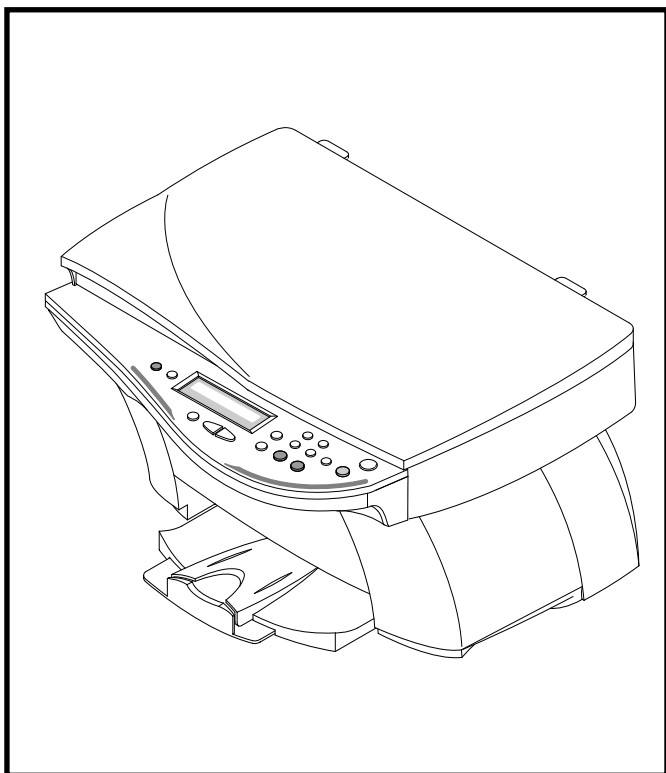




SAMSUNG
INKJET PRINTER(MFP)
SCX-1100

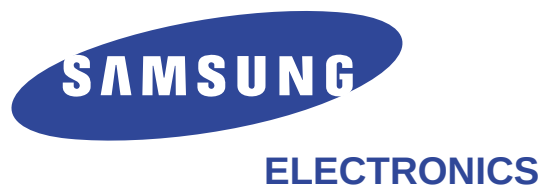
SERVICE *Manual*

INKJET PRINTER(MFP)



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the ITSELF system Samsung Electronics Co., Ltd.
“<http://itself.sec.samsung.co.kr>”

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1. Precautions

Please read the following carefully to prevent any accidents and not to damage the unit during service.

1-1 Safety Precautions

1. Safety Precautions

There are some electric or machinery parts with safety related property. If the parts replaced are different from the original, the safety may not function. Even if the part could allow higher voltage than that of the part used, do not replace it and use a regular product clarified in specifications.

2. Be careful not to leave a switch, a cover or a safety device out when reinstalling or assembling the product after repair.



Especially mind the safety on the part with this mark.

You must use regular parts described in specifications for the parts inflammable and where the current can be flown. Otherwise any hazard such as an electric shock or a fire could occur.

3. Replacing Precautions

Do not change or add parts as you like. You cannot benefit from such a remodeled product at your will during the term of guarantee.

4. You must replace overheated or damaged parts or cords with regular products. Please solve the problem causing any damage or overheating and troubles beforehand.

1-2 Precautions on Disassembly and Reassembly

Very careful precautions should be taken when replacing parts. Before replacing, please check cables because you cannot put the cables that you removed for replacing parts into the proper place if you would not make sure of where they were connected and in which condition.

Please do the following before disassembling for a repair or replacement of parts.

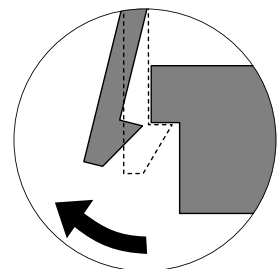
1. Pull out paper cassette, printer cartridge installed. Especially careful not to be scratched by the surface of developer or not to expose them to light.
2. Turn the power switch off.
3. Take out the power plug, printer cable from the printer.
4. Use only the same type of part as original when replacing parts.
5. Do not force to open or fasten plastic material components.
6. Be careful that small parts such as screws should not get in the printer.

7. When disassembling, assembling, also observe small components are located in place.

8. If you uncover and turn the machine over to replace some parts, toner or paper particles may contaminate the LSU window. Protect the LSU window with clean paper.

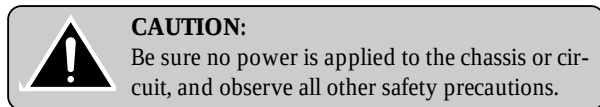
Releasing Plastic Latches

Many of parts are held in place with plastic latches. The latches break easily : release them carefully. To remove such parts, press the hook end of the latch away from the part to which it is latched.



1-3 ESD Precautions

Certain semiconductor devices can be easily damaged by static electricity. Such components are commonly called "Electrostatically Sensitive (ES) Devices", or ESDs. Examples of typical ESDs are: integrated circuits, some field effect transistors, and semiconductor "chip" components. The techniques outlined below should be followed to help reduce the incidence of component damage caused by static electricity.

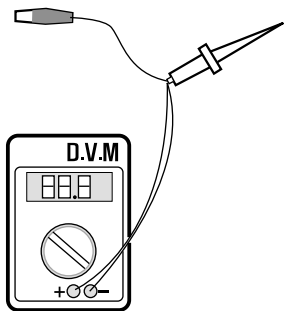


1. Immediately before handling a semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, employ a commercially available wrist strap device, which should be removed for your personal safety reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ESDs, place the assembly on a conductive surface, such as aluminum or copper foil, or conductive foam, to prevent electrostatic charge buildup in the vicinity of the assembly.
3. Use only a grounded tip soldering iron to solder or desolder ESDs.
4. Use only an "anti-static" solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ESDs.
5. Do not use Freon-propelled chemicals. When sprayed, these can generate electrical charges sufficient to damage ESDs.
6. Do not remove a replacement ESD from its protective packaging until immediately before installing it. Most replacement ESDs are packaged with all leads shorted together by conductive foam, aluminum foil, or a comparable conductive material.
7. Immediately before removing the protective shorting material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.
8. Maintain continuous electrical contact between the ESD and the assembly into which it will be installed, until completely plugged or soldered into the circuit.
9. Minimize bodily motions when handling unpackaged replacement ESDs. Normal motions, such as the brushing together of clothing fabric and lifting one's foot from a carpeted floor, can generate static electricity sufficient to damage an ESD.

