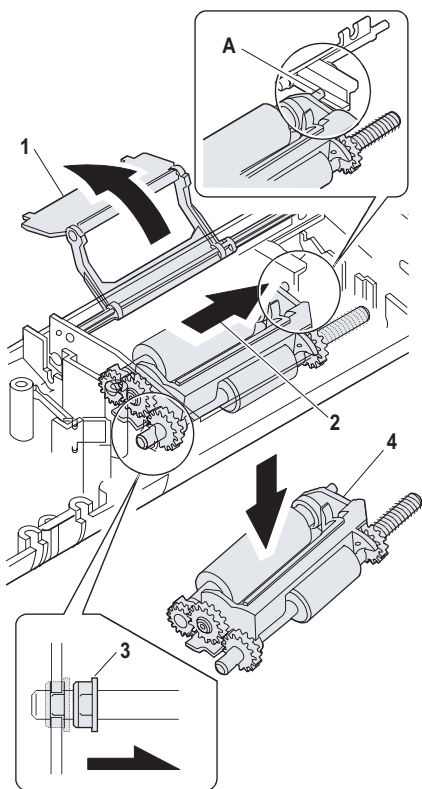
- 1) Remove the E-ring.
- 2) Remove the parts.



I. Manual paper feed roller, pickup roller

(1) Remove the pickup unit.

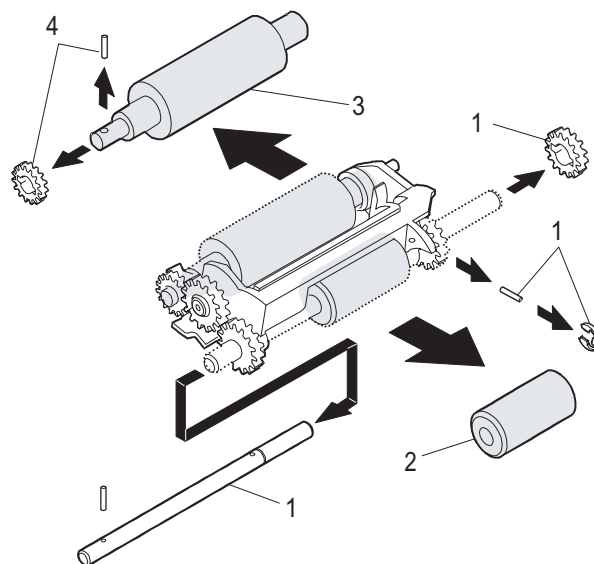
- 1) Lift the paper stopper.
- 2) Slide the take-up roller unit.
- 3) Slide the bushing in the arrow direction.
- 4) Remove the take-up roller.



Note: When reassembling, hang the convex portion of the roller unit on the solenoid arm.

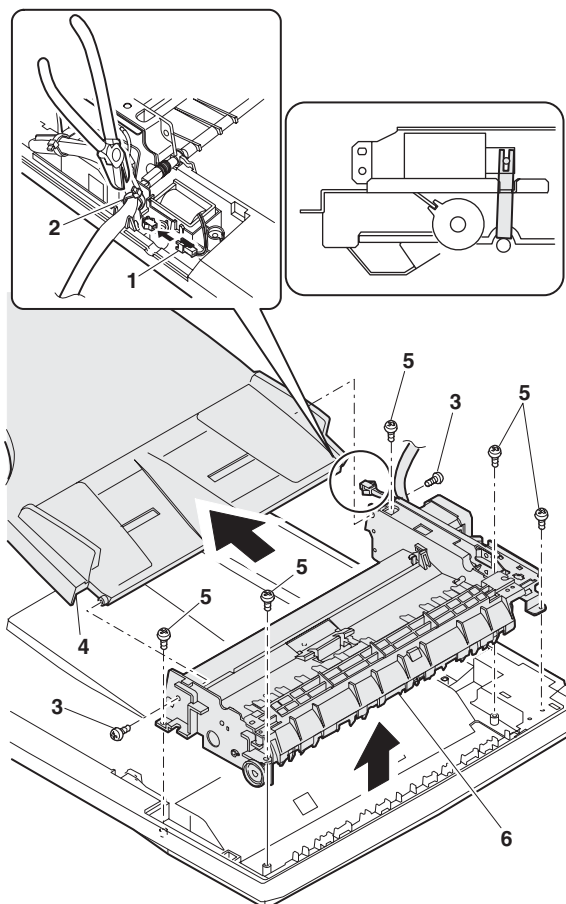
(2) Remove the Manual paper feed roller, pickup roller.

- 1) Remove the parts.
- 2) Remove the manual paper feed roller.
- 3) Remove the pickup roller.
- 4) Remove the parts.



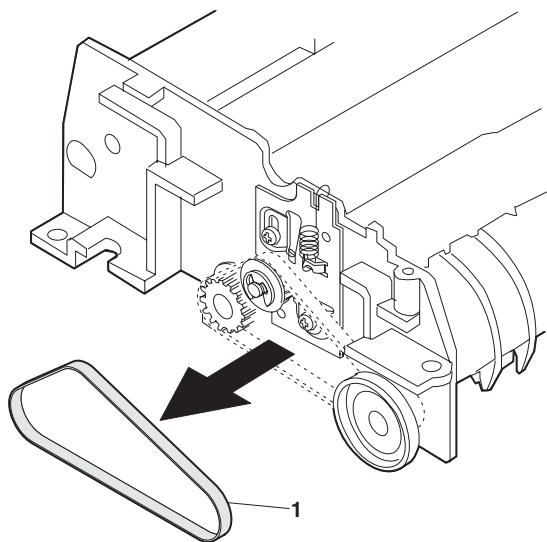
J. Transport unit removal

- 1) Disconnect the connector, and cut the binding band.
- 2) Remove two screws, and remove the document tray unit.
- 3) Remove five screws, and remove the transport unit.



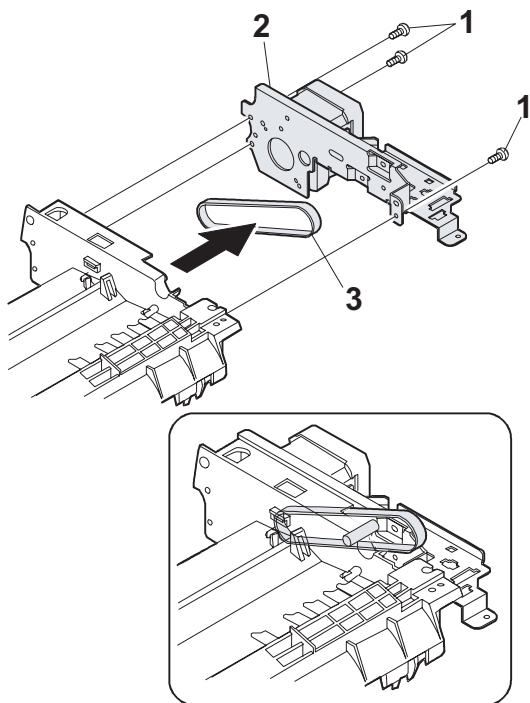
K. Belt 1

- 1) Remove the belt.



L. Belt 2

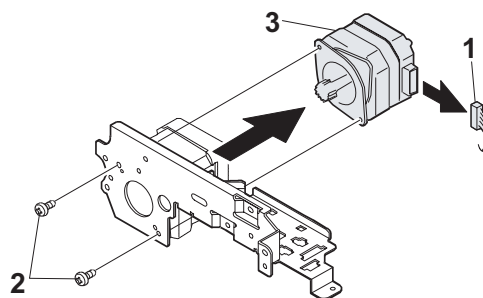
- 1) Remove three screws.
- 2) Remove the drive unit.
- 3) Remove the belt.



Note: When reassembling, hang the belt on the boss.

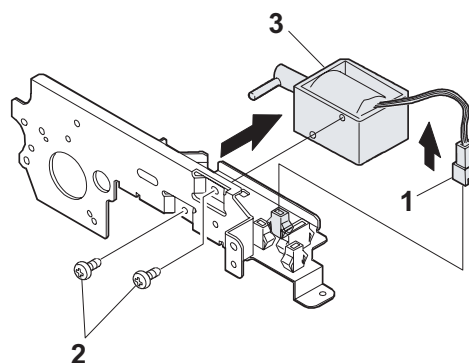
M. SPF motor

- 1) Remove the harness.
- 2) Remove two screws.
- 3) Remove the SPF motor.



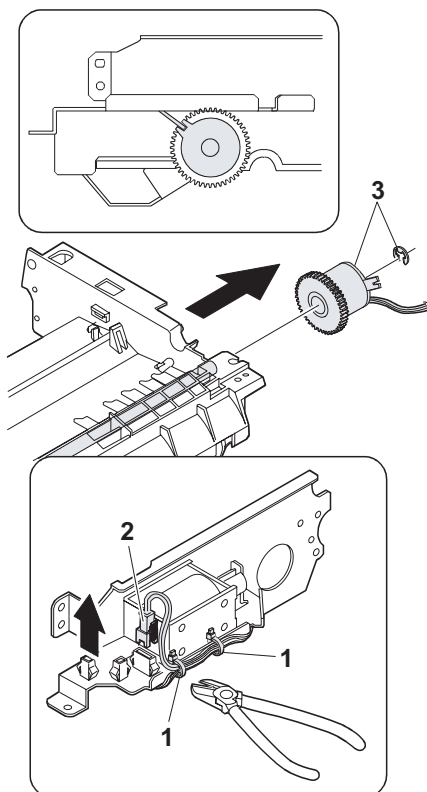
N. Solenoid

- 1) Remove the harness.
- 2) Remove two screws.
- 3) Remove the solenoid.



O. Clutch

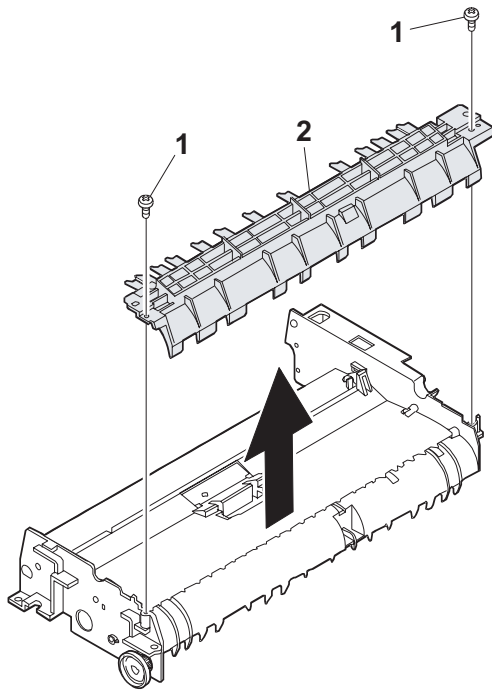
- 1) Cut the band with nippers.
- 2) Remove the harness.
- 3) Remove the clutch.



P. Paper supply roller

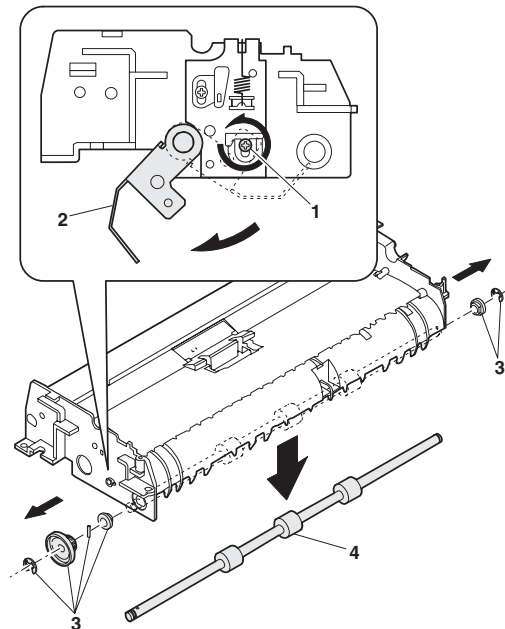
(1) Remove the parts.

- 1) Remove the two screws.
- 2) Remove the parts.



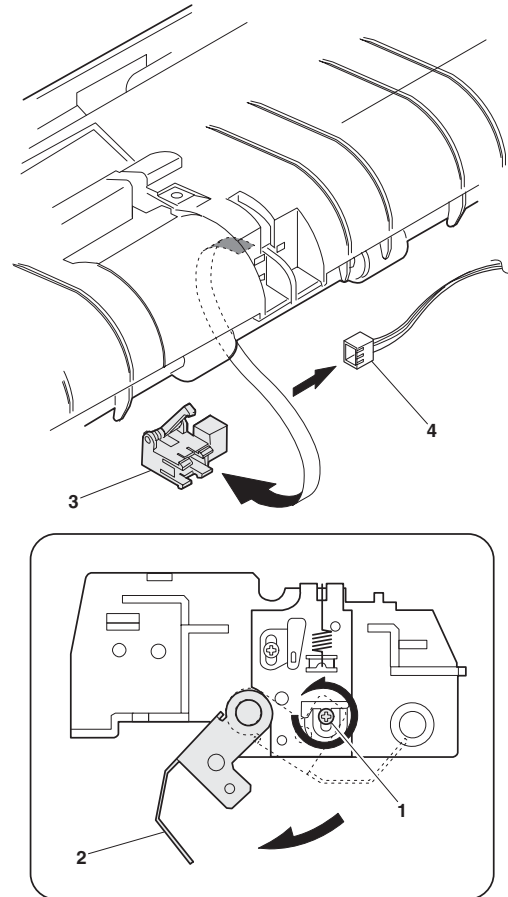
(2) Remove the paper supply roller.

- 1) Loosen the screw.
- 2) Open the paper exit paper guide.
- 3) Remove the parts.
- 4) Remove the paper supply roller.



Q. Paper entry sensor

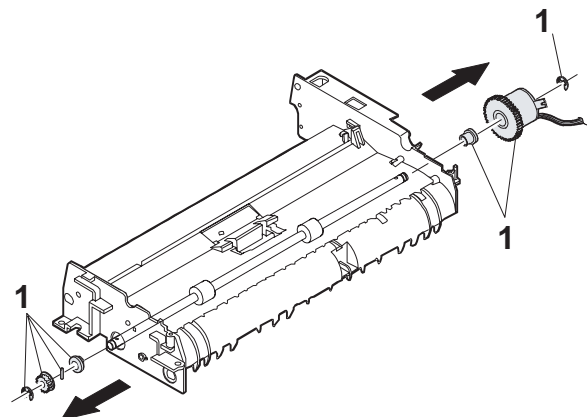
- 1) Loosen the screw.
- 2) Open the paper exit paper guide.
- 3) Remove the paper entry sensor.
- 4) Remove the harness.



R. Transport roller 1.

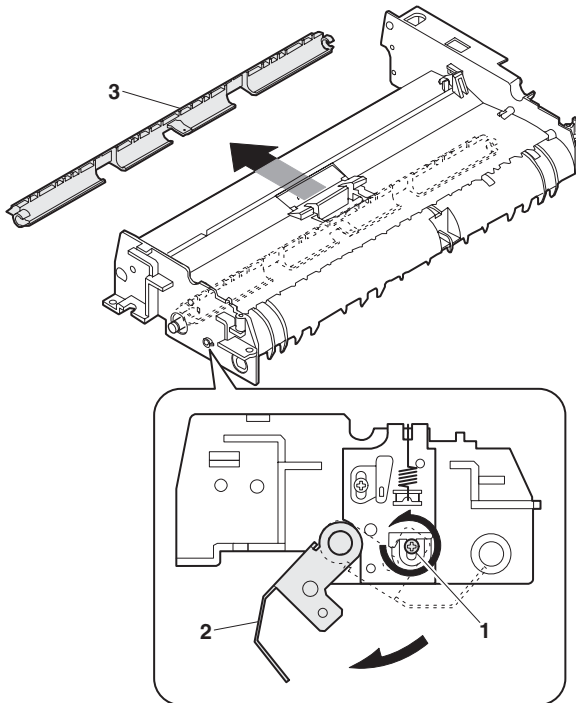
(1) Remove the parts.

- 1) Remove the parts.



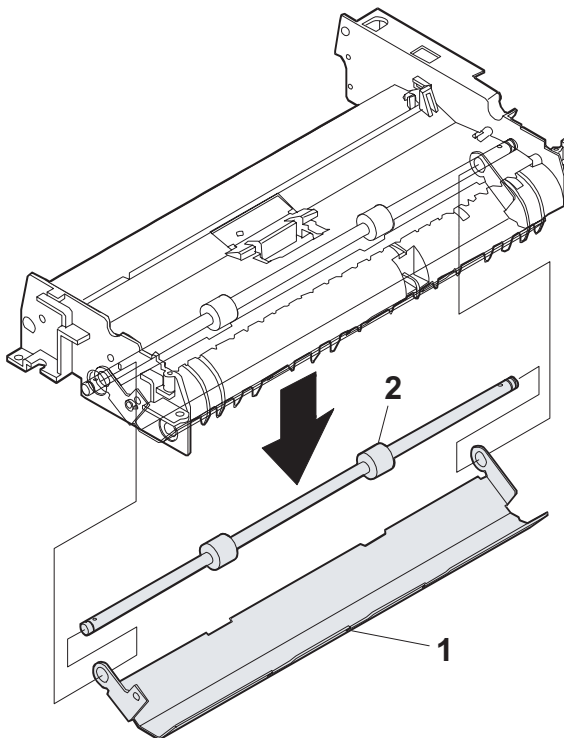
(2) Remove the parts.

- 1) Loosen the screw.
- 2) Open the paper exit paper guide.
- 3) Remove the parts.



(3) Remove the transport roller.

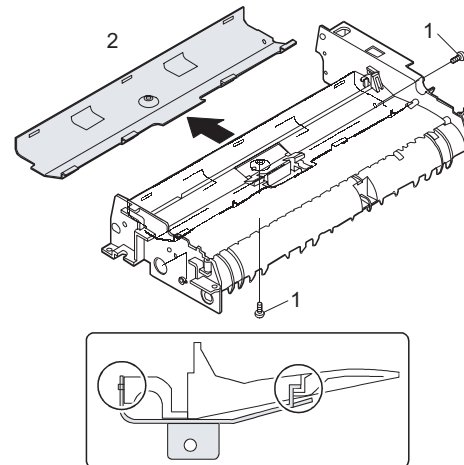
- 1) Remove the paper exit paper guide.
- 2) Remove the transport roller.



S. Paper exit roller

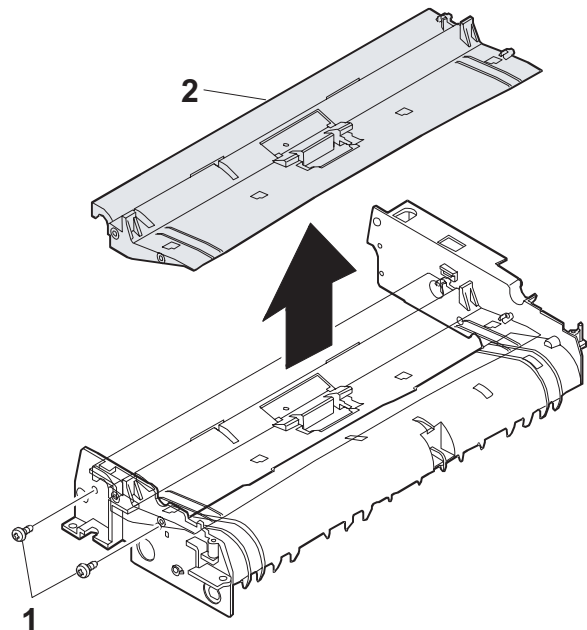
(1) Remove the parts.

- 1) Remove two screws.
- 2) Remove the parts.



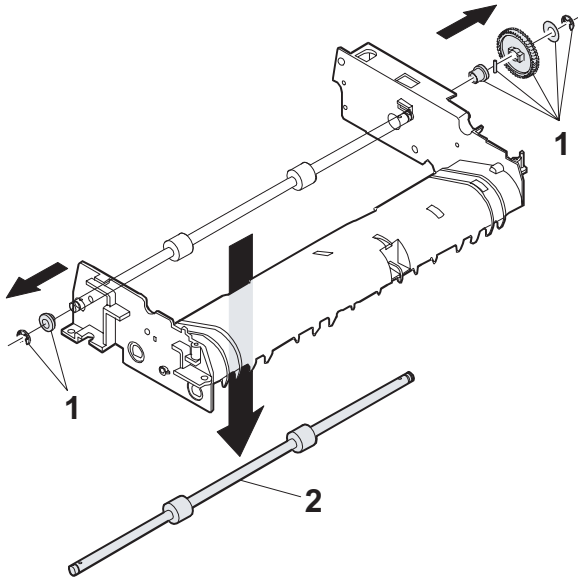
(2) Remove the paper feed paper guide upper.

- 1) Remove two screws.
- 2) Remove the paper feed paper guide upper.



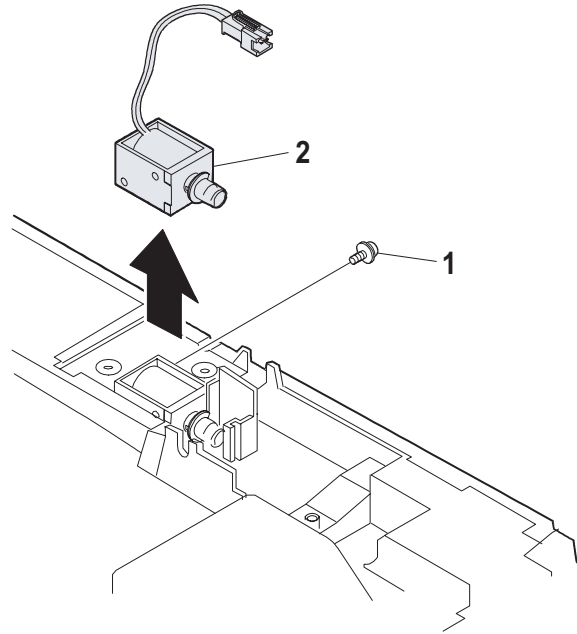
(3) Remove the paper exit roller.

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



(2) Remove the solenoid.

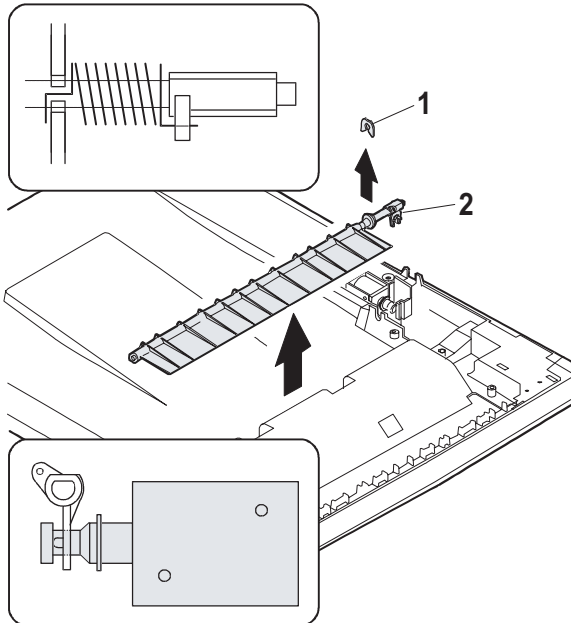
- 1) Remove the screw.
- 2) Remove the solenoid.



T. Solenoid

(1) Remove the reverse gate

- 1) Remove the ring
- 2) Remove the reverse gate



Note: When reassembling, be careful of the groove and the hole positions of the spring.

Note: When reassembling, hang 2) on the solenoid.

[9] ADJUSTMENTS

1. Optical section

A. Copy magnification ratio adjustment

The copy magnification ratio must be adjusted in the main scanning direction and in the sub scanning direction. To adjust, use TC 48-01.

(1) Outline

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

The adjustment is made by manual key operations. (The zoom data register set value is changed for adjustment.)

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

(2) Main scanning/sub scanning direction magnification ratio adjustment

a. Cases when the adjustment is required

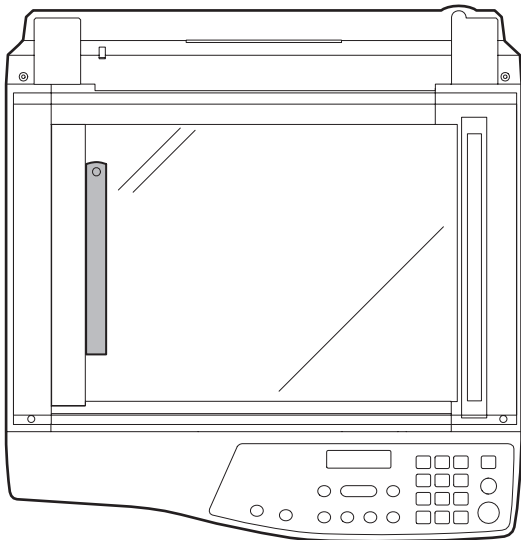
- 1) When the main PWB is replaced.
- 2) When the EEPROM in the main PWB is replaced.
- 3) When "U2" trouble occurs.
- 4) When repairing or replacing the optical section.

b. Necessary tools

- Scale

c. Main scanning direction adjustment procedure

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

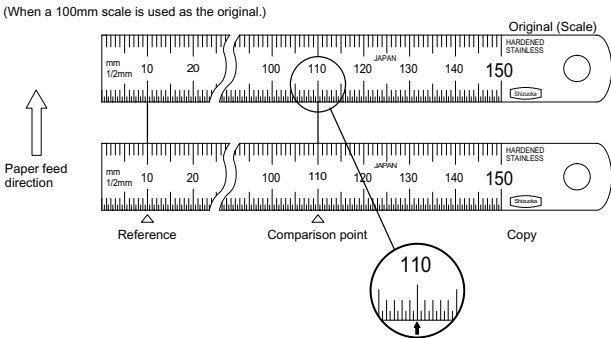


- 2) Set the copy magnification ratio to 100%.
- 3) Make a copy on A4 or 8 1/2" x 11" paper.
- 4) Measure the length of the copied scale image.

- 5) Calculate the main scanning direction magnification ratio.

Main scanning direction magnification ratio

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



- 6) Check that the copy magnification ratio is within the specified range. If it is not within the specified range, perform the following procedures.

- 7) Execute TC 48-01 to select the main scanning direction copy magnification ratio adjustment mode.

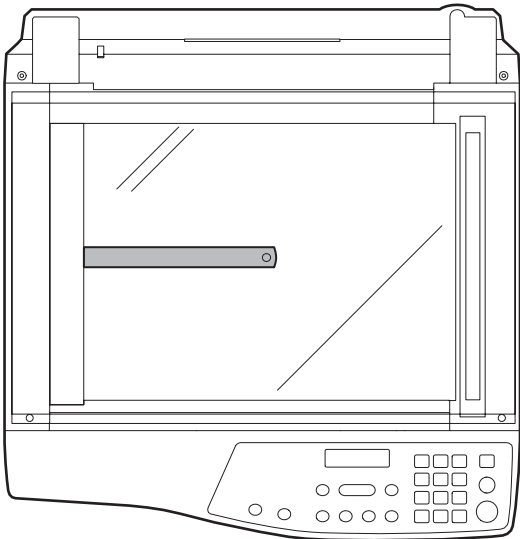
To select the adjustment mode, use the [←/→] key.

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

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

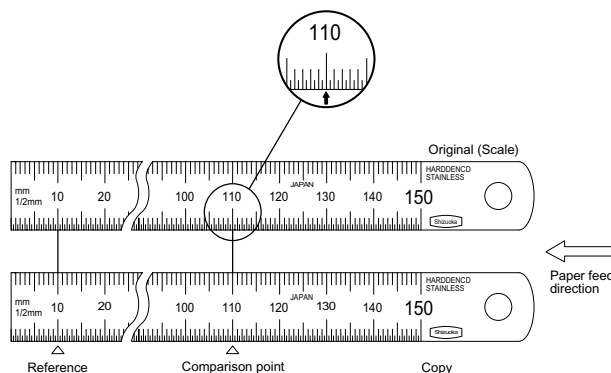
d. Sub scanning direction adjustment procedure

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



- 2) Set the copy magnification ratio to 100%.
- 3) Make a copy on A4 or 8 1/2" x 11" paper.
- 4) Measure the length of the copied scale image.
- 5) Calculate the sub scanning direction copy magnification ratio using the formula below.

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



- 6) Check that the actual copy magnification ratio is within the specified range. (100 ± 1.0%). If it is not within the specified range, perform the following procedures.
- 7) Execute TC 48-01 to select the sub scanning direction copy magnification ratio adjustment mode. To select the adjustment mode, use the [←/→] key. (SCAN mode lamp ON)
- 8) Enter the new set value of sub scanning direction copy magnification ratio with the copy quantity set key, and press the [START] key.

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

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

B. Image position adjustment

The employed test commands and the contents are as follows:

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

Mode	Display item	Default	LED	TC
Print center offset (Main cassette paper feed)	TRAY1	50	COPY mode lamp Main cassette lamp	50-10
(*) Print center offset (2nd cassette paper feed)	TRAY2	50	COPY mode lamp 2nd cassette lamp	
Print center offset (Manual paper feed)	MFT	50	COPY mode lamp Manual feed lamp	
2nd print center offset (Main cassette paper feed)	SIDE2	50	PRINT mode lamp Main cassette lamp	

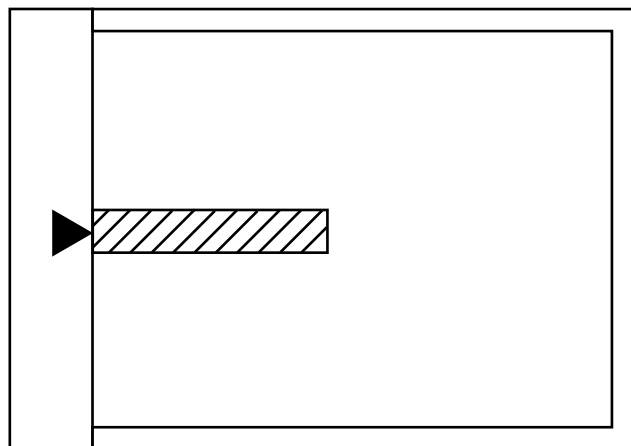
The modes can be selected by pressing [←/→] key.

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

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

(1) Lead edge adjustment

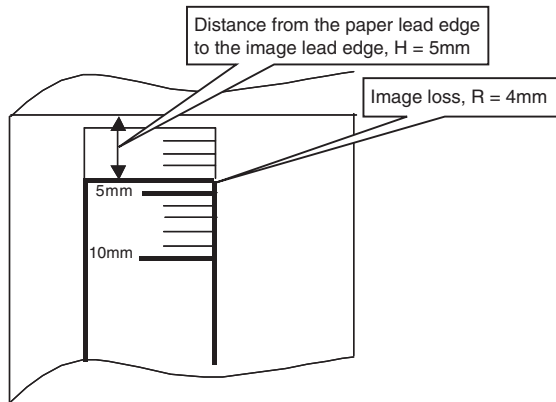
- 1) Set a scale to the center of the paper lead edge guide as shown below, and cover it with B4 or 8 1/2" x 14" paper.



- 2) Execute TC 50 - 01
- 3) Set the print start position (A: COPY mode lamp ON), the lead edge void amount (B: PRINT mode lamp ON), the scan start position (C: SCAN mode lamp) to zero, and make a copy of the scale at 100%.
- 4) Measure the image loss (Rmm) of the scale.
Set C = 10 x R (mm). (Example: Set to 40.)
When the value of C is increased by 10, the image loss is decreased by 1mm. (Default: 50)
- 5) Measure the distance (Hmm) from the paper lead edge to the image print start position.
Set A = 10 x H (mm). (Example: Set to 50.)
When the value of A is increased by 10, the image lead edge is moved to the paper lead edge by 1mm. (Default: 50).
- 6) Set the lead edge void amount to B = 50 (2.5mm). (Default: 50)
When the value of B is increased by 10, the void is extended by about 0.1mm. (For 25 or less, however, the void amount is regarded as 0.)

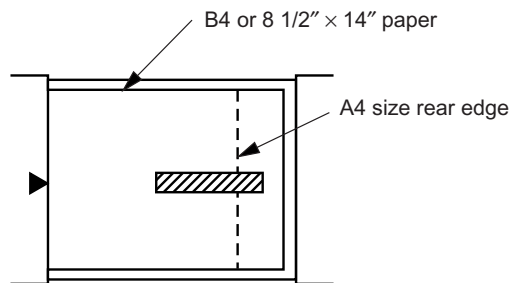
* The SFP adjustment is made by adjusting the SPF image scan start position after OC adjustment.

(Example)



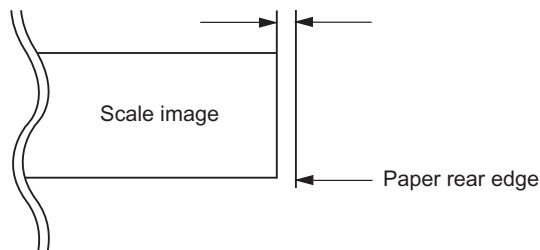
(2) Image rear edge void amount adjustment

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



- 2) Execute TC 50 - 01 to select the image rear edge void amount adjustment mode.
The set adjustment value is displayed on the copy quantity display.
- 3) Make a copy and measure the void amount of image rear edge.

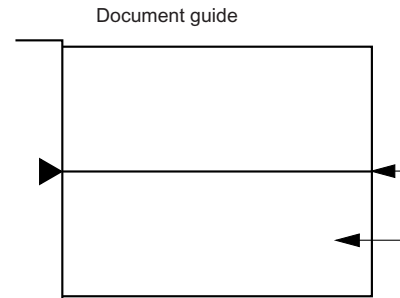
Void amount (Standard value: 2 ~ 3mm)



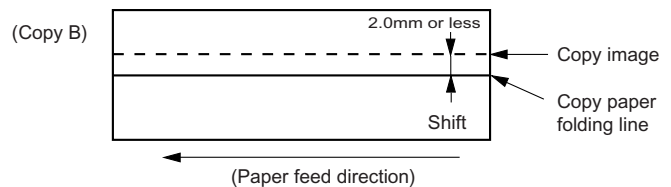
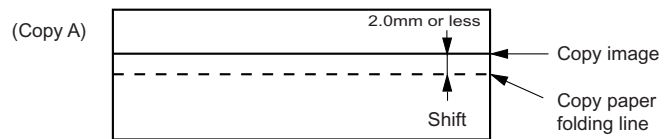
- 4) If the measurement value is out of the specified range, change the set value and repeat the adjustment procedure.
The default value is 50.

(3) Center offset adjustment

- 1) Set the self-made test chart for the center position adjustment so that its center line is aligned with the center mark of the document guide.
- Test chart for the center position adjustment.
Draw a line at the center of A4 or 8 1/2" x 11" paper in the paper transport direction.



- 2) Execute TC 50-10 to select the print center offset (cassette paper feed) adjustment mode.
The set adjustment value is displayed on the copy quantity display.
- 3) Make a copy and check that the copied center line is properly positioned.
The standard value is 0 ±2mm from the paper center.



- 4) If the measured value is out of the specified range, change the set value and repeat the adjustment procedure.
When the set value is increased by 1, the copy image is shifted by 0.1mm toward the rear frame.
- For the manual paper feed, change the manual paper feed adjustment mode and perform the similar procedures.
 - Since the document center offset is automatically adjusted by the CCD which scan the reference lines (F/R) on the back of document guide, there is no need to adjust manually.

2. Copy density adjustment

A. Copy density adjustment timing

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

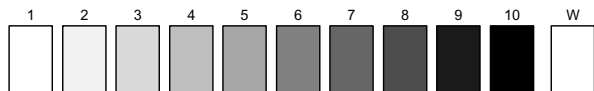
- When maintenance is performed.
- When the developing bias/grid bias voltage is adjusted.
- When the optical section is cleaned.
- When a part in the optical section is replaced.
- When the optical section is disassembled.
- When the OPC drum is replaced.
- When the main control PWB is replaced.
- When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

B. Note for copy density adjustment

- 1) Arrangement before execution of the copy density adjustment
- Clean the optical section.
 - Clean or replace the charger wire.
 - Check that the voltage at the high voltage section and the developing bias voltage are in the specified range.

C. Necessary tool for copy density adjustment

- 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

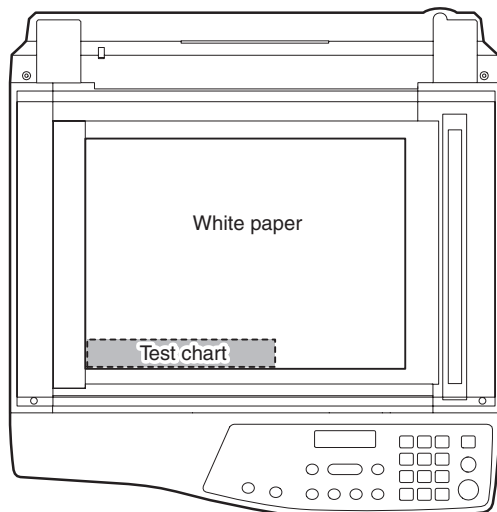
The copy density can be adjusted in 300dpi or in 600dpi.

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

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

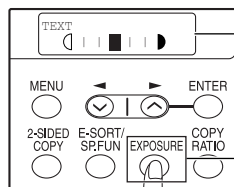
(1) Test chart (UKOG-0162FCZZ) setting

- 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.

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



(1) Exposure mode, level display

(2) Mode select key

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

- Make a copy.

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

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

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

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

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

3. High voltage adjustment

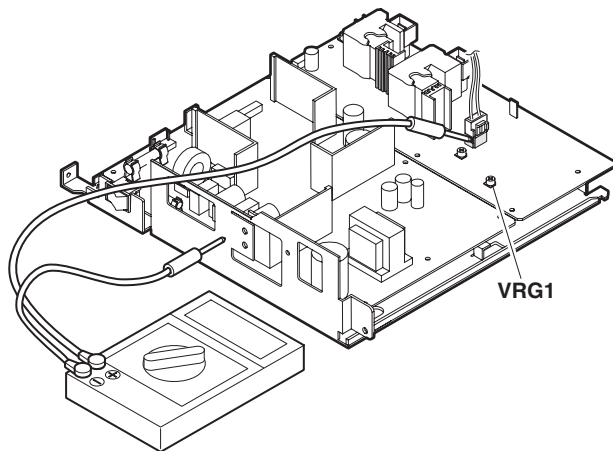
A. Main charger (Grid bias)

Note:

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

Procedures

- 1) Set the digital multi meter range to DC700V.
- 2) Set the positive side of the test rod to the connector CN11-3 (GRID) of high voltage section of the power PWB and set the negative side to the frame ground (power frame).
- 3) Execute TC 8-02. (The main charger output is supplied for 30 sec in the grid voltage HIGH output mode.)
- 4) Adjust the control volume (VRG1) so that the output voltage is 580 \pm 12V.

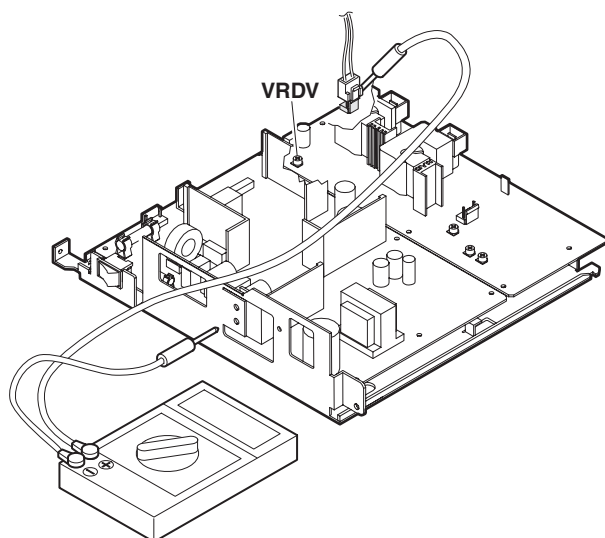


B. DV bias check

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

Procedures

- 1) Set the digital multi meter range to DC500V.
- 2) Set the positive side of the test rod to the connector CN-10-1 (DV BIAS) and set the negative side to the frame ground (power frame).
- 3) Execute TC 25-01 to output the developing bias for 30sec, and check that the output is -400 \pm 8V.



4. Duplex adjustment

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

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

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

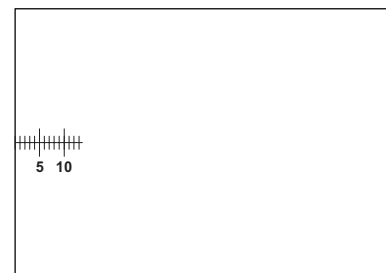
The image data is read, starting from its front end in the document delivery direction (Reference direction of document setting in the OC mode) and stored in memory.

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

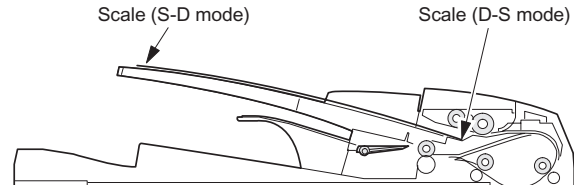
In other words, the front edge image loss of the image can be adjusted by changing the document read end position.

(Adjustment procedure)

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



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



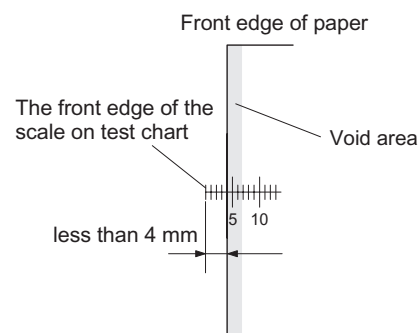
- 3) Execute test command 50-18.

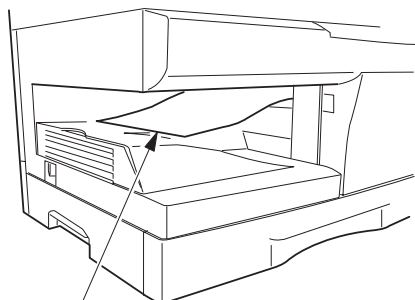
Mode	Display item	Default	LED
OC memory reverse output position	OC	50	COPY mode lamp
SPF memory reverse output position	SPF	50	PRINT mode lamp

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

Adjust the setting so that the front edge image loss is less than 4.0 mm in the R-SPF mode.

An increase of 1 in setting represents an increase of 0.1 mm in image loss.





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

B. Adjusting trailing edge void in duplex copy mode

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

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

There are two adjustment modes:

- 1) Image cut rear end void quantity (R-SPF) 50-19 (SCAN mode lamp)

The size (length) of a document read from the R-SPF is detected, the image at the trailing edge of the first printing surface is cut to make a void area. (The adjustment of void quantity at the time when the cassette paper size is not recognized.)

- 2) Paper trailing edge void quantity 50-19 (PRINT mode lamp)

This adjustment is made when the cassette paper size is recognized. The trailing edge void quantity can be adjusted by changing the trailing edge image laser OFF timing.

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

The adjustment modes can be selected by pressing [←/→] key. (Adjustment range; 1 – 99)

Enter the adjustment value and press [START] key to save the set value and make a copy. (The paper information is cleared for every copy.)

When the set value is increased by 1, the void amount is increased by about 0.1mm.

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

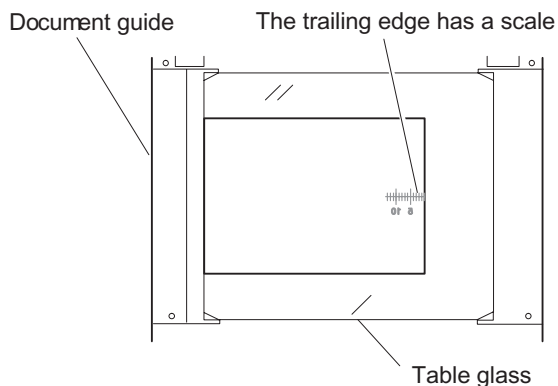
* The initial value of duplex setting is 2to2.

(Adjustment procedure)

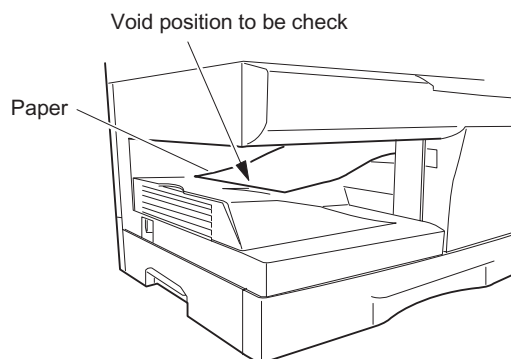
(1) Paper trailing edge void quantity

- 1) Preparing test chart (Draw a scale at the rear end of one side of a sheet of A/4 white paper or letter paper)

- 2) Set the test chart on the document glass as shown below.



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

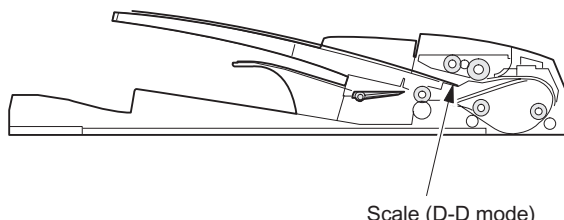


The trailing edge void on the first printing surface is shown above.

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

(2) Image cut trailing edge void quantity (R-SPF)

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



- 2) Execute test command 50-19 to turn on the SCAN mode lamp (on the operation panel) and make the printing mode in the D-D mode.
- 3) Remove and reinsert the cassette.

Note: Make sure to carry out this step before making a copy during this adjustment.

- 4) Make a copy and check the void area of the scale on the image. Adjust the setting so that the void area is 2 - 4 mm. An increase of 1 in setting represents an increase of 0.1 mm in void area. I Void position to be checked

5. SPF (RSPF) scan position automatic adjustment

Place a black chart so that it covers the SPF scan glass and the OC glass together, and close the OC cover.

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

* Default is 1. Adjustment range is 1 – 99. Adjustment unit 1 = about 0.127mm

* If the values are kept as the default values, SPF scan is not performed properly. The front area of the proper scan position may be scanned.