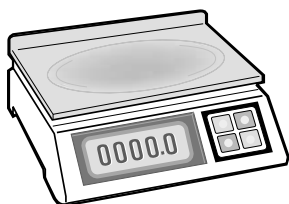
1-4 Tools for Troubleshooting

The following tools are recommended for safe and smooth troubleshooting described in this service manual.

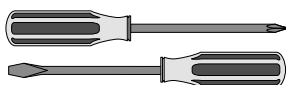
- 1 DVM(Digital Volt Meter)**
Standard: Indicates more than 3 digits.



- 2 Electronic Scale**
Standard: Equipment to check the weight of consumables supplied by Samsung Electronics.
(The gram unit can be measured.)



- 3 Driver**
Standard: "-" type, "+" type (M3 long, M3 short, M2 long, M2 short).



- 4 Pinset**
Standard: For general home use, small type.

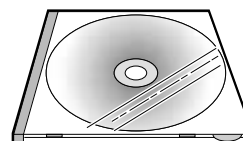


- 5 Cotton Swab**
Standard : For general home use, for medical service.



- 6 Cleaning Equipments a IPA(Isopropyl Alcohol)dry cloth or a soft stuff neutral detergent.**

- 7 Software(Driver) installation CD ROM**



Note

Mind your hands not to be touched when you disassemble and reassemble PBA ASS'Y, such as the main board.

2. Specifications

2-1 Printer Engine

Technology		Color Thermal Inkjet
Engine Type		2-Pen (K and CMY)
Operating System		Windows 95/98/2000/Me/XP
Interface		USB (without HUB Mode), Centronics 1284
Emulation		HBP(GDI)
Print Speed ⁽²⁾	Mono	14 ppm Draft / 10 ppm Normal
	Color	7 ppm Draft / 2 ppm Normal
Print Resolution (H x V)	Quick	300 x 600 dpi
	Normal	600 x 600 dpi
	High Quality	2400(H) x 1200(V) dpi (Addressable)
Maximum Paper Size		A4, Letter, Legal, Banner
Effective Printing Width		8.0" (203 ± 1mm)
Feeding Method	Automatic	100 Sheets (Maximum stacking height : 9mm)
	Manual Tray	No
Output Tray Capacity		Maximum 30 sheets
Maximum Cable Length		USB Cable, Max 6ft ⁽³⁾

Note:

(2) Speed claims based on the test files: spdtstc.sam(mono), spdtstc2.sam(color)/Letter size

(3) Non-standard cable can cause misoperations.

2-2 Ink Cartridge

	Babbage mono standard	Birch color
Model No.	M50	C60
Print Head	208 nozzles	192 nozzles
Ink type	Pigment	Dye
Ink Color	Black (Babbage)	Color (Birch)
Ink Yield	about 1075 sheets (5% Pattern, A4)	about 275 sheets (15% Pattern, A4)

2-3 Copier

Scanner Type	Flat-bed without ADF (Automatic Document Feeder)
Maximum Original Size	A4/Letter
Maximum Paper Size	A4/Letter/Legal
Maximum Scan Width	216 mm
Optical Resolution (HxV)	600 x 600 dpi
Copy Quality	Draft, Normal, Best
Paper Type Selection	Plain, Glossy, Transparency
Mono Copy Speed ⁽¹⁾	Draft: 10cpm
Color Copy Speed ⁽¹⁾	Draft: 5cpm
Effective Print-edge Margin	Top: 3.4mm, Bottom: 19.05mm, Each Side: 6.5mm(LTR), 3.5mm(A4)
Multi copy	99 pages (Memory Multi copy)
Zoom Rate	25 % ~ 400 % (1 % Step)
Contrast Control	3 Steps
Ink Saver Mode	Use Draft Mode (<20 % Savings)
Auto Sensing	Check Paper Jam , Low Ink

Note:

(1) Speed claims based on the test chart : Printed spdtstc.sam(mono), Printed spdtstc2.sam(color) / Letter size

2-4 Scanner

Operation System	Windows 98/Me/2000/XP
Interface	USB (without HUB Mode) and Centronics 1284
Compatibility	TWAIN Standard.
Device	Platen Color CCD
Scan Width	Max.: 8.5" (216 mm), Effective: 8.2" (210 mm)
Color Depth	Internal 36 bit, External 24 bit
Optical Resolution (H x V)	600 x 1200 dpi
Interpolation Resolution	Max. 4800 dpi
Pre-scan Mode	Yes, 75 dpi
Scan Speed	about 2'30 sec/A4 True Color (Pentium II 300M, 64MB Memory, 300dpi)

2-5 Power Supply

Rated AC Input Voltage	110 ~ 240 VAC (Universal)
Rated Input Frequency	50 ~ 60 Hz
Minimum/Maximum AC Input	90 VAC/265 VAC
Maximum Input Current	0.5 A
DC Channels ⁽⁴⁾ (2 Channels)	+3.3V $\pm$ 5%, +30V $\pm$ 10%
External Power On/Off Key 	Power Down Key (It does not cut the primary power input off)

Note:

(4) No load condition.

2-6 Dimension

Machine Size (W x D x H, mm)	477(W) X 415(D) X 252(H)
Machine Weight	About 8.5 Kg (Machine itself)

2-7 Environmental Condition

Absolute Storage Temperature ⁽⁵⁾		-20°C ~ 55°C
Absolute Storage Humidity ⁽⁵⁾		10% RH ~ 90% RH
Recommended Operating Condition	Temperature	5°C ~ 40°C
	Humidity	15% RH ~ 85% RH

Note:

(5) Packing Condition

3. Disassembly and Reassembly

3-1 General Precautions on Disassembly

When you disassemble and reassemble components, you must use extreme caution.

The close proximity of cables to moving parts makes proper routing a must. If components are removed or replaced, any cables disturbed by the procedure must be replaced as close as possible to their original positions.

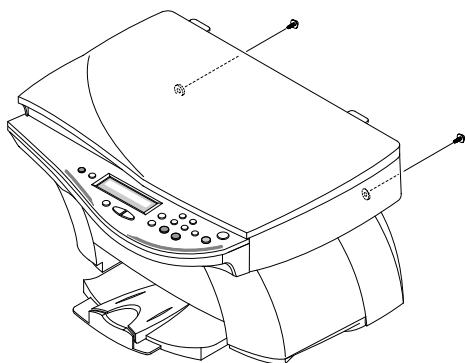
Before removing any component from the machine, note the cable routing that will be affected.