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

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

Mode	Display item	Default	LED
SPF scan position auto adjustment	AUTO	1	COPY mode lamp
SPF scan position manual adjustment	MANU	1	PRINT mode lamp

Operation

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

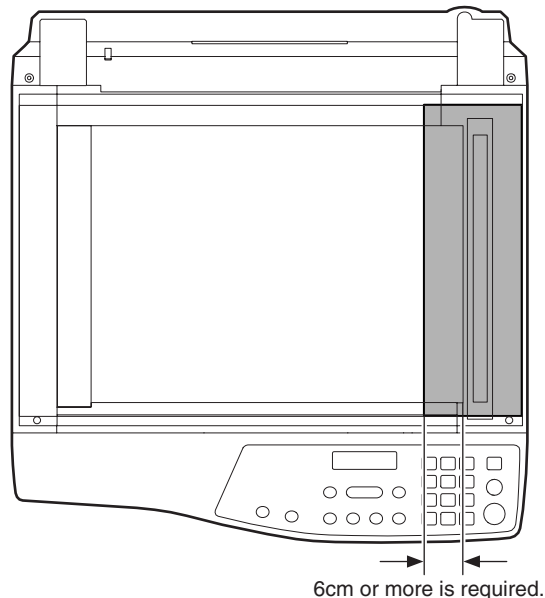
OK/ERR display in AUTO

<When OK>

53-08 SPF AUTO
AUTO 100% ** OK

<When ERR>

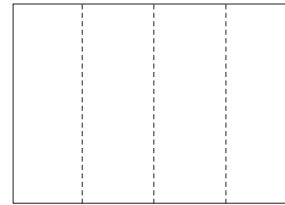
53-08 SPF AUTO
AUTO 100% ** ERR



* Use a black chart (UKOG-0011QSZZ) or prepare a chart as shown below.
Chart size: 300 x 100, prepared with cutting sheet No. 791 (Black) or an equivalent one.

Reason: To prevent erroneous detection by disturbing light of a fluorescent lamp, etc.

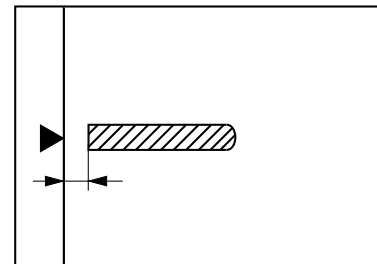
The size of the black chart (UKOG-0011QSZZ) is 297 x 420. Divide it into four for use.



6. RSPF (SPF) mode sub scanning direction magnification ratio adjustment

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

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



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

- 2) Set the test chart on the RSPF and make a duplex copy (D-D or D-S) in the normal ratio (100%).
- 3) Compare the scale image and the actual image. If necessary, perform the following adjustment procedures.
- 4) Execute TC 48-05.
- 5) The current front surface sub scanning direction magnification ratio correction value is displayed in two digits on the display section. To select SIDE1 and SIDE2, use [←/→] keys.
- 6) Enter the set value and press the start key.

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

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

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

<Adjustment specification>

Adjustment mode	Spec value	TC	Set value	Setting range
Sub scanning direction magnification ratio (SPF/RSPF mode)	At normal: $\pm 1.0\%$	48-5	Add 1: 0.1% increase Reduce 1: 0.1% decrease	1 – 99

7. Automatic black level correction

a. Cases when the adjustment is required

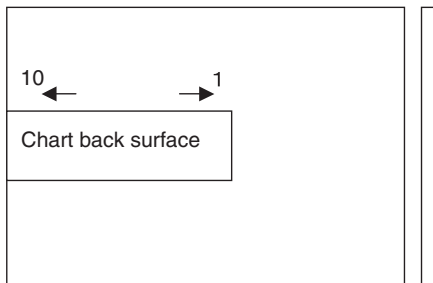
- 1) When the main PWB is replaced.
- 2) When the EEPROM in the main PWB is replaced.
- 3) When "U2" trouble occurs.
- 4) When repairing or replacing the optical section.

b. Adjustment procedure

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

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

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



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

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

* Default: 0

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

c. Operation

- 1) Initial display

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

- 2) [ENTER/START] Correction start

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

<During canceling - When C/CA is pressed->

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

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

- 3) After execution

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

- 3) In case of an error

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

[10] TEST COMMAND, TROUBLE CODES

1. Entering the test command mode

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

[#] key → [*] key → [C] key → [*] key

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

2. Key rule

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

3. List of test commands

Main code	Sub code	Contents
1	01	Mirror scan (SCAN CHK)
	02	Mirror home position sensor (MHPS) status display (MHP-SENSOR)
	06	Mirror scan aging (SCAN AGING)
2	01	Single Paper Feeder (SPF) aging (SPF AGING)
	02	SPF sensor status display (SPF SENSOR)
	03	SPF motor operation check (SPF MOTOR CHK)
	06	RSPF resist clutch operation check (RSPF RES.CHK)
	08	SPF paper feed solenoid operation check (SPF SPUS CHK)
	09	RSPF reverse solenoid operation check (RSPF SPFS CHK)
	10	RSPF paper exit gate solenoid operation check (RSPF SGS CHK)
3	03	Shifter operation check (SHIFTER CHK)
5	01	Operation panel display check (LCD/LED CHK)
	02	Fusing lamp, cooling fan operation check (HT LAMP CHK)
	03	Copy lamp ON check (C-LAMP CHK)
6	01	Paper feed solenoid (CPFS1, CPFS2, MPFS) operation check (PSOL CHK)
	02	Resist roller solenoid (RRS) operation check (RES.R SOL CHK)
7	01	Check of warm-up display and aging with JAM (W-UP/AGING)
	06	Interval aging (INTERVAL AGING)
	08	Shift to copy with warm-up display (Shift to equivalent to CA key) (W-UP C-MODE)
8	01	Developing bias output (DVL P BIAS SET.)
	02	Main charger output (Grid HIGH) (MHV(H) SET.)
	03	Main charger output (Grid LOW) (MHV(L) SET.)
	06	Transfer charger output (THV SET.)

Main code	Sub code	Contents
9	01	Duplex motor normal rotation check (DPLX ROT.)
	02	Duplex motor reverse rotation check (DPLX ROT.REV.)
10	00	Toner motor operation (TONER MOTOR)
14	00	Cancel of trouble other than U2 (TRBL CANC.)
16	00	U2 trouble cancel (U2 TRBL CANC.)
22	04	JAM total counter display (JAM TTL CNT)
	05	Total counter display (TTL CNT)
	08	SPF counter display (SPF CNT)
	12	Drum counter display (DRUM CNT)
	14	ROM version display (ROM VER.)
	16	Duplex counter display (DPLX CNT)
	17	Copy counter display (COPIES CNT)
	18	Printer counter display (PRT.CNT)
	19	Scanner mode counter display (S-MODE CNT)
	21	Scanner counter display (SCAN CNT)
	22	SPF JAM counter display (S JAM CNT)
	22	SPF JAM counter display (S JAM CNT)
24	01	JAM total counter clear (JAM TTL CLR.)
	04	SPF counter clear (SPF CLR.)
	05	Duplex counter clear (DPLX CLR.)
	07	Drum counter clear (DRUM CLR.)
	08	Copy counter clear (COPIES CLR.)
	09	Printer counter clear (PRT.CLR.)
	13	Scanner counter clear (SCAN CLR.)
	14	SPF JAM total counter clear (S JAM TTL CLR.)
	15	Scanner mode counter clear (S-MODE CLR.)
	25	01 Main motor operation check (MAIN MOTOR CHK)
	10	Polygon motor operation check (LSU CHK)


Main code	Sub code	Contents
26	01	Manual feed setting (BYPASS)
	02	(R)SPF setting (SPF/RSPF)
	03	Second cassette setting (2ND TRAY)
	04	Main unit duplex setting (DPLX)
	06	Destination setting (DESTINATION)
	07	Machine conditions check (CPM)
	20	Rear edge void setting (END EDGE)
	30	CE mark support control ON/OFF (CE MARK)
	38	Cancel of stop at drum life over (DRUM LIFE END)
	39	Memory capacity check (MEM.CHK)
	40	Polygon motor OFF time setting (Time required from completion of printing to turning OFF the motor) (LSU MOTOR OFF)
	42	Transfer ON/OFF timing control setting (TC ON TIMING)
	43	Side void amount setting (SIDE VOID)
	62	Energy-save mode copy lamp setting (C-LAMP E-S)
	64	Heater control setting in scanner mode (S-MODE HEATER)
30	01	Paper sensor status display (P-SENSOR)
41	06	OC cover float detection level (OC FLOAT LEVEL)
43	01	Fusing temperature setting (Normal copy) (FU TEMP)
	04	Fusing temperature setting in multi coy (FU TEMP MULTI)
	05	Fusing temperature setting in duplex copy (FU TEMP DPLX)
	09	Postcard size paper fusing control setting (FU CTR P-CARD) (Japan model only)
	11	Postcard size paper fusing temperature setting (FU TEMP P-CARD) (Japan model only)
	14	Fusing start temperature setting (FU TEMP START)

Main code	Sub code	Contents
46	01	Copy density adjustment (300dpi) (EXP.LEVEL 300)
	02	Copy density adjustment (600dpi) (EXP.LEVEL 600)
	18	Image contrast adjustment (300dpi) (GAMMA 300)
	19	Exposure mode setting (AE MODE)
	20	SPF exposure correction (EXP.LEVEL SPF)
	29	Image contrast adjustment (600dpi) (GAMMA 600)
	30	AE limit adjustment (AE LIMIT)
	31	Image sharpness adjustment (SHARPNESS)
	32	Copier color reproduction setting (COLOR REAPPEAR)
	48	01 Mains can/sub scan direction magnification ratio (COPY MAG.)
	05	SPF/RSPF mode sub scan direction magnification ratio in copying (SPF/RSPF MAG.)
49	01	Download mode (DOWNLOAD MODE)
50	01	Lead edge image position (LEAD EDGE)
	06	Copy lead edge position adjustment (SPF/RSPF) (SPF/RSPF EDGE)
	10	Print center offset adjustment (PRT.OFF-CENTER)
	12	Document feed off-center adjustment (ORG.OFF-CENTER)
	18	Memory reverse position adjustment in duplex copy (DPLX REVERSE)
	19	Duplex copy rear edge void adjustment (DPLX END EDGE)
51	02	Resist amount adjustment (RESIST ADJ.)
53	08	SPF scan position automatic adjustment (SPF AUTO)
61	03	HSYNC output check (LSU CHK)
63	01	Shading check (SHADING CHK)
	02	Black level automatic correction (BLACK LEVEL)
64	01	Self print (1by2 mode) (SELF PRT.)

4. Descriptions of various test commands

Main code	Sub code	Contents	Details of function/operation
1	01	Mirror scan (SCAN CHK)	<p>[Function] When [ENTER/START] key is pressed, the home position is checked and the mirror base performs full scan at the speed of the set magnification ratio. During operation, the set magnification ratio is displayed. The mirror home position sensor status is displayed with the "COPY mode lamp". (When the mirror is in the home position, the lamp lights up.) During operation, the copy lamp lights up. When [C] key is pressed, if the operation is on the way, it is terminated and the machine goes to the sub code entry standby mode.</p> <p>[Operation] 1) Initial display <div>01-01 SCAN CHK - 100% +</div> 2) [←] <div>01-01 SCAN CHK - 99% +</div> 3) [ENTER/START] <div>01-01 SCAN CHK EXECUTING... - 78% +</div> 2) [ZOOM] <div>01-01 SCAN CHK - 78% +</div> 2) [→] <div>01-01 SCAN CHK - 101% +</div></p>
	02	Mirror home position sensor (MHPS) status display (MHP-SENSOR)	<p>[Function] Monitors the mirror home position sensor, and makes the "COPY mode lamp" turn on during the sensor ON status.</p> <p>[Operation] 1) Initial display <div>01-02 MHP-SENSOR EXECUTING...</div></p>

Main code	Sub code	Contents	Details of function/operation								
1	06	Mirror scan aging (SCAN AGING)	<p>[Function] When [ENTER/START] key is pressed, the mirror base performs full scan at the speed of the set magnification ratio. During operation, the set magnification ratio is displayed. After 3sec, the mirror base performs full scan again. * When [ENTER/START] key is pressed once, the ready lamp remains OFF. The mirror home position sensor status is displayed on the "COPY mode lamp." (The lamp is ON when the mirror is in the home position.) During aging, the copy lamp is ON.</p> <p>[Operation] The operation is similar to test command 1-01.</p>								
2	01	Single Paper Feeder (SPF) aging (SPF AGING)	<p>[Function] When [ENTER/START] key is pressed, the set magnification ratio is acquired and single-face document transport is performed in the case of SPF or duplex document transport in the case of R-SPF. However, the operating conditions don't matter and the operation is not stopped even in case of a jam. Also the magnification ratio is displayed on the LCD.</p> <p>[Operation] The operation is similar to test command 1-01.</p>								
	02	SPF sensor status display (SPF SENSOR)	<p>[Function] The ON/OFF status of the SPF sensors can be checked with the LCD. When a sensor is ON, the sensor name is displayed on the LCD.</p> <table><tr><th>Sensor</th><th>Display item</th></tr><tr><td>Document set sensor</td><td>SPID</td></tr><tr><td>SPF document transport sensor</td><td>SPPD</td></tr><tr><td>SPF paper feed cover open/close sensor</td><td>SDSW</td></tr></table> <p>[Operation] 1) Initial display <div>02-02 SPF SENSOR</div> 2) When the sensor is ON: <div>02-02 SPF SENSOR SPID SPPD SDSW</div></p>	Sensor	Display item	Document set sensor	SPID	SPF document transport sensor	SPPD	SPF paper feed cover open/close sensor	SDSW
	Sensor	Display item									
	Document set sensor	SPID									
	SPF document transport sensor	SPPD									
	SPF paper feed cover open/close sensor	SDSW									
03	SPF motor operation check (SPF MOTOR CHK)	<p>[Function] When [ENTER/START] key is pressed, the motor rotates for 10sec at the speed corresponding to the set magnification ratio.</p> <p>[Operation] The operation is similar to test command 1-01.</p>									
06	RSPF resist clutch operation check (RSPF RES.CHK)	<p>[Function] When [ENTER/START] key is pressed, the RSPF resist clutch (SRRC) repeats ON for 500ms and OFF for 500ms 20 times.</p> <p>[Operation] 1) Initial display <div>02-06 RSPF RES.CHK EXECUTING...</div></p>									
08	SPF paper feed solenoid operation check (SPF SPUS CHK)	<p>[Function] The SPF paper feed solenoid (SPUS) repeats ON for 500ms and OFF for 500ms 20 times by the use of the solenoid drive control Bios.</p> <p>[Operation] 1) Initial display <div>02-08 SPF SPUS CHK EXECUTING...</div></p>									
09	RSPF reverse solenoid operation check (RSPF SPFS CHK)	<p>[Function] The SPF reverse solenoid (SPFS) repeats ON for 500ms and OFF for 500ms 20 times by the use of the solenoid drive control Bios.</p> <p>[Operation] 1) Initial display <div>02-09 RSPF SPFS CHK EXECUTING...</div></p>									

Main code	Sub code	Contents	Details of function/operation
2	10	RSPF paper exit gate solenoid operation check (RSPF SGS CHK)	<p>[Function] The SPF paper exit gate solenoid (SGS) repeats ON for 500ms and OFF for 500ms 20 times by the use of the solenoid drive control Bios.</p> <p>[Operation] 1) Initial display</p> <div>02-10 RSPF SGS CHK EXECUTING...</div>
3	03	Shifter operation check (SHIFTER CHK)	<p>[Function] The shifter is moved back and forth in four reciprocations.</p> <p>[Operation] 1) Initial display</p> <div>03-03 SHIFTER CHK EXECUTING...</div>
5	01	Operation panel display check (LCD/LED CHK)	<p>[Function] <LED check mode (All ON/Individual ON)> When [ENTER/START] key is pressed, all the LCD's on the operation panel are turned ON (all pixels ON). After 5sec of ON, the machine goes into the sub code entry standby mode. When [MODE SWITCH] key is pressed under the all ON state, the mode is shifted to the individual ON mode, where the LED's are turned on one by one from the left upper end to the left lower side then from the right upper side to the right lower side. (All the pixels of LCD are lighted simultaneously.) After lighting all the LCD's sequentially, all the LCD's are lighted simultaneously. After 5sec from lighting all the LCD's simultaneously, the machine goes into the sub code entry standby mode. (Cycle of individual ON mode: ON 300ms, OFF 20ms) When [C] key is pressed in the LED check mode, the machine goes into the sub code entry standby mode. When [START] key is pressed, the machine goes into the key input check mode. <Key input check mode> When the machine goes into the key input check mode, the LCD displays 0. Every time when a key on the operation panel is pressed, the entry number is added on the LCD and displayed. Once a key is pressed, it is not recounted. When [START] key is pressed, counting is made and the machine goes into the LED ON check mode (LED all ON status) after 3sec. When [C] key is pressed for the first time, it is counted. When it is pressed for the second time, the machine goes into the sub code entry mode. When [CA] key is pressed for the first time, it is counted. When it is pressed for the second time, the machine goes out from the test command mode. (Note in the key input check mode) <ul style="list-style-type: none"> • Be sure to press [START] key at the last. (If it is pressed on the way, the machine goes into the LED ON check mode.) (LED all ON status) • Multi key input is ignored. </p> <p>[Operation] <LED check mode (All ON/Individual ON)> 1) Initial display</p> <div> <div>  </div> <div>2) When [MODE SWITCH] key is pressed, the machine goes into the individual ON mode.</div> </div> <p><Key input check mode> 1) Initial display <div>05-01 LCD/LED CHK. 0</div> 2) [ENTER/START] <div>05-01 LCD/LED CHK. **</div> </p>

Main code	Sub code	Contents	Details of function/operation												
5	02	Fusing lamp, cooling fan operation check (HT LAMP CHK)	<p>[Function] When [ENTER/START] key is pressed, the fusing lamp repeats ON for 500ms and OFF for 500ms 5 times. During this period, the cooling fan motor rotates. The motor should be rotated at a high (normal) speed.</p> <p>[Operation] 1) Initial display</p> <div>05-02 HT LAMP CHK EXECUTING...</div>												
	03	Copy lamp ON check (C-LAMP CHK)	<p>[Function] When [ENTER/START] key is pressed, the copy lamp turns ON for 5sec.</p> <p>[Operation] 1) Initial display</p> <div>05-03 C-LAMP CHK EXECUTING...</div>												
6	01	Paper feed solenoid (CPFS1, CPFS2, MPFS) operation check (PSOL CHK)	<p>[Function] When [ENTER/START] key is pressed, the selected paper feed solenoid repeats ON for 500ms and OF for 500ms 20times. When [←/→/10KEY] is pressed, the paper feed solenoid setting is switched.</p> <table><tr><th>Code number</th><th>Setting</th><th>Remark</th></tr><tr><td>0</td><td>CPFS1</td><td></td></tr><tr><td>1</td><td>CPFS2</td><td>Operation is possible only when No. 2 cassette is installed.</td></tr><tr><td>2</td><td>MPFS</td><td></td></tr></table> <p>[Operation] 1) Initial display 2) [←/10KEY]</p> <div>06-01 PSOL CHK 0:CPFS1</div> <div>06-01 PSOL CHK 2:MPFS</div> <p>2) [→/10KEY]</p> <div>06-01 PSOL CHK 1:CPFS2</div> <div>06-01 PSOL CHK EXECUTING...</div> <p>3) [ENTER/START]</p> <p>4) Returns to the initial display.</p>	Code number	Setting	Remark	0	CPFS1		1	CPFS2	Operation is possible only when No. 2 cassette is installed.	2	MPFS	
	Code number	Setting	Remark												
0	CPFS1														
1	CPFS2	Operation is possible only when No. 2 cassette is installed.													
2	MPFS														
02	Resist roller solenoid (RRS) operation check (RES.R SOL CHK)	<p>[Function] When [ENTER/START] key is pressed, the resist solenoid repeats ON for 500ms and OFF for 500ms 20 times.</p> <p>[Operation] 1) Initial display</p> <div>06-02 RES.R SOL CHK EXECUTING...</div>													
7	01	Check of warm-up display and aging with JAM (W-UP/ AGING)	<p>[Function] Copying is repeated to make the set quantity of copies. When the test command is executed, warm-up is started and warm-up time is added for every second from 0 and displayed. When warm-up is completed, addition is stopped. When [CA] key is pressed, the ready lamp lights up. After that, enter the copy quantity with [10KEY] and press [ENTER/START] key to repeat copying of the set quantity (interval 0sec). To cancel the test command, turn off the power or execute a test command which causes hardware reset.</p> <p>[Operation] 1) Initial display 2) After 10sec</p> <div>07-01 W-UP/AGING 0</div> <div>07-01 W-UP/AGING 10</div>												

Main code	Sub code	Contents	Details of function/operation
9	01	Duplex motor normal rotation check (DPLX ROT.)	<p>[Function] Use the duplex motor Bios to drive the duplex motor in the normal direction (paper exit direction) for 30sec. After completion of this process, the machine goes into the sub code entry standby mode.</p> <p>[Operation] 1) Initial display</p> <div>09-01 DPLX ROT. EXECUTING...</div>
	02	Duplex motor reverse rotation check (DPLX ROT.REV.)	<p>[Function] Use the duplex motor Bios to drive the duplex motor in the reverse direction for 30sec. After completion of this process, the machine goes into the sub code entry standby mode.</p> <p>[Operation] 1) Initial display</p> <div>09-02 DPLX ROT.REV. EXECUTING...</div>
10	00	Toner motor operation (TONER MOTOR)	<p>[Function] When [ENTER/START] key is pressed, the toner motor is rotated for 30sec. After completion of this process, the machine goes into the main code entry standby mode.</p> <p>[Operation] 1) Initial display</p> <div>10-00 TONER MOTOR EXECUTING...</div>
14	00	Cancel of trouble other than U2 (TRBL CANC.)	<p>[Function] Used to cancel troubles other than U2. * Cancel troubles such as H trouble which writes data into EEPROM, and perform hardware reset.</p> <p>[Operation] 1) Initial display</p> <div>14-00 TRBL CANC. CLEARED</div>
16	00	U2 trouble cancel (U2 TRBL CANC.)	<p>[Function] Used to cancel U2 trouble. When [ENTER/START] key is pressed, check sum of the total counter in the EEPROM is rewritten and hardware reset is made.</p> <p>[Operation] 1) Initial display</p> <div>16-00 U2 TRBL CANC. CLEARED</div>
22	04	JAM total counter display (JAM TTL CNT)	<p>[Function] The JAM total counter is displayed.</p> <p>[Operation] 1) Initial display</p> <div>22-04 JAM TTL CNT ***,***</div>
	05	Total counter display (TTL CNT)	<p>[Function] The total counter value is displayed.</p> <p>[Operation] 1) Initial display</p> <div>22-05 TTL CNT ***,***</div>
	08	SPF counter display (SPF CNT)	<p>[Function] The SPF counter is displayed.</p> <p>[Operation] 1) Initial display</p> <div>22-08 SPF CNT ***,***</div>

Main code	Sub code	Contents	Details of function/operation															
22	12	Drum counter display (DRUM CNT)	<p>[Function] The drum counter is displayed.</p> <p>[Operation] 1) Initial display</p> <div>22-12 DRUM CNT ***,***</div>															
	14	ROM version display (ROM VER.)	<p>[Function] The P-ROM version is displayed. Press [←/→/10KEY] to switch the display version.</p> <table><tr><th>Code number</th><th>Version</th><th>Display item</th></tr><tr><td>0</td><td>Main unit Program</td><td>MAIN PROG.</td></tr><tr><td>1</td><td>IMC Program</td><td>IMC PROG.</td></tr><tr><td>2</td><td>FAX Program</td><td>FAX PROG.</td></tr><tr><td>3</td><td>LCD DATA</td><td>LCD DATA</td></tr></table> <p>[Operation] 1) Initial display</p> <div>22-14 ROM VER. MAIN PROG. 00.00</div> <p>2) [→/10KEY]</p> <div>22-14 ROM VER. IMC PROG. 00.00</div> <p>2) [←/10KEY]</p> <div>22-14 ROM VER. LCD DATA 00.00</div>	Code number	Version	Display item	0	Main unit Program	MAIN PROG.	1	IMC Program	IMC PROG.	2	FAX Program	FAX PROG.	3	LCD DATA	LCD DATA
	Code number	Version	Display item															
	0	Main unit Program	MAIN PROG.															
	1	IMC Program	IMC PROG.															
	2	FAX Program	FAX PROG.															
3	LCD DATA	LCD DATA																
16	Duplex counter display (DPLX CNT)	<p>[Function] The duplex counter is displayed.</p> <p>[Operation] 1) Initial display</p> <div>22-16 DPLX CNT ***,***</div>																
17	Copy counter display (COPIES CNT)	<p>[Function] The copy counter is displayed.</p> <p>[Operation] 1) Initial display</p> <div>22-17 COPIES CNT ***,***</div>																
18	Printer counter display (PRT.CNT)	<p>[Function] The printer counter is displayed.</p> <p>[Operation] 1) Initial display</p> <div>22-18 PRT.CNT ***,***</div>																
19	Scanner mode counter display (S-MODE CNT)	<p>[Function] The scanner mode counter is displayed.</p> <p>[Operation] 1) Initial display</p> <div>22-19 S-MODE CNT ***,***</div>																
21	Scanner counter display (SCAN CNT)	<p>[Function] The scanner counter is displayed.</p> <p>[Operation] 1) Initial display</p> <div>22-21 SCAN CNT ***,***</div>																

Main code	Sub code	Contents	Details of function/operation
22	22	SPF JAM counter display (S JAM CNT)	<p>[Function] The SPF JAM counter is displayed.</p> <p>[Operation] 1) Initial display</p> <div>22-22 S JAM CNT ***, ***</div>
24	01	JAM total counter clear (JAM TTL CLR.)	<p>[Function] When [ENTER/START] key is pressed, the JAM total counter is cleared to 0 and "000,000" is displayed on the LCD.</p> <p>[Operation] 1) Initial display</p> <div>24-01 JAM TTL CLR. CLEARED 000,000</div>
	04	SPF counter clear (SPF CLR.)	<p>[Function] When [ENTER/START] key is pressed, the SPF counter value is cleared to 0 and "000,000" is displayed on the LCD.</p> <p>[Operation] 1) Initial display</p> <div>24-04 SPF CLR. CLEARED 000,000</div>
	05	Duplex counter clear (DPLX CLR.)	<p>[Function] When [ENTER/START] key is pressed, the duplex counter value is cleared to 0, and "000,000" is displayed on the LCD.</p> <p>[Operation] 1) Initial display</p> <div>24-05 DPLX CLR. CLEARED 000,000</div>
	07	Drum counter clear (DRUM CLR.)	<p>[Function] When [ENTER/START] key is pressed, the drum counter value is cleared to 0, and "000,000" is displayed on the LCD.</p> <p>[Operation] 1) Initial display</p> <div>24-07 DRUM CLR. CLEARED 000,000</div>
	08	Copy counter clear (COPIES CLR.)	<p>[Function] When [ENTER/START] key is pressed, the copy counter value is cleared to 0, and "000,000" is displayed on the LCD.</p> <p>[Operation] 1) Initial display</p> <div>24-08 COPIES CLR. CLEARED 000,000</div>
	09	Printer counter clear (PRT.CLR.)	<p>[Function] When [ENTER/START] key is pressed, the printer counter value is cleared to 0, and "000,000" is displayed on the LCD.</p> <p>[Operation] 1) Initial display</p> <div>24-09 PRT.CLR. CLEARED 000,000</div>
	13	Scanner counter clear (SCAN CLR.)	<p>[Function] When [ENTER/START] key is pressed, the scanner counter value is cleared to 0, and "000,000" is displayed on the LCD.</p> <p>[Operation] 1) Initial display</p> <div>24-13 SCAN CLR. CLEARED 000,000</div>

Main code	Sub code	Contents	Details of function/operation											
24	14	SPF JAM total counter clear (S JAM TTL CLR.)	<p>[Function] When [ENTER/START] key is pressed, the SPF JAM total counter value is cleared to 0, and "000,000" is displayed on the LCD.</p> <p>[Operation] 1) Initial display</p> <table><tr><td>24-14 S JAM TTL CLR.</td></tr><tr><td>CLEARED 000,000</td></tr></table>	24-14 S JAM TTL CLR.	CLEARED 000,000									
	24-14 S JAM TTL CLR.													
CLEARED 000,000														
15	Scanner mode counter clear (S-MODE CLR.)	<p>[Function] When [ENTER/START] key is pressed, the scanner mode counter value is cleared to 0, and "000,000" is displayed on the LCD.</p> <p>[Operation] 1) Initial display</p> <table><tr><td>24-15 S-MODE CLR.</td></tr><tr><td>CLEARED 000,000</td></tr></table>	24-15 S-MODE CLR.	CLEARED 000,000										
24-15 S-MODE CLR.														
CLEARED 000,000														
25	01	Main motor operation check (MAIN MOTOR CHK)	<p>[Function] When [ENTER/START] key is pressed, the main motor (and the duplex motor in the case of a duplex model) is operated for 30sec. To reduce toner consumption, if the developing unit is installed, the developing bias, the main charger, and the grid are also outputted. In this case, laser discharge is required when stopping the motor, the polygon motor is also operated at the same time. Check for installation of the developing unit. If it is not installed, the high voltage above is not outputted and only the motor is rotated. To check the developing bias, install the developing unit. After completion of 30sec operation, the machine goes into the sub code entry standby mode.</p> <p>[Operation] 1) Initial display</p> <table><tr><td>25-01 MAIN MOTOR CHK</td></tr><tr><td>EXECUTING...</td></tr></table>	25-01 MAIN MOTOR CHK	EXECUTING...									
	25-01 MAIN MOTOR CHK													
EXECUTING...														
10	Polygon motor operation check (LSU CHK)	<p>[Function] When [ENTER/START] key is pressed, the Bios is called to rotate the polygon motor for 30sec. After completion of 30sec operation, the operation is turned off with the Bios and the machine goes into the sub code entry standby mode.</p> <p>[Operation] 1) Initial display</p> <table><tr><td>25-10 LSU CHK</td></tr><tr><td>EXECUTING...</td></tr></table>	25-10 LSU CHK	EXECUTING...										
25-10 LSU CHK														
EXECUTING...														
26	01	Manual feed setting (BYPASS)	<p>[Function] When the test command is executed, the current set bypass is displayed. Enter the code number corresponding to the bypass and press [ENTER/START] key to save the setting.</p> <table><tr><td>Code number</td><td>Bypass</td><td>Display item</td></tr><tr><td>0</td><td>Single bypass</td><td>SINGLE</td></tr><tr><td>1</td><td>Multi bypass</td><td>MULTI</td></tr></table> <p>* For single bypass, there is no schedule for production.</p> <p>[Operation] The operation is similar to test command 21-01.</p>	Code number	Bypass	Display item	0	Single bypass	SINGLE	1	Multi bypass	MULTI		
	Code number	Bypass	Display item											
0	Single bypass	SINGLE												
1	Multi bypass	MULTI												
02	(R)SPF setting (SPF/RSPF)	<p>[Function] When this test command is executed, the current set SPF is displayed. Enter the code number corresponding to the desired SPF and press [ENTER/START] key to save the setting.</p> <table><tr><td>Code number</td><td>SPF</td><td>Display item</td></tr><tr><td>0</td><td>SPF NO</td><td>SPF OFF</td></tr><tr><td>1</td><td>SPF YES</td><td>SPF ON</td></tr><tr><td>2</td><td>RSPF YES</td><td>RSPF ON</td></tr></table> <p>[Operation] The operation is similar to test command 21-01.</p>	Code number	SPF	Display item	0	SPF NO	SPF OFF	1	SPF YES	SPF ON	2	RSPF YES	RSPF ON
Code number	SPF	Display item												
0	SPF NO	SPF OFF												
1	SPF YES	SPF ON												
2	RSPF YES	RSPF ON												

Main code	Sub code	Contents	Details of function/operation																							
26	03	Second cassette setting (2ND TRAY)	<p>[Function]</p> <p>When this test command is executed, the current set second cassette is displayed. Enter the code number corresponding to the desired second cassette and press [ENTER/START] key to save the setting.</p> <table><tr><td>Code number</td><td>Second cassette</td><td>Display item</td></tr><tr><td>0</td><td>Second cassette NO</td><td>OFF</td></tr><tr><td>1</td><td>Second cassette YES</td><td>ON</td></tr></table> <p>[Operation]</p> <p>The operation is similar to test command 21-01.</p>	Code number	Second cassette	Display item	0	Second cassette NO	OFF	1	Second cassette YES	ON														
Code number	Second cassette	Display item																								
0	Second cassette NO	OFF																								
1	Second cassette YES	ON																								
	04	Main unit duplex setting (DPLX)	<p>[Function]</p> <p>When this test command is executed, the current set duplex is displayed. Enter the code number corresponding to the desired duplex and press [ENTER/START] key to save the setting.</p> <table><tr><td>Code number</td><td>Duplex</td><td>Display item</td></tr><tr><td>0</td><td>Duplex NO</td><td>OFF</td></tr><tr><td>1</td><td>Duplex YES</td><td>ON</td></tr></table> <p>[Operation]</p> <p>The operation is similar to test command 21-01.</p>	Code number	Duplex	Display item	0	Duplex NO	OFF	1	Duplex YES	ON														
Code number	Duplex	Display item																								
0	Duplex NO	OFF																								
1	Duplex YES	ON																								
	06	Destination setting (DESTINATION)	<p>[Function]</p> <p>When this test command is executed, the current set destination is displayed. Enter the code number corresponding to the desired destination and press [ENTER/START] key to save the setting.</p> <table><tr><td>Code number</td><td>Destination</td><td>Display item</td></tr><tr><td>0</td><td>Inch series</td><td>INCH</td></tr><tr><td>1</td><td>EX Japan AB series</td><td>AB</td></tr><tr><td>2</td><td>Japan AB series</td><td>—</td></tr><tr><td>3</td><td>China (EX Japan AB series + China paper support)</td><td>CHINA</td></tr></table> <p>* For Japan AB series, there is no schedule for production.</p> <p>[Operation]</p> <p>The operation is similar to test command 21-01.</p>	Code number	Destination	Display item	0	Inch series	INCH	1	EX Japan AB series	AB	2	Japan AB series	—	3	China (EX Japan AB series + China paper support)	CHINA								
Code number	Destination	Display item																								
0	Inch series	INCH																								
1	EX Japan AB series	AB																								
2	Japan AB series	—																								
3	China (EX Japan AB series + China paper support)	CHINA																								
	07	Machine conditions check (CPM)	<p>[Function]</p> <p>When this test command is executed, the current machine setting is displayed.</p> <table><tr><td>CPM</td><td>Coy quantity</td><td>Remark</td></tr><tr><td>10 CPM</td><td>10</td><td></td></tr><tr><td>12 CPM</td><td>12</td><td></td></tr><tr><td>13 CPM</td><td>13</td><td></td></tr><tr><td>14 CPM</td><td>14</td><td></td></tr><tr><td>15 CPM</td><td>15</td><td></td></tr><tr><td>16 CPM</td><td>16</td><td></td></tr></table> <p>[Operation]</p> <p>1) The machine setting is displayed.</p> <table><tr><td>26-07 CPM</td></tr><tr><td>10 CPM</td></tr></table>	CPM	Coy quantity	Remark	10 CPM	10		12 CPM	12		13 CPM	13		14 CPM	14		15 CPM	15		16 CPM	16		26-07 CPM	10 CPM
CPM	Coy quantity	Remark																								
10 CPM	10																									
12 CPM	12																									
13 CPM	13																									
14 CPM	14																									
15 CPM	15																									
16 CPM	16																									
26-07 CPM																										
10 CPM																										
	20	Rear edge void setting (END EDGE)	<p>[Function]</p> <p>When this test command is executed, the current set rear edge void is displayed. Enter the code number corresponding to the desired rear edge void and press [ENTER/START] key to save the setting.</p> <table><tr><td>Code number</td><td>Setting</td><td>Display item</td><td>Remark</td></tr><tr><td>0</td><td>Rear edge void NO</td><td>OFF</td><td></td></tr><tr><td>1</td><td>Rear edge void YES</td><td>ON</td><td>Default</td></tr></table> <p>[Operation]</p> <p>The operation is similar to test command 21-01.</p>	Code number	Setting	Display item	Remark	0	Rear edge void NO	OFF		1	Rear edge void YES	ON	Default											
Code number	Setting	Display item	Remark																							
0	Rear edge void NO	OFF																								
1	Rear edge void YES	ON	Default																							

Main code	Sub code	Contents	Details of function/operation																																	
26	30	CE mark support control ON/OFF (CE MARK)	<p>[Function] When this test command is executed, the current set CE mark support control is displayed. Enter the code number corresponding to the desired CE mark support control and press [ENTER/START] key to save the setting.</p> <table><tr><th>Code number</th><th>Setting</th><th>Display item</th><th>Remark</th></tr><tr><td>0</td><td>CE mark support control OFF</td><td>OFF</td><td>Default (100V series)</td></tr><tr><td>1</td><td>CE mark support control ON</td><td>ON</td><td></td></tr></table> <p>[Operation] The operation is similar to test command 21-01.</p>	Code number	Setting	Display item	Remark	0	CE mark support control OFF	OFF	Default (100V series)	1	CE mark support control ON	ON																						
Code number	Setting	Display item	Remark																																	
0	CE mark support control OFF	OFF	Default (100V series)																																	
1	CE mark support control ON	ON																																		
	38	Cancel of stop at drum life over (DRUM LIFE END)	<p>[Function] When this test command is executed, the current setting is displayed. Enter the code number corresponding to the desired setting and press [ENTER/START] key to save the setting.</p> <table><tr><th>Code number</th><th>Setting</th><th>Display item</th><th>Remark</th></tr><tr><td>0</td><td>Stop at drum life over</td><td>STOP</td><td>Default</td></tr><tr><td>1</td><td>Cancel of stop at drum life over</td><td>NONSTOP</td><td></td></tr></table> <p>[Operation] The operation is similar to test command 21-01.</p>	Code number	Setting	Display item	Remark	0	Stop at drum life over	STOP	Default	1	Cancel of stop at drum life over	NONSTOP																						
Code number	Setting	Display item	Remark																																	
0	Stop at drum life over	STOP	Default																																	
1	Cancel of stop at drum life over	NONSTOP																																		
	39	Memory capacity check (MEM.CHK)	<p>[Function] When the test command is executed, the currently installed SDRAM of the main unit is displayed.</p> <table><tr><th>Code number</th><th>Setting</th><th>Remark</th></tr><tr><td>8</td><td>8 MBYTE</td><td></td></tr></table> <p>[Operation] 1) Memory capacity display</p> <div>26-39 MEM.CHK 8 MBYTE</div>	Code number	Setting	Remark	8	8 MBYTE																												
Code number	Setting	Remark																																		
8	8 MBYTE																																			
	40	Polygon motor OFF time setting (Time required from completion of printing to turning OFF the motor) (LSU MOTOR OFF)	<p>[Function] When this test command is executed, the current setting is displayed. Enter the code number corresponding to the desired setting and press [ENTER/START] key to save the setting.</p> <table><tr><th>Code number</th><th>Setting</th><th>Display item</th><th>Remark</th></tr><tr><td>0</td><td>0sec</td><td>0 SEC.</td><td></td></tr><tr><td>1</td><td>30sec</td><td>30 SEC.</td><td>Default</td></tr><tr><td>2</td><td>60sec</td><td>60 SEC.</td><td></td></tr><tr><td>3</td><td>90sec</td><td>90 SEC.</td><td></td></tr></table> <p>[Operation] The operation is similar to test command 21-01.</p>	Code number	Setting	Display item	Remark	0	0sec	0 SEC.		1	30sec	30 SEC.	Default	2	60sec	60 SEC.		3	90sec	90 SEC.														
Code number	Setting	Display item	Remark																																	
0	0sec	0 SEC.																																		
1	30sec	30 SEC.	Default																																	
2	60sec	60 SEC.																																		
3	90sec	90 SEC.																																		
	42	Transfer ON/OFF timing control setting (TC ON TIMING)	<p>[Function] When this test command is executed, the currently set value of the transfer ON timing is displayed (initial display), and the set value is saved. (Setting range: 0 – 9, Default: 5)</p> <table><tr><th>Code</th><th>Setting</th><th>Remark</th></tr><tr><td>0</td><td>0 msec</td><td></td></tr><tr><td>1</td><td>40 msec</td><td></td></tr><tr><td>2</td><td>–30 msec</td><td></td></tr><tr><td>3</td><td>–20 msec</td><td></td></tr><tr><td>4</td><td>–10 msec</td><td></td></tr><tr><td>5</td><td>0 msec</td><td>Default</td></tr><tr><td>6</td><td>+10 msec</td><td></td></tr><tr><td>7</td><td>+20 msec</td><td></td></tr><tr><td>8</td><td>+30 msec</td><td></td></tr><tr><td>9</td><td>+40 msec</td><td></td></tr></table> <p>* The default “5” of transfer ON timing is “330ms passed from PS release.” * When set to “0,” it is the same as setting to “5.”</p> <p>[Operation] The operation is similar to test command 21-01.</p>	Code	Setting	Remark	0	0 msec		1	40 msec		2	–30 msec		3	–20 msec		4	–10 msec		5	0 msec	Default	6	+10 msec		7	+20 msec		8	+30 msec		9	+40 msec	
Code	Setting	Remark																																		
0	0 msec																																			
1	40 msec																																			
2	–30 msec																																			
3	–20 msec																																			
4	–10 msec																																			
5	0 msec	Default																																		
6	+10 msec																																			
7	+20 msec																																			
8	+30 msec																																			
9	+40 msec																																			

Main code	Sub code	Contents	Details of function/operation																																				
26	43	Side void amount setting (SIDE VOID)	<p>[Function] When this test command is executed, the currently set code of the side void quantity is displayed (initial display), and the set data are saved. (Setting range: 0 – 10, Default: 4 (= One side 2.0mm))</p> <table><tr><th>Code</th><th>Setting</th><th>Remark</th></tr><tr><td>0</td><td>0 mm</td><td>4</td></tr><tr><td>1</td><td>0.5 mm</td><td></td></tr><tr><td>2</td><td>1.0 mm</td><td></td></tr><tr><td>3</td><td>1.5 mm</td><td></td></tr><tr><td>4</td><td>2.0 mm</td><td>Default</td></tr><tr><td>5</td><td>2.5 mm</td><td></td></tr><tr><td>6</td><td>3.0 mm</td><td></td></tr><tr><td>7</td><td>3.5 mm</td><td></td></tr><tr><td>8</td><td>4.0 mm</td><td></td></tr><tr><td>9</td><td>4.5 mm</td><td></td></tr><tr><td>10</td><td>5.5 mm</td><td></td></tr></table> <p>* When the adjustment value is increased by 1, the side void is changed as follows: Side void adjustment: The side void is increased by 0.5mm. (The side void of “Set value x 0.5mm” is made.)</p> <p>[Operation] 1) Initial display <div>26-43 SIDE VOID 4 (0-10)</div> 2) [→/10KEY] <div>26-43 SIDE VOID 5 (0-10)</div> 3) [ENTER/START] <div>26-43 SIDE VOID 5 (0-10)</div> 2) [←/10KEY] <div>26-43 SIDE VOID 3 (0-10)</div></p>	Code	Setting	Remark	0	0 mm	4	1	0.5 mm		2	1.0 mm		3	1.5 mm		4	2.0 mm	Default	5	2.5 mm		6	3.0 mm		7	3.5 mm		8	4.0 mm		9	4.5 mm		10	5.5 mm	
Code	Setting	Remark																																					
0	0 mm	4																																					
1	0.5 mm																																						
2	1.0 mm																																						
3	1.5 mm																																						
4	2.0 mm	Default																																					
5	2.5 mm																																						
6	3.0 mm																																						
7	3.5 mm																																						
8	4.0 mm																																						
9	4.5 mm																																						
10	5.5 mm																																						
	62	Energy-save mode copy lamp setting (C-LAMP E-S)	<p>[Function] Used to set half-ON /OFF of the copy lamp in the pre-heat mode. When this test command is executed, the current set code number is displayed. Enter the desired code number and press [ENTER/START] key to save the setting.</p> <table><tr><th>Code number</th><th>Setting</th><th>Display item</th><th>Remark</th></tr><tr><td>0</td><td>Copy lamp OFF</td><td>OFF</td><td></td></tr><tr><td>1</td><td>Copy lamp half-ON</td><td>ON</td><td>Default</td></tr></table> <p>[Operation] The operation is similar to test command 21-01.</p>	Code number	Setting	Display item	Remark	0	Copy lamp OFF	OFF		1	Copy lamp half-ON	ON	Default																								
Code number	Setting	Display item	Remark																																				
0	Copy lamp OFF	OFF																																					
1	Copy lamp half-ON	ON	Default																																				
	64	Heater control setting in scanner mode (S-MODE HEATER)	<p>[Function] When this test command is executed, the code number of the current heater control setting is displayed. Enter the code number corresponding to the desired heater control setting and press [ENTER/START] key to save the setting.</p> <table><tr><th>Code number</th><th>Heater control setting</th><th>Display item</th><th>Remark</th></tr><tr><td>0</td><td>Heater control OFF</td><td>OFF</td><td>Default (Only for Europe)</td></tr><tr><td>1</td><td>Heater control ON</td><td>ON</td><td>Default (Only for other than Europe)</td></tr></table> <p>[Operation] The operation is similar to test command 21-01.</p>	Code number	Heater control setting	Display item	Remark	0	Heater control OFF	OFF	Default (Only for Europe)	1	Heater control ON	ON	Default (Only for other than Europe)																								
Code number	Heater control setting	Display item	Remark																																				
0	Heater control OFF	OFF	Default (Only for Europe)																																				
1	Heater control ON	ON	Default (Only for other than Europe)																																				
30	01	Paper sensor status display (P-SENSOR)	<p>[Function] The paper sensor status is displayed on the LCD.</p> <table><tr><th>Sensor</th><th>Display item</th><th>Remark</th></tr><tr><td>Paper exit sensor</td><td>POD</td><td></td></tr><tr><td>No. 1 tray paper width sensor</td><td>PD1</td><td></td></tr><tr><td>No. 2 tray paper width sensor</td><td>PD2</td><td></td></tr><tr><td>Paper entry sensor</td><td>PPD1</td><td></td></tr><tr><td>Duplex sensor</td><td>PPD2</td><td></td></tr><tr><td>No. 2 tray paper feed sensor</td><td>PPD3</td><td></td></tr><tr><td>New drum cartridge sensor</td><td>DRST</td><td></td></tr></table> <p>* Since the manual paper feed sensor is a single bypass sensor, its status is not displayed.</p> <p>[Operation] 1) Initial display <div>30-01 P-SENSOR</div> 2) When sensor ON <div>30-01 POD PD1 PD2 PPD1 PPD2 PPD3 DRST</div></p>	Sensor	Display item	Remark	Paper exit sensor	POD		No. 1 tray paper width sensor	PD1		No. 2 tray paper width sensor	PD2		Paper entry sensor	PPD1		Duplex sensor	PPD2		No. 2 tray paper feed sensor	PPD3		New drum cartridge sensor	DRST													
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Duplex sensor	PPD2																																						
No. 2 tray paper feed sensor	PPD3																																						
New drum cartridge sensor	DRST																																						

Main code	Sub code	Contents	Details of function/operation																														
41	06	OC cover float detection level (OC FLOAT LEVEL)	<p>[Function]</p> <p>When this test command is executed, the current set value is displayed. When [ENTER/START] key is pressed, the mirror base unit moves to the SPF scan position to acquire the OC cover float detection level.</p> <p>When the mirror base unit returns to the home position, the acquired value is displayed.</p> <p>If the detection level is not acquired, ERR display is made. (Default: 0)</p> <p>Note that, this test command must be executed with the OC cover closed.</p> <p>* If the value is 0, float detection is not performed in normal jobs.</p> <p>[Operation]</p> <div><div>1) Initial display</div><div>41-06 OC FLOAT LEVEL 0</div></div> <div><div>2) [ENTER/START]</div><div>41-06 OC FLOAT LEVEL EXECUTING...</div></div> <div><div><Canceling - when C/CA key is pressed-></div><div>After canceling, the machine goes into the sub code entry standby mode.</div><div>THE JOB IS BEING CANCELED.</div></div> <div><div>3) When the level is acquired:</div><div>41-06 OC FLOAT LEVEL **** OK</div></div> <div><div>3) When the level is not acquired:</div><div>41-06 OC FLOAT LEVEL **** ERR</div></div>																														
43	01	Fusing temperature setting (Normal copy) (FU TEMP)	<p>[Function]</p> <p>When this test command is executed, the current set code number is displayed. Press [←/→/10KEY] key to change the setting and press [ENTER/START] key to save the setting into the EERPOM. The machine goes into the sub code entry standby mode.</p> <table><tr><th>Code</th><th>Set temperature (°C)</th><th>Remark</th></tr><tr><td>0</td><td>160</td><td></td></tr><tr><td>1</td><td>165</td><td></td></tr><tr><td>2</td><td>170</td><td></td></tr><tr><td>3</td><td>175</td><td></td></tr><tr><td>4</td><td>180</td><td></td></tr><tr><td>5</td><td>185</td><td></td></tr><tr><td>6</td><td>190</td><td>Default</td></tr><tr><td>7</td><td>195</td><td></td></tr><tr><td>8</td><td>200</td><td></td></tr></table> <p>[Operation]</p> <p>The operation is similar to test command 21-01.</p>	Code	Set temperature (°C)	Remark	0	160		1	165		2	170		3	175		4	180		5	185		6	190	Default	7	195		8	200	
Code	Set temperature (°C)	Remark																															
0	160																																
1	165																																
2	170																																
3	175																																
4	180																																
5	185																																
6	190	Default																															
7	195																																
8	200																																
	04	Fusing temperature setting in multi coy (FU TEMP MULTI)	<p>[Function]</p> <p>For 20th sheet or later in multi copy, the fusing temperature is automatically changed from the temperature set with test command 43-1 to the temperature set with this test command.</p> <p>When this test command is executed, the current set code number is displayed. Enter the code number and press [ENTER/START] key to change the setting.</p> <table><tr><th>Code</th><th>Set temperature (°C)</th><th>Remark</th></tr><tr><td>0</td><td>155</td><td></td></tr><tr><td>1</td><td>160</td><td></td></tr><tr><td>2</td><td>165</td><td></td></tr><tr><td>3</td><td>170</td><td>Default</td></tr><tr><td>4</td><td>175</td><td></td></tr><tr><td>5</td><td>180</td><td></td></tr></table> <p>[Operation]</p> <p>The operation is similar to test command 21-01.</p>	Code	Set temperature (°C)	Remark	0	155		1	160		2	165		3	170	Default	4	175		5	180										
Code	Set temperature (°C)	Remark																															
0	155																																
1	160																																
2	165																																
3	170	Default																															
4	175																																
5	180																																

Main code	Sub code	Contents	Details of function/operation																																	
43	05	Fusing temperature setting in duplex copy (FU TEMP DPLX)	<p>[Function] In the case of duplex copy, the shift temperature set with this test command is applied to the fusing temperature. When this test command is executed, the current set code number is displayed. Enter the desired code number and press [ENTER/START] key to save the setting.</p> <table><tr><th>Code</th><th>Shift temperature (°C)</th><th>Remark</th></tr><tr><td>0</td><td>±0</td><td>Default</td></tr><tr><td>1</td><td>-8</td><td></td></tr><tr><td>2</td><td>-6</td><td></td></tr><tr><td>3</td><td>-4</td><td></td></tr><tr><td>4</td><td>-2</td><td></td></tr><tr><td>5</td><td>±0</td><td></td></tr><tr><td>6</td><td>+2</td><td></td></tr><tr><td>7</td><td>+4</td><td></td></tr><tr><td>8</td><td>+6</td><td></td></tr><tr><td>9</td><td>+8</td><td></td></tr></table> <p>[Operation] The operation is similar to test command 21-01.</p>	Code	Shift temperature (°C)	Remark	0	±0	Default	1	-8		2	-6		3	-4		4	-2		5	±0		6	+2		7	+4		8	+6		9	+8	
	Code	Shift temperature (°C)	Remark																																	
	0	±0	Default																																	
1	-8																																			
2	-6																																			
3	-4																																			
4	-2																																			
5	±0																																			
6	+2																																			
7	+4																																			
8	+6																																			
9	+8																																			
	09	Postcard size paper fusing control setting (FU CTR P-CARD) (Japan model only)	<p>[Function] When this test command is executed, the current set code number is displayed. Enter the desired code number and press [ENTER/START] key to save the setting.</p> <table><tr><th>Code</th><th>Shift temperature (°C)</th><th>Display item</th><th>Remark</th></tr><tr><td>0</td><td>Cancel</td><td>OFF</td><td>Default</td></tr><tr><td>1</td><td>Setting</td><td>ON</td><td></td></tr></table> <p>* Setting" is default for Japan. However, there is no schedule for production of the Japan model.</p> <p>[Operation] The operation is similar to test command 21-01.</p>	Code	Shift temperature (°C)	Display item	Remark	0	Cancel	OFF	Default	1	Setting	ON																						
Code	Shift temperature (°C)	Display item	Remark																																	
0	Cancel	OFF	Default																																	
1	Setting	ON																																		
	11	Postcard size paper fusing temperature setting (FU TEMP P-CARD) (Japan model only)	<p>[Function] When this test command is executed, the current set code number is displayed. When [←/→/10KEY] key is pressed, setting is changed. When [ENTER/START] key is pressed, setting is written into the EEPROM. The machine goes into the sub code entry standby mode.</p> <table><tr><th>Code</th><th>Shift temperature (°C)</th><th>Remark</th></tr><tr><td>0</td><td>160</td><td></td></tr><tr><td>1</td><td>165</td><td></td></tr><tr><td>2</td><td>170</td><td></td></tr><tr><td>3</td><td>175</td><td></td></tr><tr><td>4</td><td>180</td><td></td></tr><tr><td>5</td><td>185</td><td></td></tr><tr><td>6</td><td>190</td><td></td></tr><tr><td>7</td><td>195</td><td>Default</td></tr><tr><td>8</td><td>200</td><td></td></tr></table> <p>* Applied only to the Japan model. However, there is no schedule to produce the Japan model. Setting is reflected only when ON with test command 43-09.</p> <p>[Operation] The operation is similar to test command 21-01.</p>	Code	Shift temperature (°C)	Remark	0	160		1	165		2	170		3	175		4	180		5	185		6	190		7	195	Default	8	200				
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7	195	Default																																		
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Main code	Sub code	Contents	Details of function/operation																														
43	14	Fusing start temperature setting (FU TEMP START)	<p>[Function] When this test command is started, the currently set code number is displayed. Press [←/→/10KEY] to switch the setting, and press [ENTER/START] key to save it to the EEPROM. The machine goes to the sub code entry standby mode.</p> <table><tr><th>Code</th><th>Set temperature (°C)</th><th>Remark</th></tr><tr><td>0</td><td>160</td><td></td></tr><tr><td>1</td><td>165</td><td></td></tr><tr><td>2</td><td>170</td><td></td></tr><tr><td>3</td><td>175</td><td></td></tr><tr><td>4</td><td>180</td><td></td></tr><tr><td>5</td><td>185</td><td></td></tr><tr><td>6</td><td>190</td><td></td></tr><tr><td>7</td><td>195</td><td>Default</td></tr><tr><td>8</td><td>200</td><td></td></tr></table> <p>[Operation] The operation is similar to test command 21-01.</p>	Code	Set temperature (°C)	Remark	0	160		1	165		2	170		3	175		4	180		5	185		6	190		7	195	Default	8	200	
Code	Set temperature (°C)	Remark																															
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5	185																																
6	190																																
7	195	Default																															
8	200																																
46	01	Copy density adjustment (300dpi) (EXP.LEVEL 300)	<p>[Function] Copy density is set for each mode. When this test command is executed, the current se value is displayed in 2 digits (Default: 50). Change the set value and press [START] key to make a copy under the set value. When the set value is increased, the copy becomes darker. When the set value is decreased, the copy becomes lighter. In this case, only Exp.3 copy is made. When, however, the setting is made to make darker copy, Exp.1 and Exp.5 copies also become darker. When made to lighter copy, Exp1. and Exp.5 copies become lighter, too. Press [←/→] key to switch the mode. The set value of the selected mode is displayed on the LCD. (Adjustment value: 1 – 99) The setting procedure of the magnification ratio is the same as that to copy operation.</p> <table><tr><th>Mode</th><th>Display item</th><th>Default</th><th>LED</th></tr><tr><td>AE mode (300dpi)</td><td>AE</td><td>50</td><td>COPY mode lamp</td></tr><tr><td>TEXT mode (300dpi)</td><td>TEXT</td><td>50</td><td>PRINT mode lamp</td></tr><tr><td>PHOTO mode</td><td>PHOTO</td><td>50</td><td>SCAN mode lamp</td></tr><tr><td>TS mode (TEXT)(300dpi)</td><td>TSTXT</td><td>50</td><td>PRINT mode lamp SCAN mode lamp</td></tr><tr><td>TS mode (AE)(300dpi)</td><td>TSAE</td><td>50</td><td>COPY mode lamp SCAN mode lamp</td></tr></table> <p>[Operation] 1) Initial display <div>46-01 EXP.LEVEL 300 AE 100% 50 (0-99)</div> 2) [←] Mode selection <div>46-01 EXP.LEVEL 300 TSAE 100% 50 (0-99)</div> 2) [→] Mode selection <div>46-01 EXP.LEVEL 300 TEXT 100% 50 (0-99)</div> 3) [10KEY] Value entry <div>46-01 EXP.LEVEL 300 AE 100% 62 (0-99)</div> 4) [START] Fixing and printing value (No change on the LCD) * Print is started in the set mode. <div>46-01 EXP.LEVEL 300 AE 100% 62 (0-99)</div> 4) To fix the set value without printing, press [Enter] key. <div>46-01 EXP.LEVEL 300 AE 100% 62 (0-99)</div> * To cancel manual feed paper empty MSG, press any key. * When performing the AE mode exposure adjustment, place the test chart on the document table so that the center area of 10cm is not covered.</p>	Mode	Display item	Default	LED	AE mode (300dpi)	AE	50	COPY mode lamp	TEXT mode (300dpi)	TEXT	50	PRINT mode lamp	PHOTO mode	PHOTO	50	SCAN mode lamp	TS mode (TEXT)(300dpi)	TSTXT	50	PRINT mode lamp SCAN mode lamp	TS mode (AE)(300dpi)	TSAE	50	COPY mode lamp SCAN mode lamp						
Mode	Display item	Default	LED																														
AE mode (300dpi)	AE	50	COPY mode lamp																														
TEXT mode (300dpi)	TEXT	50	PRINT mode lamp																														
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TS mode (TEXT)(300dpi)	TSTXT	50	PRINT mode lamp SCAN mode lamp																														
TS mode (AE)(300dpi)	TSAE	50	COPY mode lamp SCAN mode lamp																														

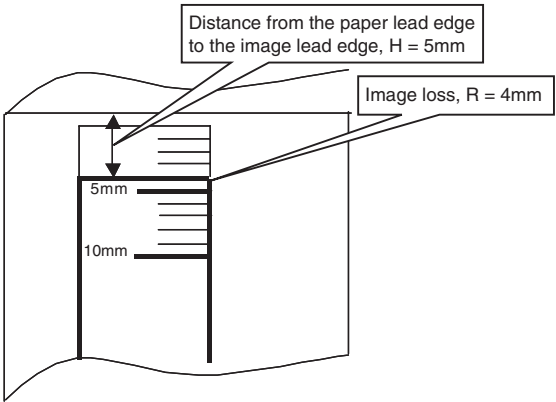
Main code	Sub code	Contents	Details of function/operation																								
46	02	Copy density adjustment (600dpi) (EXP.LEVEL 600)	<p>[Function] Copy density is set for each mode. When this test command is executed, the current se value is displayed in 2 digits (Default: 50). Change the set value and press [START] key to make a copy under the set value. When the set value is increased, the copy becomes darker. When the set value is decreased, the copy becomes lighter. In this case, only Exp.3 copy is made. When, however, the setting is made to make darker copy, Exp.1 and Exp.5 copies also become darker. When made to lighter copy, Exp1. and Exp.5 copies become lighter, too. Press [←/→] key to switch the mode. The set value of the selected mode is displayed on the LCD. (Adjustment value: 1 – 99)</p> <table border="1"> <thead> <tr> <th>Mode</th><th>Display item</th><th>Default</th><th>LED</th></tr> </thead> <tbody> <tr> <td>AE mode (600dpi)</td><td>AE</td><td>50</td><td>COPY mode lamp</td></tr> <tr> <td>TEXT mode (600dpi)</td><td>TEXT</td><td>50</td><td>PRINT mode lamp</td></tr> <tr> <td>PHOTO mode</td><td>PHOTO</td><td>50</td><td>SCAN mode lamp</td></tr> <tr> <td>TS mode (TEXT) (600dpi)</td><td>TSTXT</td><td>50</td><td>PRINT mode lampSCAN mode lamp</td></tr> <tr> <td>TS mode (AE) (600dpi)</td><td>TSAE</td><td>50</td><td>COPY mode lampSCAN mode lamp</td></tr> </tbody> </table> <p>[Operation] The operation is similar to test command 46-01.</p>	Mode	Display item	Default	LED	AE mode (600dpi)	AE	50	COPY mode lamp	TEXT mode (600dpi)	TEXT	50	PRINT mode lamp	PHOTO mode	PHOTO	50	SCAN mode lamp	TS mode (TEXT) (600dpi)	TSTXT	50	PRINT mode lampSCAN mode lamp	TS mode (AE) (600dpi)	TSAE	50	COPY mode lampSCAN mode lamp
Mode	Display item	Default	LED																								
AE mode (600dpi)	AE	50	COPY mode lamp																								
TEXT mode (600dpi)	TEXT	50	PRINT mode lamp																								
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TS mode (TEXT) (600dpi)	TSTXT	50	PRINT mode lampSCAN mode lamp																								
TS mode (AE) (600dpi)	TSAE	50	COPY mode lampSCAN mode lamp																								
	18	Image contrast adjustment (300dpi) (GAMMA 300)	<p>[Function] Contrast is set for each mode. When this test command is executed, the current se value is displayed in 2 digits (Default: 50). Change the set value and press [START] key to make a copy under the set value. When the set value is increased, the contrast becomes higher. When the set value is decreased, the contrast becomes lower. In this case, only Exp.3 copy is made. When, however, the setting is made to make higher contrast, Exp.1 and Exp.5 copies also become in higher contrast. When made to a lower contrast, Exp1. and Exp.5 copies become lower contrast, too. Press [←/→] key to switch the mode. The set value of the selected mode is displayed on the LCD. (Adjustment value: 1 – 99)</p> <table border="1"> <thead> <tr> <th>Mode</th><th>Display item</th><th>Default</th><th>LED</th></tr> </thead> <tbody> <tr> <td>AE mode (300dpi)</td><td>AE</td><td>50</td><td>COPY mode lamp</td></tr> <tr> <td>TEXT mode (300dpi)</td><td>TEXT</td><td>50</td><td>PRINT mode lamp</td></tr> <tr> <td>PHOTO mode</td><td>PHOTO</td><td>50</td><td>SCAN mode lamp</td></tr> <tr> <td>TS mode (TEXT) (300dpi)</td><td>TSTXT</td><td>50</td><td>PRINT mode lamp SCAN mode lamp</td></tr> <tr> <td>TS mode (AE) (300dpi)</td><td>TSAE</td><td>50</td><td>COPY mode lamp SCAN mode lamp</td></tr> </tbody> </table> <p>* No density display on LCD.</p> <p>[Operation] The operation is similar to test command 46-01.</p>	Mode	Display item	Default	LED	AE mode (300dpi)	AE	50	COPY mode lamp	TEXT mode (300dpi)	TEXT	50	PRINT mode lamp	PHOTO mode	PHOTO	50	SCAN mode lamp	TS mode (TEXT) (300dpi)	TSTXT	50	PRINT mode lamp SCAN mode lamp	TS mode (AE) (300dpi)	TSAE	50	COPY mode lamp SCAN mode lamp
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TS mode (AE) (300dpi)	TSAE	50	COPY mode lamp SCAN mode lamp																								

Main code	Sub code	Contents	Details of function/operation																																					
46	19	Exposure mode setting (AE MODE)	<p>[Function]</p> <p><γ table setting></p> <p>When this test command is executed, the code number of the current set gamma table is displayed. (Default: Japan -1/Ex Japan -2)</p> <p>Enter the code number corresponding to the desired gamma table, and press [←/→] key to change the mode and write into the EEPROM.</p> <p><AE operation mode></p> <p>When setting the γ table, press [→] key to change to the AE operation mode, and the current set code number of the AE operation mode is displayed. (Default: 0)</p> <p>Enter the code number corresponding to the desired AE operation mode and press [←/→] key to change the mode and write into the EEPROM.</p> <p><PHOTO image process setting></p> <p>When [→] key is pressed in AE operation mode setting, the mode is changed to the PHOTO image process setting and the code number of the current set PHOTO image process setting is displayed. (Default: 0)</p> <p>Enter the code number corresponding to the desired PHOTO image process setting and press [←/→] key to change the mode and write into the EEPROM.</p> <table><tr><th>Mode</th><th>Display item</th><th>Code number</th><th>Setting content</th><th>Remark</th></tr><tr><td rowspan="2">γ</td><td rowspan="2">GAMMA</td><td>1</td><td>Image quality priority mode</td><td>Japan default</td></tr><tr><td>2</td><td>Toner consumption priority mode</td><td>EX Japan default</td></tr><tr><td rowspan="2">AE</td><td rowspan="2">AE</td><td>0</td><td>Lead edge stop</td><td>Default</td></tr><tr><td>1</td><td>Real time process</td><td></td></tr><tr><td rowspan="2">PHOTO</td><td rowspan="2">PHOTO</td><td>1</td><td>Error diffusion process</td><td>Default</td></tr><tr><td>2</td><td>Dither process</td><td></td></tr></table> <p>[Operation]</p> <div><div>1) Initial display <γ table setting> <table><tr><td>46-19 AE MODE</td></tr><tr><td>GAMMA 2 (1-2)</td></tr></table></div><div>2) [→] Mode selection <table><tr><td>46-19 AE MODE</td></tr><tr><td>AE 0 (0-1)</td></tr></table></div><div>3) [10KEY] Value input <table><tr><td>46-19 AE MODE</td></tr><tr><td>AE 1 (0-1)</td></tr></table></div><div>2) [←] Mode selection <table><tr><td>46-19 AE MODE</td></tr><tr><td>PHOTO 1 (1-2)</td></tr></table></div><div>4) [ENTER/START] Save the set value. The machine goes to the sub code entry standby mode.</div></div>	Mode	Display item	Code number	Setting content	Remark	γ	GAMMA	1	Image quality priority mode	Japan default	2	Toner consumption priority mode	EX Japan default	AE	AE	0	Lead edge stop	Default	1	Real time process		PHOTO	PHOTO	1	Error diffusion process	Default	2	Dither process		46-19 AE MODE	GAMMA 2 (1-2)	46-19 AE MODE	AE 0 (0-1)	46-19 AE MODE	AE 1 (0-1)	46-19 AE MODE	PHOTO 1 (1-2)
Mode	Display item	Code number	Setting content	Remark																																				
γ	GAMMA	1	Image quality priority mode	Japan default																																				
		2	Toner consumption priority mode	EX Japan default																																				
AE	AE	0	Lead edge stop	Default																																				
		1	Real time process																																					
PHOTO	PHOTO	1	Error diffusion process	Default																																				
		2	Dither process																																					
46-19 AE MODE																																								
GAMMA 2 (1-2)																																								
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AE 1 (0-1)																																								
46-19 AE MODE																																								
PHOTO 1 (1-2)																																								
	20	SPF exposure correction (EXP.LEVEL SPF)	<p>[Function]</p> <p>Used to adjust the exposure correction amount in the SPF mode. The adjustment is made by adjusting Vref voltage variation for the OC mode.</p> <p>When this test command is executed, the current set value is displayed in 2 digits (Default: 50). Change the set value and press [START] key to save the setting and make a copy.</p> <p>When the set value is increased, copy becomes darker. When the set value is decreased, copy becomes lighter. (Adjustment range: 1 – 99)</p> <table><tr><th>Mode</th><th>Display item</th><th>Default</th><th>Remark</th></tr><tr><td>SPF</td><td>SPF</td><td>50</td><td></td></tr></table> <p>[Operation]</p> <p>The operation is similar to test command 46-01.</p>	Mode	Display item	Default	Remark	SPF	SPF	50																														
Mode	Display item	Default	Remark																																					
SPF	SPF	50																																						

Main code	Sub code	Contents	Details of function/operation																																			
46	29	Image contrast adjustment (600dpi) (GAMMA 600)	<p>[Function] Contrast is set for each mode. When this test command is executed, the current se value is displayed in 2 digits (Default: 50). Change the set value and press [START] key to make a copy under the set value. When the set value is increased, the contrast becomes higher. When the set value is decreased, the contrast becomes lower. In this case, only Exp.3 copy is made. When, however, the setting is made to make higher contrast, Exp.1 and Exp.5 copies also become in higher contrast. When made to a lower contrast, Exp1. and Exp.5 copies become lower contrast, too. Press [←/→] key to switch the mode. The set value of the selected mode is displayed on the LCD. (Adjustment value: 1 – 99)</p> <table><tr><th>Mode</th><th>Display item</th><th>Default</th><th>LED</th></tr><tr><td>AE mode (600dpi)</td><td>AE</td><td>50</td><td>COPY mode lamp</td></tr><tr><td>TEXT mode (600dpi)</td><td>TEXT</td><td>50</td><td>PRINT mode lamp</td></tr><tr><td>PHOTO mode</td><td>PHOTO</td><td>50</td><td>SCAN mode lamp</td></tr><tr><td>TS mode (TEXT)(600dpi)</td><td>TSTXT</td><td>50</td><td>PRINT mode lamp SCAN mode lamp</td></tr><tr><td>TS mode (AE)(600dpi)</td><td>TSAE</td><td>50</td><td>COPY mode lamp SCAN mode lamp</td></tr></table> <p>* No density display on LCD.</p> <p>[Operation] The operation is similar to test command 46-01.</p>	Mode	Display item	Default	LED	AE mode (600dpi)	AE	50	COPY mode lamp	TEXT mode (600dpi)	TEXT	50	PRINT mode lamp	PHOTO mode	PHOTO	50	SCAN mode lamp	TS mode (TEXT)(600dpi)	TSTXT	50	PRINT mode lamp SCAN mode lamp	TS mode (AE)(600dpi)	TSAE	50	COPY mode lamp SCAN mode lamp											
	Mode	Display item	Default	LED																																		
AE mode (600dpi)	AE	50	COPY mode lamp																																			
TEXT mode (600dpi)	TEXT	50	PRINT mode lamp																																			
PHOTO mode	PHOTO	50	SCAN mode lamp																																			
TS mode (TEXT)(600dpi)	TSTXT	50	PRINT mode lamp SCAN mode lamp																																			
TS mode (AE)(600dpi)	TSAE	50	COPY mode lamp SCAN mode lamp																																			
30	AE limit adjustment (AE LIMIT)	<p>[Function] Used to set the limit value in AE and AE (toner save). Change the setting and press [ENTER/START] key to write the setting into the EEPROM. The machine goes into the sub code entry standby mode. By pressing [←/→] key, setting is changed. (Setting range: 0 – 31, Default: 0)</p> <table><tr><th>Mode</th><th>Display item</th><th>Remark</th></tr><tr><td>Limit value for AE</td><td>AE</td><td></td></tr><tr><td>Limit value for AE (toner save)</td><td>TSAE</td><td></td></tr></table> <p><Remark> When test command 26-06 (Destination setting) or test command 46-19 Auto Exposure mode is changed, the setting of this test command is also changed to the default in connection.</p> <p>[Operation] The operation is similar to test command 46-19.</p>	Mode	Display item	Remark	Limit value for AE	AE		Limit value for AE (toner save)	TSAE																												
Mode	Display item	Remark																																				
Limit value for AE	AE																																					
Limit value for AE (toner save)	TSAE																																					
31	Image sharpness adjustment (SHARPNESS)	<p>[Function] Used to adjust sharpening/blurring of image in each mode.</p> <table><tr><th>Image quality</th><th>Setting No</th><th>Remark</th></tr><tr><td>Blurring</td><td>0</td><td></td></tr><tr><td>Standard</td><td>1</td><td>Default</td></tr><tr><td>Sharpening</td><td>2</td><td></td></tr></table> <p>When this test command is executed, warm-up and shading are performed and the current set value is displayed. (Default: 1) Change the set value and press [START] key to make a copy under the set conditions. To change the mode, press [←/→] key. The code number of the selected mode is dip0splayed on the LCD.</p> <table><tr><th>Mode</th><th>Display item</th><th>Default setting</th><th>LED</th></tr><tr><td>AE mode</td><td>AE</td><td>1</td><td>COPY mode lamp</td></tr><tr><td>TEXT mode</td><td>TEXT</td><td>1</td><td>PRINT mode lamp</td></tr><tr><td>PHOTO mode</td><td>PHOTO</td><td>1</td><td>SCAN mode lamp</td></tr><tr><td>TS mode (TEXT)</td><td>TSTXT</td><td>1</td><td>PRINT mode lamp SCAN mode lamp</td></tr><tr><td>TS mode (AE)</td><td>TSAE</td><td>1</td><td>COPY mode lamp SCAN mode lamp</td></tr></table> <p>[Operation] The operation is similar to test command 46-01.</p>	Image quality	Setting No	Remark	Blurring	0		Standard	1	Default	Sharpening	2		Mode	Display item	Default setting	LED	AE mode	AE	1	COPY mode lamp	TEXT mode	TEXT	1	PRINT mode lamp	PHOTO mode	PHOTO	1	SCAN mode lamp	TS mode (TEXT)	TSTXT	1	PRINT mode lamp SCAN mode lamp	TS mode (AE)	TSAE	1	COPY mode lamp SCAN mode lamp
	Image quality	Setting No	Remark																																			
Blurring	0																																					
Standard	1	Default																																				
Sharpening	2																																					
Mode	Display item	Default setting	LED																																			
AE mode	AE	1	COPY mode lamp																																			
TEXT mode	TEXT	1	PRINT mode lamp																																			
PHOTO mode	PHOTO	1	SCAN mode lamp																																			
TS mode (TEXT)	TSTXT	1	PRINT mode lamp SCAN mode lamp																																			
TS mode (AE)	TSAE	1	COPY mode lamp SCAN mode lamp																																			

Main code	Sub code	Contents	Details of function/operation																									
46	32	Copier color reproduction setting (COLOR REAPPEAR)	[Function] Used to set color reproduction in each mode. Colors easy to be copied and colors difficult to be copied can be switched.																									
			<table><tr><td>Set value</td><td>Colors easy to be copied</td><td>Colors difficult to be copied</td></tr><tr><td>0</td><td>Purple, Blue, Red</td><td>Yellow, Green, Water blue</td></tr><tr><td>1</td><td>Water blue, Green, Blue</td><td>Purple, Red, Yellow</td></tr><tr><td>2</td><td>Yellow, Red, Green</td><td>Blue, Water blue, Purple</td></tr></table>	Set value	Colors easy to be copied	Colors difficult to be copied	0	Purple, Blue, Red	Yellow, Green, Water blue	1	Water blue, Green, Blue	Purple, Red, Yellow	2	Yellow, Red, Green	Blue, Water blue, Purple													
			Set value	Colors easy to be copied	Colors difficult to be copied																							
0	Purple, Blue, Red	Yellow, Green, Water blue																										
1	Water blue, Green, Blue	Purple, Red, Yellow																										
2	Yellow, Red, Green	Blue, Water blue, Purple																										
<p>* This setting has virtually no effect on black-and-white documents.</p> <p>When this test command is executed, warm-up and shading are performed and the current set value is displayed. (Default: 0)</p> <p>Press [START] key to make a copy under the set conditions . At that time, color components are changed for used in copying.</p> <p>To change the mode, press [←/→] key. The code number of the selected mode is displayed on the LCD.</p> <table><tr><td>Specification component</td><td>Setting No</td><td>Remark</td></tr><tr><td>Green</td><td>0</td><td>Default</td></tr><tr><td>Red</td><td>1</td><td></td></tr><tr><td>Blue</td><td>2</td><td></td></tr></table> <table><tr><td>Mode</td><td>Display item</td><td>Default setting</td><td>LED</td></tr><tr><td>AE mode (including TS)</td><td>AE</td><td>0</td><td>COPY mode lamp</td></tr><tr><td>TEXT mode (including TS)</td><td>TEXT</td><td>0</td><td>PRINT mode lamp</td></tr><tr><td>PHOTO mode</td><td>PHOTO</td><td>0</td><td>SCAN mode lamp</td></tr></table>	Specification component	Setting No	Remark	Green	0	Default	Red	1		Blue	2		Mode	Display item	Default setting	LED	AE mode (including TS)	AE	0	COPY mode lamp	TEXT mode (including TS)	TEXT	0	PRINT mode lamp	PHOTO mode	PHOTO	0	SCAN mode lamp
Specification component	Setting No	Remark																										
Green	0	Default																										
Red	1																											
Blue	2																											
Mode	Display item	Default setting	LED																									
AE mode (including TS)	AE	0	COPY mode lamp																									
TEXT mode (including TS)	TEXT	0	PRINT mode lamp																									
PHOTO mode	PHOTO	0	SCAN mode lamp																									
48	01	Main scan/sub scan direction magnification ratio (COPY MAG.)	[Function] Used to adjust the magnification ratio in the main scan (front/rear) direction and sub scan direction. Enter the adjustment value with [10KEY]. Press [START] key to save the set value and make a copy. (When the adjustment value is increased by 1, the magnification ratio is increased by 0.1%.) The adjustment mode can be changed by pressing [←/→] key. (Adjustment range: 1 – 99, Default: 50)																									
			<table><tr><td>Mode</td><td>Display item</td><td>Default value</td><td>LED</td></tr><tr><td>Main scan direction magnification ratio</td><td>F-R</td><td>50</td><td>PRINT mode lamp</td></tr><tr><td>OC mode sub scan direction magnification ratio</td><td>SCAN</td><td>50</td><td>SCAN mode lamp</td></tr></table>	Mode	Display item	Default value	LED	Main scan direction magnification ratio	F-R	50	PRINT mode lamp	OC mode sub scan direction magnification ratio	SCAN	50	SCAN mode lamp													
			Mode	Display item	Default value	LED																						
Main scan direction magnification ratio	F-R	50	PRINT mode lamp																									
OC mode sub scan direction magnification ratio	SCAN	50	SCAN mode lamp																									
[Operation] The operation is similar to test command 46-01.																												
	05	SPF/RSPF mode sub scan direction magnification ratio in copying (SPF/RSPF MAG.)	[Function] Used to display the current SPF/RSPF mode sub scan direction magnification ratio on the LCD. When [START] key is pressed, the entered data is acquired and saved into the EEPROM, and a copy is made. (When the set value is increased by 1, the magnification ratio is increased by 0.1%.) (Adjustment range: 1 – 99, Default: 50)																									
			<p>When adjusting the RSPF, use [2-SIDED COPY] key to select single/duplex after entering the one page print mode, performing 2-page single copy.</p> <p>For printing, regardless of the density mode and the density level,</p> <p>Density mode = MANUAL</p> <p>Density level = 3</p> <table><tr><td>Mode</td><td>Display item</td><td>Default</td><td>LED</td></tr><tr><td>Sub scan magnification ratio adjustment on the surface of SPF/RSPF document</td><td>SIDE1</td><td>50</td><td>COPY mode lamp</td></tr><tr><td>Sub scan magnification ratio adjustment on the surface of RSPF document</td><td>SIDE2</td><td>50</td><td>PRINT mode lamp</td></tr></table>	Mode	Display item	Default	LED	Sub scan magnification ratio adjustment on the surface of SPF/RSPF document	SIDE1	50	COPY mode lamp	Sub scan magnification ratio adjustment on the surface of RSPF document	SIDE2	50	PRINT mode lamp													
			Mode	Display item	Default	LED																						
Sub scan magnification ratio adjustment on the surface of SPF/RSPF document	SIDE1	50	COPY mode lamp																									
Sub scan magnification ratio adjustment on the surface of RSPF document	SIDE2	50	PRINT mode lamp																									
<p>* When there is no document in SPF, copy is inhibited.</p> [Operation] The operation is similar to test command 46-01.																												

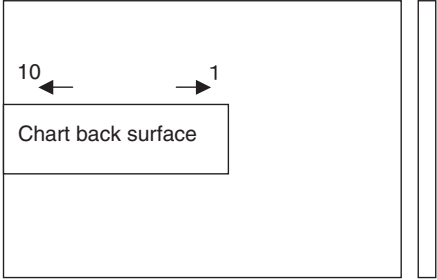
Main code	Sub code	Contents	Details of function/operation																																																																					
49	01	Download mode (DOWNLOAD MODE)	<p>[Function]</p> <p>When this test command is executed, "DLOWLOAD MODE" is displayed on the LCD and the machine goes into the program writing mode from PC to Flash ROM.</p> <p>Use the writing tool on the PC and write the program.</p> <p>During writing, the display shows as follows:</p> <p>After completion of download, turn OFF/ON the power to reset.</p> <table><tr><th>Status</th><th>Display item</th></tr><tr><td>Download data receiving</td><td>RECEIVING</td></tr><tr><td>Loader function transfer</td><td>LOADER COPYING</td></tr><tr><td>Date delete start</td><td>FLASH ERASE</td></tr><tr><td>Data write (Boot section)</td><td>BOOT WRITING</td></tr><tr><td>Data write (Program section)</td><td>PROGRAM WRITING</td></tr><tr><td>Data write (EEPROM)</td><td>E2PROM WRITING</td></tr><tr><td>Data write (LCD)</td><td>LCD DATE WRITING</td></tr><tr><td>During SUM CHECK</td><td>FLASH ROM SUM CHECK</td></tr><tr><td>During BOOT SUM CHECK</td><td>BOOT SUM CHECK</td></tr><tr><td>During EEPROM SUM CHECK</td><td>EEPROM SUM CHECK</td></tr><tr><td>Download complete</td><td>DOWNLOAD COMPLETE!</td></tr></table> <p>In case of an error in download, the following message is displayed on the LCD.</p> <table><tr><th>Error status</th><th>Display item</th></tr><tr><td>PC data receiving</td><td>E-01 PC TRANS</td></tr><tr><td>Loader function transfer</td><td>E-02 LOADER COPY</td></tr><tr><td>FLASH ROM delete</td><td>E-03 FLASH ERASE</td></tr><tr><td>Boot section FLASH ROM write</td><td>E-04 BOOT WRITE</td></tr><tr><td>Program section FLASH ROM write</td><td>E-05 PROGRAM WRITE</td></tr><tr><td>Loader section SUM CHECK</td><td>E-06 LOADER SUM</td></tr><tr><td>Boot section SUM CHECK</td><td>E-07 BOOT SUM</td></tr><tr><td>Program section SUM CHECK</td><td>E-08 PROGRAM SUM</td></tr><tr><td>E2PROM SUM CHECK</td><td>E-09 E2PROM SUM</td></tr><tr><td>E2PROM write</td><td>E-10 E2PROM WRITE</td></tr><tr><td>E2PROM read Verify</td><td>E-11 E2PROM READ</td></tr><tr><td>E2PROM collating Verify</td><td>E-12 E2PROM COLLATE</td></tr><tr><td>Boot section lens check</td><td>E-13 BOOT LENGTH</td></tr><tr><td>Program section lens check</td><td>E-14 PROGRAM LENGTH</td></tr><tr><td>E2PROM lens check</td><td>E-15 E2PROM LENGTH</td></tr><tr><td>Total data size check</td><td>E-16 DATE SIZE</td></tr><tr><td>IMC communication error</td><td>E-17 IMC TRANS</td></tr><tr><td>IMC FRASH ROM write</td><td>E-18 IMC FLASH WRITE</td></tr><tr><td>LCD section lens check</td><td>E-19 LCD DATE LENGTH</td></tr><tr><td>LCD section FLASH ROM write</td><td>E-20 LCD DATE WRITE</td></tr><tr><td>LCD section SUM CHECK</td><td>E-21 LCD DATE SUM</td></tr></table> <p>To enter the download mode, there is a method to use key operations as well as to use a test command. With the power OFF, press and hold [CA] + [←], turn on the power.</p> <p>[Operation]</p> <p>1) Initial display</p> <table><tr><td>DOWNLOAD MODE</td></tr></table>	Status	Display item	Download data receiving	RECEIVING	Loader function transfer	LOADER COPYING	Date delete start	FLASH ERASE	Data write (Boot section)	BOOT WRITING	Data write (Program section)	PROGRAM WRITING	Data write (EEPROM)	E2PROM WRITING	Data write (LCD)	LCD DATE WRITING	During SUM CHECK	FLASH ROM SUM CHECK	During BOOT SUM CHECK	BOOT SUM CHECK	During EEPROM SUM CHECK	EEPROM SUM CHECK	Download complete	DOWNLOAD COMPLETE!	Error status	Display item	PC data receiving	E-01 PC TRANS	Loader function transfer	E-02 LOADER COPY	FLASH ROM delete	E-03 FLASH ERASE	Boot section FLASH ROM write	E-04 BOOT WRITE	Program section FLASH ROM write	E-05 PROGRAM WRITE	Loader section SUM CHECK	E-06 LOADER SUM	Boot section SUM CHECK	E-07 BOOT SUM	Program section SUM CHECK	E-08 PROGRAM SUM	E2PROM SUM CHECK	E-09 E2PROM SUM	E2PROM write	E-10 E2PROM WRITE	E2PROM read Verify	E-11 E2PROM READ	E2PROM collating Verify	E-12 E2PROM COLLATE	Boot section lens check	E-13 BOOT LENGTH	Program section lens check	E-14 PROGRAM LENGTH	E2PROM lens check	E-15 E2PROM LENGTH	Total data size check	E-16 DATE SIZE	IMC communication error	E-17 IMC TRANS	IMC FRASH ROM write	E-18 IMC FLASH WRITE	LCD section lens check	E-19 LCD DATE LENGTH	LCD section FLASH ROM write	E-20 LCD DATE WRITE	LCD section SUM CHECK	E-21 LCD DATE SUM	DOWNLOAD MODE
Status	Display item																																																																							
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PC data receiving	E-01 PC TRANS																																																																							
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FLASH ROM delete	E-03 FLASH ERASE																																																																							
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Program section FLASH ROM write	E-05 PROGRAM WRITE																																																																							
Loader section SUM CHECK	E-06 LOADER SUM																																																																							
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Program section SUM CHECK	E-08 PROGRAM SUM																																																																							
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E2PROM write	E-10 E2PROM WRITE																																																																							
E2PROM read Verify	E-11 E2PROM READ																																																																							
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Boot section lens check	E-13 BOOT LENGTH																																																																							
Program section lens check	E-14 PROGRAM LENGTH																																																																							
E2PROM lens check	E-15 E2PROM LENGTH																																																																							
Total data size check	E-16 DATE SIZE																																																																							
IMC communication error	E-17 IMC TRANS																																																																							
IMC FRASH ROM write	E-18 IMC FLASH WRITE																																																																							
LCD section lens check	E-19 LCD DATE LENGTH																																																																							
LCD section FLASH ROM write	E-20 LCD DATE WRITE																																																																							
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DOWNLOAD MODE																																																																								

Main code	Sub code	Contents	Details of function/operation																												
50	01	Lead edge image position (LEAD EDGE)	<p>[Function]</p> <p>Used to adjust the copy image position and the lead edge void amount on copy paper. The adjustment is made by adjusting the image scan start position at 100% and the print start position (resist roller ON timing). When this test command is executed, the current set value is displayed in 2 digits. (Center value: 50)</p> <p>When [←/→] key is pressed, the setting mode and the display are changed.</p> <p>Enter the adjustment value and press [START] key to save the set value and make a copy.</p> <p>When the adjustment is made by the main cassette paper feed, the adjustment values of all the paper feed ports become the same. (When the set value is increased by 1, shift is made by 0.1mm.)</p> <table border="1"> <thead> <tr> <th>Mode</th><th>Display item</th><th>Default</th><th>LED</th></tr> </thead> <tbody> <tr> <td>Print start position (Main cassette paper feed)</td><td>TRAY1</td><td>50</td><td>COPY mode lamp Main cassette lamp</td></tr> <tr> <td>(*) Print start position (2nd cassette paper feed)</td><td>TRAY2</td><td>50</td><td>COPY mode lamp 2nd cassette lamp</td></tr> <tr> <td>Print start position (Manual paper feed)</td><td>MFT</td><td>50</td><td>COPY mode lamp Manual feed lamp</td></tr> <tr> <td>Image lead edge void amount</td><td>DEN-A</td><td>50</td><td>PRINT mode lamp</td></tr> <tr> <td>Image scan start position</td><td>RRC-A</td><td>50</td><td>SCAN mode lamp</td></tr> <tr> <td>Image rear edge void amount</td><td>DEN-B</td><td>50</td><td>COPY mode lamp PRINT mode lamp SCAN mode lamp</td></tr> </tbody> </table> <p>(*): Support for the installation models. For non-installation models, skip.</p> <p>[Adjustment procedure]</p> <ol style="list-style-type: none"> Set the print start position (A: COPY mode lamp ON), the lead edge void amount (B: PRINT mode lamp ON), the scan start position (C: SCAN mode lamp) to zero, and make a copy of the scale at 100%. Measure the image loss (Rmm) of the scale. Set C = 10 x R (mm). (Example: Set to 40.) When the value of C is increased by 10, the image loss is decreased by 1mm. (Default: 50) Measure the distance (Hmm) from the paper lead edge to the image print start position. Set A = 10 x H (mm). (Example: Set to 50.) When the value of A is increased by 10, the image lead edge is moved to the paper lead edge by 1mm. (Default: 50). Set the lead edge void amount to B = 50 (2.5mm). (Default: 50) When the value of B is increased by 10, the void is extended by about 0.1mm. (For 25 or less, however, the void amount is regarded as 0.) <p>* The SFP adjustment is made by adjusting the SPF image scan start position after OC adjustment. * When paper is discharged, the shifter is operated.</p> <p>(Example)</p>  <p>[Operation]</p> <p>The operation is similar to test command 46-01.</p>	Mode	Display item	Default	LED	Print start position (Main cassette paper feed)	TRAY1	50	COPY mode lamp Main cassette lamp	(*) Print start position (2nd cassette paper feed)	TRAY2	50	COPY mode lamp 2nd cassette lamp	Print start position (Manual paper feed)	MFT	50	COPY mode lamp Manual feed lamp	Image lead edge void amount	DEN-A	50	PRINT mode lamp	Image scan start position	RRC-A	50	SCAN mode lamp	Image rear edge void amount	DEN-B	50	COPY mode lamp PRINT mode lamp SCAN mode lamp
Mode	Display item	Default	LED																												
Print start position (Main cassette paper feed)	TRAY1	50	COPY mode lamp Main cassette lamp																												
(*) Print start position (2nd cassette paper feed)	TRAY2	50	COPY mode lamp 2nd cassette lamp																												
Print start position (Manual paper feed)	MFT	50	COPY mode lamp Manual feed lamp																												
Image lead edge void amount	DEN-A	50	PRINT mode lamp																												
Image scan start position	RRC-A	50	SCAN mode lamp																												
Image rear edge void amount	DEN-B	50	COPY mode lamp PRINT mode lamp SCAN mode lamp																												