Whenever servicing the machine, you must perform as follows:

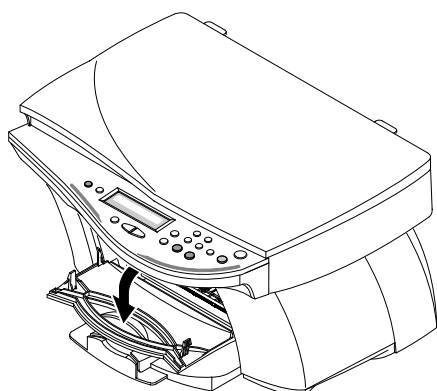
1. Check to verify that documents are not stored in memory.
2. Unplug the power cord.
3. Use a flat and clean surface.
4. Replace only with authorized components.
5. Do not force to remove or planten plastic-material components.
6. Make sure all components are in their proper position.

3-2 Scanner Ass'y

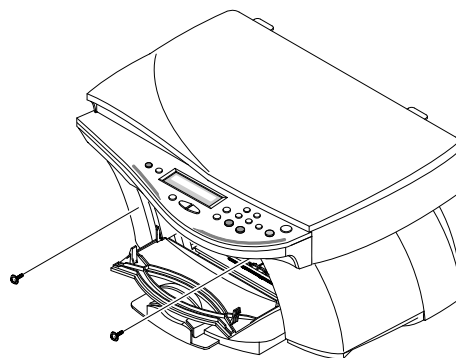
1. Remove two screws securing the rear cover.



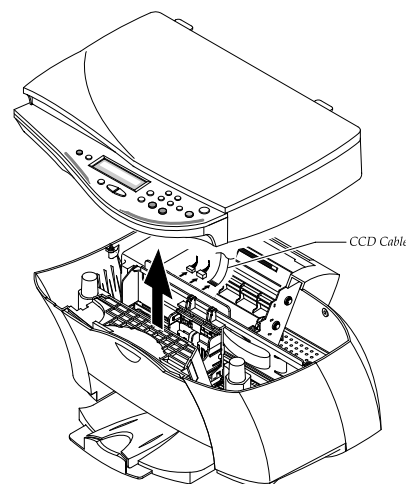
2. Open the front door from the main cover.



3. Remove two screws securing the main cover.

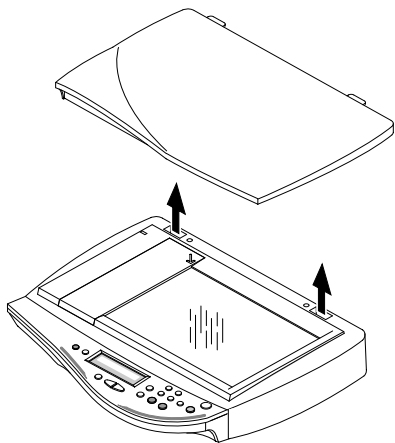


4. Pull the scanner ass'y upward then, unplug the two connectors and CCD cable.

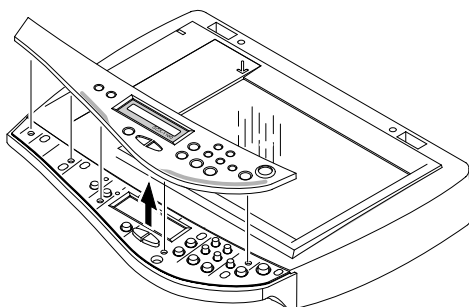


Note : You should connect or remove the CCD cable vertically to avoid the CCD cable pin damage.

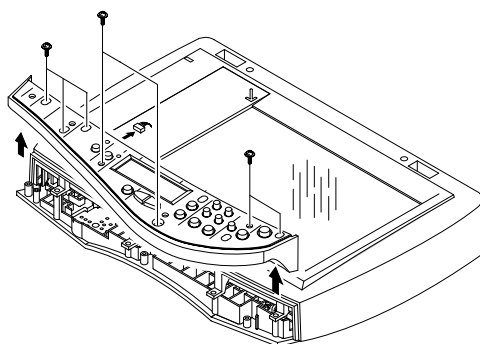
5. Pull the platen cover upward and remove it.



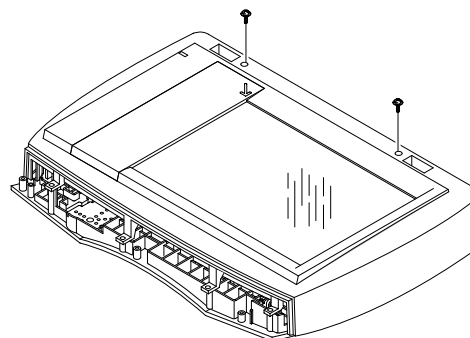
6. Pull the OPE cover upward and remove it.



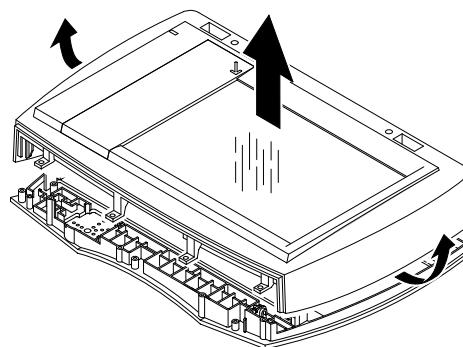
7. Remove five screws securing the OPE upper and unplug the one connector from the OPE panel.



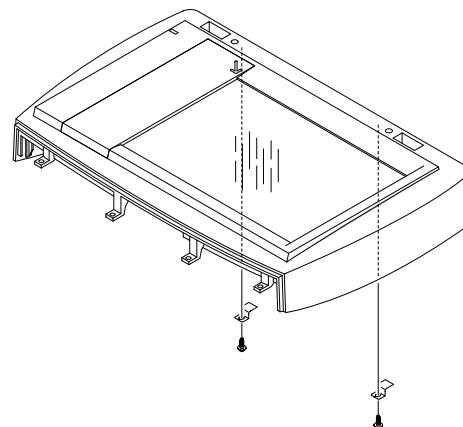
8. Remove two screws securing the scan upper and remove it.



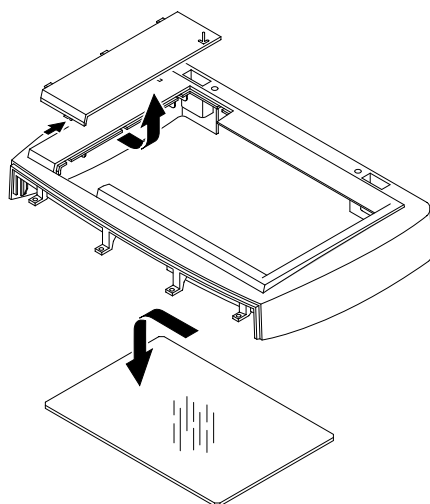
9. Unlatch the scan lower securing the scan upper and remove it.