Main code	Sub code	Contents	Details of function/operation																				
50	06	Copy lead edge position adjustment (SPF/RSPF) (SPF/RSPF EDGE)	<p>[Function] Used to adjust the SPF copy lead edge. When the adjustment value of the document scan position adjustment is increased by 1, the scan start timing is advanced by 0.1mm. The print result is shifted to the opposite direction of the scan start position. The adjustment mode can be changed by pressing [←/→] key. (Adjustment range: 1 – 99, Default:50) When scanning a back surface of document, the mode must be changed to operate the RSPF by pressing [2-SIDED COPY] key.</p> <table border="1"> <thead> <tr> <th>Mode</th><th>Display item</th><th>Default</th><th>LED</th></tr> </thead> <tbody> <tr> <td>Front surface document scan position adjustment</td><td>SIDE1</td><td>50</td><td>COPY mode lamp</td></tr> <tr> <td>Back surface document scan position adjustment</td><td>SIDE2</td><td>50</td><td>PRINT mode lamp</td></tr> <tr> <td>Rear edge void adjustment (SPF)</td><td>END</td><td>50</td><td>SCAN mode lamp</td></tr> </tbody> </table> <p>* When there is no document in the SPF, copy is inhibited. * When paper is discharged, the shifter is operated.</p> <p>[Operation] The operation is similar to test command 46-01.</p>	Mode	Display item	Default	LED	Front surface document scan position adjustment	SIDE1	50	COPY mode lamp	Back surface document scan position adjustment	SIDE2	50	PRINT mode lamp	Rear edge void adjustment (SPF)	END	50	SCAN mode lamp				
Mode	Display item	Default	LED																				
Front surface document scan position adjustment	SIDE1	50	COPY mode lamp																				
Back surface document scan position adjustment	SIDE2	50	PRINT mode lamp																				
Rear edge void adjustment (SPF)	END	50	SCAN mode lamp																				
	10	Print center offset adjustment (PRT.OFF-CENTER)	<p>[Function] Used to adjust the center offset position of copy images on copy paper and that in scanning document. When this test command is executed, the current set value is displayed. Enter the adjustment value and press [START] key to save the setting and make a copy. (When the set value is changed by 1, the center is shifted by 0.1mm.) When the adjustment value is increased, the center is shifted to right. When decreased, the center is shifted to left. The modes can be selected by pressing [←/→] key. When the set value is changed largely, the area outside the shading area may be scanned to cause black streaks on the edges. When the RSPF is used, select the mode for use of the RSPF by [2-SIDED COPY] key.</p> <table border="1"> <thead> <tr> <th>Mode</th><th>Display item</th><th>Default</th><th>LED</th></tr> </thead> <tbody> <tr> <td>Print center offset (Main cassette paper feed)</td><td>TRAY1</td><td>50</td><td>COPY mode lamp Main cassette lamp</td></tr> <tr> <td>(*) Print center offset (2nd cassette paper feed)</td><td>TRAY2</td><td>50</td><td>COPY mode lamp 2nd cassette lamp</td></tr> <tr> <td>Print center offset (Manual paper feed)</td><td>MFT</td><td>50</td><td>COPY mode lamp Manual feed lamp</td></tr> <tr> <td>2nd print center offset (Main cassette paper feed)</td><td>SIDE2</td><td>50</td><td>PRINT mode lamp Main cassette lamp</td></tr> </tbody> </table> <p>(*) : Support for the installation models. For non-installation models, skip. * In the 2nd print center offset adjustment, print is made forcibly as 1to2/Short Edge from OC regardless of duplex setting. * When paper is discharged, the shifter is operated.</p> <p>[Operation] The operation is similar to test command 46-01.</p>	Mode	Display item	Default	LED	Print center offset (Main cassette paper feed)	TRAY1	50	COPY mode lamp Main cassette lamp	(*) Print center offset (2nd cassette paper feed)	TRAY2	50	COPY mode lamp 2nd cassette lamp	Print center offset (Manual paper feed)	MFT	50	COPY mode lamp Manual feed lamp	2nd print center offset (Main cassette paper feed)	SIDE2	50	PRINT mode lamp Main cassette lamp
Mode	Display item	Default	LED																				
Print center offset (Main cassette paper feed)	TRAY1	50	COPY mode lamp Main cassette lamp																				
(*) Print center offset (2nd cassette paper feed)	TRAY2	50	COPY mode lamp 2nd cassette lamp																				
Print center offset (Manual paper feed)	MFT	50	COPY mode lamp Manual feed lamp																				
2nd print center offset (Main cassette paper feed)	SIDE2	50	PRINT mode lamp Main cassette lamp																				
	12	Document feed off-center adjustment (ORG.OFF-CENTER)	<p>[Function] Used to adjust document scan off-center adjustment. The adjustment modes can be selected by pressing [←/→] key. (Adjustment range: 1 – 99, Default:50) When the adjustment value is increased, the print result is shifted to left.</p> <table border="1"> <thead> <tr> <th>Mode</th><th>Display item</th><th>Default</th><th>LED</th></tr> </thead> <tbody> <tr> <td>Platen document scan</td><td>OC</td><td>50</td><td>COPY mode lamp</td></tr> <tr> <td>SPF document front scan</td><td>SPF</td><td>50</td><td>PRINT mode lamp</td></tr> <tr> <td>RSPF document back scan</td><td>RSPF</td><td>50</td><td>SCAN mode lamp</td></tr> </tbody> </table> <p>* When paper is discharged, the shifter is operated.</p> <p>[Operation] The operation is similar to test command 46-01.</p>	Mode	Display item	Default	LED	Platen document scan	OC	50	COPY mode lamp	SPF document front scan	SPF	50	PRINT mode lamp	RSPF document back scan	RSPF	50	SCAN mode lamp				
Mode	Display item	Default	LED																				
Platen document scan	OC	50	COPY mode lamp																				
SPF document front scan	SPF	50	PRINT mode lamp																				
RSPF document back scan	RSPF	50	SCAN mode lamp																				

Main code	Sub code	Contents	Details of function/operation												
50	18	Memory reverse position adjustment in duplex copy (DPLX REVERSE)	<p>[Function] When this test command is executed, the current set correction value is displayed. Enter the correction value and press [START] key to save the entered correction value. (Correction value range; 1 – 99, Default: 50) For S-D mode front surface print and print of even paged in D-S mode, reverse memory copy operation is performed from the rear edge of documents. When, therefore, the print position adjustment of output images is required, adjust as follows: In the reverse memory coping, when the document scan is made in the arrow direction, the output image is printed from the rear edge of scan image, When, therefore, the print lead edge is shifted, set the reference chart so that the reference position is on the rear edge, and use this test command to adjust the set value so that the print lead edge is matched. Since printing is made from the image data most lately stored in memory to the lead edge data from the print start position, the image lead edge adjustment is made by changing the end data position stored in memory by the set value of this test command. Since it is performed by changing the scan end position, the image position adjustment is made by changing the scan end position and the end data stored in memory.</p> <table border="1"> <thead> <tr> <th>Mode</th><th>Display item</th><th>Default</th><th>LED</th></tr> </thead> <tbody> <tr> <td>OC memory reverse output position</td><td>OC</td><td>50</td><td>COPY mode lamp</td></tr> <tr> <td>SPF memory reverse output position</td><td>SPF</td><td>50</td><td>PRINT mode lamp</td></tr> </tbody> </table> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>Document transport direction</p> </div> <div style="text-align: center;"> <p>Document transport direction</p> </div> </div> <p>* The initial value of duplex setting is: 1to2/Long Edge * When paper is discharged, the shifter is operated.</p> <p>[Operation] The operation is similar to test command 46-01.</p>	Mode	Display item	Default	LED	OC memory reverse output position	OC	50	COPY mode lamp	SPF memory reverse output position	SPF	50	PRINT mode lamp
Mode	Display item	Default	LED												
OC memory reverse output position	OC	50	COPY mode lamp												
SPF memory reverse output position	SPF	50	PRINT mode lamp												
19		Duplex copy rear edge void adjustment (DPLX END EDGE)	<p>[Function] Used to adjust the rear edge void amount in duplex copy. When this test command is executed, the current set value is displayed in 2 digits. (Center value: 50. However, Set value 50 = Set value 0) When the correction value is set to 0, write 50. The adjustment modes can be selected by pressing [←/→] key. (Adjustment range; 1 – 99) Enter the adjustment value and press [START] key to save the set value and make a copy. (The paper information is cleared for every copy.) When the set value is increased by 1, the void amount is increased by about 0.1mm.</p> <table border="1"> <thead> <tr> <th>Mode</th><th>Display item</th><th>Default</th><th>LED</th></tr> </thead> <tbody> <tr> <td>Paper rear edge void amount</td><td>DEN-B</td><td>50</td><td>PRINT mode lamp</td></tr> <tr> <td>Print start position (Duplex back surface)</td><td>RRC-D</td><td>50</td><td>SCAN mode lamp</td></tr> </tbody> </table> <p>* The initial value of duplex setting is 2to2. * When paper is discharged, the shifter is operated.</p> <p>[Operation] The operation is similar to test command 46-01.</p>	Mode	Display item	Default	LED	Paper rear edge void amount	DEN-B	50	PRINT mode lamp	Print start position (Duplex back surface)	RRC-D	50	SCAN mode lamp
Mode	Display item	Default	LED												
Paper rear edge void amount	DEN-B	50	PRINT mode lamp												
Print start position (Duplex back surface)	RRC-D	50	SCAN mode lamp												

Main code	Sub code	Contents	Details of function/operation																												
51	02	Resist amount adjustment (RESIST ADJ.)	<p>[Function] Used to adjust the contact pressure of the main unit resist roller and the RSPF resist roller onto paper. When this test command is executed, the current set value is displayed. The adjustment modes can be selected by pressing [←/→] key. Enter the adjustment value with [10KEY] and press [START] key to save the set value and make a copy.</p> <table><tr><th>Mode</th><th>Display item</th><th>Default</th><th>LED</th></tr><tr><td>Main cassette paper fed</td><td>TRAY1</td><td>50</td><td>COPY mode lamp Main cassette lamp</td></tr><tr><td>(*) 2nd cassette paper feed</td><td>TRAY2</td><td>50</td><td>COPY mode lamp 2nd cassette lamp</td></tr><tr><td>Manual paper feed</td><td>MFT</td><td>50</td><td>COPY mode lamp Manual feed lamp</td></tr><tr><td>RSPF document paper feed (Front surface)</td><td>SIDE1</td><td>50</td><td>COPY mode lamp PRINT mode lamp SCAN mode lamp</td></tr><tr><td>RSPF document paper feed (Back surface)</td><td>SIDE2</td><td>50</td><td>COPY mode lamp PRINT mode lamp</td></tr><tr><td>Duplex back surface</td><td>DUP-2</td><td>50</td><td>PRINT mode lamp SCAN mode lamp</td></tr></table> <p>(*): Support for the installation models. For non-installation models, skip.</p> <p>[Operation] The operation is similar to test command 46-01.</p>	Mode	Display item	Default	LED	Main cassette paper fed	TRAY1	50	COPY mode lamp Main cassette lamp	(*) 2nd cassette paper feed	TRAY2	50	COPY mode lamp 2nd cassette lamp	Manual paper feed	MFT	50	COPY mode lamp Manual feed lamp	RSPF document paper feed (Front surface)	SIDE1	50	COPY mode lamp PRINT mode lamp SCAN mode lamp	RSPF document paper feed (Back surface)	SIDE2	50	COPY mode lamp PRINT mode lamp	Duplex back surface	DUP-2	50	PRINT mode lamp SCAN mode lamp
Mode	Display item	Default	LED																												
Main cassette paper fed	TRAY1	50	COPY mode lamp Main cassette lamp																												
(*) 2nd cassette paper feed	TRAY2	50	COPY mode lamp 2nd cassette lamp																												
Manual paper feed	MFT	50	COPY mode lamp Manual feed lamp																												
RSPF document paper feed (Front surface)	SIDE1	50	COPY mode lamp PRINT mode lamp SCAN mode lamp																												
RSPF document paper feed (Back surface)	SIDE2	50	COPY mode lamp PRINT mode lamp																												
Duplex back surface	DUP-2	50	PRINT mode lamp SCAN mode lamp																												
53	08	SPF scan position automatic adjustment (SPF AUTO)	<p>[Function] Place a black chart so that it covers the SPF scan glass and the OC glass together, and close the OC cover. When this test command is executed, the current adjustment value is displayed as the initial display. * Default is 1. Adjustment range is 1 – 99. Adjustment unit 1 = about 0.127mm * If the values are kept as the default values, SPF scan is not performed properly. The front area of the proper scan position may be scanned. In case of AUTO, press [START] key, and the mirror unit scans from the home position to the SPF scan position with the adjustment value displayed. The SPF glass cover edge position is calculated from the difference between the SPFG glass cover edge and the OC side document glass CCD output level. If the adjustment is normal, the adjusted value is displayed. If abnormal, the error LED lights up with the current set value displayed. During the error LED is lighted, when [START] key is pressed again, execution is performed again.</p> <table><tr><th>Mode</th><th>Display item</th><th>Default</th><th>LED</th></tr><tr><td>SPF scan position auto adjustment</td><td>AUTO</td><td>1</td><td>COPY mode lamp</td></tr><tr><td>SPF scan position manual adjustment</td><td>MANU</td><td>1</td><td>PRINT mode lamp</td></tr></table> <p>[Operation] The operation is similar to test command 46-01. (In MANUAL) OK/ERR display in AUTO</p> <div><div><When OK></div><div><div>53-08 SPF AUTO</div><div>AUTO 100% ** OK</div></div></div> <div><div><When ERR></div><div><div>53-08 SPF AUTO</div><div>AUTO 100% ** ERR</div></div></div>	Mode	Display item	Default	LED	SPF scan position auto adjustment	AUTO	1	COPY mode lamp	SPF scan position manual adjustment	MANU	1	PRINT mode lamp																
Mode	Display item	Default	LED																												
SPF scan position auto adjustment	AUTO	1	COPY mode lamp																												
SPF scan position manual adjustment	MANU	1	PRINT mode lamp																												
61	03	HSYNC output check (LSU CHK)	<p>[Function] When [ENTER/START] key is pressed, HSYNC is performed and the polygon motor is rotated for 30sec. At that time, the COPY mode lamp is lighted for 100msec every time when HSYNC is detected.</p> <p>[Operation] 1) Initial display</p> <div><div>61-03 LSU CHK</div><div>EXECUTING...</div></div>																												

Main code	Sub code	Contents	Details of function/operation
63	01	Shading check (SHADING CHK)	<p>[Function] Used to display the detection level of white plate for shading. When [ENTER/START] key is pressed, the mirror base unit moves to the white plate for shading and the copy lamp is lighted. When the light quantity is stabilized, revision is made for every second, and the level of one pixel at the center of CCD which is not corrected is detected and the value is displayed in decimal values on the LCD. (3 digits)</p> <p>[Operation] 1) Initial display</p> <div style="border: 1px solid black; padding: 2px; width: fit-content;"> 63-01 SHADING CHK EXECUTING... 000 </div>
	02	Black level automatic correction (BLACK LEVEL)	<p>[Function] Used to acquire the black level target value used for the black level adjustment of white balance. When this test command is executed, the current correction value is displayed in 3 digits of 12bit hexadecimal number. Place the gray gradation chart (UKOG-0162FCZZ) used as the correction document so that the density 10 (black side) comes on the left side and that the chart is upside down at the center of the plate left center.</p> <div style="text-align: center; margin: 10px 0;">  </div> <p>When [ENTER/START] key is pressed, the mirror base unit scans the chart and calculates the correction value. After completion of correction, the corrected value is displayed on the LCD.</p> <p>* Default: 0 * If the value is set to the default, operation is made with 0x60.</p> <p>[Operation] 1) Initial display</p> <div style="border: 1px solid black; padding: 2px; width: fit-content;"> 63-02 BLACK LEVEL 0 </div> <p>2) [ENTER/START] Correction start</p> <div style="border: 1px solid black; padding: 2px; width: fit-content;"> 63-02 BLACK LEVEL EXECUTING... </div> <div style="margin-top: 20px;"> <p><During canceling - When C/CA is pressed-> After canceling, the machine goes into the sub code entry standby mode.</p> <div style="border: 1px solid black; padding: 2px; width: fit-content;"> THE JOB IS BEING CANCELED. </div> <p>3) After execution</p> <div style="border: 1px solid black; padding: 2px; width: fit-content;"> 63-02 BLACK LEVEL *** OK </div> <p>3) In case of an error</p> <div style="border: 1px solid black; padding: 2px; width: fit-content;"> 63-02 BLACK LEVEL *** ERR </div> </div>

Main code	Sub code	Contents	Details of function/operation															
64	01	Self print (1by2 mode) (SELF PRT.)	<p>[Function]</p> <p>The status of the optical section is ignored and printing of one page is made. Also when the print command is received from the host, printing is made.</p> <p>When this test command is executed, warm-up is performed and the ready lamp is lighted. (Since, however, the scanner is disabled, initializing is not made.)</p> <p>Enter the code number and press [ENTER/START] key to start paper feed from the selected cassette and print in the selected pattern.</p> <table><tr><th>Code number</th><th>Pattern</th><th>Display item</th></tr><tr><td>0</td><td>1by2</td><td>1 BY 2</td></tr><tr><td>1</td><td>Grid pattern</td><td>CHECK</td></tr><tr><td>2</td><td>White paper</td><td>WHITE</td></tr><tr><td>3</td><td>Black background</td><td>BLACK</td></tr></table> <p>* For 4 – 99, flip.</p> <p>[Operation]</p> <p>The operation is similar to test command 21-01.</p>	Code number	Pattern	Display item	0	1by2	1 BY 2	1	Grid pattern	CHECK	2	White paper	WHITE	3	Black background	BLACK
Code number	Pattern	Display item																
0	1by2	1 BY 2																
1	Grid pattern	CHECK																
2	White paper	WHITE																
3	Black background	BLACK																

5. Trouble codes

A. Trouble codes list

Main code	Sub code	Details of trouble
E1	00	IMC communication trouble
	10	IMC trouble
	13	IMC flash ROM error
	16	IMC DIMM memory read/write check error
	81	IMC communication interface error (parity)
	82	IMC communication interface error (Overrun)
	84	IMC communication interface error (Framing)
E7	02	LSU trouble
	10	Shading trouble (Black correction)
	11	Shading trouble (White correction)
	16	Abnormal laser output
F5	02	Copy lamp lighting abnormality
H2	00	Thermistor open
H3	00	Heat roller high temperature detection
H4	00	Heat roller low temperature detection
L1	00	Feeding is not completed within the specified time after starting feeding. (The scan head locking switch is locked)
L3	00	Scanner return trouble
L4	01	Main motor lock detection
L6	10	Polygon motor lock detection
U2	04	EEPROM read/write error (Serial communication error)
	11	Counter check sum error (EEPROM)
U9	99	Operation panel language error

B. Details of trouble codes

Main code	Sub code	Details of trouble	
E1	00	Content	IMC communication trouble
		Detail	An abnormality occurs in communication between the CPU and the IMC.
		Cause	IMC – CPU signal line abnormality IMC Memory defect/data abnormality
		Check and remedy	Replace the MCU PWB with new one.
	10	Content	IMC trouble
		Detail	An abnormality occurs in the IMC.
		Cause	USB chip error/CODEC error on the IMC.
		Check and remedy	Replace the MCU PWB with a new one.
	13	Content	IMC flash ROM error
		Detail	An abnormality occurs in the IMC flash ROM.
		Cause	IMC abnormality
		Check and remedy	Replace the MCU PWB with a new one. If downloading of the program is abnormally terminated, it may cause an error. Download the program again to avoid this.
	16	Content	IMC DIMM memory read/write check error
		Detail	An installation error occurs in the IMC memory module. An error occurs during access to the IMC memory.
		Cause	Improper installation of the IMC memory module. IMC memory module abnormality IMC memory contact abnormality IMC abnormality.
		Check and remedy	Check installation of the memory module. Replace the memory module. Replace the MCU PWB with a new one.
	81	Content	IMC communication interface error (parity)
		Detail	A parity error occurs in communication between the CPU and the IMC.
		Cause	IMC memory defect/data abnormality
		Check and remedy	Check the memory of the IMC. Replace the MCU PWB with new one.

Main code	Sub code	Details of trouble	
E1	82	Content	IMC communication interface error (Overrun)
		Detail	An overrun error occurs in communication between the CPU and the IMC.
		Cause	IMC memory defect/data abnormality.
		Check and remedy	Check the memory of the IMC. Replace the MCU PWB with new one.
	84	Content	IMC communication interface error (Framing)
		Detail	A framing error occurs in communication between the CPU and the IMC.
		Cause	IMC memory defect/data abnormality.
		Check and remedy	Check the memory of the IMC.
E7	02	Content	LSU trouble
		Detail	The BD signal from the LSU cannot be detected in a certain cycle. (Always OFF or always ON)
		Cause	LSU connector or LSU harness defect or disconnection Polygon motor rotation abnormality Laser beams are not generated. MCU PWB abnormality.
		Check and remedy	Check connection of the LSU connector. Execute TC 61-03 to check the LSU operations. Check that the polygon motor rotates normally. Check that the laser emitting diode generates laser beams. Replace the LSU unit. Replace the MCU PWB.
	10	Content	Shading trouble (Black correction)
		Detail	The CCD black scan level is abnormal when the shading.
		Cause	Improper connection of the CCD unit flat cable CCD unit abnormality MCU PWB abnormality
		Check and remedy	Check connection of the CCD unit flat cable. Check the CCD unit.
	11	Content	Shading trouble (White correction)
		Detail	The CCD white scan level is abnormal when the shading.
		Cause	Improper connection of the CCD unit flat cable Dirt on the mirror, the lens, and the reference white plate Copy lamp lighting abnormality CCD unit abnormality MCU PWB abnormality (When occurred in the SPF scan position.) Improper installation of the mirror unit
		Check and remedy	Clean the mirror, lens, and the reference white plate. Check the light quantity and lighting status of the copy lamp (TC 05-03). Check the MCU PWB.
	16	Content	Abnormal laser output
		Detail	When the laser output is stopped, HSYNC is detected.
		Cause	Laser abnormality MCU PWB abnormality.
		Check and remedy	Check the laser emitting diode operation. Replace the MCU PWB.

Main code	Sub code	Details of trouble	
F5	02	Content	Copy lamp lighting abnormality
		Detail	The copy lamp does not turn on.
		Cause	Copy lamp abnormality Copy lamp harness abnormality CCD PWB harness abnormality.
		Check and remedy	Use TC 5-3 to check the copy lamp operations. When the copy lamp lights up. Check the harness and the connector between the CCD unit and the MCU PWB. When the copy lamp does not light up. Check the harness and the connector between the copy lamp unit and the MCU PWB. Replace the copy lamp unit. Replace the MCU PWB.
H2	00	Content	Thermistor open
		Detail	The thermistor is open. The fusing unit is not installed.
		Cause	Thermistor abnormality Control PWB abnormality Fusing section connector disconnection The fusing unit is not installed.
		Check and remedy	Check the harness and the connector between the thermistor and the PWB. Use TC 14 to clear the self diagnostic display.
H3	00	Content	Heat roller high temperature detection
		Detail	The fusing temperature exceeds 240°C.
		Cause	Thermistor abnormality Control PWB abnormality Fusing section connector disconnection.
		Check and remedy	Use TC 5-02 to check the heater lamp blinking operation. When the lamp blinks normally. Check the thermistor and its harness. Check the thermistor input circuit on the control PWB. When the lamp keeps ON. Check the power PWB and the lamp control circuit on the MCU PWB. Use TC 14 to clear the self diagnostic display.
H4	00	Content	Heat roller low temperature detection
		Detail	The fusing temperature does not reach 185°C within 27 sec of turning on the power, or the fusing temperature keeps at 140°C.
		Cause	Thermistor abnormality Heater lamp abnormality Thermostat abnormality Control PWB abnormality
		Check and remedy	Use TC 5-02 to check the heater lamp blinking operation. When the lamp blinks normally. Check the thermistor and its harness. Check the thermistor input circuit on the control PWB. When the lamp does not light up. Check for disconnection of the heater lamp and the thermostat. Check the interlock switch. Check the power PWB and the lamp control circuit on the MCU PWB. Use TC 14 to clear the self diagnostic display.

Main code	Sub code	Details of trouble	
L1	00	Content	Feeding is not completed within the specified time after starting feeding. (The scan head locking switch is locked)
		Detail	The white area and the black marking on the shading plate are used to obtain the difference in the CCD level values for judgment of lock. When the difference in the levels of which and black is small, it is judged that the black mark could not be scanned by lock and the trouble code "L1" is displayed.
		Cause	The scan head is locked by the lock switch. Mirror unit abnormality The scanner wire is disconnected. The origin detection sensor abnormality Mirror motor harness abnormality
		Check and remedy	Check to confirm that the scan head lock switch is released. Use TC 1-1 to check the mirror reciprocating operations. When the mirror does not feed. Check for disconnection of the scanner wire. Check the harness and the connector between the mirror motor and the MCU PWB. Replace the mirror unit. Replace the MCU PWB. When the mirror does feed. Use TC 1-2 to check the mirror home position sensor.
L3	00	Content	Scanner return trouble
		Detail	When the mirror base is returned for the specified time (6 sec) in mirror initializing after turning on the power, the mirror home position sensor (MHPS) does not turn ON. Or when the mirror base is returned for the specified time (about 6 sec) after start of copy return, the mirror home position sensor (MHPS) does not turn ON.
		Cause	Mirror unit abnormality Scanner wire disconnection Origin detection sensor abnormality Mirror motor harness abnormality
		Check and remedy	Use TC 1-1 to check the mirror reciprocating operations. When the mirror does not return. Check for disconnection of the scanner wire. Check the harness and the connector between the mirror motor and the MCU PWB. Replace the mirror unit. Replace the MCU PWB. When the mirror does feed. Use TC 1-2 to check the mirror home position sensor.
L4	01	Content	Main motor lock detection
		Detail	When the main motor encoder pulse is not detected for 100 msec.
		Cause	Main motor unit abnormality Improper connection or disconnection the main motor and the harness. MCU PWB abnormality
		Check and remedy	Use TC 25-01 to check the main motor operations. Check connection of the main motor harness/connector. Replace the main motor. Replace the MCU PWB.

Main code	Sub code	Details of trouble	
L6	10	Content	Polygon motor lock detection
		Detail	The lock signal (specified rpm signal) does not return within a certain time (about 20 sec) from starting the polygon motor rotation.
		Cause	Polygon motor unit abnormality Improper connection or disconnection of the polygon motor and the harness. MCU PWB abnormality
		Check and remedy	Use TC 61-1 to check the polygon motor operations. Check connection of the polygon motor harness/connector. Replace the polygon motor. Replace the MCU PWB.
U2	04	Content	EEPROM read/write error (Serial communication error)
		Detail	EEPROM access process error
		Cause	EEPROM abnormality
		Check and remedy	Check that the EEPROM is properly set. Use TC 16 to cancel the trouble. Replace the MCU PWB.
	11	Content	Counter check sum error (EEPROM)
		Detail	Check sum error of the counter area in the EEPROM
U9	99	Cause	EEPROM abnormality
		Check and remedy	Check that the EEPROM is properly set. Use TC 16 to cancel the trouble. Replace the MCU PWB.
		Content	Operation panel language error
		Detail	There is no language file. The language file is destroyed.
		Cause	Language file abnormality MCU PWB abnormality
		Check and remedy	MCU firmware download Replace the MCU PWB.

[11] USER PROGRAM

The user settings consist of the following items.

1. User programs

A. Copy mode

Program number	Program name	Setting codes (factory default setting appears in bold)	Explanation
1	AUTO CLEAR	1: 10 SEC. 2: 30 SEC. 3: 60 SEC. 4: 90 SEC. 5: 120 SEC. 6: OFF	<ul style="list-style-type: none"> Auto clear time automatically returns the copy settings to the initial settings if no keys are pressed for a preset period of time following the end of a copy job. This program is used to select the period of time. Auto clear time can also be disabled.
2	PREHEAT MODE	1: 30 SEC. 2: 1 MIN. 3: 5 MIN. 4: 30 MIN. 5: 60 MIN. 6: 120 MIN. 7: 240 MIN.	<ul style="list-style-type: none"> This function automatically switches the machine to a low power consumption state if the set duration of time elapses without the machine being used when the power is on. The power save indicator lights up, however, the keys on the operation panel can be used. Normal operation automatically resumes when a key on the operation panel is pressed, an original is placed, a print job is received.
3	AUTO SHUT-OFF	1: ON 2: OFF	<ul style="list-style-type: none"> Use this setting to enable or disable auto power shut-off mode.
4	AUTO SHUT-OFF TIME	1: 5 MIN. 2: 30 MIN. 3: 60 MIN. 4: 120 MIN. 5: 240 MIN.	<ul style="list-style-type: none"> This function automatically switches the machine to a state that consumes even less power than preheat mode if the set duration of time elapses without the machine being used when the power is on. All lights except the power save indicator go off. To resume normal operation, press the [START] key. Normal operation also resumes automatically when a print job is received or scanning is begun from a computer. While in auto power shut-off mode, no keys (except the [START] key) can be used.
5	STREAM FEEDING	1: ON 2: OFF	<ul style="list-style-type: none"> When copying using the RSPF, while "SET ORIGINALS FOR STREAM FEEDING." appears in the display after an original has been scanned (about 5 seconds), a subsequent original can be placed and automatically fed into the machine.
6	LAYOUT IN 2IN1	1: PATTERN 1 2: PATTERN 2	<ul style="list-style-type: none"> Use this setting to select the layout pattern when two original pages are copied onto a single sheet of paper (see page 35 for the layout patterns).
7	OFFSET FUNCTION	1: ON 2: OFF	<ul style="list-style-type: none"> When enabled, this function offsets the position in the paper output tray of sets of copies during sort copy or copy job, and print jobs when using the printer function.
8	ROTATE ORIG. IMAGE	1: ON 2: OFF	<ul style="list-style-type: none"> When two-sided copying is performed, this function rotates the image on the back of the original. This is convenient when binding the copies at the top (tablet binding).
9	AE/TEXT RESOLUTION	1: 300dpi 2: 600dpi	<ul style="list-style-type: none"> The copy resolution in auto and text mode is normally 300 dpi. If high-quality copies are preferred, use this setting to change the resolution to 600 dpi.
10	2-SIDED COPY MODE	1: HI-SPEED 2: NORMAL	<ul style="list-style-type: none"> If the memory fills up when two-sided copying is performed, "NORMAL" can be selected to make copying possible. However, "NORMAL" results in a slower copying speed. Normally "HI-SPEED" is selected to enable fast two-sided copying.
11	MARGIN WIDTH	1: 1/4" 2: 1/2" 3: 3/4" 4: 1"	<ul style="list-style-type: none"> Use this setting to set the margin width.
12	MEM. FOR PRINTER	1: 30% 2: 40% 3: 50% 4: 60% 5: 70%	<ul style="list-style-type: none"> Use this to change the proportion of machine memory used for printer mode.
13	AUTO KEY REPEAT	1: ON 2: OFF	<ul style="list-style-type: none"> Use this setting to select whether or not holding down a key causes repeated input of the key. For keys that normally cause a set value to increase when held down (for example, holding down the [<] key [v] or [>] key [^]), this program can be used to have the set value not change when the key is held down.
14	KEY PRESS TIME	1: NORMAL 2: 0.5 SEC. 3: 1.0 SEC. 4: 1.5 SEC. 5: 2.0 SEC.	<ul style="list-style-type: none"> Use this setting to select how long a key must be pressed for the input to be accepted. By selecting a longer time, you can prevent settings from being changed by the accidental pressing of a key.
15	KEY TOUCH SOUND	1: LOW 2: HIGH 3: OFF	<ul style="list-style-type: none"> This sets the volume of beep signals.

Program number	Program name	Setting codes (factory default setting appears in bold)	Explanation
16	SOUND AT DEFAULT	1: ON 2: OFF	• Use this to sound a beep when a base setting is selected.
17	TONER SAVE MODE	1: ON 2: OFF	• This mode reduces toner usage by about 10% when copying. Toner save mode is effective when the exposure mode is AUTO or TEXT.
18	AE LEVEL ADJUST	1: SPF/RSPF 2: DOCUMENT GLASS	• This is used to adjust the exposure level. • The automatic exposure level can be adjusted separately for the document glass and the RSPF.
19	LANGUAGE	1: AMERICAN ENGLISH	This is used to set the language used in the display.
20	RESET FACTORY	1: Yes 2: No	This is used to return all settings to the factory default settings.

B. Print mode

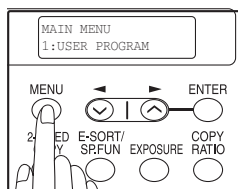
Program number	Program name	Setting codes (factory default setting appears in bold)	Explanation
1	FORCED OUTPUT	1: ON 2: OFF	When this function is enabled, printing in printer mode will automatically continue using a different size of paper if the specified size of paper runs out in all trays. This feature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

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

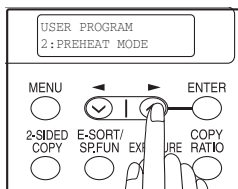
2. Selecting a setting for a user program

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

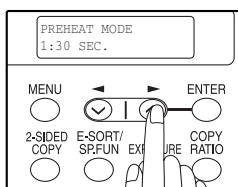
In printer mode, the user programs are accessed by simply pressing the [MENU] key.



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



- 3) Press the [<] key [v] or [>] key [^] to change the setting of the selected item.



NOTE:

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

- 4) Press the [ENTER] key.

Your selection appears briefly and then the previous screen appears.

NOTE:

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

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

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

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

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

Base settings

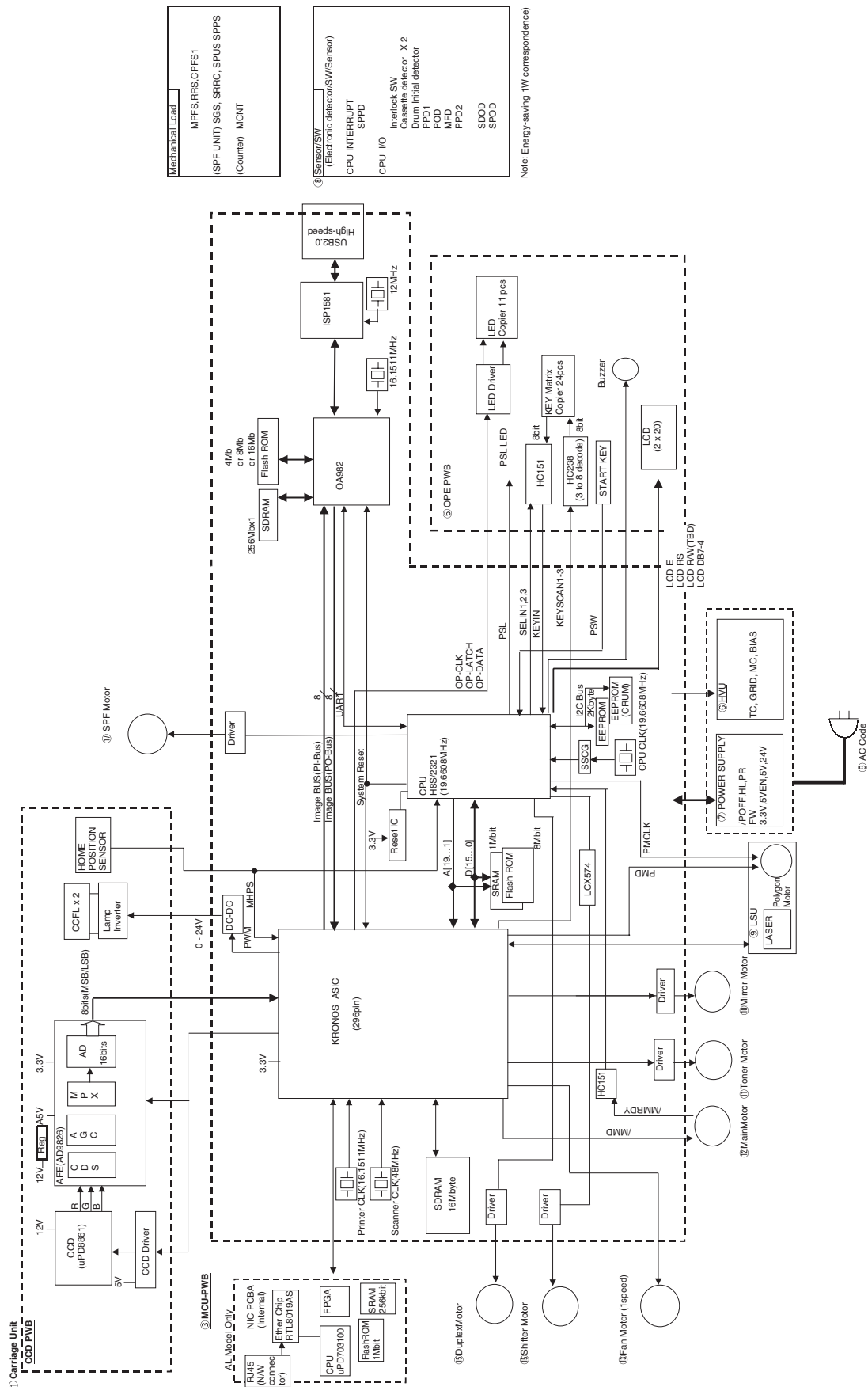
The base settings are preset standard selections for each copy setting. The base settings are as follows:

Copy ratio: 100% Paper feed location: Paper tray
Light and Dark level: center AUTO/TEXT/PHOTO: AUTO

[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 section which performs mechanical sequence control, U/I, and each function job management.
The CPU connects with the ASIC and memory by use of the system bus and performs jog management and sequence control of the whole engine.
- Image process ASIC which performs image process, CCD control, LSU control, and print control.
- OA982 peripheral section which performs E-Sort and FAX control. (The AL-1651CS has no FAX function.)
The OA982 performs image data input/output with the ASIC, SDRAM memory management, and communication with USB2.0 devices.
- I/F section for USB2.0 and IEEE1284 control. (For the AL series, IEEE1284 is not available.)
- Motor control circuit
- Mechanical load, sensor I/O circuit

It performs control and management of the process, the transport loads, the fusing, the optical, and the operation panel sections for executing a series of copy/print/scan operations.

(2) CPU signal table (H8S/2321)

PIN No.	Signal code	Input/ Output	Operating
1	/CS1	Output	SRAM chip select
2	/CS0	Output	Flash ROM chip select
3	GND		DGND
4	GND		DGND
5	Vcc		CPU3.3V
6	A0	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 level input	Print SW
31	SPPD	Interruption level input	SPF paper sensor
32	CCD_TG	Interruption level input	CCD horizontal sync signal
33	MHPS	Interruption level input	Mirror Home Position
34	/CPUSYNC	Interruption level input	Horizontal sync (ASIC)
35	GND		DGND
36	GND		DGND

PIN No.	Signal code	Input/ Output	Operating
37	FW	Interruption level input	Zero cross signal
38	ARB_INT	Interruption level input	ASIC interruption
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
45	D4	Data I/O	Data bus
46	D5	Data I/O	Data bus
47	D6	Data I/O	Data bus
48	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	POFF	Output	Shut off control
60	TxD1	Output	For debug
61	SDA	Output	EEPROM Data bus
62	SCL	Output	EEPROM clock
63	LCDRS	Output	LCD control
64	LCDE	Output	LCD control
65	GND		DGND
66	CS4 (FAX)		Chip select (FAX)
67	GND		DGND
68	GND		DGND
69	RY/BY	Input	Flash Busy signal
70	LCDDB4	Output	LCD control
71	LCDDB5	Output	LCD control
72	BZR	Output	Buzzer signal
73	LCDDB7	Output	LCD control
74	LCDDB6	Output	LCD control
75	Reset OUT1	Output	Reset signal
76	DMT0	Output	Duplex Motor signal
77	DMT1	Output	Duplex Motor signal
78	DMT2	Output	Duplex Motor signal
79	DMT3	Output	Duplex Motor signal
80	WDTOVF	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	PRINTST	Output	Print start signal
91	/RD	Output	Read signal
92	/HWR	Output	Write signal (High address)
93	/LWR	Output	Write signal (Low address)
94	SELIN3	Output	HC151 select signal
95	SELIN2	Output	HC151 select signal
96	SELIN1	Output	HC151 select signal
97	ESSTS	Output	E-sort control
98	ESCMD	Input	E-sort control
99	GND		DGND
100	GND		DGND
101	ESSRDY	Input	E-sort control
102	ESCRDY	Output	E-sort control
103	AVcc		CPU3.3V
104	Vref		CPU3.3V

PIN No.	Signal code	Input/ Output	Operating
105	RTH	Analog input	Fusing thermistor
106	ESPAGE	Input	E-sort control
107	SIN1	Input	HC151 select detection
108	SIN2	Input	HC151 select detection
109	SIN3	Input	HC151 select detection
110			Pull up
111	KEY IN	Input	NC
112	MSUST1	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	PMCLK	Output	Polygon clock
119	SPMT3	Output	SPF motor signal
120	SPMT2	Output	SPF motor signal
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	/CS3	Output	Chip select signal
128	/CS2	Output	ASIC chip select

(3) Image process ASIC (HG73C114HF)

a. General

The ASIC is composed of the three blocks: the image process block, the print control block, and the I/F block.

Image process section

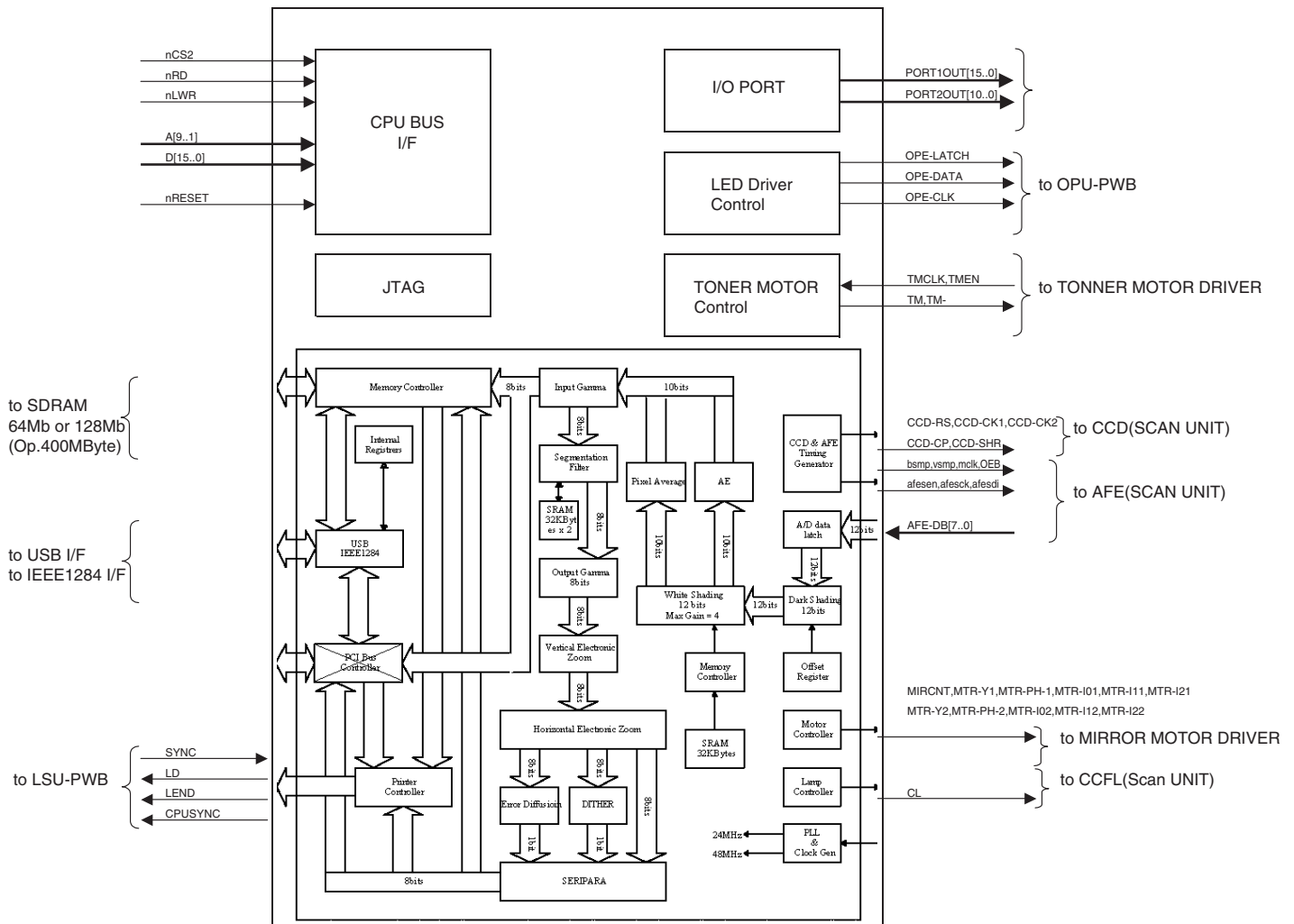
According to the operation mode set by the register set value, the image data from the CCD PWB are placed under shading, AE process, input gamma process, area separation, filter process, resolution conversion, zoom process, output gamma process, and binary coding.

Print control section

During copying, image-processed data are outputted to the LSU at the timing of LSU writing.