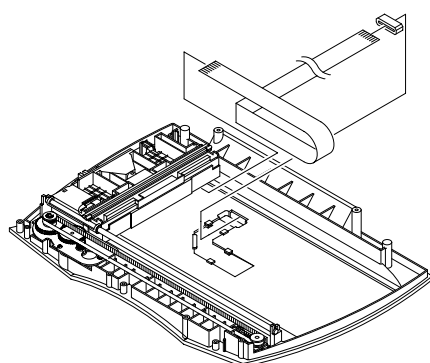
10. Remove the two screws securing the scan upper.



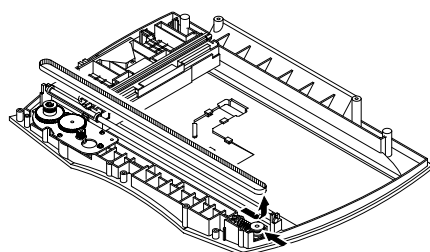
11. Unlatch the scan dummy and take out the glass from the scan upper.



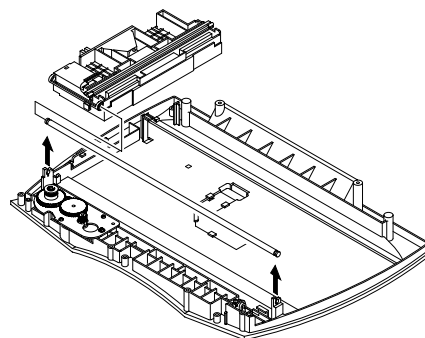
12. Remove the CCD cabl.



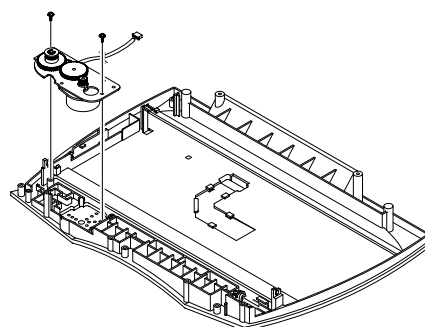
13. Push the belt holder and take out the belt, as shown below.



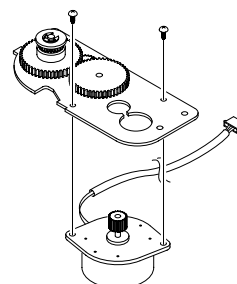
14. Pull up the CCD shaft and take out the scanner module.



15. Remove two screws and take out the motor bracket.



16. Remove two screws securing the scan motor and remove it.

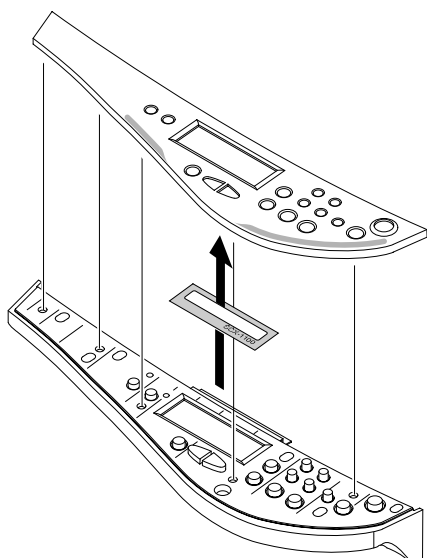


3-3 OPE Unit

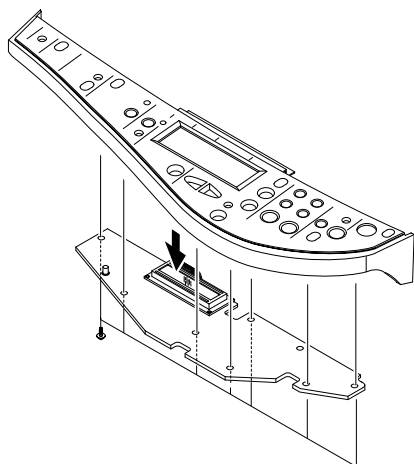
1. Before you remove the ope unit, you should remove:

- Scanner Ass'y (see page 3-1)

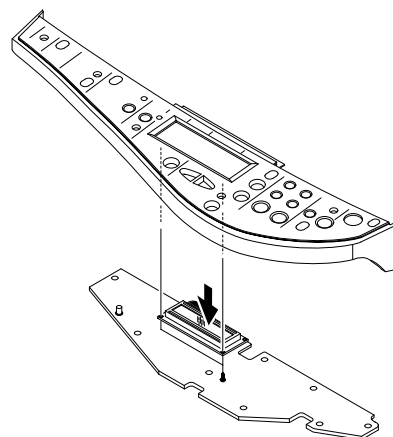
2. Pull the OPE cover upward and remove it.
Take out the LCD window from the OPE cover.



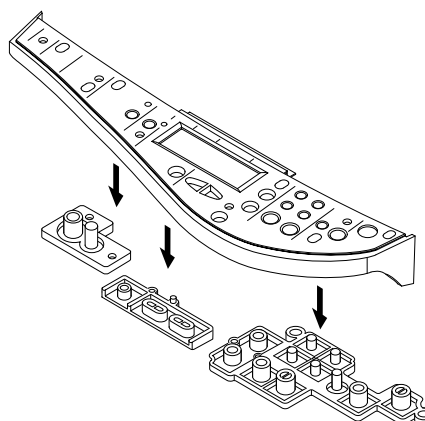
3. Remove five screws securing the OPE upper to the OPE PBA.



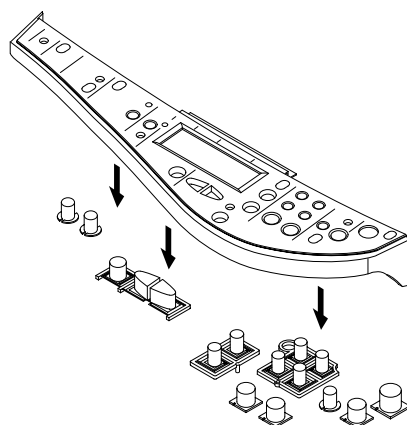
4. Remove two screws securing the OPE upper to the LCD board.



5. Remove the contact rubber from the OPE upper.



6. Remove the Key pad from the OPE upper.

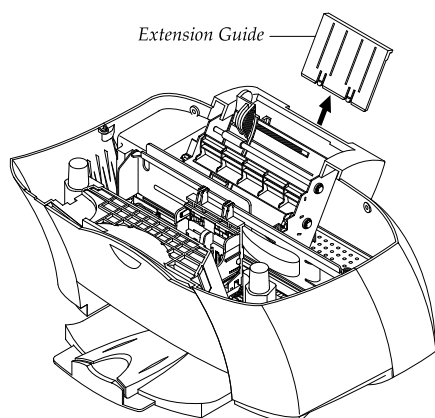


3-4 Rear Cover

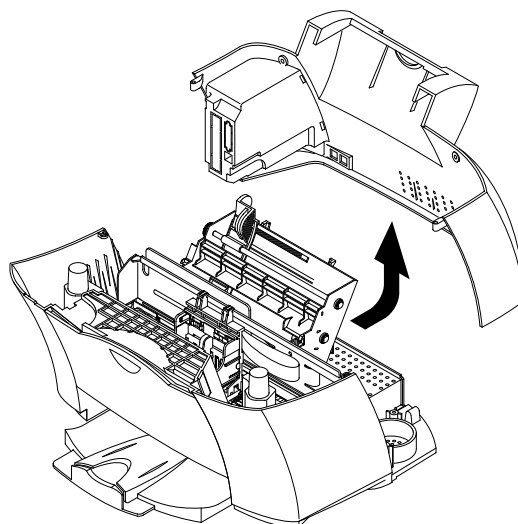
1. Before you remove the rear cover, you should remove:

- Scanner Ass'y (see page 3-1)

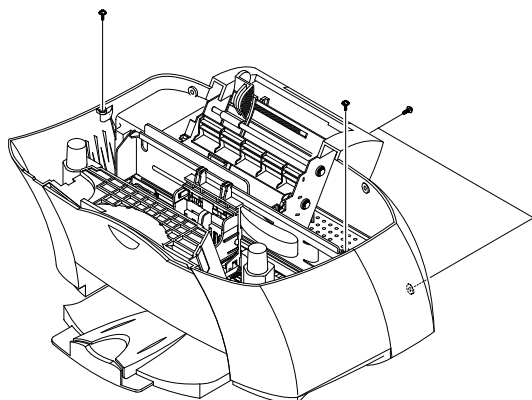
2. Pull the extension guide upward and remove it.



4. Remove the rear cover, as shown below.



3. Remove four screws securing the rear cover.

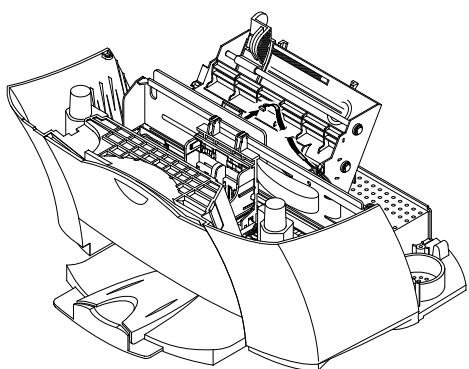


3-5 SMPS

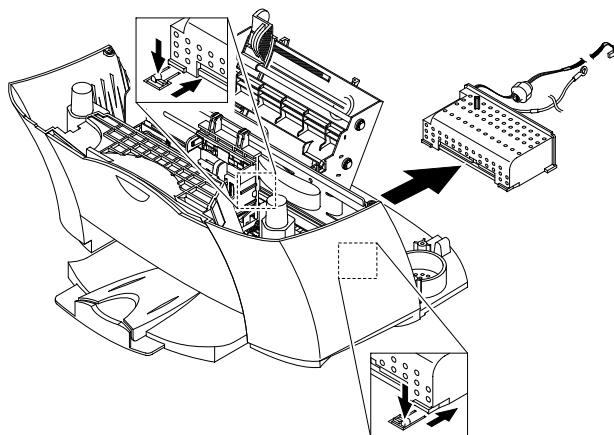
1. Before you remove the SMPS, you should remove:

- Scanner Ass'y (see page 3-1)
- Rear Cover (see page 3-5)

2. Unplug the one connector from the main PBA.



3. Pushing down the hooks on both ends, pullout the SMPS.

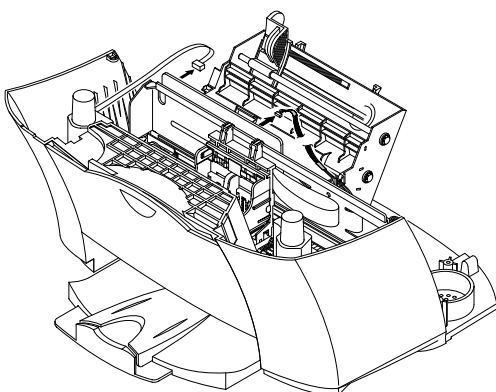


3-6 Engine Ass'y

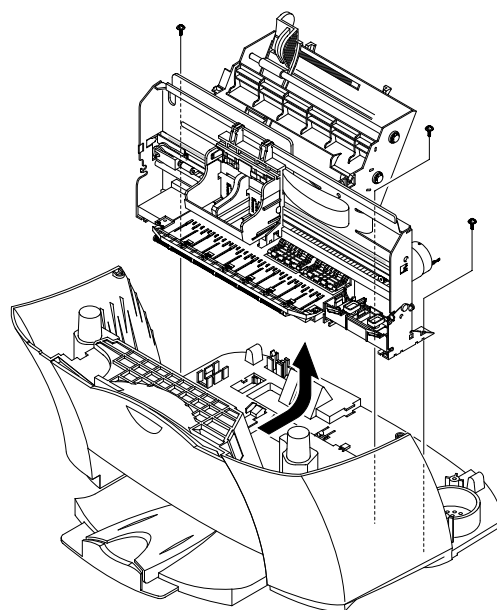
1. Before you remove the engine ass'y you should remove:

- Scanner Ass'y (see page 3-1)
- Rear Cover (see page 3-5)