I/F section

This section performs DRUM control as image data buffer, image data send/receive with the OA982, and data send/receive with the IEEE1284 I/F.



d. ASIC (Signal table)

PIN No.	Signal Name	IN/OUT	Connected to	Description
1	cpudata7	IN/OUT	CPU	CPU data bus
2	cpudata6	IN/OUT	CPU	CPU data bus
3	cpudata5	IN/OUT	CPU	CPU data bus
4	cpudata4	IN/OUT	CPU	CPU data bus
5	VCC_AC	Power		
6	cpudata3	IN/OUT	CPU	CPU data bus
7	cpudata2	IN/OUT	CPU	CPU data bus
8	cpudata1	IN/OUT	CPU	CPU data bus
9	cpudata0	IN/OUT	CPU	CPU data bus
10	GND_AC	Power		
11	mircnt	OUT	Buffer IC	SPF scanner select signal
12	cpusync	OUT	CPU	CPU SYNC signal
13	mem_intr			Not used
14	arb_intr	OUT	CPU	INTR signal
15	VCC_core	Power		
16	cpu_ad8	IN	CPU	CPU address bus
17	cpu_ad7	IN	CPU	CPU address bus
18	cpu_ad6	IN	CPU	CPU address bus
19	cpu_ad5	IN	CPU	CPU address bus
20	GND_core	Power		
21	ram_clk_in	IN	ASIC	SDRAM clock on the board
22	cpu_ad4	IN	CPU	CPU address bus
23	cpu_ad3	IN	CPU	CPU address bus
24	cpu_ad2	IN	CPU	CPU address bus
25	cpu_ad1	IN	CPU	CPU address bus
26	cpu_ad0	IN	CPU	CPU address bus
27	xcpucs	IN	CPU	CS signal
28	sfclk	IN	Oscillator	Clock
29	GND_core	Power		
30	xcpuwr	IN	CPU	CPU write signal
31	xcpurd	IN	CPU	CPU read signal
32	nrst	IN	SYSTEM RESET	SYSTEM RESET
33	VCC_core	Power		
34	pfclk2	IN		Not used
35	clock_sw	IN		Pull up
36	GND_core	Power		
37	pfclk1_xout	OUT	X-tal units	VIDEO clock
38	pfclk1	IN	X-tal units	VIDEO clock
39	VSSPLL2			Pull up
40	VDDPLL2			Pull up
41	VSS2			Pull up
42	VDDI2			Pull up
43	tm2_15m			Pull up
44	xsync	IN	LSU	Horizontal sync signal from LSU (/SYNC)
45	GND_AC	Power		
46	xld	OUT	LSU	Laser drive signal
47	xlend	OUT	LSU	Laser APC signal
48	VCC_AC	Power		
49	mmd	OUT	Tr array IC	Main motor control signal. "H": Main motor ON
50	pmd	OUT	I/O	Polygon motor drive
51	tc	OUT	Tr array IC	Transfer charger control signal. "H":ON
52	gridl	OUT	Tr array IC	Main charger grid control signal. "H": L output

PIN No.	Signal Name	IN/OUT	Connected to	Description
53	mc	OUT	Tr array IC	Main charger control signal. "H": ON
54	bias	OUT	I/O	HV bias drive
55	NC	OUT	I/O	Not used
56	vfmnt	OUT	Tr array IC	Ventilation fan rotation speed control signal. "H": High speed, "L": Low speed
57	VCC_core	Power		
58	vfm	OUT	Tr array IC	Ventilation fan control signal. "H": Fan ON
59	/FPOFF	OUT	I/O	FAX poff signal
60	GND_core	Power		
61	DEV DIR	OUT	I/O	CRUM bus control
62	spfclh	OUT	Tr array IC	SPF/RSPF resist roller clutch control signal "H":ON
63	spfrsol	OUT	Tr array IC	SPF/RSPF document feed solenoid control signal "H":ON
64	spfgsol	OUT	Tr array IC	SPF/RSPF gate solenoid control signal "H":ON
65	spfpsol	OUT	Tr array IC	SPF/RSPF document transport solenoid control signal "H":ON
66	VCC_core	Power		
67	bias	OUT	Tr array IC	DV bias control signal. "H":ON
68	lden	OUT	Tr array IC	Laser circuit control signal. "H": Laser circuit ON
69	GND_AC	Power		
70	MRPS1	OUT	I/O	SPF current control
71	MRPS2	OUT	I/O	SPF current control
72	MRPS3	OUT	I/O	SPF current control
73	CPFS1	OUT	I/O	1st cassette pick up solenoid
74	VCC_AC	Power		
75	CPFS2	OUT	I/O	2nd cassette pick up solenoid
76	pr	OUT	I/O	Power relay control
77	hl	OUT	Tr array IC	Heater lamp control signal. "H":ON
78	GND_core	Power		
79	MPFS	OUT	I/O	Multi-bypass solenoid
80	miron	OUT	Buffer IC	SPF scanner select signal
81	spfon	OUT	Buffer IC	SPF ON signal
82	KEYSC1	OUT	I/O	Key sense control
83	KEYSC2	OUT	I/O	Key sense control
84	KEYSC3	OUT	I/O	Key sense control
85	IMC ready	OUT	I/O	IMC control
86	VCC_core	Power		
87	tmx	OUT	Buffer IC	Toner motor control signal
88	tm	OUT	Buffer IC	Toner motor control signal
89	op_data	OUT	Tr array IC	Operation circuit data signal
90	ope_latch	OUT	Tr array IC	Operation circuit latch signal. Data take-in at "L"
91	GND_AC	Power		

PIN No.	Signal Name	IN/OUT	Connected to	Description
92	op_clk	OUT	Tr array IC	Operation circuit clock signal
93	VCC_AC	Power		
94	scanstop	IN	CPU	Scan stop signal
95	testpin0	IN	TEST	TEST
96	testmode_on	IN	TEST	TEST
97	ie1284_stb	IN	I/F board connector	/STB signal (IEEE1284 communication port)
98	ie1284_autofd	IN	I/F board connector	/AUTOFD signal (IEEE1284 communication port)
99	VCC_core	Power		
100	ie1284_slctin	IN	I/F board connector	/SLCTIN signal (IEEE1284 communication port)
101	ie1284_init	IN	I/F board connector	/INIT signal (IEEE1284 communication port)
102	ie1284_slct	OUT	I/F board connector	SLCT signal (IEEE1284 communication port)
103	GND_core	Power		
104	ie1284_pe	OUT	I/F board connector	PE signal (IEEE1284 communication port)
105	ie1284_busy	OUT	I/F board connector	BUSY signal (IEEE1284 communication port)
106	ie1284_ack	OUT	I/F board connector	/ACK signal (IEEE1284 communication port)
107	ie1284_fault	OUT	I/F board connector	/FAULT signal (IEEE1284 communication port)
108	VCC_core	Power		
109	ie1284_rev	OUT	I/F board connector	/REV signal (IEEE1284 communication port)
110	ie1284_parad7	IN/OUT	I/F board connector	DATA bus (IEEE1284 communication port)
111	ie1284_parad6	IN/OUT	I/F board connector	DATA bus (IEEE1284 communication port)
112	ie1284_parad5	IN/OUT	I/F board connector	DATA bus (IEEE1284 communication port)
113	ie1284_parad4	IN/OUT	I/F board connector	DATA bus (IEEE1284 communication port)
114	ie1284_parad3	IN/OUT	I/F board connector	DATA bus (IEEE1284 communication port)
115	ie1284_parad2	IN/OUT	I/F board connector	DATA bus (IEEE1284 communication port)
116	VCC_AC	Power		
117	ie1284_parad1	IN/OUT	I/F board connector	DATA bus (IEEE1284 communication port)
118	ie1284_parad0	IN/OUT	I/F board connector	DATA bus (IEEE1284 communication port)
119	suspend	OUT	I/F board connector	SUSPEND signal (USB communication port)
120	GND_AC	Power		
121	oen	OUT	I/F board connector	OEN signal (USB communication port)
122	vmout	OUT	I/F board connector	VMOUT signal (USB communication port)
123	vpout	OUT	I/F board connector	VPOUT signal (USB communication port)
124	GND_core	Power		

PIN No.	Signal Name	IN/OUT	Connected to	Description
125	vmin	IN	I/F board connector	VMIN signal (USB communication port)
126	vpin	IN	I/F board connector	VPIN signal (USB communication port)
127	rcv	IN	I/F board connector	RCV signal (USB communication port)
128	scanst	IN	CPU	Scan start signal
129	printst	IN	Start signal	Start signal
130	receptst	IN	Start signal	Start signal
131	transst	IN	CPU	Data transfer start signal
132	VCC_core	Power		
133	dci_dat7	IN	E-SORT (OA982)	E-SORT data bus
134	dci_dat6	IN	E-SORT (OA982)	E-SORT data bus
135	dci_dat5	IN	E-SORT (OA982)	E-SORT data bus
136	dci_dat4	IN	E-SORT (OA982)	E-SORT data bus
137	dci_dat3	IN	E-SORT (OA982)	E-SORT data bus
138	dci_dat2	IN	E-SORT (OA982)	E-SORT data bus
139	dci_dat1	IN	E-SORT (OA982)	E-SORT data bus
140	dci_dat0	IN	E-SORT (OA982)	E-SORT data bus
141	GND_core	Power		
142	out_dc_req	IN	E-SORT (OA982)	E-SORT control signal
143	in_dc_req	IN	E-SORT (OA982)	E-SORT control signal
144	GND_AC	Power		
145	out_dc_ack	OUT	E-SORT (OA982)	E-SORT control signal
146	out_dc_wt	OUT	E-SORT (OA982)	E-SORT control signal
147	VCC_AC	Power		
148	in_dc_ack	OUT	E-SORT (OA982)	E-SORT control signal
149	in_dc_cs	OUT	E-SORT (OA982)	E-SORT control signal
150	dco_dat7	OUT	E-SORT (OA982)	E-SORT data bus
151	dco_dat6	OUT	E-SORT (OA982)	E-SORT data bus
152	dco_dat5	OUT	E-SORT (OA982)	E-SORT data bus
153	dco_dat4	OUT	E-SORT (OA982)	E-SORT data bus
154	dco_dat3	OUT	E-SORT (OA982)	E-SORT data bus
155	VCC_AC	Power		
156	dco_dat2	OUT	E-SORT (OA982)	E-SORT data bus
157	dco_dat1	OUT	E-SORT (OA982)	E-SORT data bus
158	dco_dat0	OUT	E-SORT (OA982)	E-SORT data bus
159	hsync		FAX	FAX
160	GND_core	Power		
161	out_req			Not used
162	in_ack			Not used
163	in_cs			Not used
164	GND_AC	Power		

PIN No.	Signal Name	IN/OUT	Connected to	Description
165	mdat00			Not used
166	mdat01			Not used
167	mdat02			Not used
168	mdat03			Not used
169	VCC_core	Power		
170	mdat04			Not used
171	mdat05			Not used
172	mdat06			Not used
173	GND_core	Power		
174	mdat07			Not used
175	mdat08			Not used
176	mdat09			Not used
177	VCC_AC	Power		
178	mdat10			Not used
179	mdat11			Not used
180	mdat12			Not used
181	VCC_core	Power		
182	mdat13			Not used
183	mdat14			Not used
184	mdat15			Not used
185	GND_AC	Power		
186	pcl_s_print			Not used
187	fax_s_print			Not used
188	es_s_print			Not used
189	out_ack			Not used
190	out_cs			Not used
191	in_req			Not used
192	VCC_core	Power		
193	TCK		JTAG	Not used
194	TMS		JTAG	Not used
195	TRSTA		JTAG	Not used
196	TDI		JTAG	Not used
197	TDO		JTAG	Not used
198	GND_core	Power		
199	afp_vsmp	OUT	CCD PWB	AFE control signal
200	ccd_tg	OUT	CCD PWB	CCD control signal
201	ccdrs	OUT	CCD PWB	CCD control signal
202	afp_bsmp	OUT	CCD PWB	AFE control signal
203	ccdcp	OUT	CCD PWB	CCD control signal
204	afe_sdata	IN	CCD PWB	AD's serial data
205	ccd_ph2	OUT	CCD PWB	CCD control signal
206	ccd_ph1	OUT	CCD PWB	CCD control signal
207	afp_afesen	OUT	CCD PWB	AFE control signal
208	GND_core	Power		
209	afp_adccclk	OUT	CCD PWB	AFE control signal
210	VCC_core	Power		
211	afp_afesck	OUT	CCD PWB	AFE control signal
212	GND_AC	Power		
213	afp_data7	IN	CCD PWB	Image scan data
214	afp_data6	IN	CCD PWB	Image scan data
215	afp_data5	IN	CCD PWB	Image scan data
216	afp_data4	IN	CCD PWB	Image scan data
217	afp_data3	IN	CCD PWB	Image scan data
218	afp_data2	IN	CCD PWB	Image scan data
219	afp_data1	IN	CCD PWB	Image scan data
220	afp_data0	IN	CCD PWB	Image scan data
221	VCC_AC	Power		
222	cl	OUT	Logic IC	Copy lamp control signal
223	GND_core	Power		
224	mtr_y3	OUT	I/O	Carriage motor current control signal
225	mtr_y2	OUT	Tr array IC	Carriage motor current control signal

PIN No.	Signal Name	IN/OUT	Connected to	Description
226	mtr_y1	OUT	Tr array IC	Carriage motor current control signal
227	VCC_core	Power		
228	mtr_phase2	OUT	Motor driver	Carriage motor control signal
229	mtr_i02	OUT	Motor driver	Carriage motor control signal
230	mtr_i12	OUT	Motor driver	Carriage motor control signal
231	mtr_i22	OUT	Motor driver	Carriage motor control signal
232	mtr_phase1	OUT	Motor driver	Carriage motor control signal
233	mtr_i01	OUT	Motor driver	Carriage motor control signal
234	mtr_i11	OUT	Motor driver	Carriage motor control signal
235	mtr_i21	OUT	Motor driver	Carriage motor control signal
236	GND_AC	Power		
237	ram_mad3	OUT	SDRAM	SDRAM (Image process page memory) address bus
238	ram_mad2	OUT	SDRAM	SDRAM (Image process page memory) address bus
239	GND_core	Power		
240	ram_mad1	OUT	SDRAM	SDRAM (Image process page memory) address bus
241	ram_mad0	OUT	SDRAM	SDRAM (Image process page memory) address bus
242	ram_mad10	OUT	SDRAM	SDRAM (Image process page memory) address bus
243	VCC_core	Power		
244	ram_banks1	OUT	SDRAM	SDRAM (Image process page memory) BANK signal
245	ram_banks0	OUT	SDRAM	SDRAM (Image process page memory) BANK signal
246	xram_cs	OUT		SDRAM (Image process page memory) CS signal
247	xram_ras	OUT	SDRAM	SDRAM (Image process page memory) RAS signal
248	xram_cas	OUT	SDRAM	SDRAM (Image process page memory) CAS signal
249	VCC_AC	Power		
250	xram_wde	OUT	SDRAM	SDRAM (Image process page memory) WDE signal
251	ram_dqm0	OUT	SDRAM	SDRAM (Image process page memory) DQM signal
252	GND_AC	Power		
253	ram_data7	IN/OUT	SDRAM	SDRAM (Image process page memory) data bus

PIN No.	Signal Name	IN/OUT	Connected to	Description
254	ram_data6	IN/OUT	SDRAM	SDRAM (Image process page memory) data bus
255	ram_data5	IN/OUT	SDRAM	SDRAM (Image process page memory) data bus
256	ram_data4	IN/OUT	SDRAM	SDRAM (Image process page memory) data bus
257	GND_core	Power		
258	ram_data3	IN/OUT	SDRAM	SDRAM (Image process page memory) data bus
259	ram_data2	IN/OUT	SDRAM	SDRAM (Image process page memory) data bus
260	ram_data1	IN/OUT	SDRAM	SDRAM (Image process page memory) data bus
261	ram_data0	IN/OUT	SDRAM	SDRAM (Image process page memory) data bus
262	GND_AC	Power		
263	ram_data15	IN/OUT	SDRAM	SDRAM (Image process page memory) data bus
264	ram_data14	IN/OUT	SDRAM	SDRAM (Image process page memory) data bus
265	VCC_AC	Power		
266	ram_data13	IN/OUT	SDRAM	SDRAM (Image process page memory) data bus
267	ram_data12	IN/OUT	SDRAM	SDRAM (Image process page memory) data bus
268	ram_data11	IN/OUT	SDRAM	SDRAM (Image process page memory) data bus
269	ram_data10	IN/OUT	SDRAM	SDRAM (Image process page memory) data bus
270	ram_data9	IN/OUT	SDRAM	SDRAM (Image process page memory) data bus
271	ram_data8	IN/OUT	SDRAM	SDRAM (Image process page memory) data bus
272	VCC_core	Power		
273	ram_dqm1	OUT	SDRAM	SDRAM (Image process page memory) DQM signal
274	ram_cke	OUT	SDRAM	SDRAM (Image process page memory) CKE signal
275	GND_AC	Power		
276	ram_clk_out		SDRAM	SDRAM's clock
277	GND_core	Power		
278	ram_mad12	OUT	SDRAM	SDRAM (Image process page memory) address bus
279	ram_mad11	OUT	SDRAM	SDRAM (Image process page memory) address bus
280	ram_mad9	OUT	SDRAM	SDRAM (Image process page memory) address bus

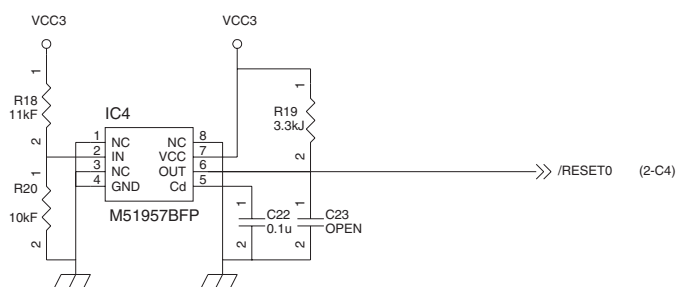
PIN No.	Signal Name	IN/OUT	Connected to	Description
281	VCC_core	Power		
282	ram_mad8	OUT	SDRAM	SDRAM (Image process page memory) address bus
283	ram_mad7	OUT	SDRAM	SDRAM (Image process page memory) address bus
284	VCC_AC	Power		
285	ram_mad6	OUT	SDRAM	SDRAM (Image process page memory) address bus
286	ram_mad5	OUT	SDRAM	SDRAM (Image process page memory) address bus
287	ram_mad4	OUT	SDRAM	SDRAM (Image process page memory) address bus
288	GND_AC	Power		
289	cpudata15	IN/OUT	CPU	CPU data bus
290	cpudata14	IN/OUT	CPU	CPU data bus
291	cpudata13	IN/OUT	CPU	CPU data bus
292	cpudata12	IN/OUT	CPU	CPU data bus
293	cpudata11	IN/OUT	CPU	CPU data bus
294	cpudata10	IN/OUT	CPU	CPU data bus
295	cpudata9	IN/OUT	CPU	CPU data bus
296	cpudata8	IN/OUT	CPU	CPU data bus

(4) Reset circuit

This circuit detects ON/OFF of the power source, and controls start/stop of each circuit. The voltage of 3.3V in the MCU PWB is detected by the reset IC to generate the reset signal.

When the power voltage reaches the specified level, each circuit is operated, but stopped before the power voltage falls below the specified level in order to protect against malfunction of the circuit. The CPU/Flash ROM is reset by the power reset circuit, and system reset of ASIC, OA982, FAX, and NIC is generated from the CPU (general-purpose port output).

Reset IC

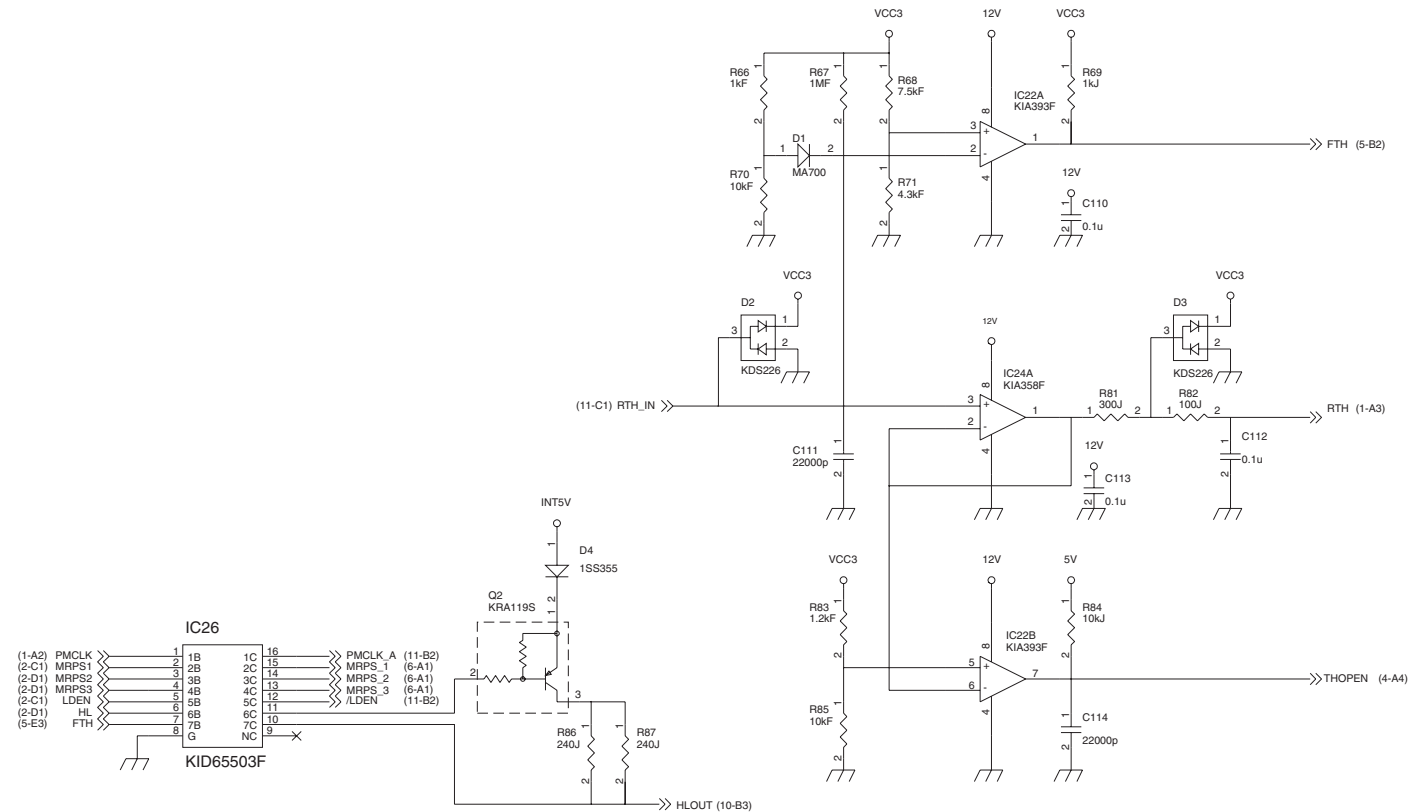


(5) Heater lamp control circuit

a. Outline

The heater lamp control circuit detects the heat roller surface temperature, and converts the temperature into a voltage. The converted voltage is inputted to the CPU.

The CPU converts the inputted analog voltage into a digital value. The digital conversion value and the set value of the test command are compared to control ON/OFF of the heater lamp according to the level, controlling the heat roller surface temperature to be the fixed level.



[High temperature protection circuit in case of CPU hung up (uncontrollable)]

For IC22 3Pin (reference voltage), +3.3V is divided by the resistor. The thermistor terminal voltage is inputted to IC22 2Pin. When, therefore, the voltage at 2Pin falls below the voltage at 3Pin, IC22 1Pin becomes "H" and the HL signal is pulled to the GND level, suppressing generation of the lighting signal of the heater lamp. (IC22 output 1Pin is normally Low.)

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

- When the thermistor terminal voltage is higher than the set level, the output signal HL from ASIC becomes HIGH level.
- This HL signal becomes the HLOUT signal through IC26, and is inputted to the photo triac coupler in the power PWB. When, therefore, the HL signal is HIGH, the internal triac turns on.
- When the internal triac turns on, the heater lamp lights up.

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

- When the thermistor terminal voltage falls below the set level, the output signal HL from ASIC becomes LOW level.
- The HL signal becomes LOW, the power PWB photo triac coupler turns OFF, and the heater lamp turns OFF.

[When the thermistor is open]

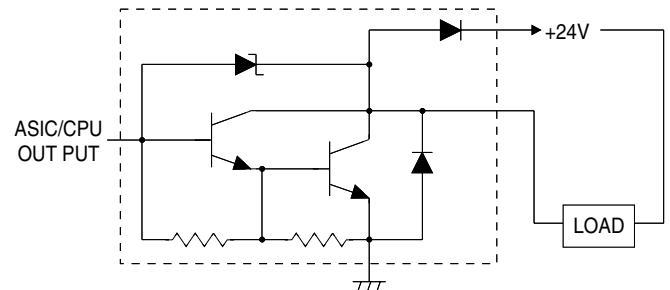
The voltage at IC22 6Pin becomes higher than the voltage at 5Pin, and the 7Pin output THOPEN becomes LOW. This is inputted to the CPU to display the trouble code H2.

(6) Driver circuit (Clutch, solenoid)

Since a load cannot be directly driven by each load signal from the CPU or the ASIC, each load is driven through the driver IC (transistor array).

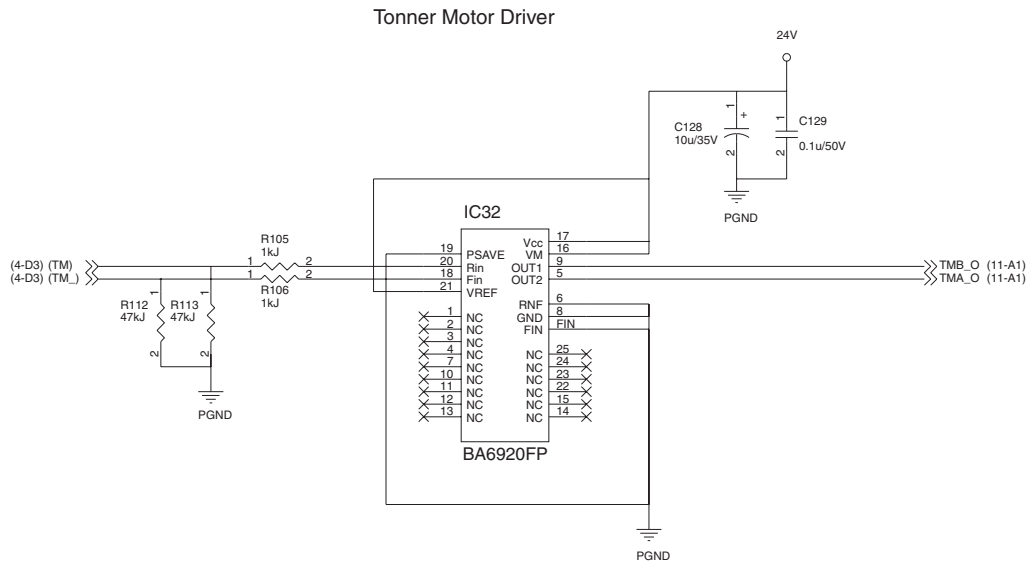
A large drive current (load current) is obtained from a small input current (ASIC output current).

When the driver input voltage (base resistor input) is HIGH, the transistor turns ON to flow a current through the load, operating the load.



(7) Toner motor control circuit

The IC32 is the motor drive IC, which generates pseudo-AC wave-forms by the pulse signal from the ASIC to drive the toner supply motor.



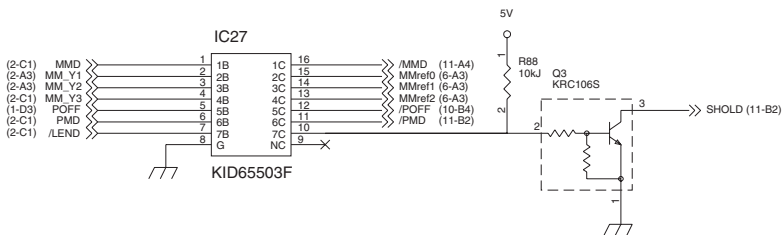
(8) Main motor control circuit/ LSU (Polygon motor) control circuit

The motors are driven by the MMD (main motor) signal and the PMD (polygon motor) signal from the ASIC.

The MMD signal and the PMD signal are turned HIGH and sent

through the driver IC27 to the control circuit in the main motor/LSU, rotating each motor.

When the motor RPM reaches the specified level, the MMLD signal (main) and the PMLD signal (LSU) become LOW. The CPU detects it to start process control.



(9) Mirror motor control circuit, SPF motor control circuit, Duplex motor control circuit, Shifter motor control circuit.

Stepping motors are employed for the mirror motor, the SPF motor, and the duplex motor. The driver for IC29 (for the mirror motor) is the bipolar drive constant current drive IC. The drive for IC31 (for the SPF) is the uni-polar drive constant current drive IC. The drive for IC28 (for the duplex) and IC30 (for the shifter) is the constant current drive IC. Each motor is driven in W1-2 phase excitement, 1-2 phase excitement, or 2-phase excitement.

The mirror motor/SPF motor related to image scan are driven by a constant current, and each motor current is switched in each magnification ratio.

(10-D2) OUT_A-
 (10-D2) OUT_A+
 (10-D2) OUT_B+
 (10-D2) OUT_B-

R90 0.88Ω 1W
 R92 1.5kΩ
 C116 820pF
 PGND
 5V
 R93 1kΩ
 R96 2kΩ
 R97 1kΩ
 R98 510Ω
 C119 0.1µF
 PGND
 (5-C1) MMréf0
 (5-C1) MMréf1
 (5-C1) MMréf2
 (2-A3) MM_BIO
 (2-A3) MM_BI1
 (2-A3) MM_PH_B
 IC29
 1 OUT 1A
 2 OUT 2A
 3 SENSE 2
 4 COMP 2
 5 OUT 2B
 6 I01
 7 GND
 8 I02
 9 I12
 10 PHASE 1
 11 VREF 1
 12 RC 2
 13 VSS
 14 RC 1
 15 VREF 2
 16 I11
 17 I16
 18 GND
 19 I01
 20 OUT 1B
 21 COMP 1
 22 SENSE 1
 23 VS
 24
 L6219DS or AMM56219
 24V
 5V
 R99 0.68µF 1W
 C115 820pF
 PGND
 MM_AIO (2-A3)
 MM_AI1 (2-A3)
 MM_PH_A (2-A3)
 R95 30kΩ
 C118 820pF
 PGND
 C121 0.1µF
 PGND

The schematic diagram illustrates the internal components and connections of the MTD1361/F module. The central component is the MTD1361/F IC, which is connected to various external components and signals.

Internal Components and Connections:

- Resistors:** R101 (1k Ω), R102 (750 Ω), R103 (1 Ω), R104 (2.4k Ω), R105 (2.4k Ω), R106 (1 Ω), R107 (300 Ω), R108 (620 Ω), R109 (1.2k Ω), R110 (100 Ω), R111 (2.4k Ω), R112 (1 Ω), R113 (1 Ω), R114 (1 Ω), R115 (1k Ω).
- Capacitors:** C125 (2200pF), C126 (2200pF), C127 (OPEN), C130 (OPEN), C132 (2200pF), C135 (2200pF), C136 (OPEN), C137 (OPEN), C134 (0.1 μ F).
- Power and Grounding:** 5V supply, PGND, 24V supply, 24V ground.
- Signal Connections:** MRPS_1, MRPS_2, MRPS_3 (5-C2), SPMT_2 (11-E1), SPMT_0 (11-D1), SPMT_3 (11-D1), SPMT_1 (11-E1), (4-D3) (SPFMT2), (4-D3) (SPFMT0), (4-D3) (SPFMT3), (4-D3) (SPFMT1).

The diagram shows the internal wiring of the module, including the connections between the IC pins and the external components. The 5V supply is connected to the MRPS_1, MRPS_2, and MRPS_3 pins. The 24V supply is connected to the 24V pin. The PGND is connected to the PGND pin. The SPMT_2, SPMT_0, SPMT_3, and SPMT_1 pins are connected to the (4-D3) (SPFMT2), (4-D3) (SPFMT0), (4-D3) (SPFMT3), and (4-D3) (SPFMT1) pins, respectively.

[illegible]

(10) NIC PWB

The NIC PWB is used to realize 10Base-T network functions (print only). It is provided with the CPU, the Ether chip, FPGA, memory, and the RJ45LAN connector. Data are converted into IEEE1284 parallel data and sent to the MCU PWB, realizing network functions.

(11) OPE PWB

a. Outline

The operation circuit is composed of the LCD control circuit, the key matrix circuit, the display matrix circuit, and the buzzer circuit, realizing the U/I functions.

b. LCD control circuit

The character LCD (COG) in 2 lines and 16 digits is used. The display data are sent from the MCU (CPU) to LCD internal registers, controlling the LCD.

c. Key matrix circuit

The SEL signal is sent from the CPU of MCU to the matrix selector IC (multiplexer) in the operation circuit. The signal detects OFF/ON of the key, and is sent to the CPU as serial data.

d. LED matrix circuit

The display is controlled by inputting the serial data signal, the clock signal, and the latch signal from ASIC to the LED driver in the operation circuit.

In the LED driver, data are set to the register (8bit) and latched to control the IC output port, performing matrix-driving of ON/OFF of the LED.

(12) Carriage Unit

a. Outline

The carriage unit is provided with the CCD PWB, the inverter PWB, the lamps, etc. A document is radiated, and image data read by the CCD are A/D converted to be sent to the ASIC.

b. CCD PWB

The color image sensor uPD8861 (5400 pixels x 3 lines) is used as the CCD on the CCD PWB to scan images in the resolution of 600dpi/US letter size in the main scanning direction.

Image data scanned by the CCD are inputted to AFE (AD9826), where they are A/D-converted to output digital data. The output digital data are sent to the MCU PWB and to the ASIC. The ASIC performs image process with the digital data.

c. Lamp inverter PWB

The transformer is controlled by the lamp control signal from the MCU PWB to turn ON/OFF the cool cathode ray tube by the transformer output.

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).

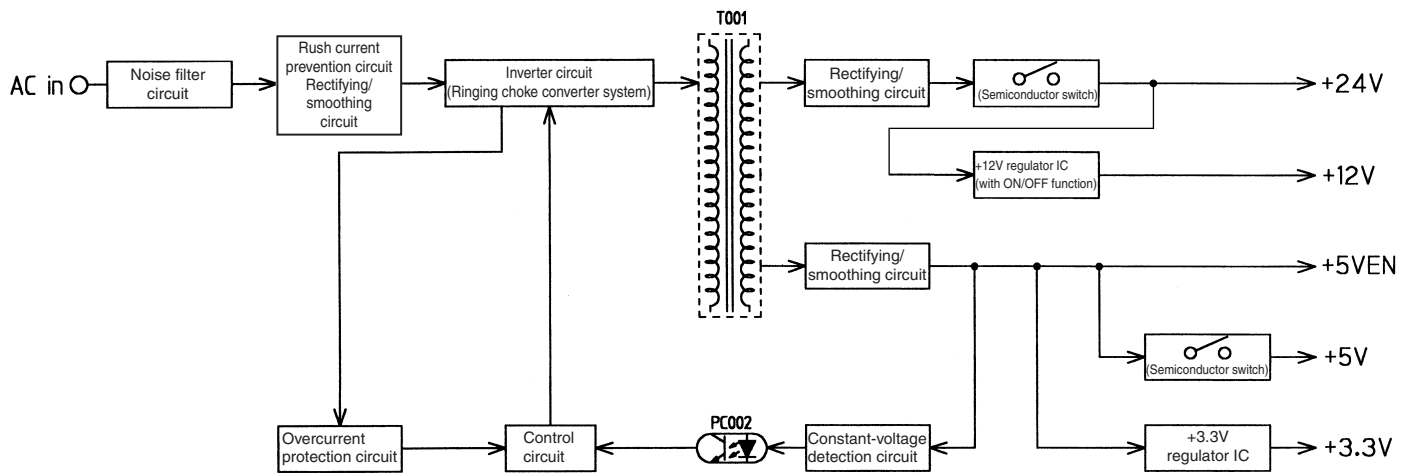


fig (1) Block diagram

(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 C002, C003, and C022 to GND.

The normal noise means that overlapped in the AC line or the output line. It is attenuated by C023, C001, L002, C004, and L003. Refer to fig (2).

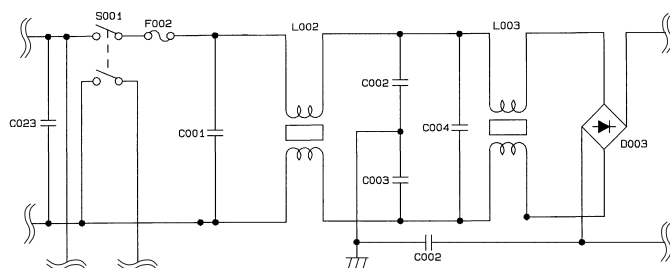


fig (2) Noise filter circuit

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

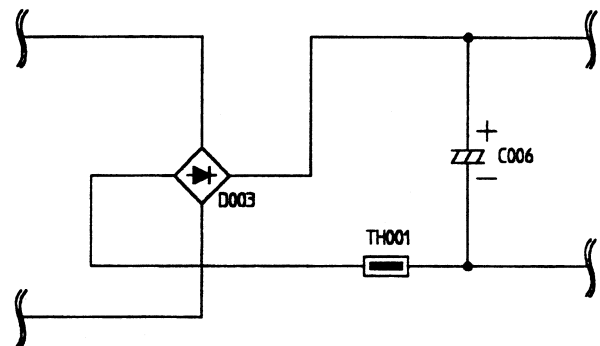


fig (3) Rush current prevention, rectifying/smoothing circuit

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 C006 when turning on the power.

To prevent against this, the rush current prevention resistor TH001 is provided between the rectifying diode D003 and the smoothing diode C006, suppressing a rush current.

The rectifying/smoothing circuit rectifies a 60Hz AC voltage with the rectifying circuit, and smoothes it with the smoothing capacitor C006.

(3) Inverter and control circuit (Ringing choke converter system)

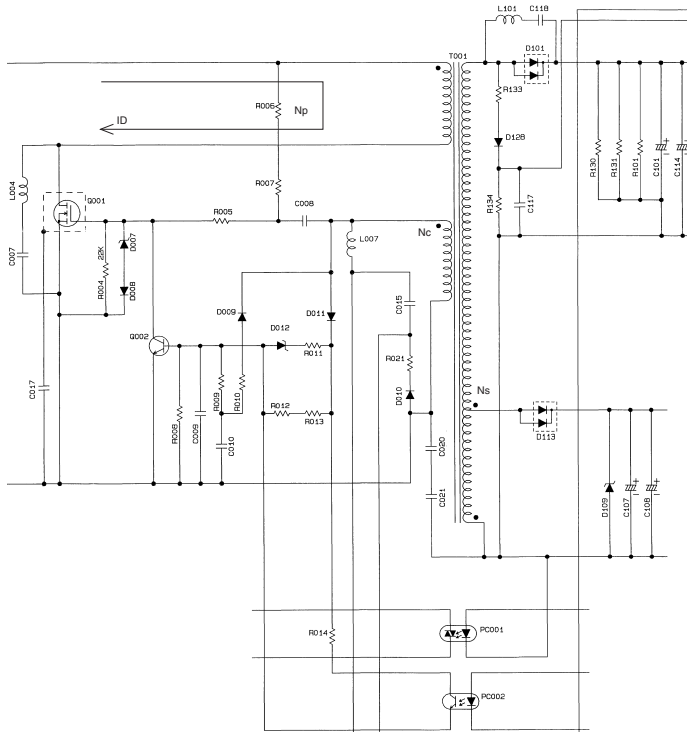


Fig. (4) Inverter and control circuit

When the power is supplied to this circuit, the DC voltage, V_{ref} , supplied by the rectifying/smoothing circuit is applied through R006 and R007 to FET (Q001), turning on Q001.

When Q001 is turned on, the drain current, I_D , flows as the waveform B in Fig. (5) to apply V_{DC} to the main winding, N_p , on the primary side.

At the same time, a voltage is generated in N_c winding and applied through R005 and C008b to the gate of Q001. As a result, Q001 is turned on rapidly.

At the same time with this, C009 is charged through D001, R001, and D012. When the potential of C009 reaches 0.7V ($= V_{BE}$ of Q002), Q002 turns on to turn off Q001.

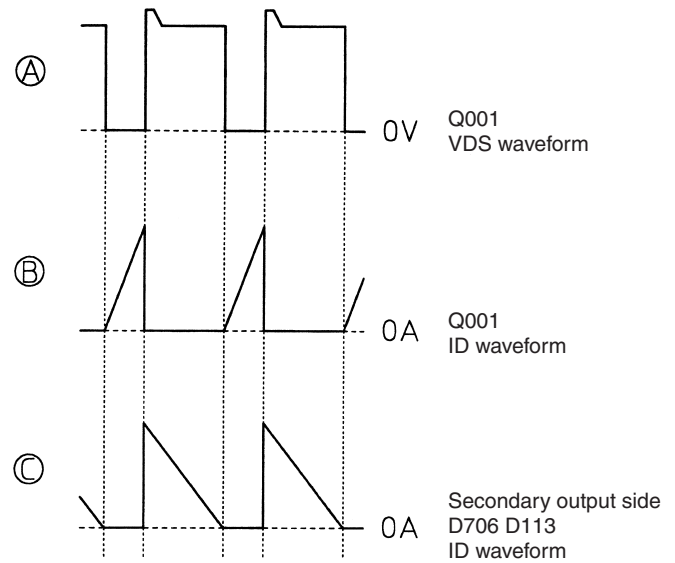


Fig. (5) Ringing choke converter operation waveforms

When Q001 turns off, energy accumulated in the transformer (T001) flows a current of waveform C in the path indicated with dotted line as shown in the figure above through D101 and D113 and dissipates to the secondary output side. When this energy is exhausted, the current flowing through D101 and D113 turns off. However, the N_s winding has a slight remaining energy, which generates a voltage in the base winding N_c and turns on Q001 again to repeat switching operation, supplying a high frequency power to the secondary side.

(4) Overcurrent protection circuit (Primary side)

The ON period extension due to an increased output load is detected, and the OFF period of Q001 is extended by the control circuit, and energy accumulated in the primary winding of the transformer T001 is reduced, providing protection against an overcurrent. Refer to Fig. (4).

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

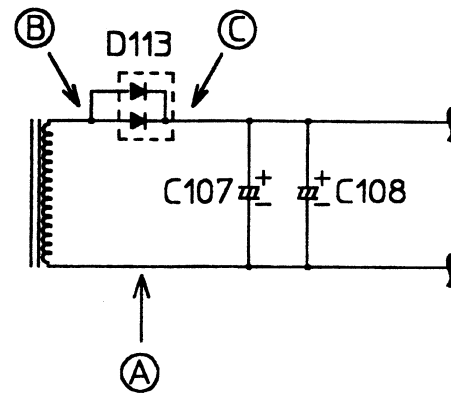


fig (6) Rectifying/smoothing circuit

The high frequency pulse generated by the inverter circuit is decreased by the converter transformer, rectified by the high frequency diode D113, and smoothed by C107 and C108.

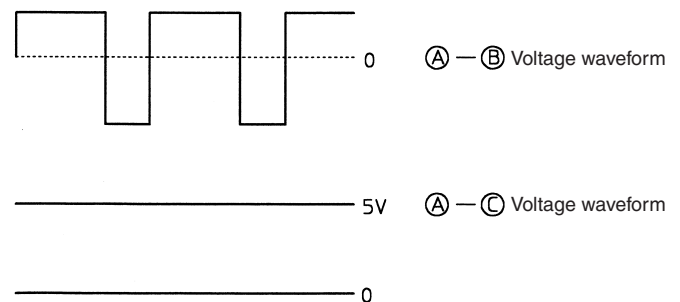
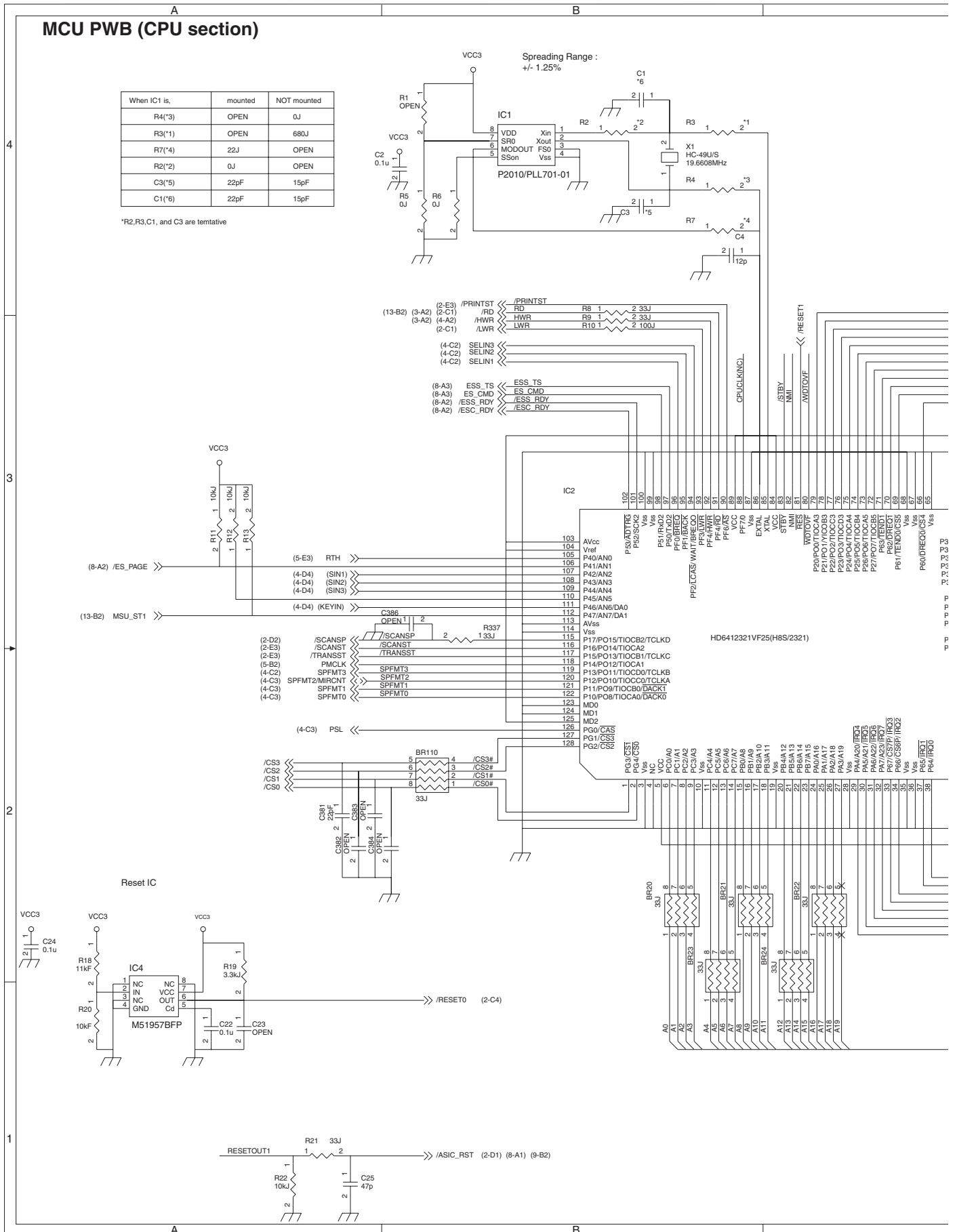
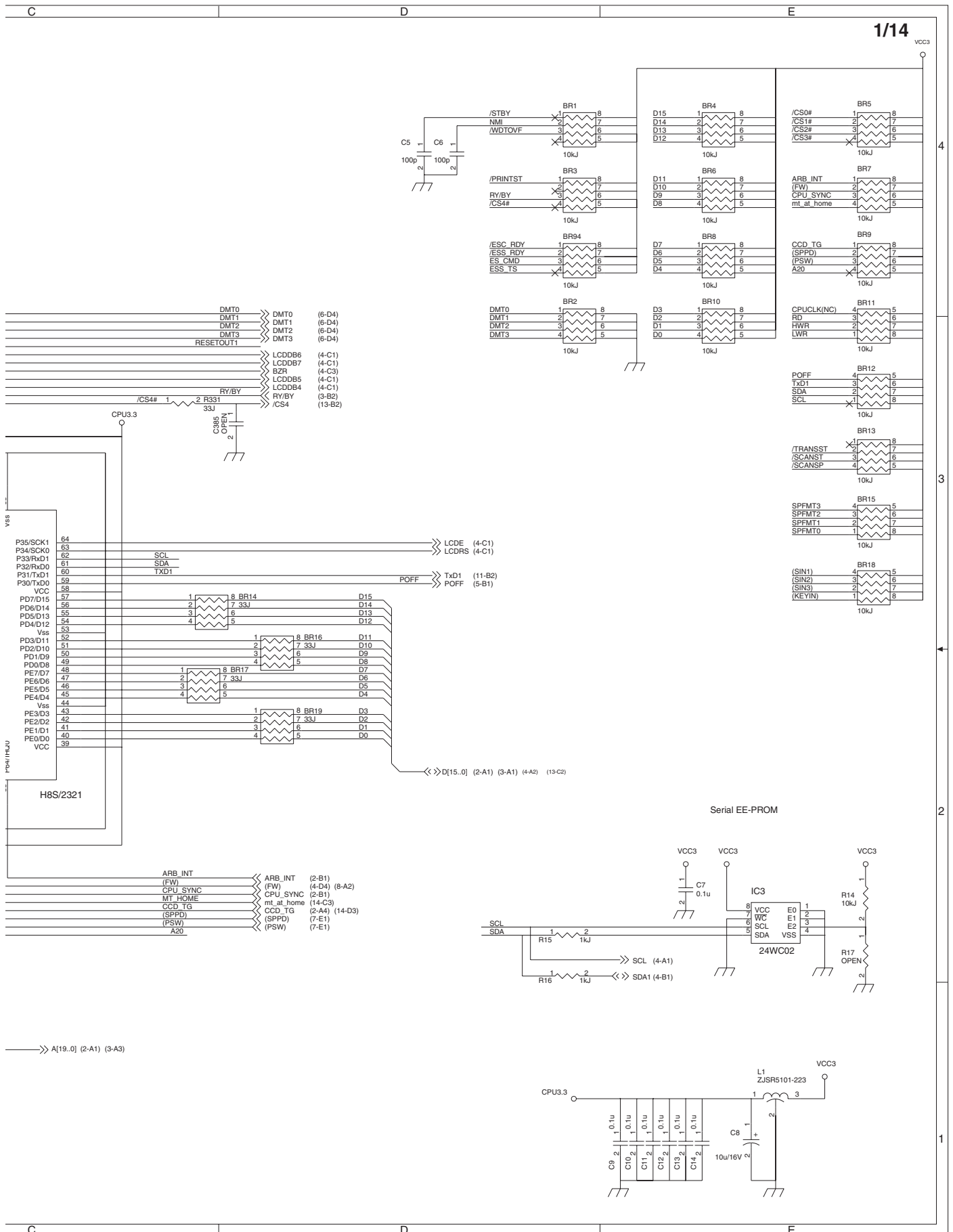


fig (7) +5V rectifying/smoothing circuit voltage waveform

[13] CIRCUIT DIAGRAM

1. MCU PWB

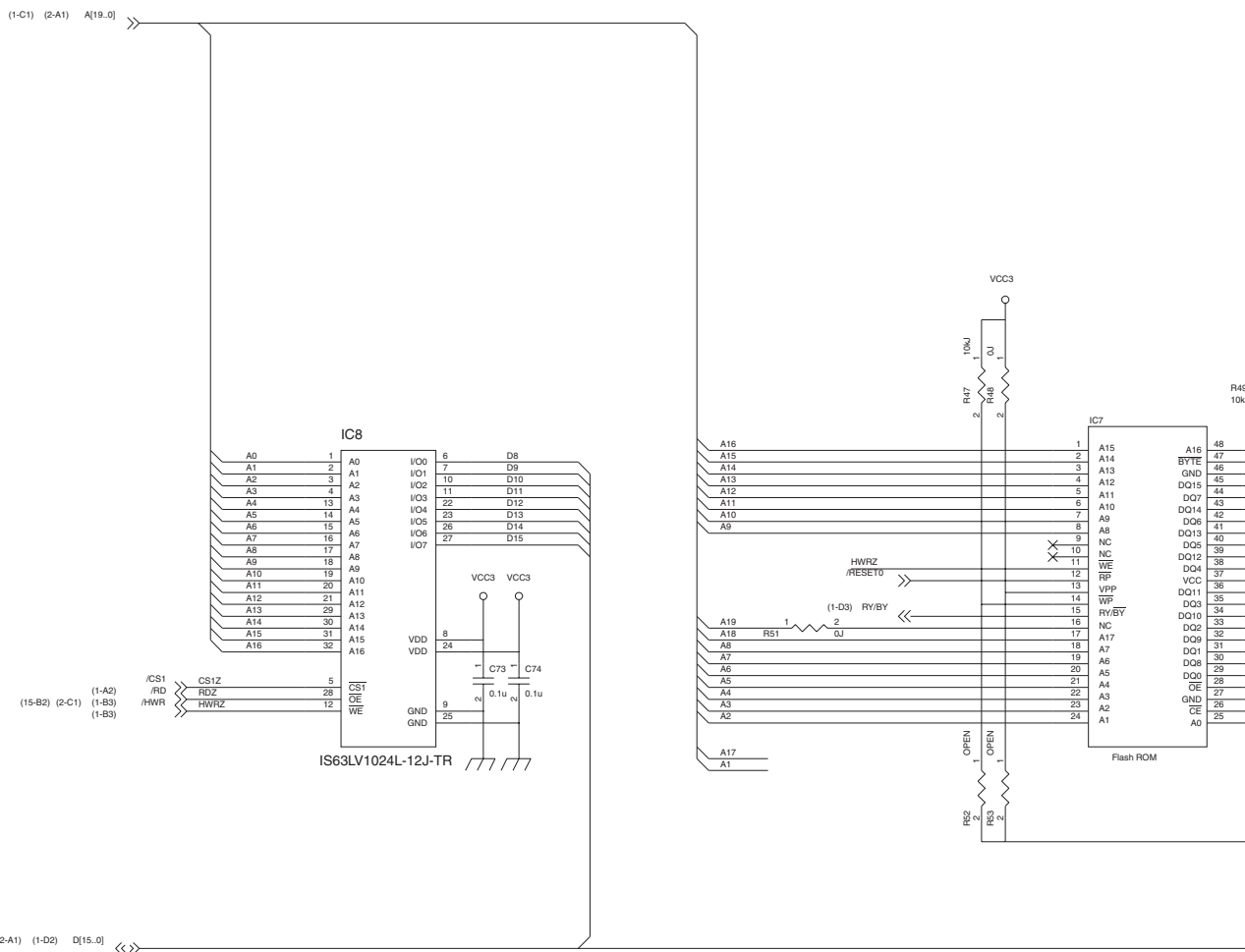




AL-1651CS CIRCUIT DIAGRAM 13 - 2

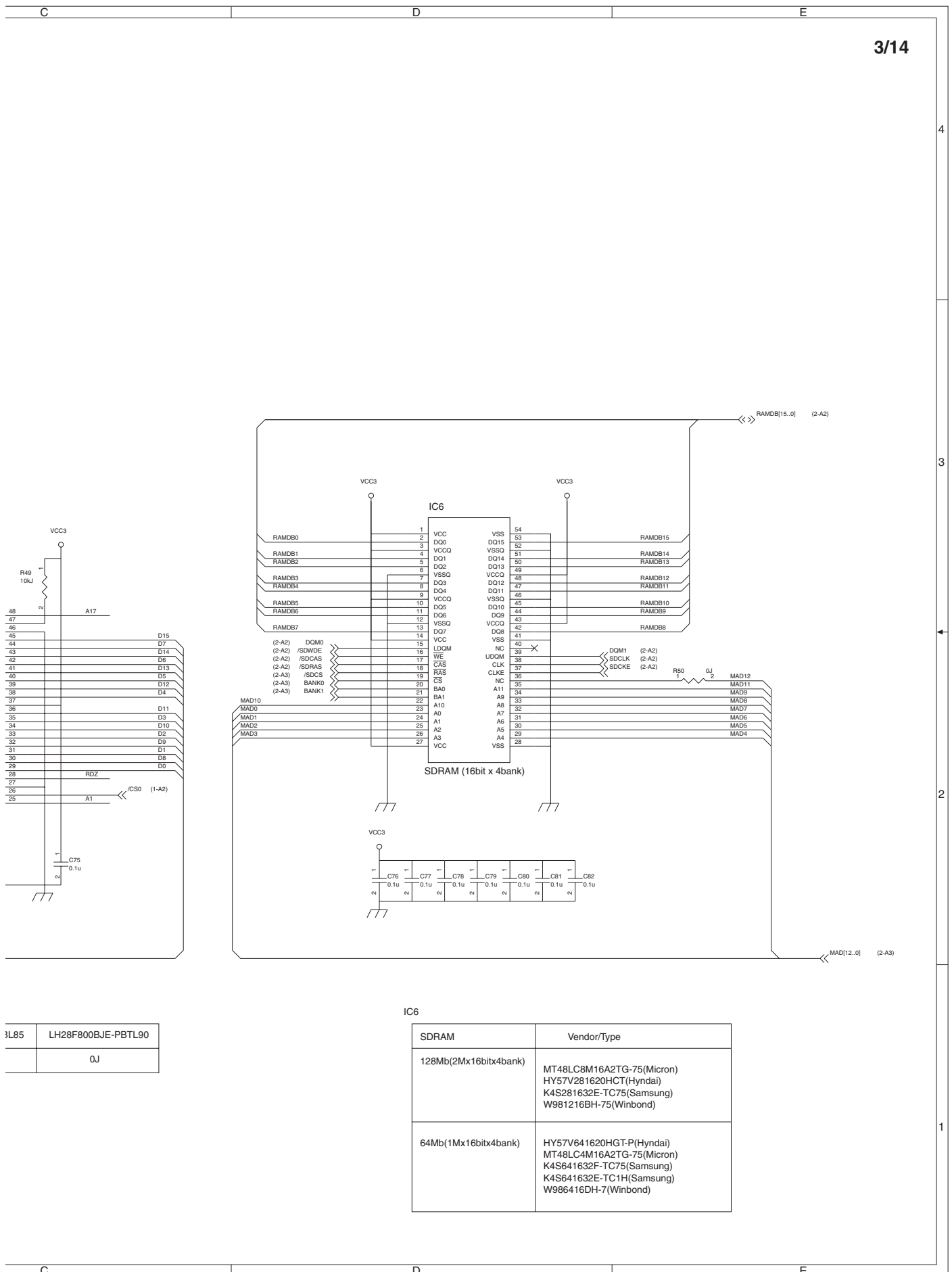


MCU PWB (Memory section)



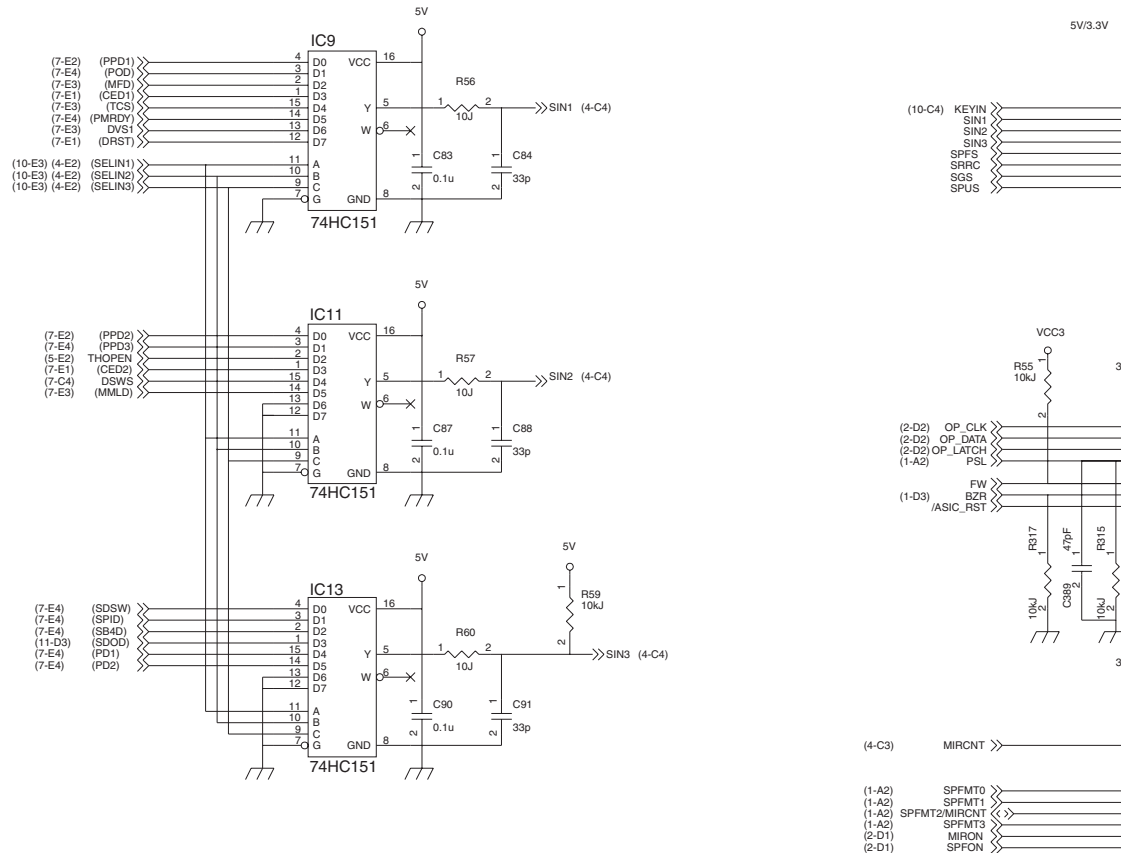
Flash ROM

IC7	LH28F400BVE-BL85
R51	OPEN

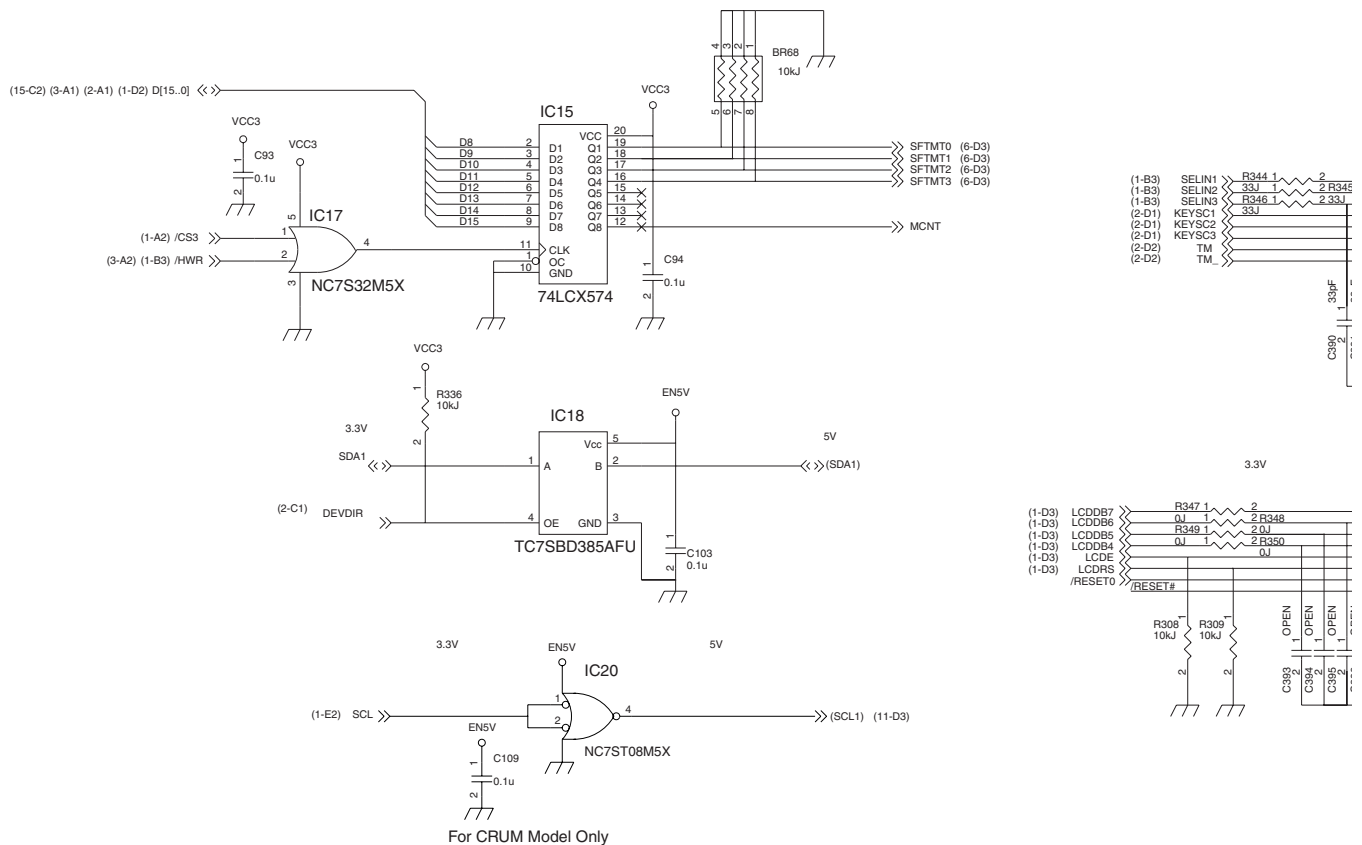


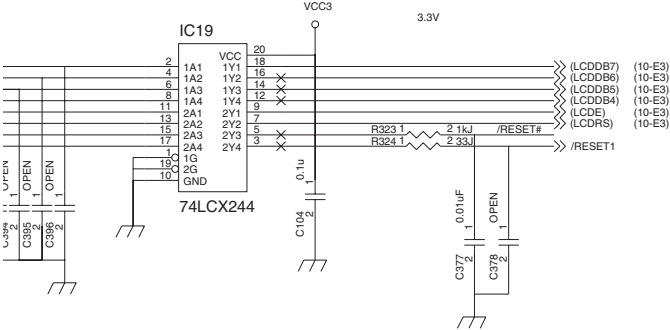
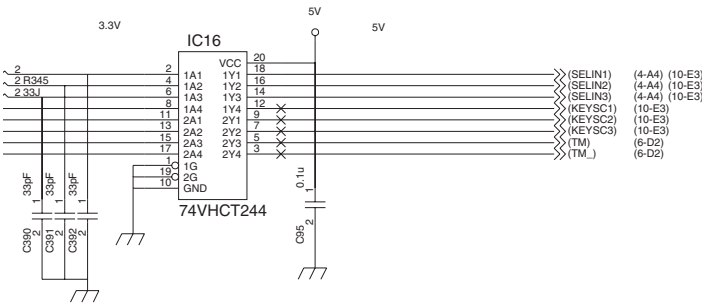
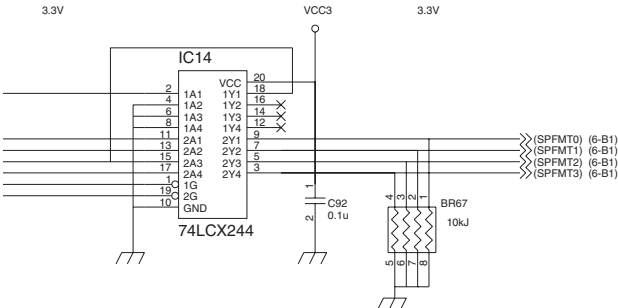
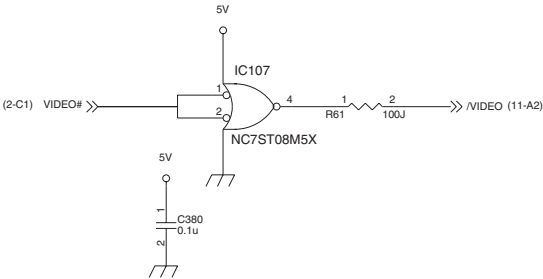
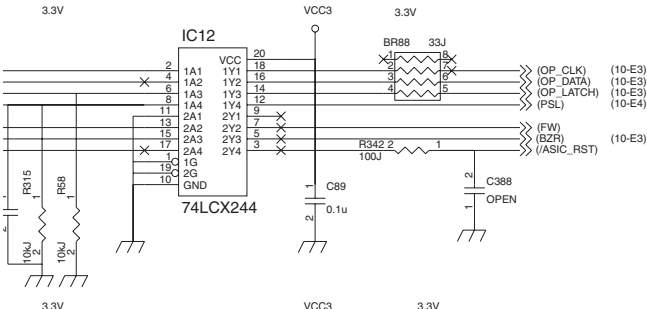
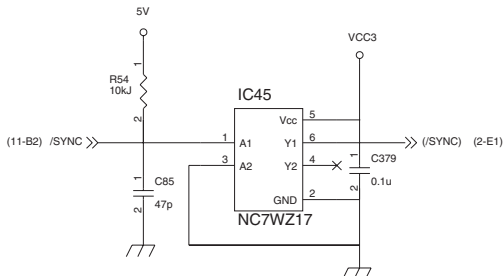
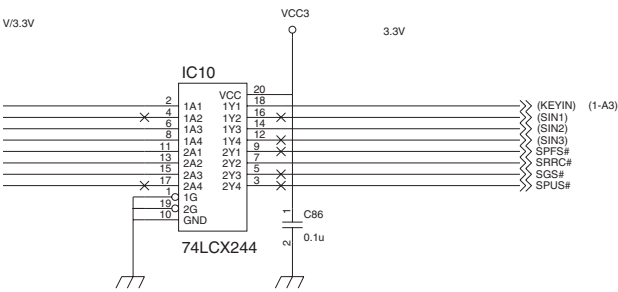
MCU PWB (Driver section 1)

Digital Input Multiplexer

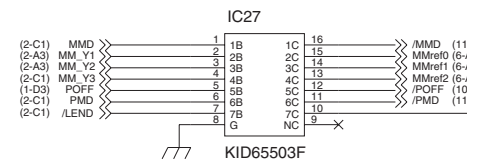
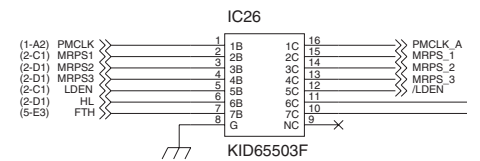
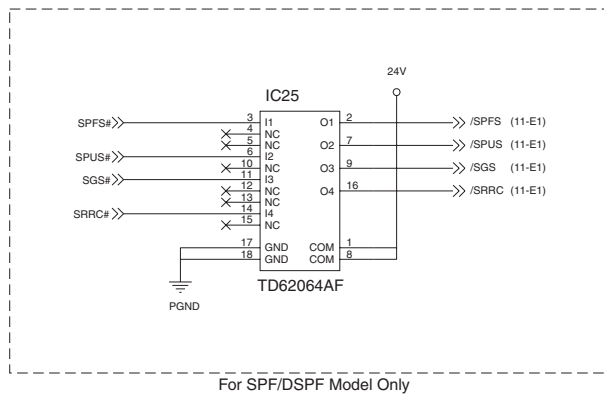
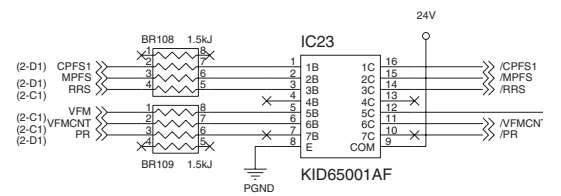
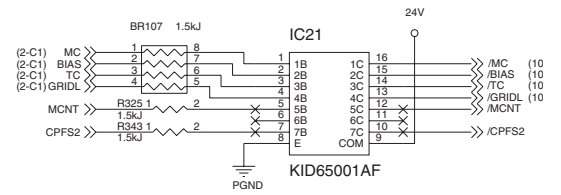


Extension Digital Output Port

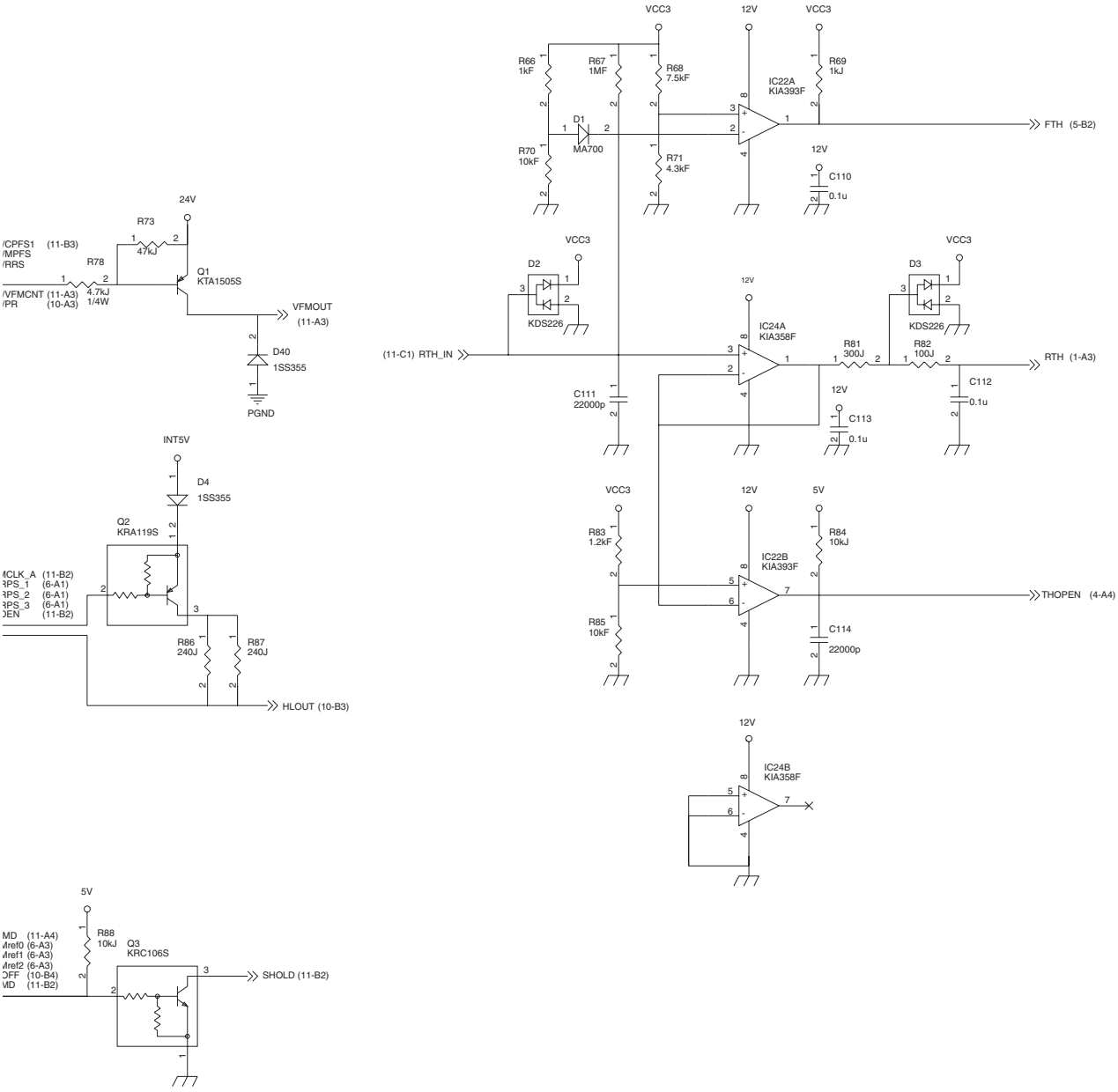




MCU PWB (Driver section 2)

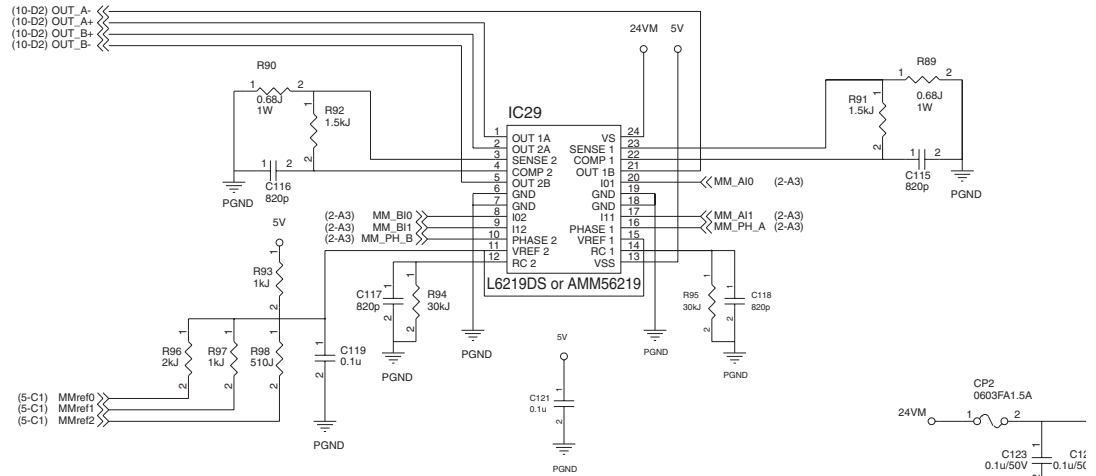


C (10-B4)
AS (10-A4)
> (10-B4)
3IDL (10-A4)
CNT
FS2

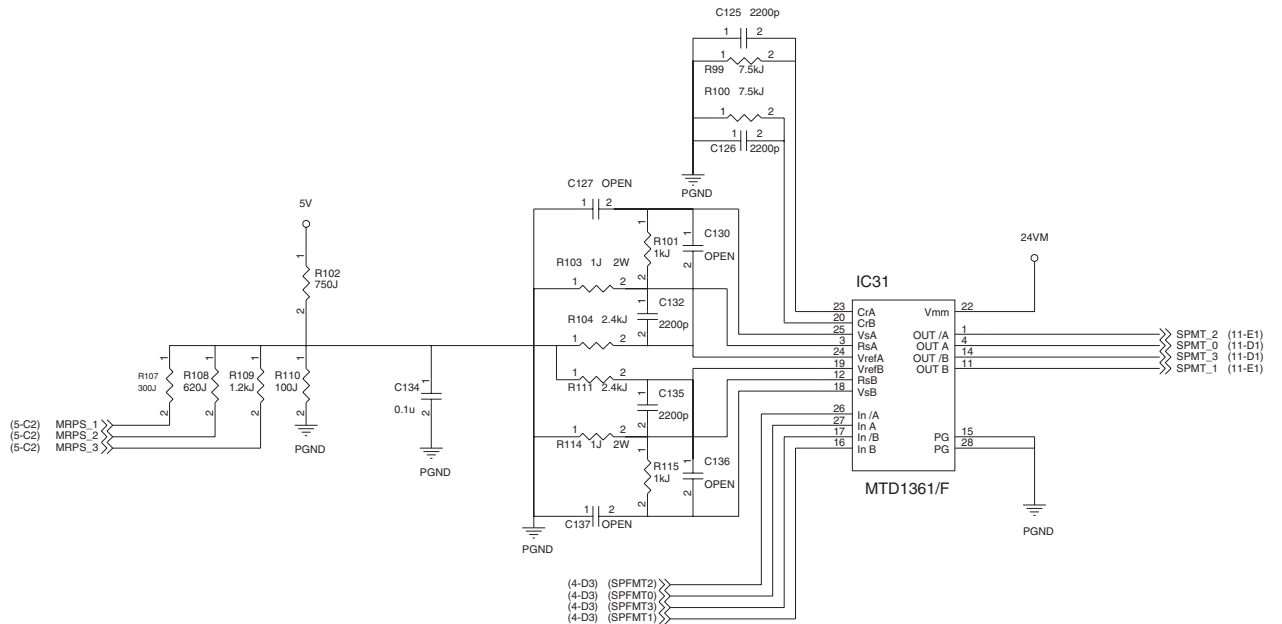


MCU PWB (Driver section 3)

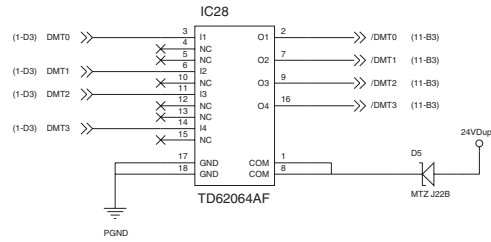
Scanner Motor Driver



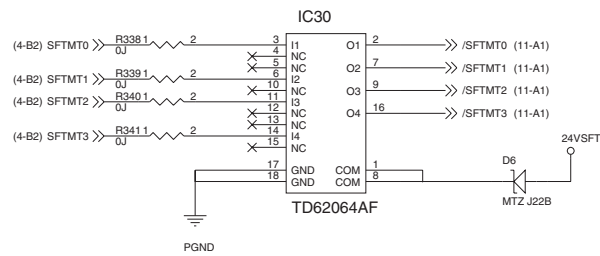
SPF Motor Driver



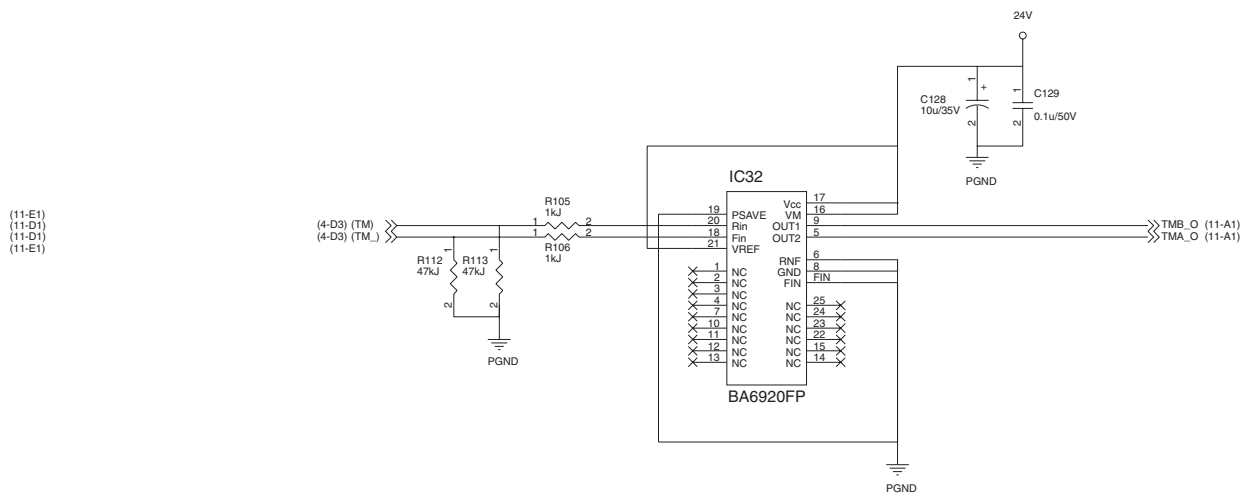
Duplex Motor Driver



Shifter Motor Driver



Tonner Motor Driver



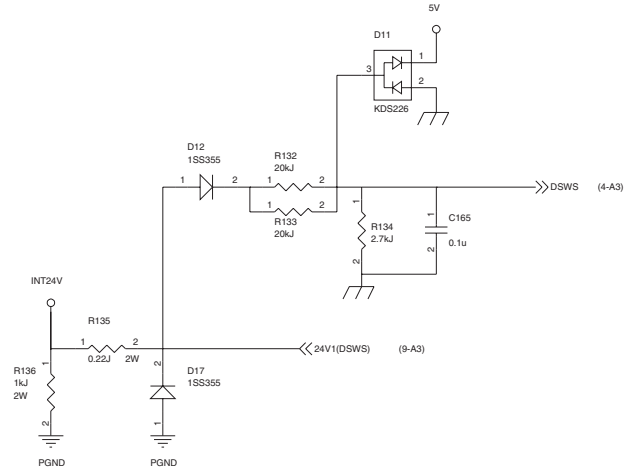
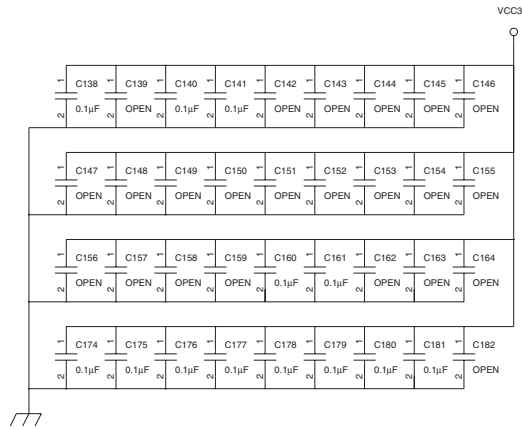
4

3

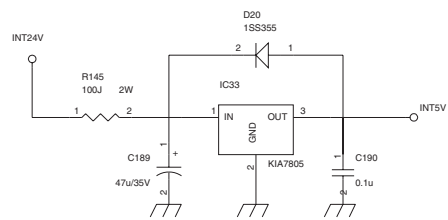
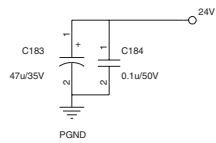
2

1

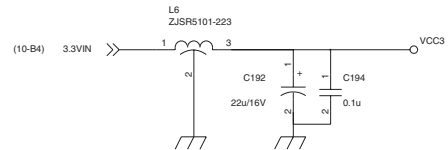
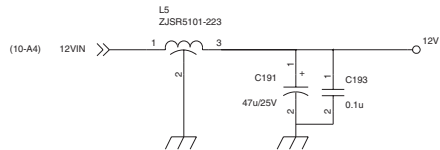
MCU PWB (Noise filter/Pull-up section)



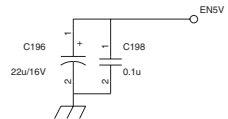
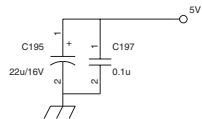
(1*)
(1*)
(1*)
(1*)
(1*)



(1*)
(1*)
(1*)



(1*)
(1*)
(1*)
(1*)

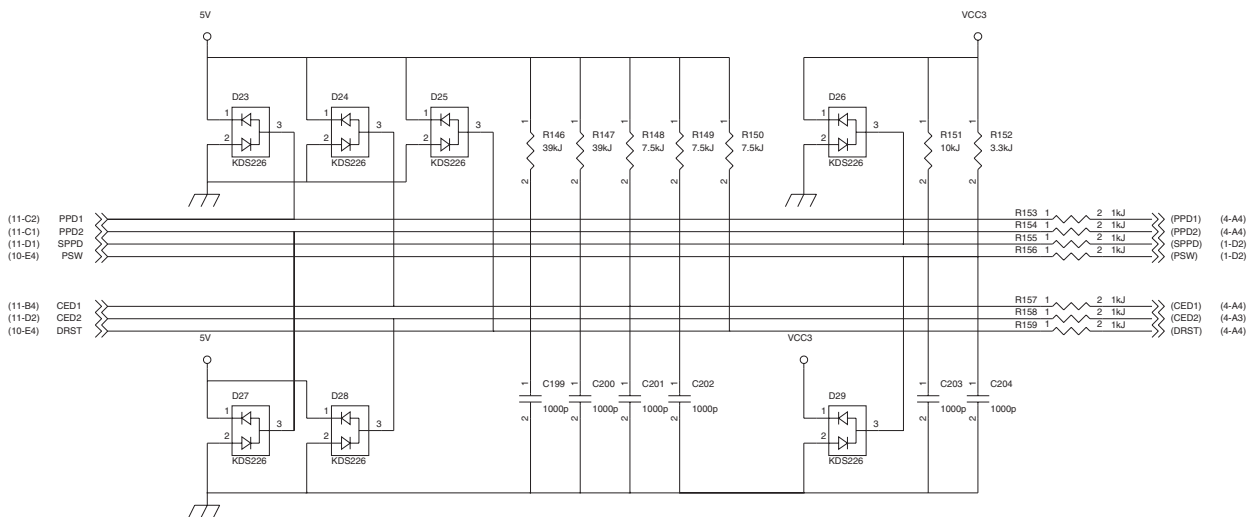
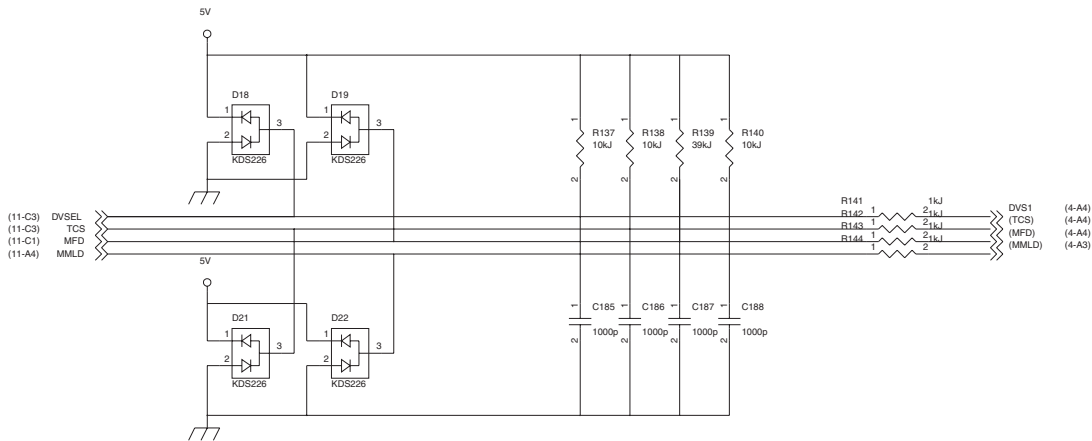
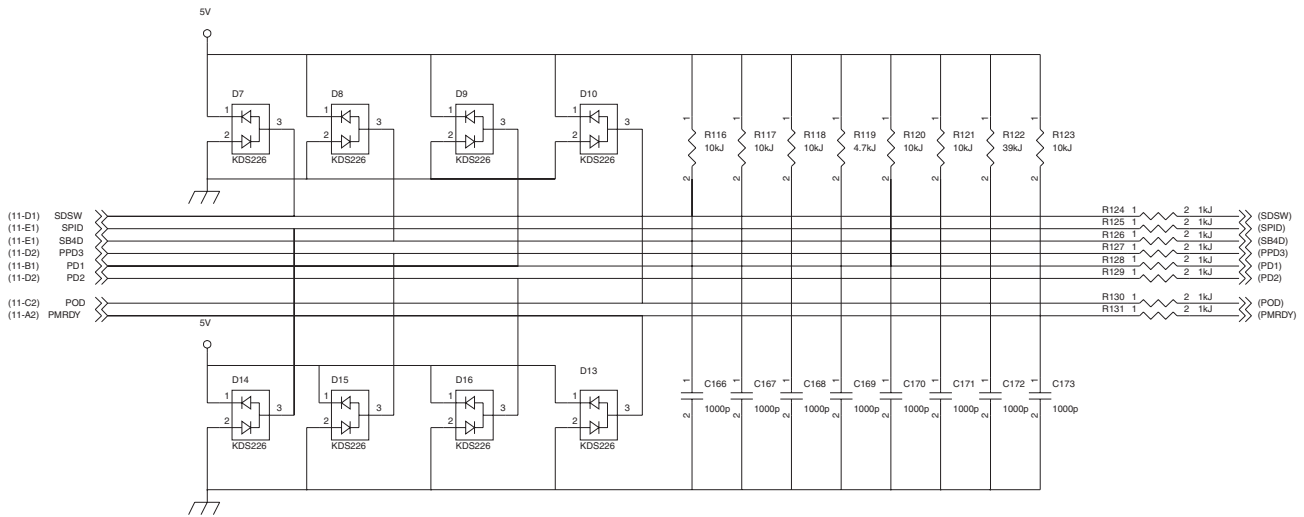


(1*)
(1*)
(1*)