2. Unplug the SMPS connector and cover open sensor connector from the main PBA.



3. Remove the three screws securing the engine ass'y and remove it.

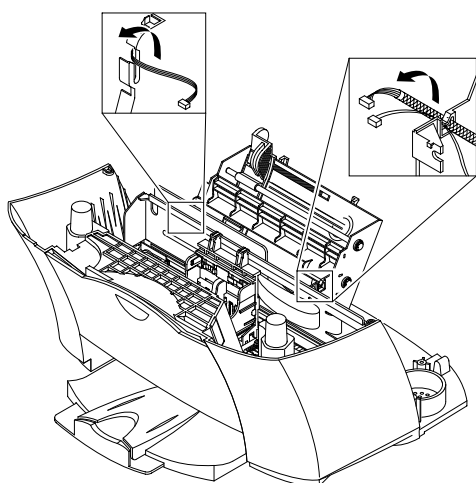


3-7 ASF Feeder

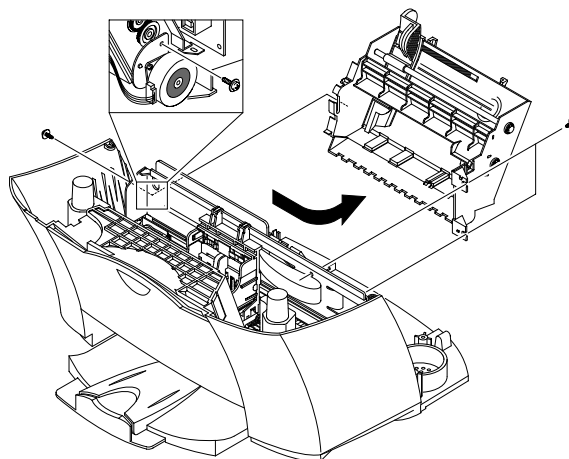
1. Before you remove the asf feeder, you should remove:

- Scanner Ass'y (see page 3-1)
- Rear Cover (see page 3-5)
- SMPS (see page 3-6)

2. Make sure the harness is released from the hooks, as shown below.



3. Remove three screws securing the ASF feeder to the main cover.
Take out the ASF feeder.

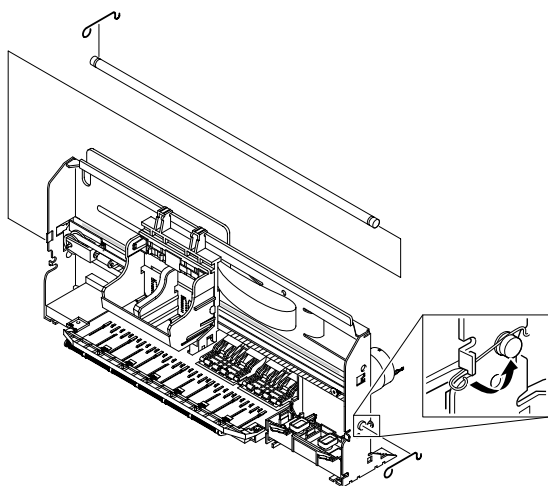


3-8 Cartridge Ass'y

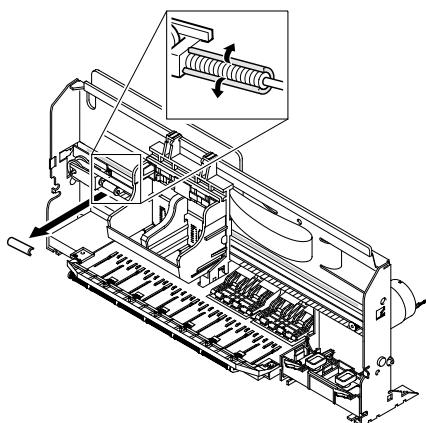
1. Before you remove the cartridge ass'y you should remove:

- Scanner Ass'y (see page 3-1)
- Rear Cover (see page 3-5)
- Engine Ass'y (see page 3-6)
- ASF Feeder (see page 3-7)

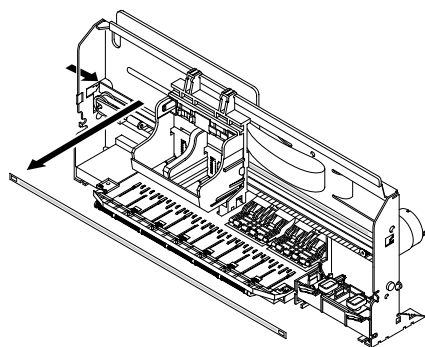
2. Rotate to remove both springs securing the carrier shaft. Then take out the carrier shaft.



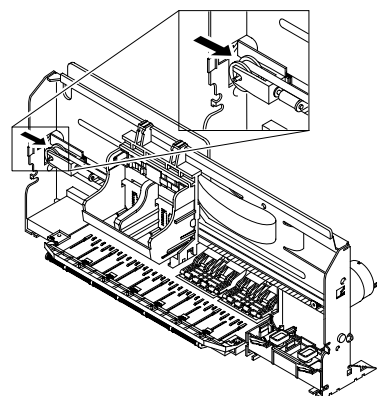
3. Remove the C-cab.



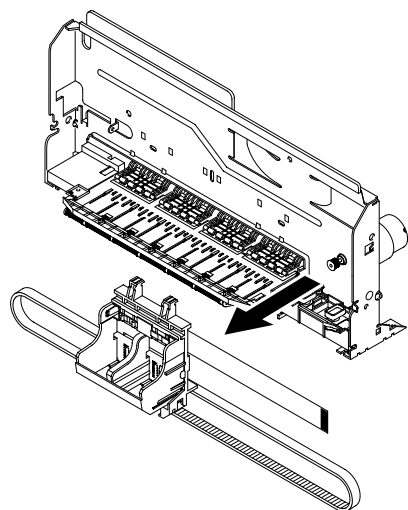
4. Take out the emcoder strip, as shown below.



5. Push the holder pulley to the right and take out the belt.



6. Take out the cartridge carrier from the main frame.

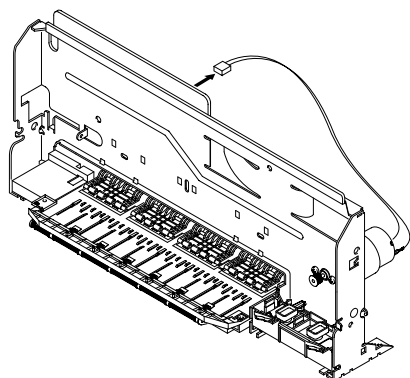


3-9 Carrier Motor

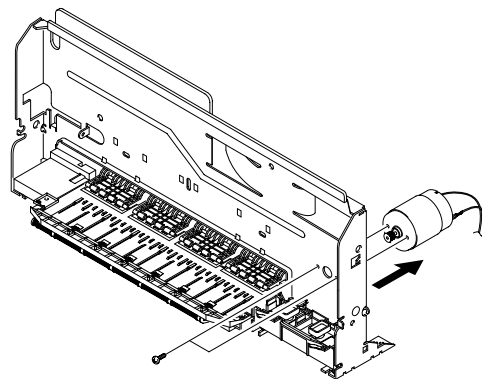
1. Before you remove the carrier motor, you should remove:

- Scanner Ass'y (see page 3-1)
- Rear Cover (see page 3-5)
- Engine Ass'y (see page 3-6)
- ASF Feeder (see page 3-7)
- Cartridge Ass'y (see page 3-8)

2. Unplug the one connector from the main PBA.



3. Remove two screws securing the carrier motor and take out the motor from the main frame.

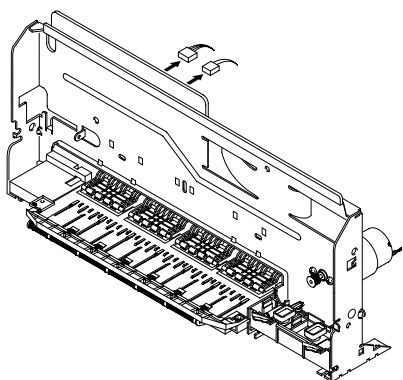


3-10 Main PBA

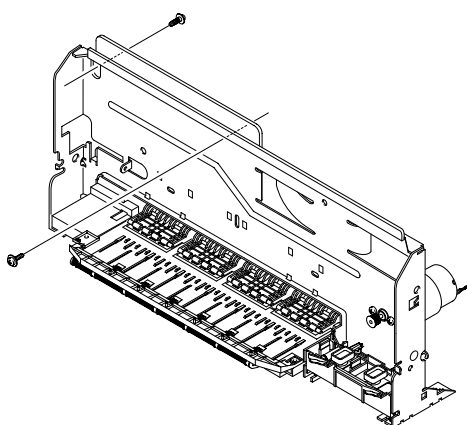
1. Before you remove the main PBA, you should remove:

- Scanner Ass'y (see page 3-1)
- Rear Cover (see page 3-5)
- Engine Ass'y (see page 3-6)
- ASF Feeder (see page 3-7)
- Cartridge Ass'y (see page 3-8)

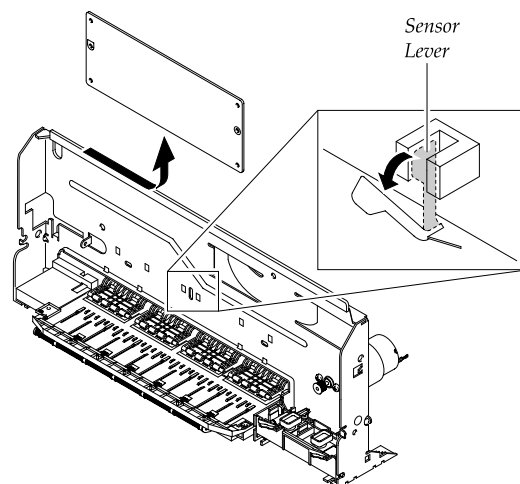
2. Unplug all connectors from the main PBA.



3. Remove the two screws securing the main PBA.



4. Pull the sensor lever backward and take out the main PBA, as shown below.

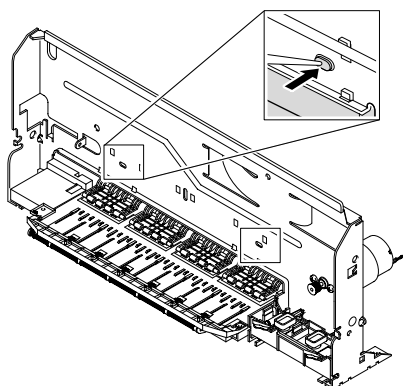


3-11 Holder Roller

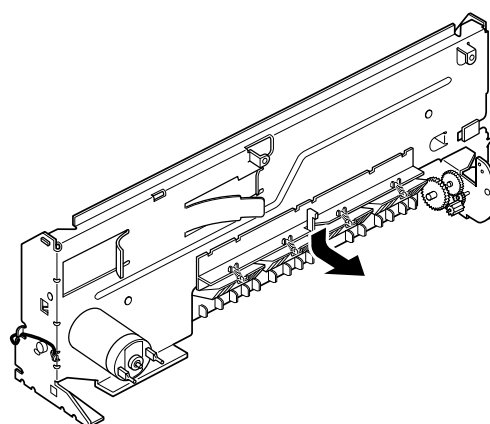
1. Before you remove the holder roller, you should remove:

- Scanner Ass'y (see page 3-1)
- Rear Cover (see page 3-5)
- Engine Ass'y (see page 3-6)
- ASF Feeder (see page 3-7)
- Cartridge Ass'y (see page 3-8)
- Main PBA (see page 3-10)

2. Unlatch the holder by pushing the parts hooked to the main frame using a sharp tool.



3. Pull the holder downward and take it out from the main frame.

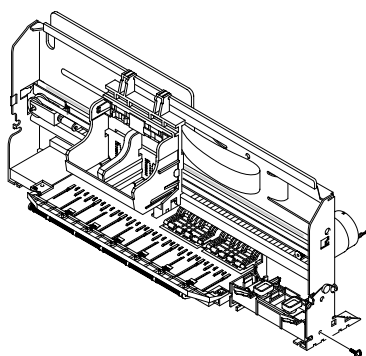


3-12 Home Ass'y

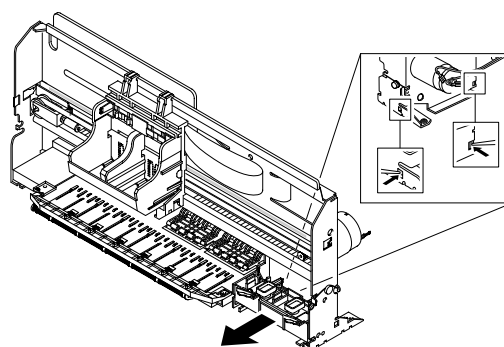
1. Before you remove the home ass'y you should remove:

- Scanner Ass'y (see page 3-1)
- Rear Cover (see page 3-5)
- Engine Ass'y (see page 3-6)
- ASF Feeder (see page 3-7)

2. Remove one screw securing the home ass'y.



3. Unlatch the home ass'y by pushing the parts hooked to the main frame using a sharp tool. Take out the home ass'y from the main frame.