D

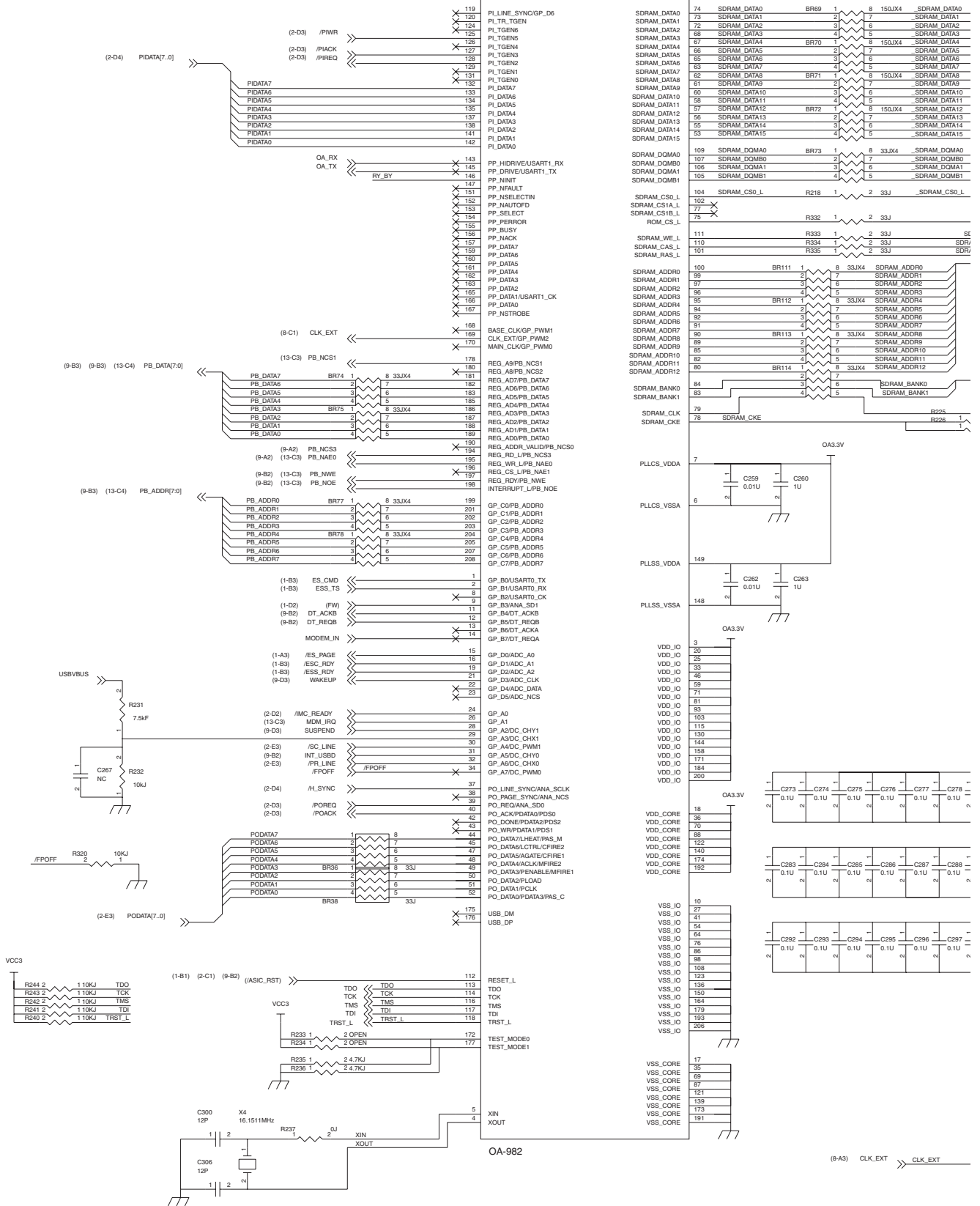
E

7/14



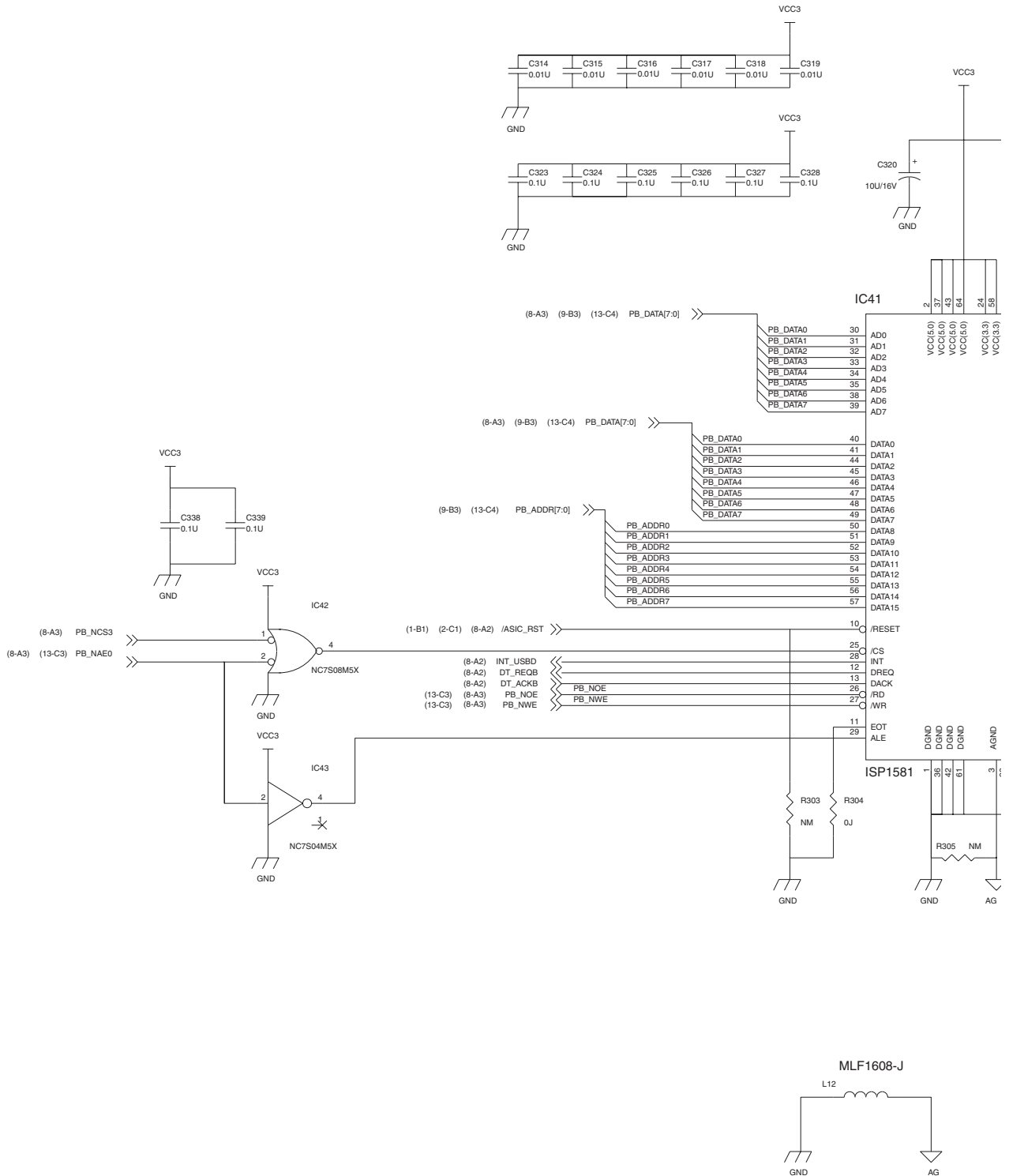
MCU PWB (IMC2 section 1/2)

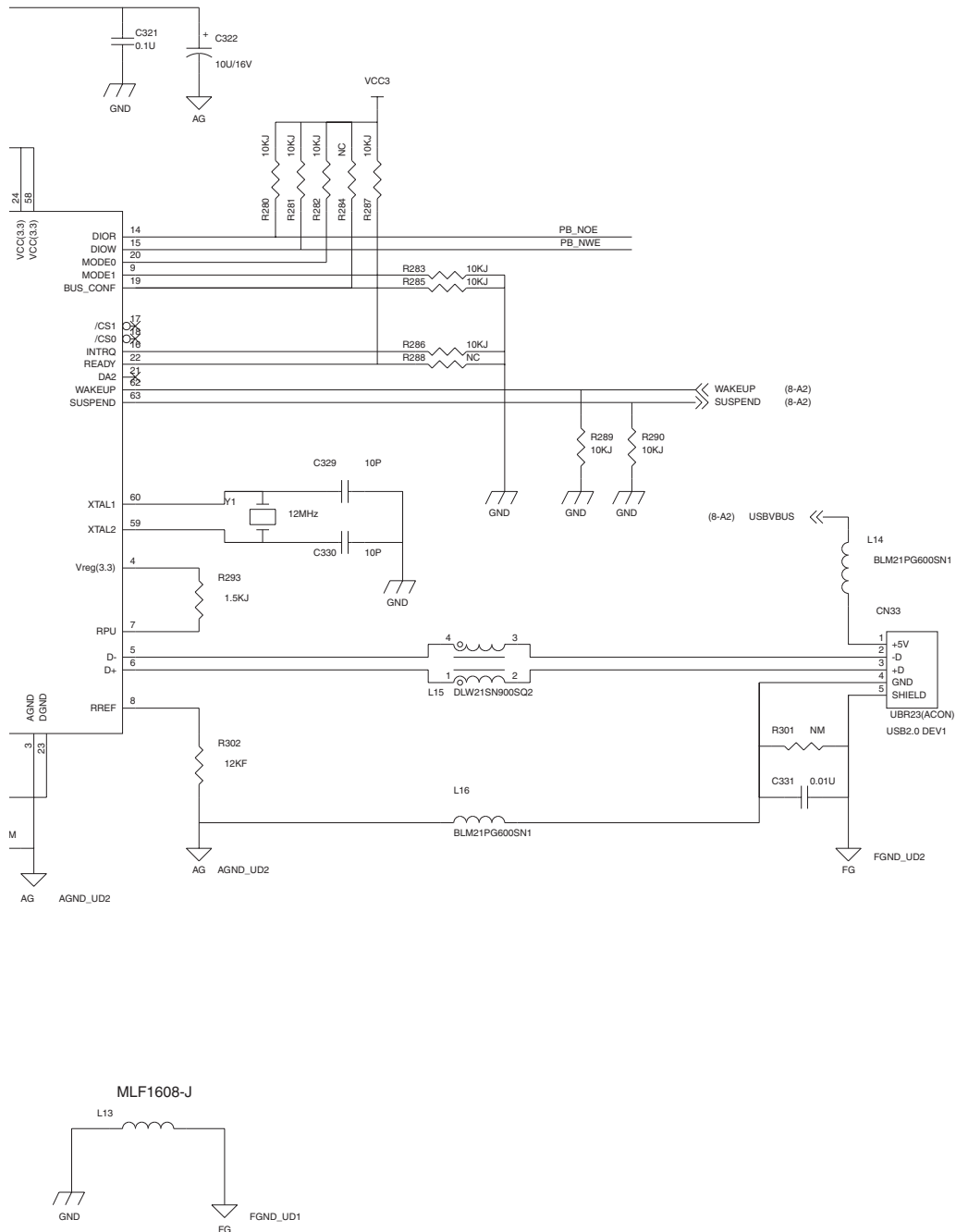
IC37



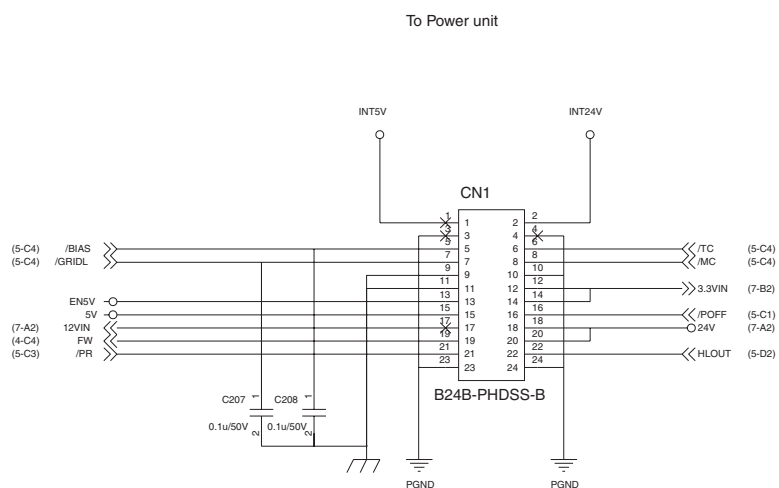


MCU PWB (IMC2 USB2.0 section 2/2)

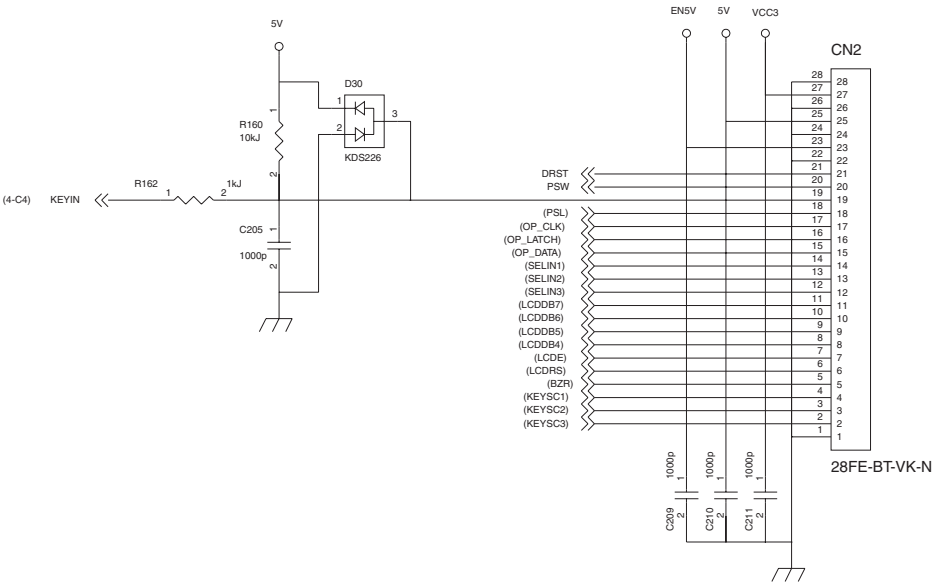




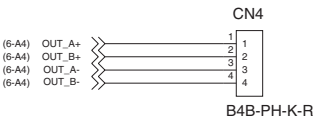
MCU PWB (Connector section 1)



To Operational PWB



To Mirror motor



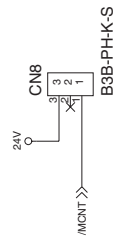
11/14



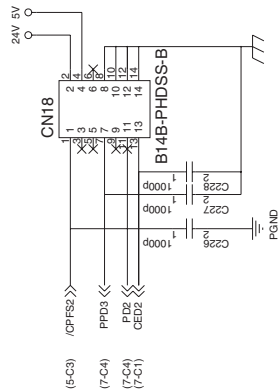
MCU PWB (Connector section 3)

11/14

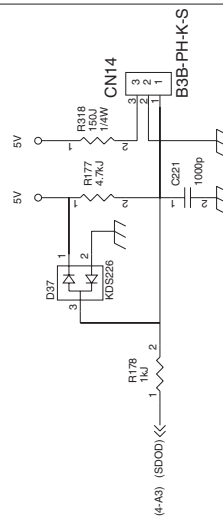
To Mechanical COUNTER



To 2nd. cassette



To Cover open detect



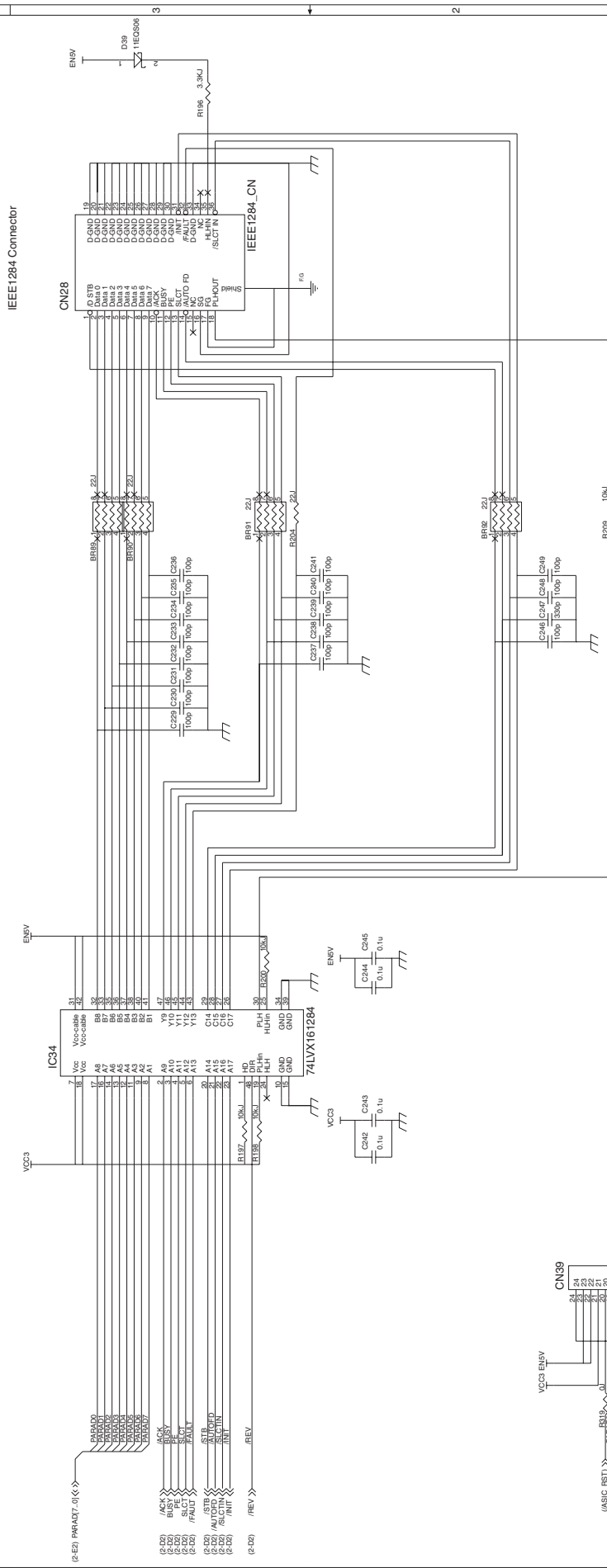
For SP7/DSPF Model Only

MCU PWB (IEEE1284Interface section)

12/14

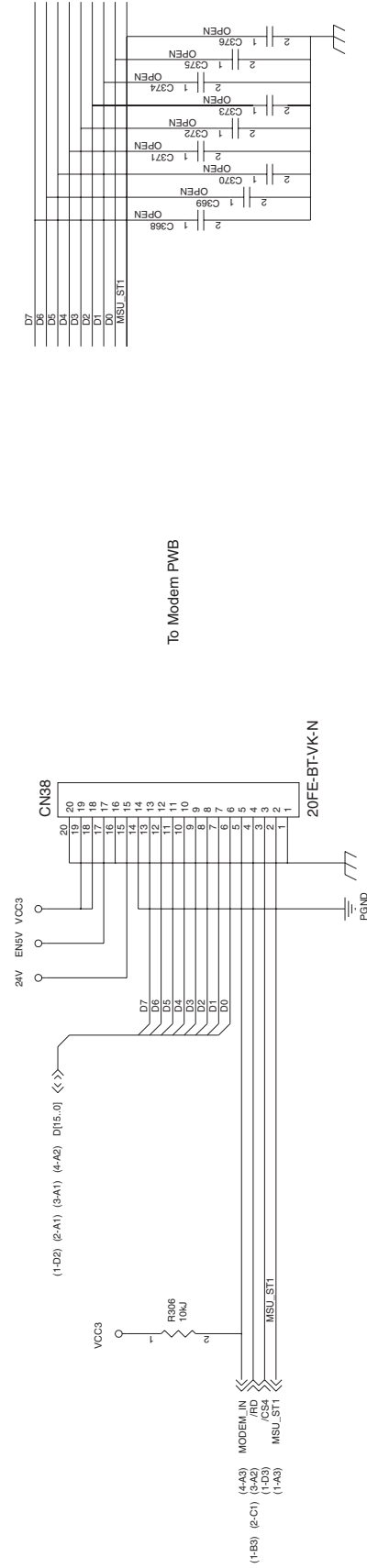
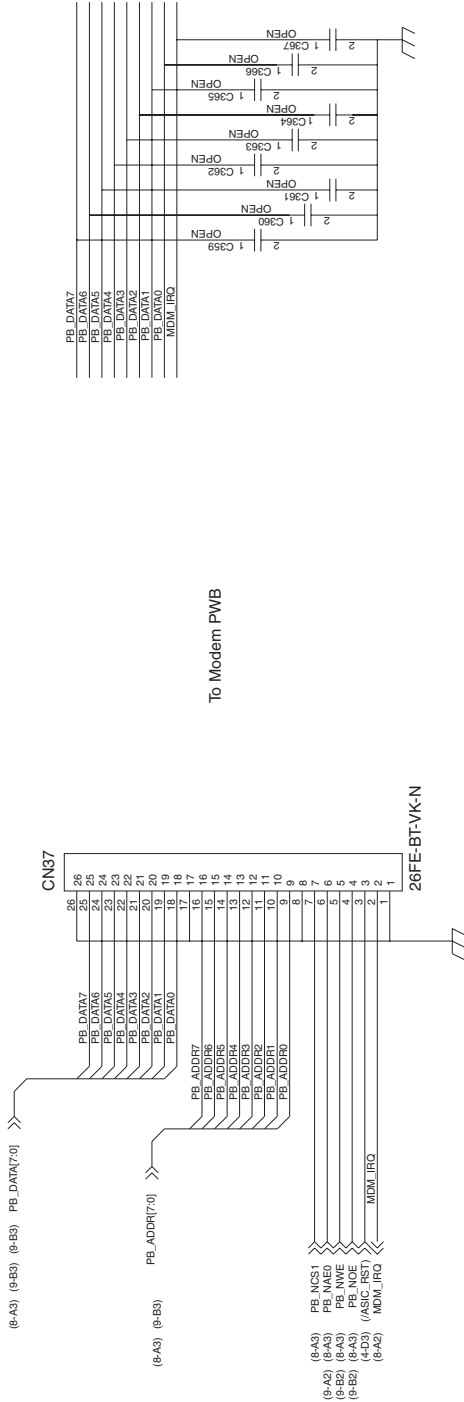
IEEE1284 Driver/Receiver

IEEE1284 Connector



MCU PWB (Modem I/F Connector)

13/14

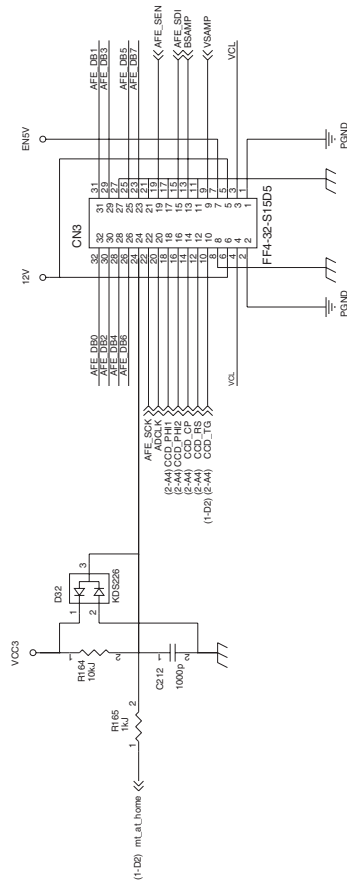
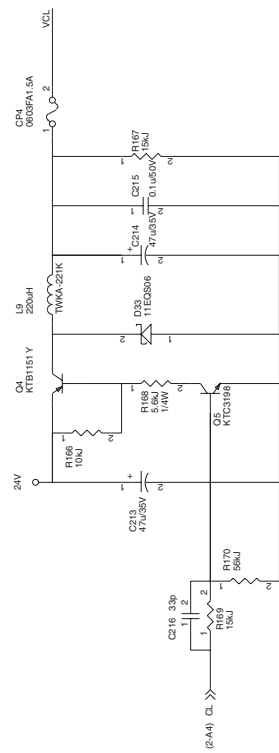


MCU PWB (Scanner I/F section)

14/14

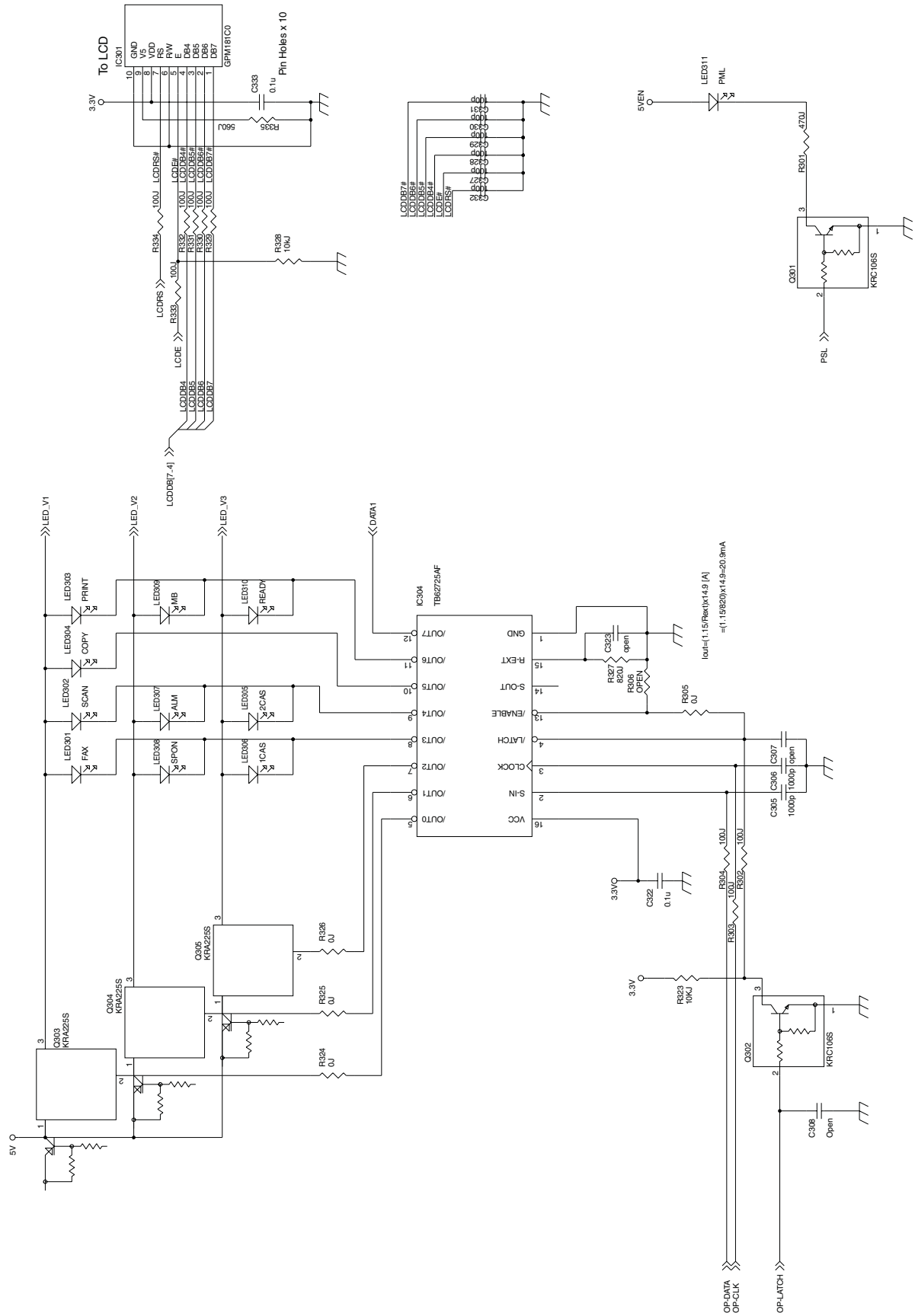
To Scanner unit

Oxy Lamp Inverter



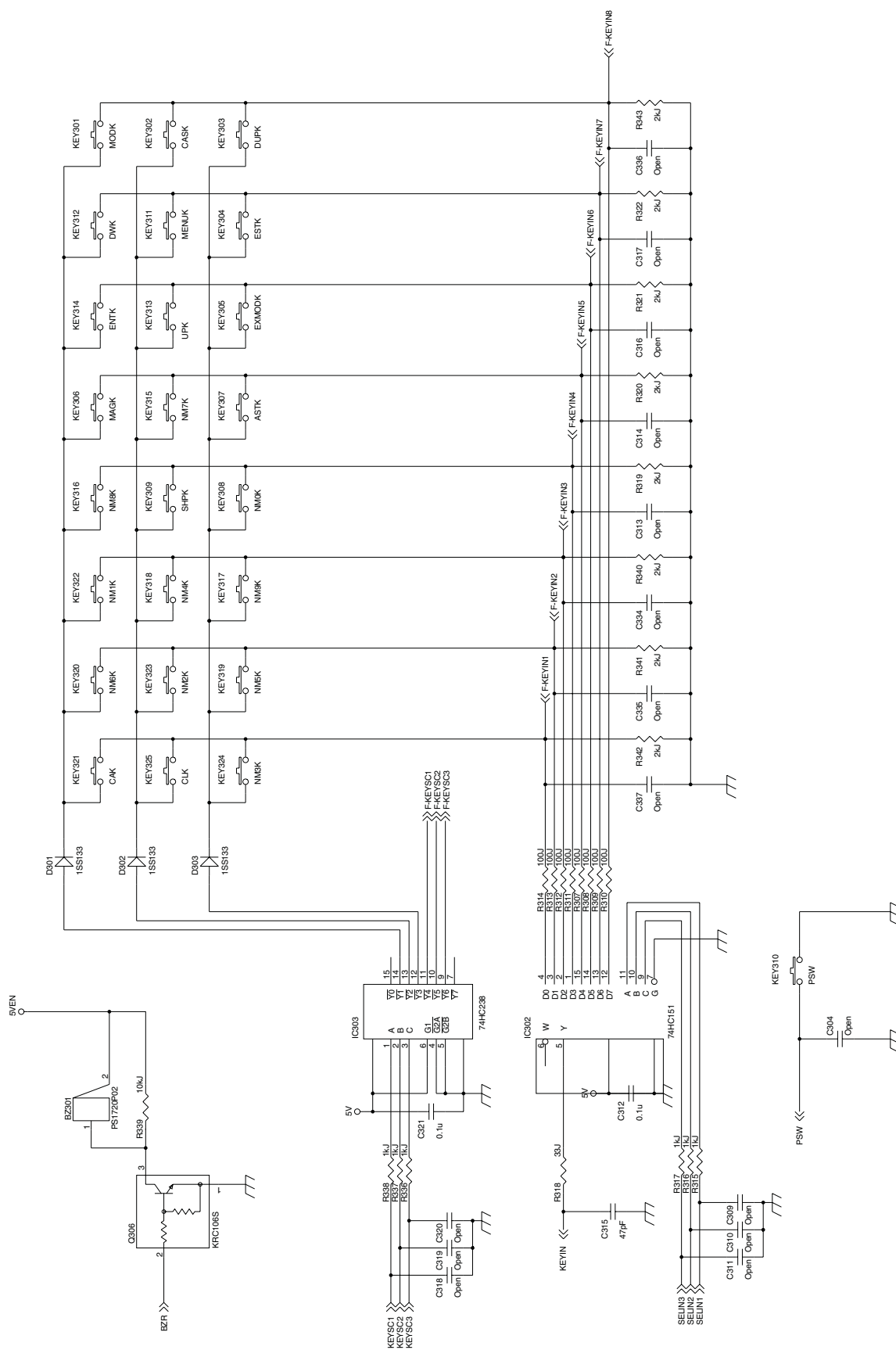
OPERATION PWB (LED/LCD Section)

AL-1651CS CIRCUIT DIAGRAM 13 - 26



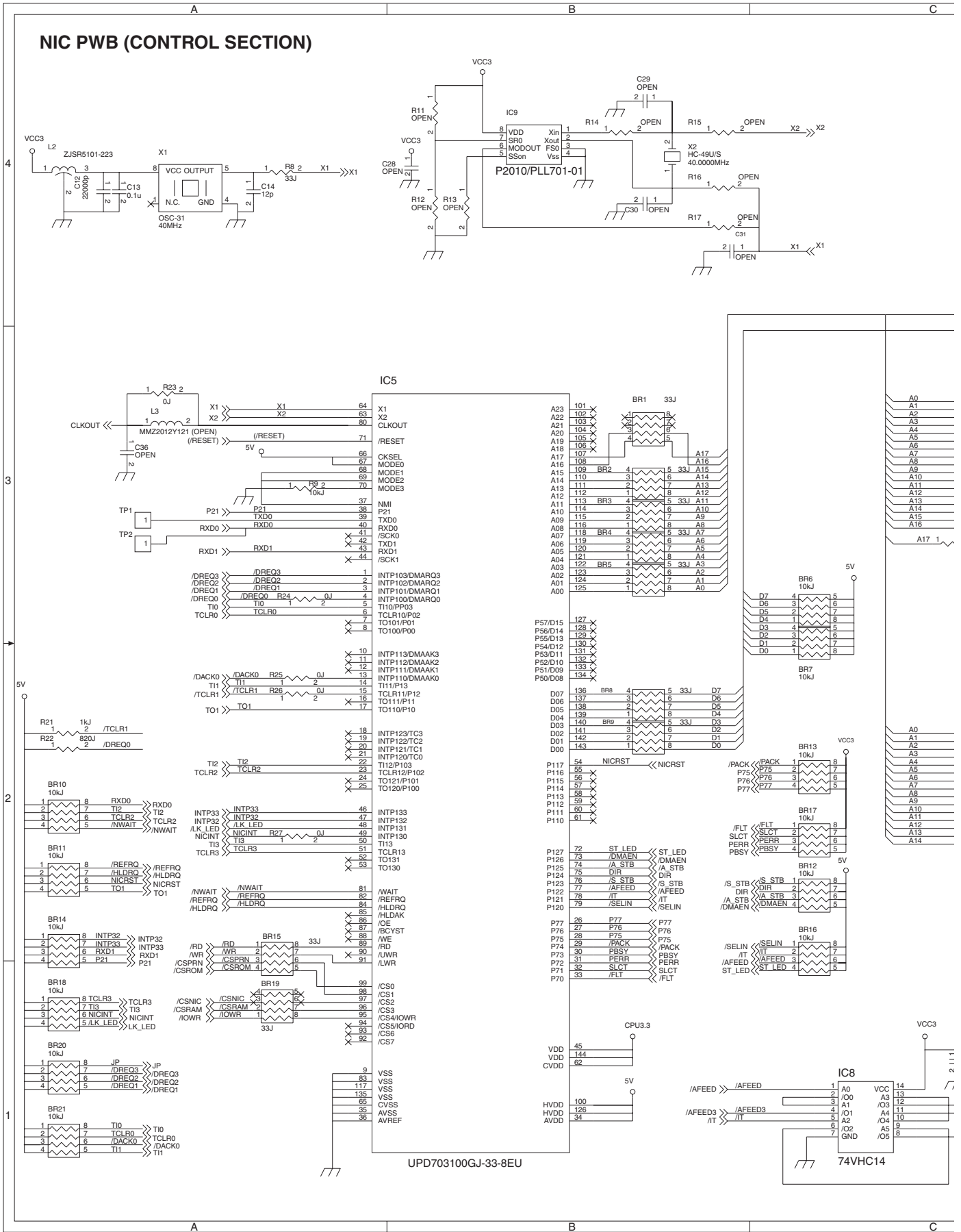
OPERATION PWB (KEY / Buzzer Section)

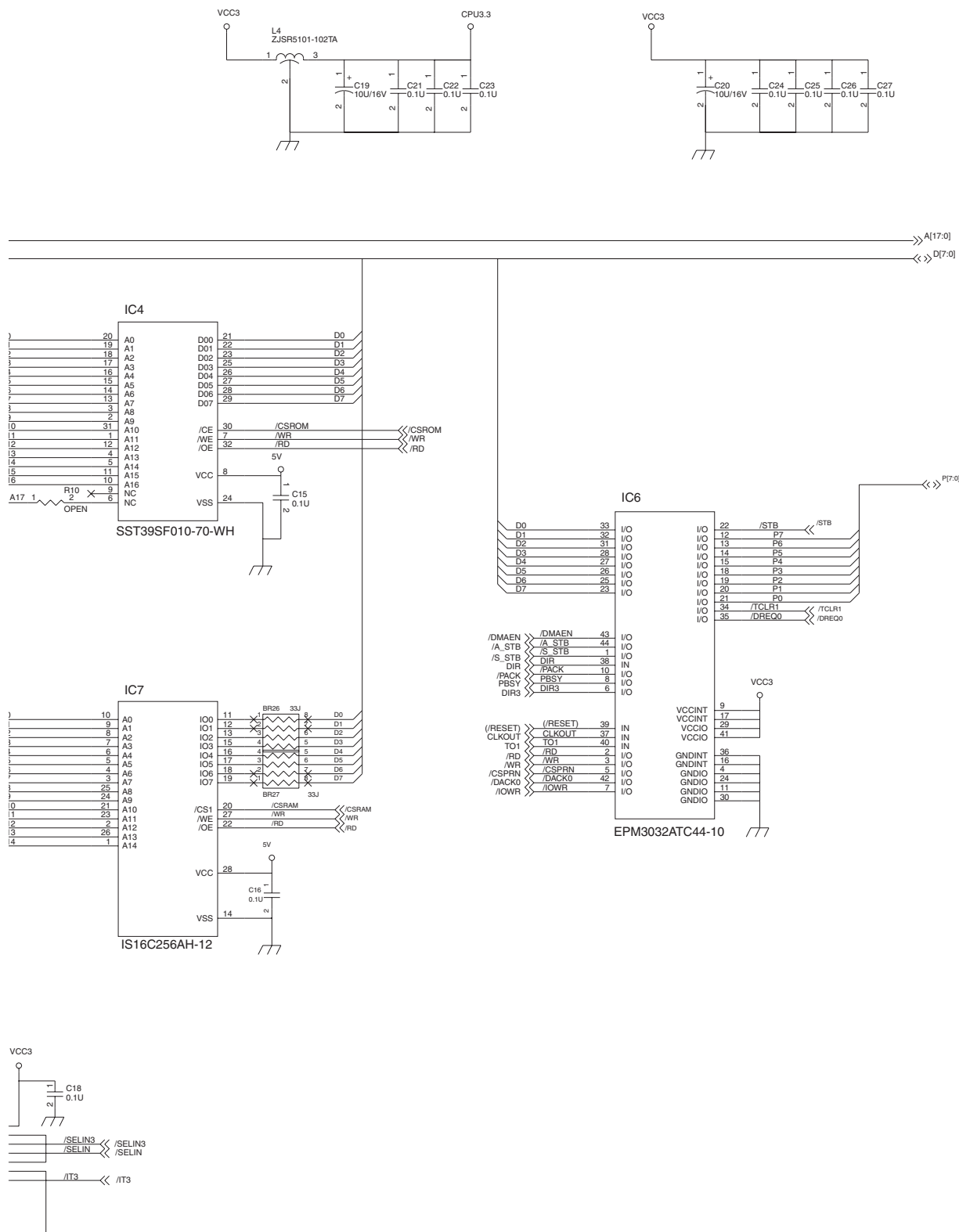
2/3



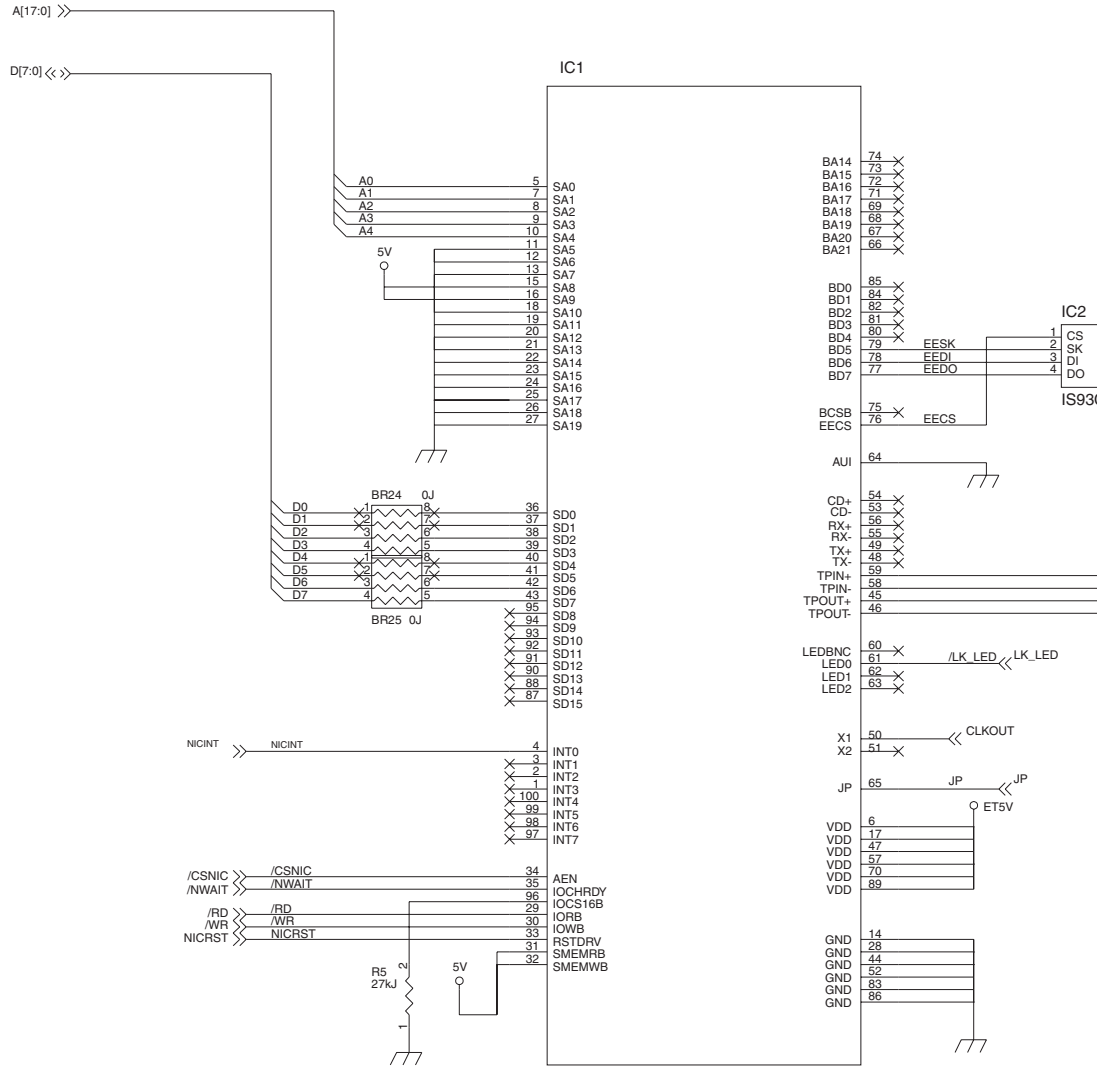


3. NIC PWB

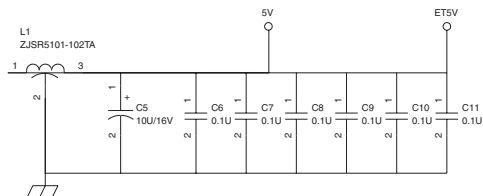


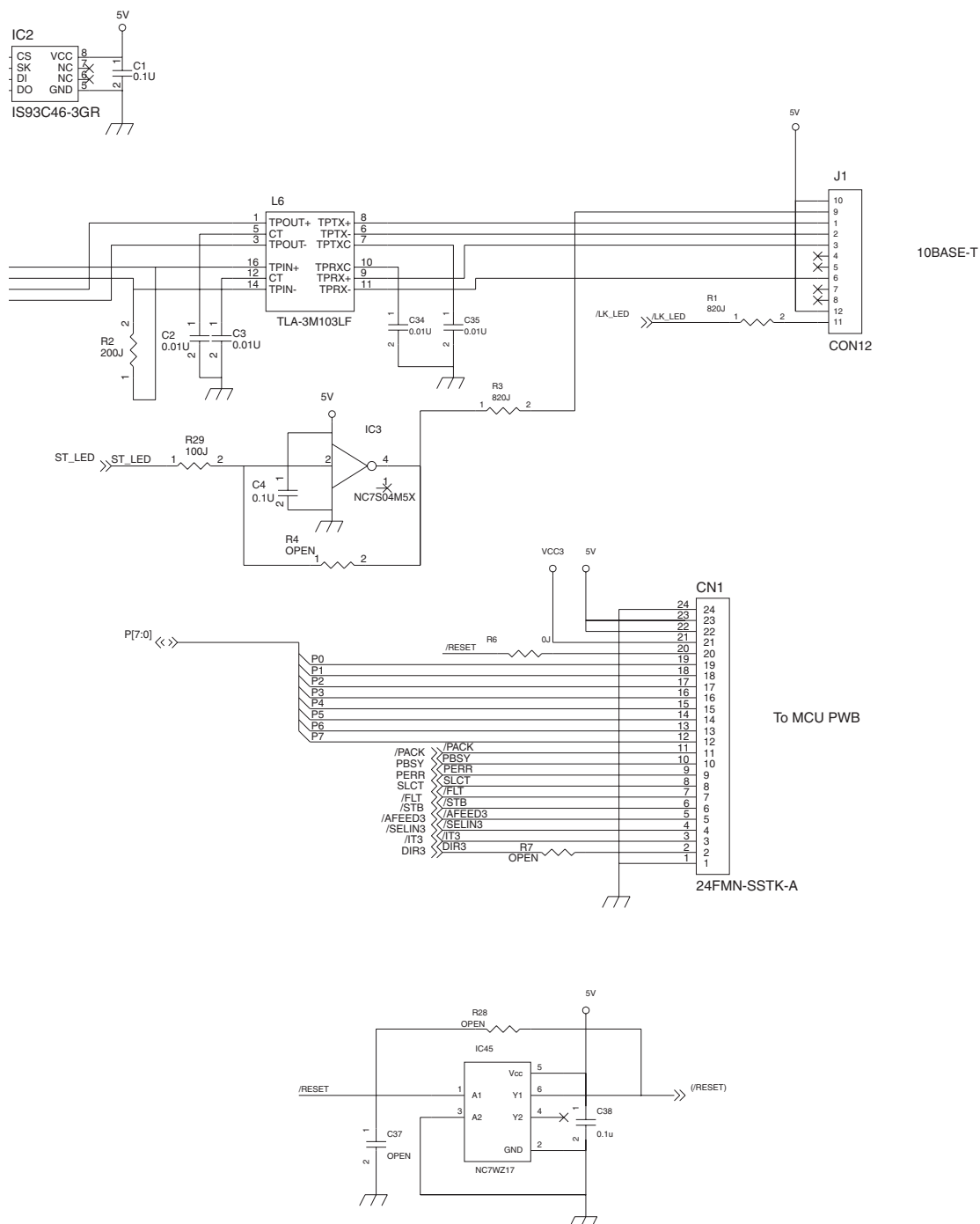


NIC PWB (ETHERNET SECTION)

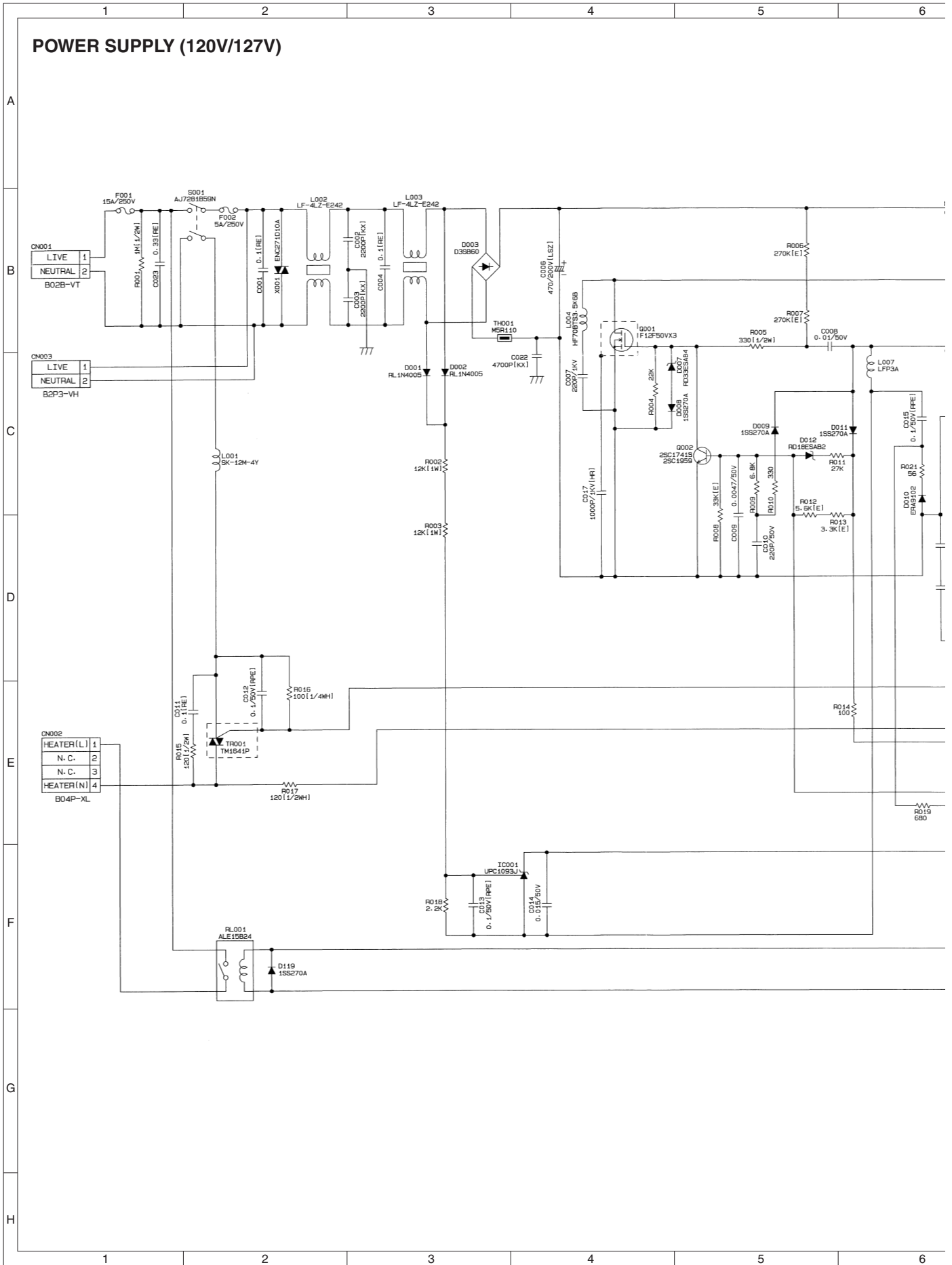


RTL8019AS





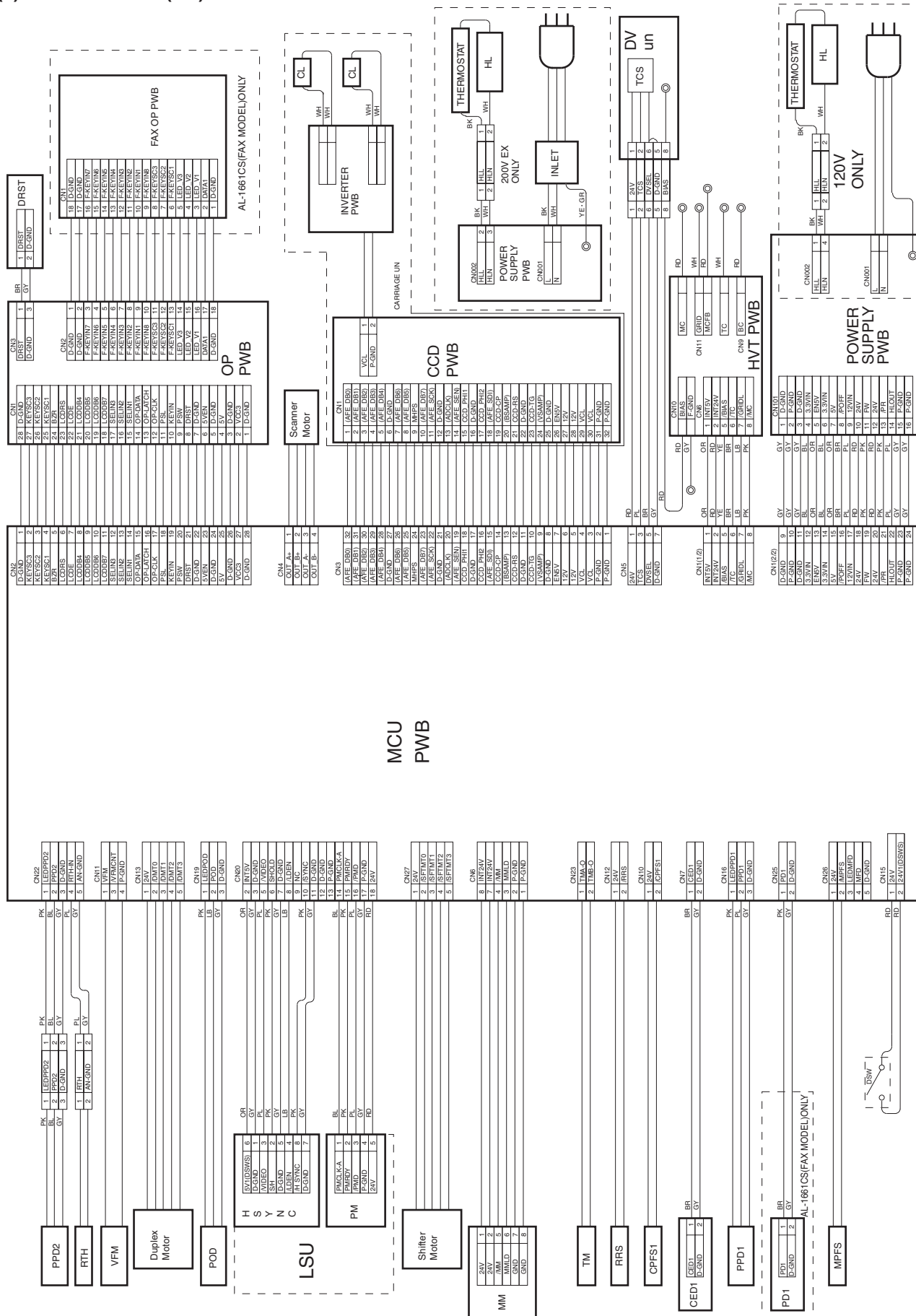
4. POWER SUPPLY



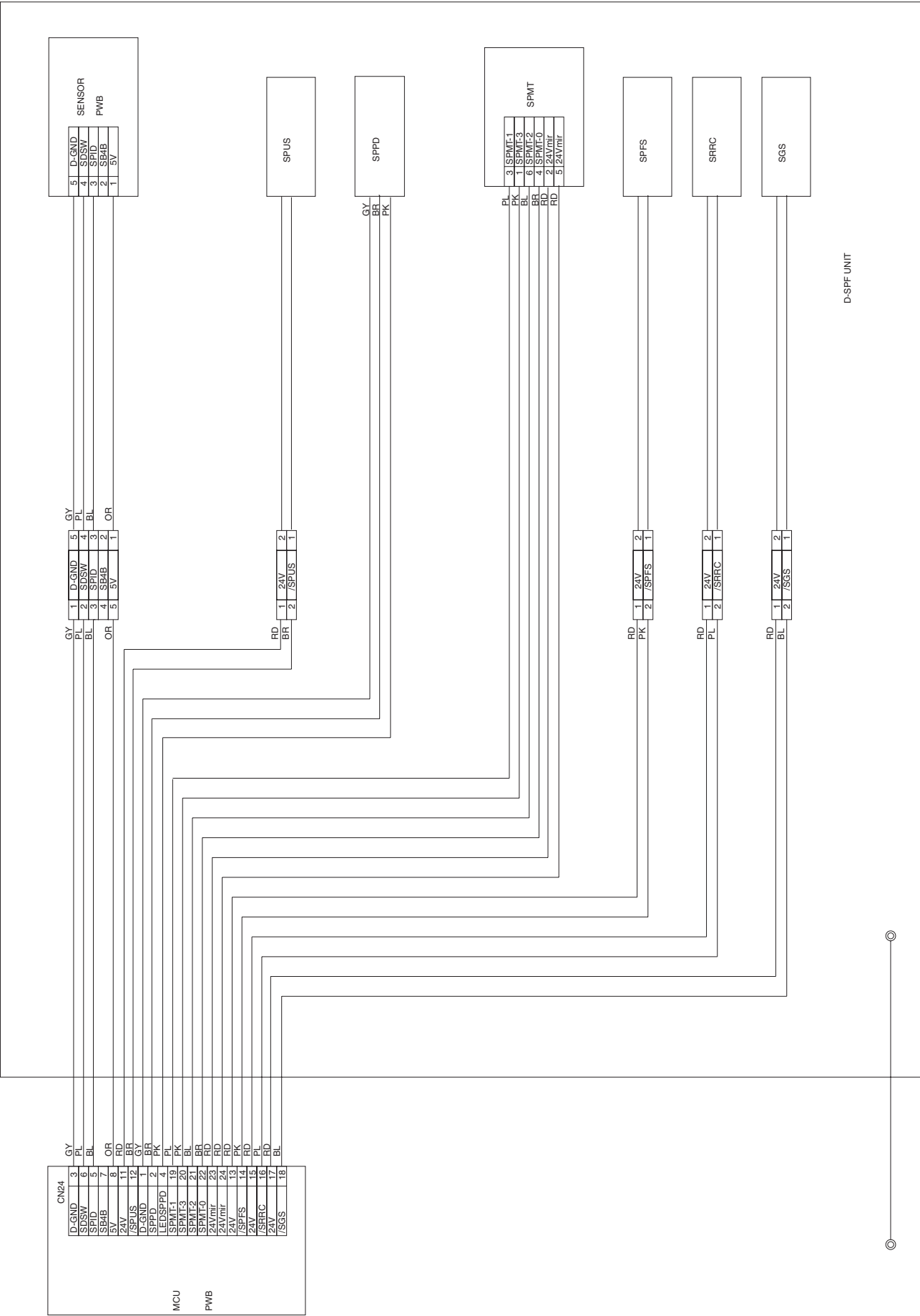


5. ACTUAL WIRING DIAGRAM

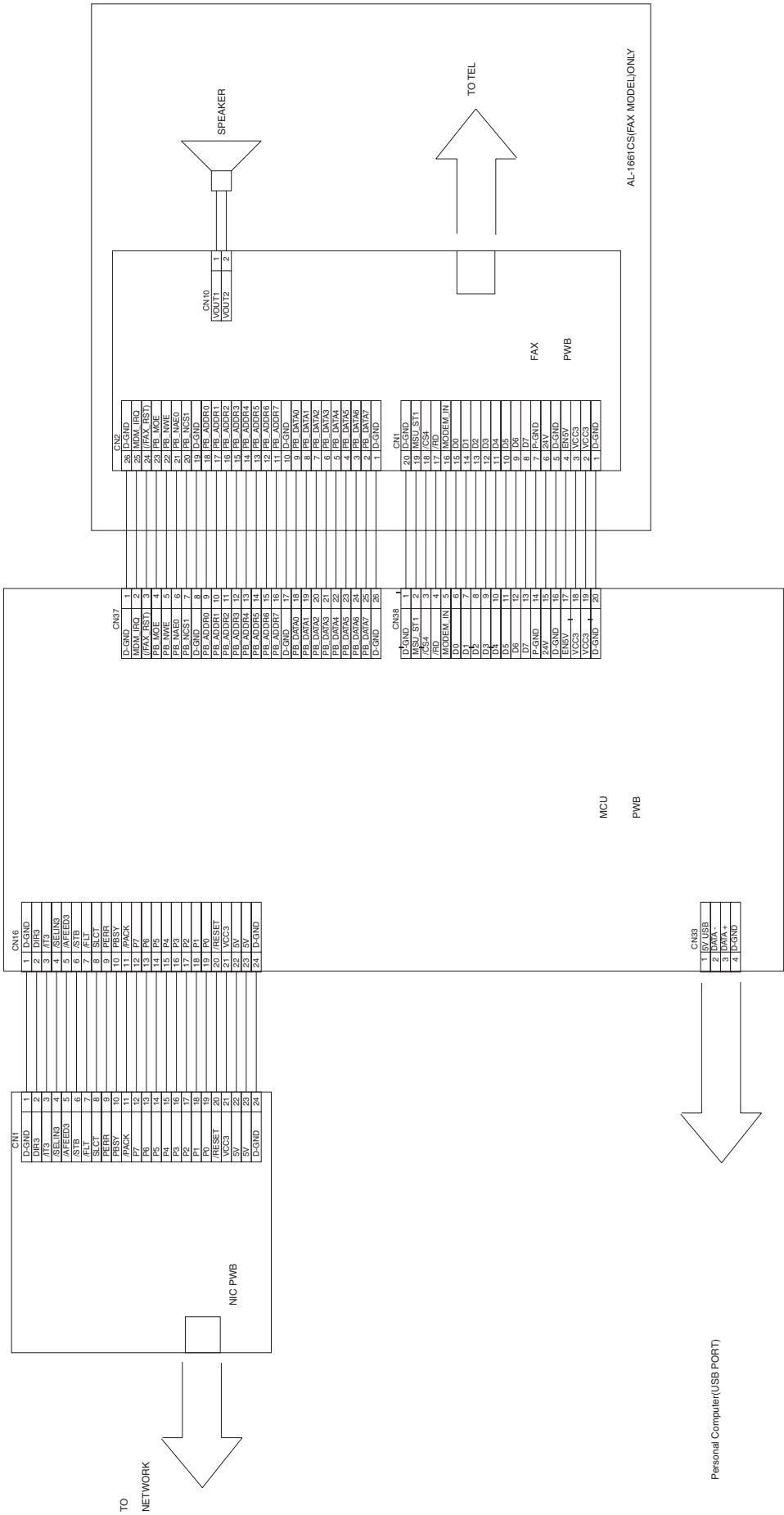
(1) MCU SECTION (1/3)



(2) D-SPF SECTION (2/3)



(3) NIC & FAX SECTION (3/3)



AL-1651CS CIRCUIT DIAGRAM 13 - 37

[14] FIRMWARE DOWNLOAD PROCEDURES

[Preparation]

The maintenance tool can be operated on Windows XP/2000/Me/98SE.

A USB port is required for the PC.

Copy the following files in a same folder.

- MaintenanceTool.exe (← Tool program)
- MaintenanceTool.fmt
- MaintenanceTool.ini
- Drivers/2KXp/Jaguar2.inf
- Drivers/Win9xME/Jaguar2.inf
- Drivers/Win9xME/usbscan.sys
- Download file (extension .dwl)

To execute the maintenance tool, the driver for the maintenance tool must be installed.

For installation procedures, refer to 5. Installing procedures.

In addition, a number must be initially assigned to the PC before the maintenance tool can download files into the copier.

Please Refer to section 4. Serial number setting procedures.

To download files, refer to "Download file making procedures."

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

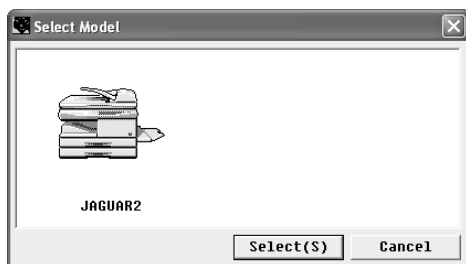
[Example]

Erroneous case: c:\Jaguar2 Download Tool

Proper case: c:\Jaguar2\Downtool

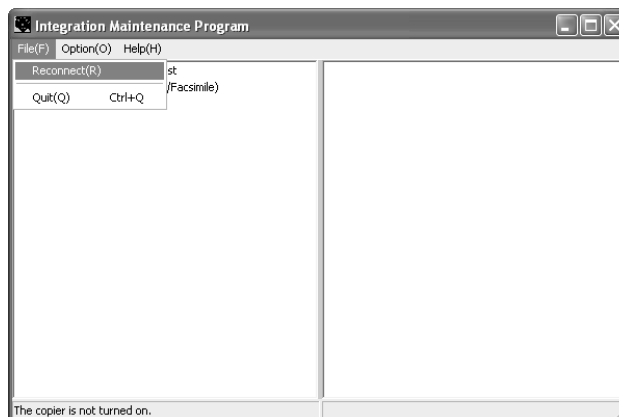
1. Download procedures

- 1) Main unit side: Press and hold [CA] key and [LEFT(V)] key together, and turn on the power simultaneously. (Check that "DOWNLOAD MODE" is displayed on the LCD of the operation panel.)
- 2) Connect machine and the PC with a USB cable.
- 3) PC side: Boost "Mainetenence.exe" and select "JAGUAR2" in the Select Model menu.

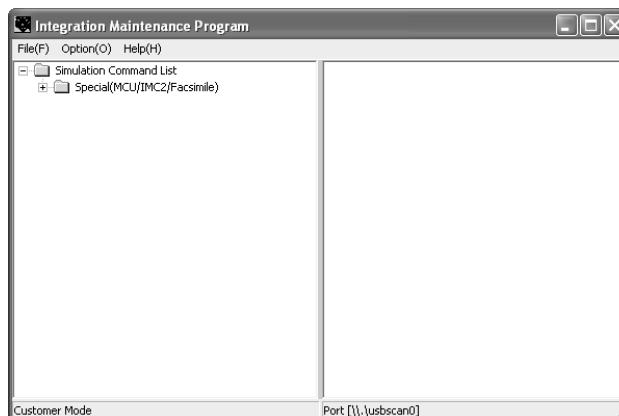


- 4) PC side: Check that the "test command list" tree is displayed on the integration maintenance program.

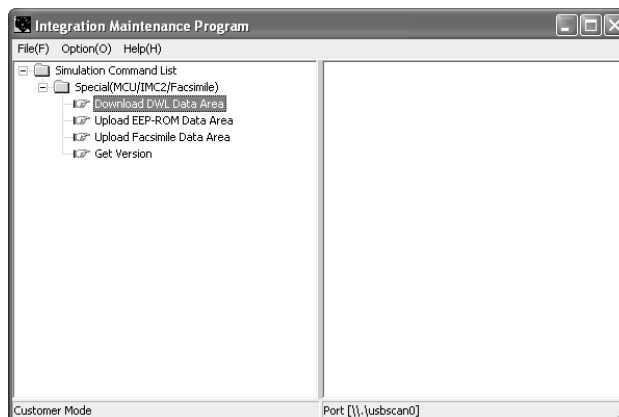
- 5) PC side: When the integration maintenance program is boosted and "The copier is not turned on." is displayed at the bottom of display, select "File" → "Reconnect" on the menu bar.



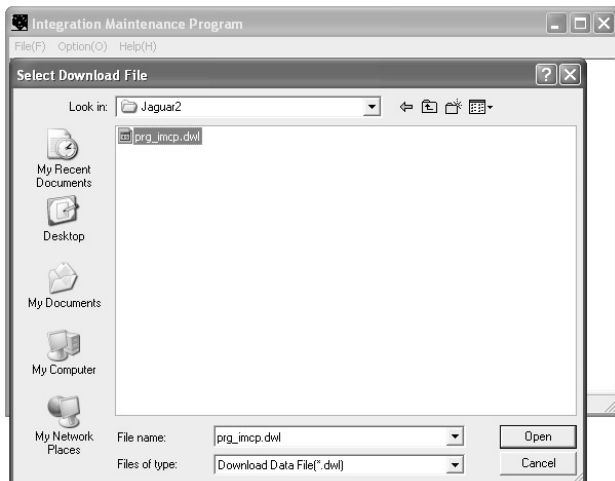
- 6) PC side: Check that trees are displayed in the "Special (MCU/IMC2/Facsimile)" folder in the integration maintenance program. (If trees are not displayed, check that the USB connector is connected, and select "Reconnect" in procedure 5) again.)



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



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

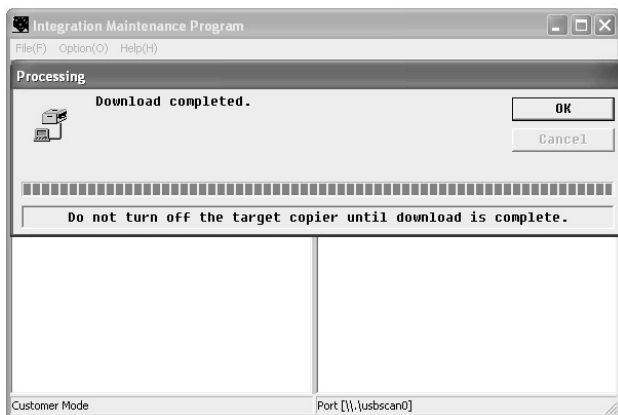


9) PC side: When a download file is specified, downloading is performed automatically.

On specifying a download file, "FLASH ERASE" is displayed on the LCD of machine.

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

Completion message: "Download completed."



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

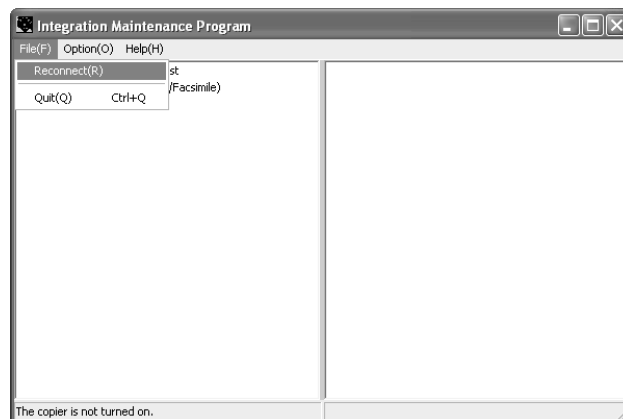
11) Main unit side: Wait until "DOWNLOAD COMPLETE!" is displayed on the LCD of the operation panel. When "DOWNLOAD COMPLETE!" is displayed, download is completed.

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

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

Download is completed with the above procedures.

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



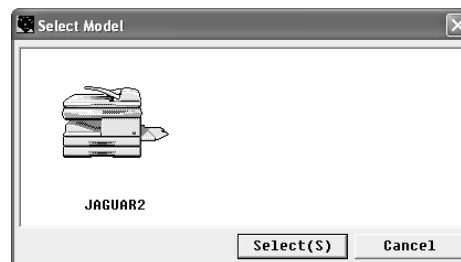
* Inhibition during download (Important)

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

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

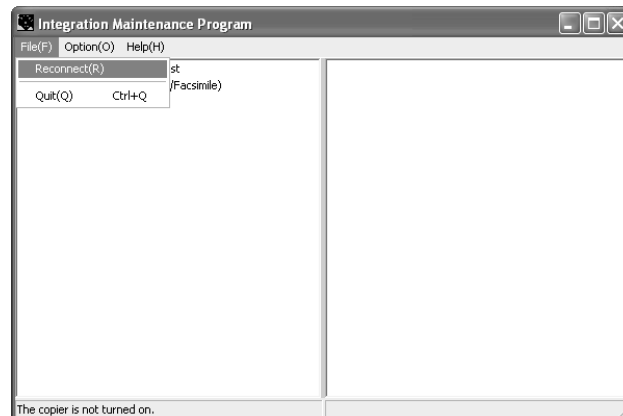
2. Version acquisition procedures

- 1) Main unit side: Press and hold "CA" key and "LEFT(V)" key, and turn on the power simultaneously. (Check that "DOWNLOAD MODE" is displayed on the operation panel of the main unit.)
- 2) Connect the machine and the PC with a USB cable.
- 3) PC side: Boost "Mainetenance.exe" and select "JAGUAR2" in the "Select Model" menu.

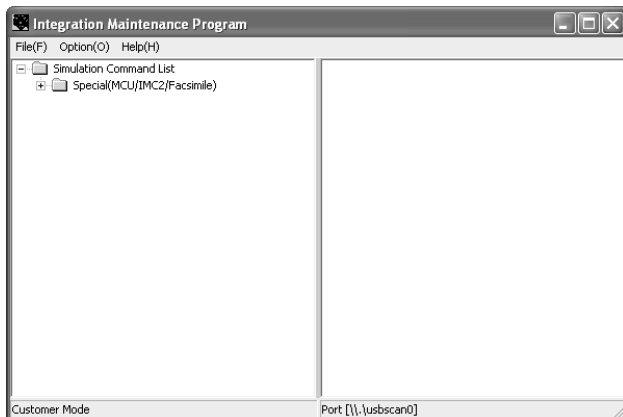


4) PC side: Check that the "test command list" tree on the integration maintenance program.

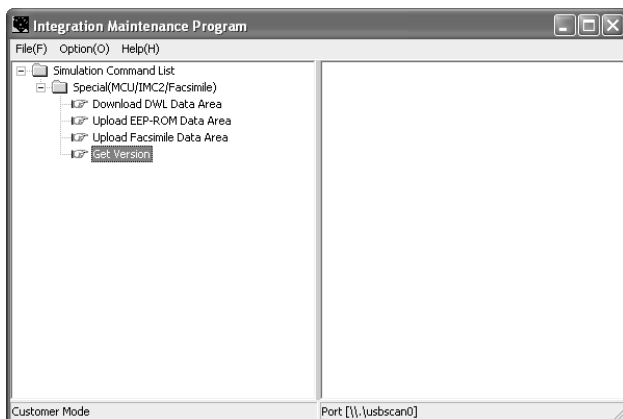
5) PC side: Boot the integration maintenance program. If "The copier is not turned on." is displayed, select "File" → "Reconnect" on the menu bar.



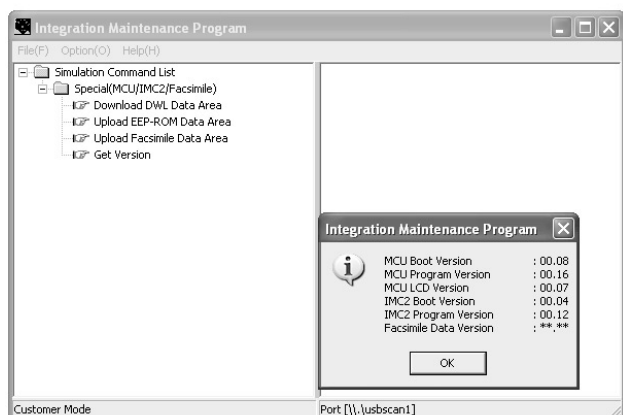
- 6) PC side: Check that trees are displayed on "Special (MCU/IMC2/Facsimile)" in the integration maintenance program. (If trees are not displayed, check that the USB cable is connected and select "Reconnect" again in procedure 5).



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



- 8) Check that the following display is shown.



With the above procedures, version acquisition is completed.

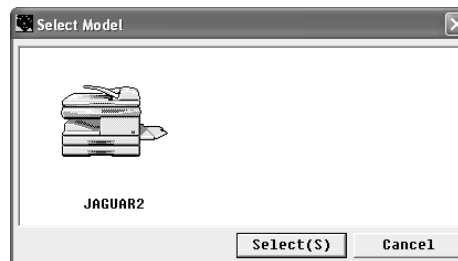
- The display of ".*.*.*" means its version is not downloaded. The downloaded versions are displayed in a version number as shown in "MCU Boot Version: 00.08."

Note: For models without FAX, the facsimile data version is not downloaded and always displayed as ".*.*.*"

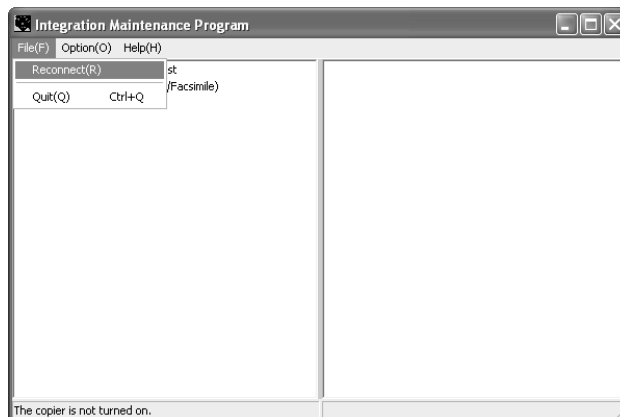
3. EEPROM data acquisition procedure

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

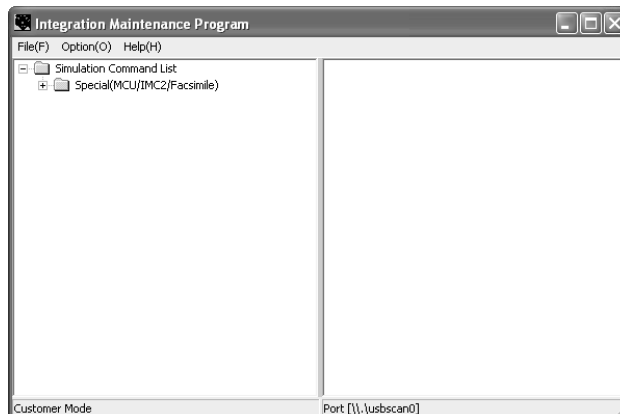
- 1) Main unit side: Press and hold [CA] key and [LEFT(V)] key, and turn on the power simultaneously. (Check that "DOWNLOAD MODE" is displayed on the operation panel of the main unit.)
- 2) Connect the machine and the PC with a USB cable.
- 3) PC side: Boot "Maintenance.exe" and select "JUGUAR2" in the "Select Model" menu.



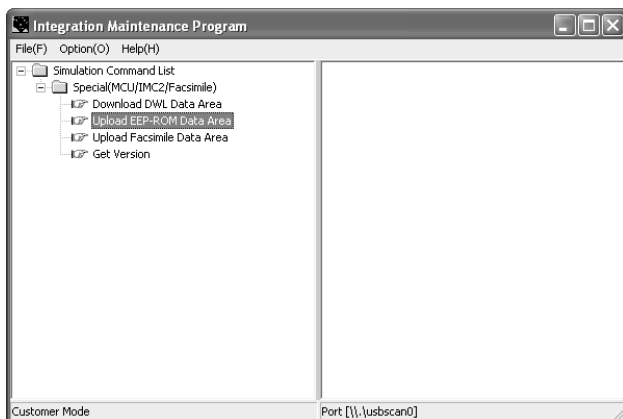
- 4) PC side: Check that "test command list" tree is displayed in the integration maintenance program.
- 5) PC side: Boot the integration maintenance program. If "The copier is not turned on." is displayed on the lower side of the display, select "File" → "Reconnect" on the menu bar.



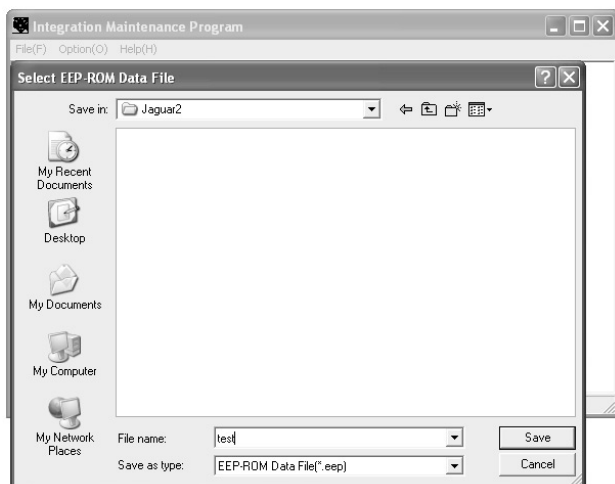
- 6) PC side: Check that trees are displayed on "Special (MCU/IMC2/Facsimile)" in the integration maintenance program. (If trees are not displayed, check that the USB cable is connected and select "Reconnect" again in procedure 5).



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



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



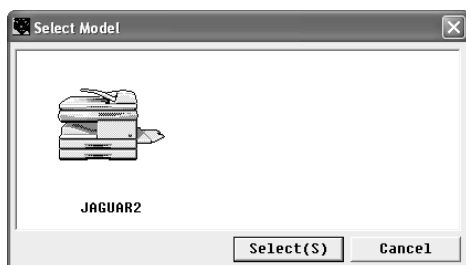
- 9) PC side: When upload is completed, the complete message is displayed.

With the above procedure, the EEPROM data acquisition is completed. Data acquired by the EEPROM data acquisition procedure are saved in a file with extension of .eep.

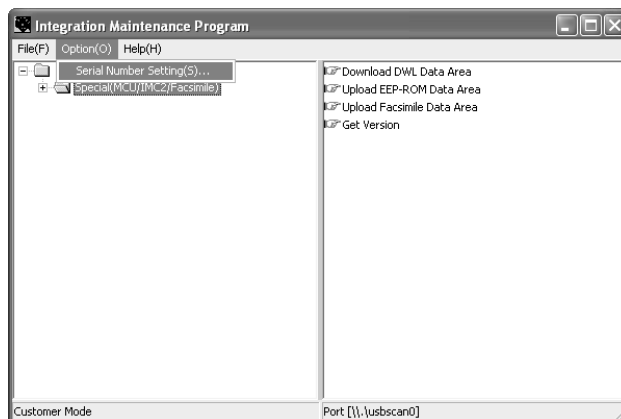
4. Serial number setting

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

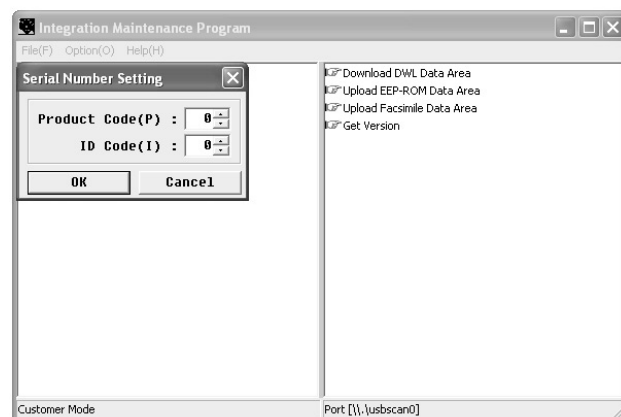
- 1) PC side: Boot "Maintenance.exe" and select "JUGARD2" in the "Select Model" menu.
(Only to set the serial number, the PC should not be connected to the machine.)



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



- 3) Enter optional values to "Product Code" and "ID Code" on the menu box.



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

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

After completion setting, press [OK] key.

- 4) The PC number (serial number) has been assigned.

5. Installing procedures

<USB integration maintenance program installation>

Driver installation is made on plug-and-play.

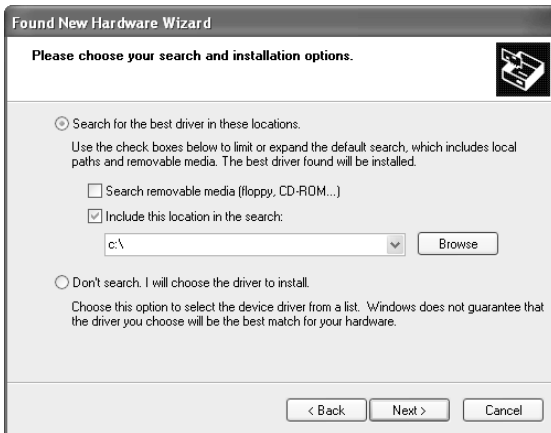
<Installation on Windows XP>

- 1) Main unit side: Press and hold [CA] key and [LEFT(V)] key, and turn on the power simultaneously. (Check that "DOWNLOAD MODE" is displayed on the LCD of the operation panel.)
- 2) Connect the machine and the PC with a USB cable.

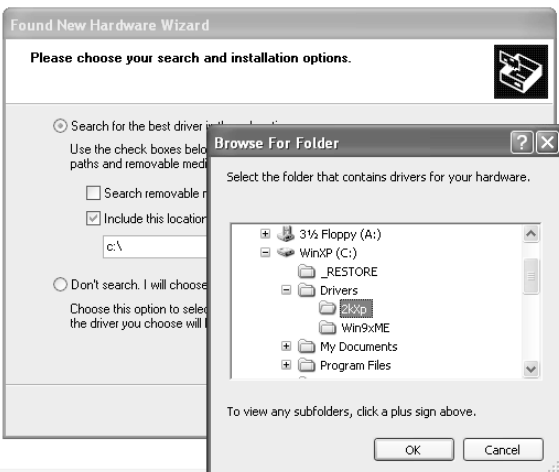
- 3) The following display is shown.
Select [Install from a list or specific location] and press <Next> button.



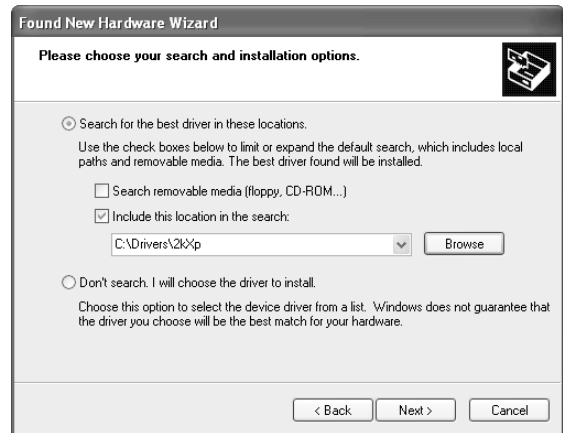
- 4) Select [Include this location in the search;]. If the search location is not the folder which includes the maintenance tool driver (Jaguar2.inf), select <Browse>. If the search location is the folder which includes the maintenance tool driver, press <Next> button to go to procedure 7).



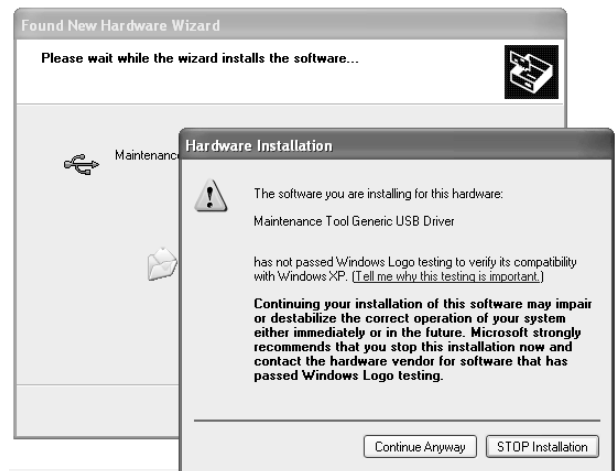
- 5) Select the folder which includes the maintenance tool driver (Jaguar2s.inf) and press <OK> button.
(Suppose that the driver is included in C:\Drivers\2kXp folder.)



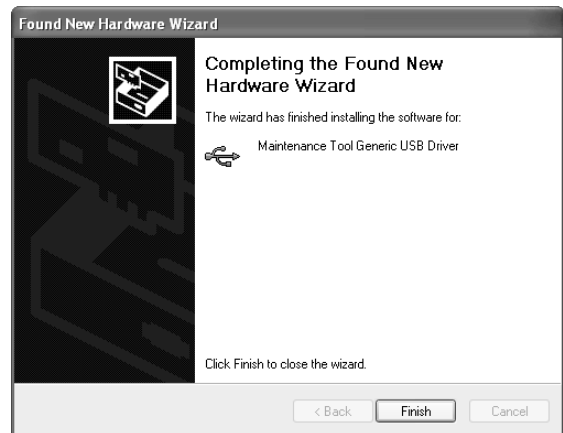
- 6) Check the path to the folder which includes the maintenance tool driver (Jaguar2.inf), and press <Next> button.



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



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



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

<Installation on Windows 2000>

- 1) Main unit side: Press and hold [CA] key and [LEFT(V)] key, and turn on the power simultaneously. (Check that "DOWNLOAD MODE" is displayed on the LCD of the operation panel.)
- 2) Connect the machine and the PC with a USB cable.
- 3) Check that the Found New Hardware Wizard is displayed, and press <Next> button.



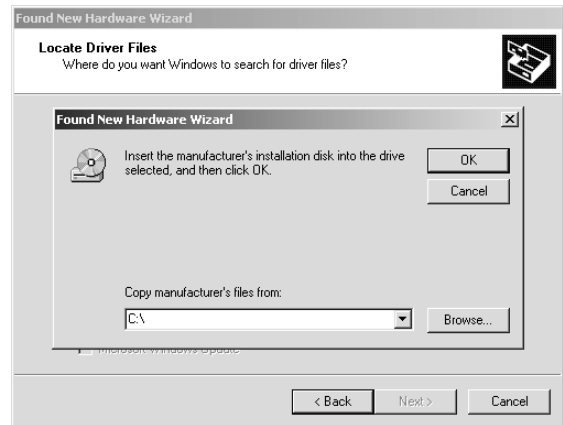
- 4) Select [Search for a suitable driver for my device] and press <Next> button.



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



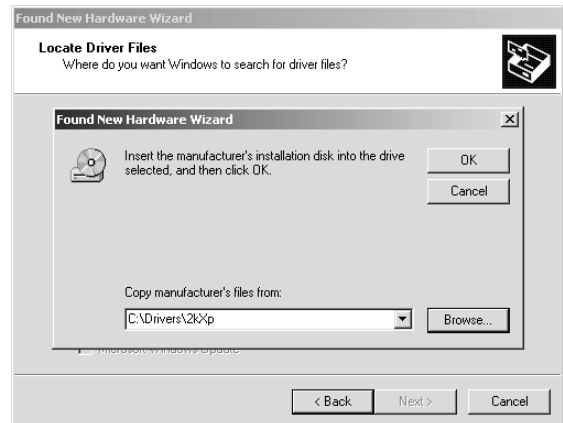
- 6) Press <Browse> button.



- 7) Specify the folder which includes the maintenance tool driver (Jaguar2.inf), and press <Open> button.



- 8) Check that the path to the folder which includes the maintenance tool driver (jaguar2.inf) is displayed, and press <OK> button. (Suppose that the maintenance tool driver is included in C:\Drivers\2kXp folder.)



9) Press <Next> button to start installation.



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



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

<Installation on Windows Me>

- 1) Main unit side: Press and hold [CA] key and [LEFT(V)] key, and turn on the power simultaneously. (Check that "DOWNLOAD MODE" is displayed on the LCD of the operation panel.)
- 2) Connect the machine and the PC with a USB cable.
- 3) The following display is shown on the PC side.
Select [Specify the location of the driver], and press <Next> button.



- 4) Select [Specify a location], specify the folder which includes the maintenance tool driver (Jaguar2.inf) as the search location, and press <Next> button.

If the search location does not include the maintenance tool driver (Jaguar2.inf), press <Browse> button to specify the folder which includes the maintenance tool driver (Jaguar2.inf).

(Suppose that the maintenance tool driver is included in C:\Driver\Win9xME folder.)



- 5) Press <Next> button to start installation.



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

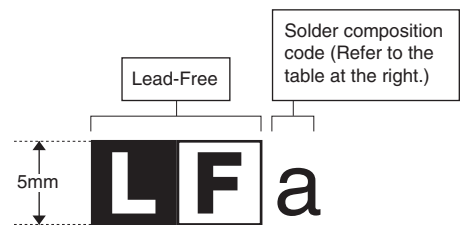


With the above procedures, installation (on Windows ME) of the integration maintenance program is completed.

LEAD-FREE SOLDER

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

Example:



<Solder composition code of lead-free solder>

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

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

When repairing a lead-free solder PWB, use lead-free solder thread.
Never use conventional lead solder thread, which may cause a breakdown or an accident.
Since the melting point of lead-free solder thread is about 40°C higher than that of conventional lead solder thread, the use of the exclusive-use soldering iron is recommendable.

(2) NOTE FOR SOLDERING WORK

Since the melting point of lead-free solder is about 220°C, which is about 40°C higher than that of conventional lead solder, and its soldering capacity is inferior to conventional one, it is apt to keep the soldering iron in contact with the PWB for longer time. This may cause land separation or may exceed the heat-resistive temperature of components. Use enough care to separate the soldering iron from the PWB when completion of soldering is confirmed.
Since lead-free solder includes a greater quantity of tin, the iron tip may corrode easily. Turn ON/OFF the soldering iron power frequently.
If different-kind solder remains on the soldering iron tip, it is melted together with lead-free solder. To avoid this, clean the soldering iron tip after completion of soldering work.
If the soldering iron tip is discolored black during soldering work, clean and file the tip with steel wool or a fine filer.

CAUTION FOR BATTERY REPLACEMENT

(Danish)

ADVARSEL !

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

(English)

Caution !

Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type
recommended by the manufacturer.

Dispose of used batteries according to manufacturer's instructions.

(Finnish)

VAROITUS

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

(French)

ATTENTION

Il y a danger d'explosion s' il y a remplacement incorrect
de la batterie. Remplacer uniquement avec une batterie du
même type ou d'un type équivalent recommandé par
le constructeur.

Mettre au rebut les batteries usagées conformément aux
instructions du fabricant.

(Swedish)

VARNING

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

(German)

Achtung

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

CAUTION FOR BATTERY DISPOSAL

(For USA, CANADA)

"BATTERY DISPOSAL"

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

"TRAITEMENT DES PILES USAGÉES"

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



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