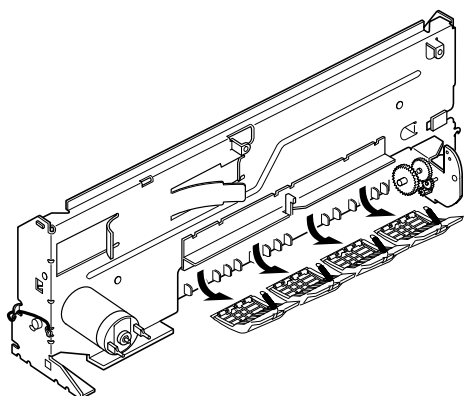


3-13 Base Frame

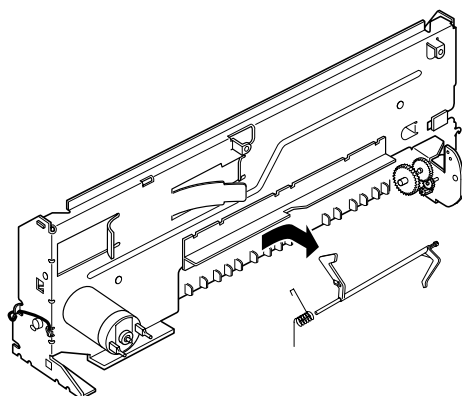
1. Before you remove the base frame, you should remove:

- Scanner Ass'y (see page 3-1)
- Rear Cover (see page 3-5)
- Engine Ass'y (see page 3-6)
- ASF Feeder (see page 3-7)
- Cartridge Ass'y (see page 3-8)
- Main PBA (see page 3-10)
- Hold Roller (see page 3-11)
- Home Ass'y (see page 3-11)

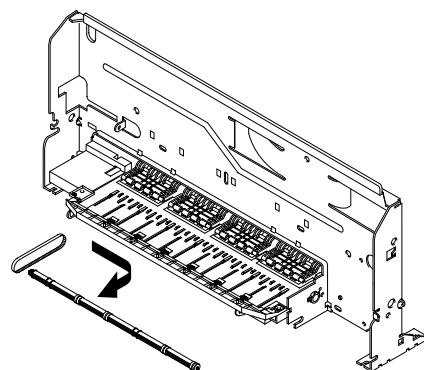
2. Remove the four springs and take out the four roller frictions, as shown below.



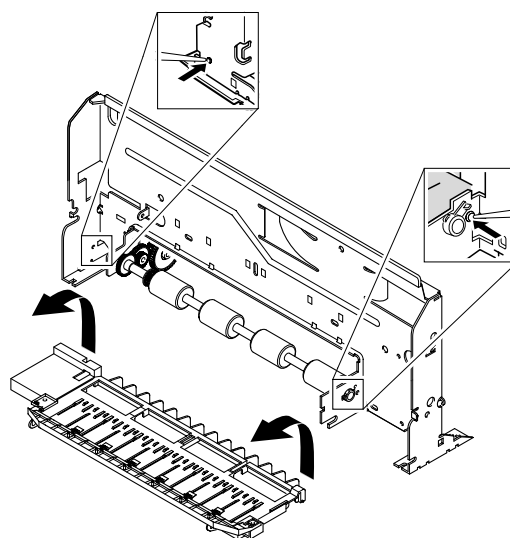
3. Take out the actuator feed from the main frame, as shown below.



4. Remove the exit roller from the main frame and take out the exit belt.



5. Unlatch the base frame ass'y by pushing the parts hooked to the main frame using a sharp tool, as shown below.

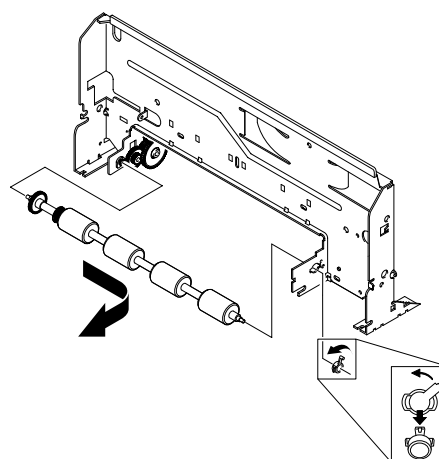


3-14 Feed Roller

1. Before you remove the feed roller, you should remove:

- Scanner Ass'y (see page 3-1)
- Rear Cover (see page 3-5)
- Engine Ass'y (see page 3-6)
- ASF Feeder (see page 3-7)
- Cartridge Ass'y (see page 3-8)
- Main PBA (see page 3-10)
- Hold Roller (see page 3-11)
- Home Ass'y (see page 3-11)
- Base Frame (see page 3-12)

2. Turn the bearing feed counterclockwise and take out the base frame and feed roller from the main frame.

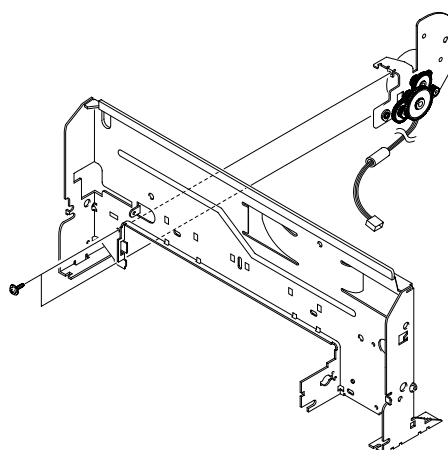


3-15 Line Feed Bracket Ass'y

1. Before you remove the LF bracket ass'y, you should remove:

- Scanner Ass'y (see page 3-1)
- Rear Cover (see page 3-5)
- Engine Ass'y (see page 3-6)
- ASF Feeder (see page 3-7)
- Cartridge Ass'y (see page 3-8)
- Main PBA (see page 3-10)
- Hold Roller (see page 3-11)
- Home Ass'y (see page 3-11)
- Base Frame (see page 3-12)
- Feed Roller (see page 3-13)

2. Remove two screws and take out the LF bracket ass'y from the main frame.



4. Troubleshooting

4-1 Setting-up System in User Mode

FUNCTION	ITEM	DEFAULT
LANGUAGE	ENG/GER/FRE/ITA/SPA/POR/DUT	ENGLISH
POWER SAVE MODE	1/4/8/12 HOUR	1
PAPER SIZE	LETTER/A4/LEGAL	A4
PAPER TYPE	PLAIN/INKJET/PHOTO/TRANSPARENCY	PLAIN PAPER
MAINTENANCE	CLEAN CARTRIDGE	
	ALIGN CARTRIDGE	
	VIEW INK LEVEL	"COLOR : _/8 , BLOCK : _/8"
	HELP LIST	
	DEFAULT SETUP	CONTRAST
		QUALITY
		COPY PAGE
		ZONE RATE
		RESOLUTION
	ADJUST SHADING	
KEY SOUND	ON/OFF	ON

4-2 Setting-up System in Service Mode

• How to enter service mode

In service (tech) mode, the technician can check the machine and perform various tests to isolate the cause of a malfunction.

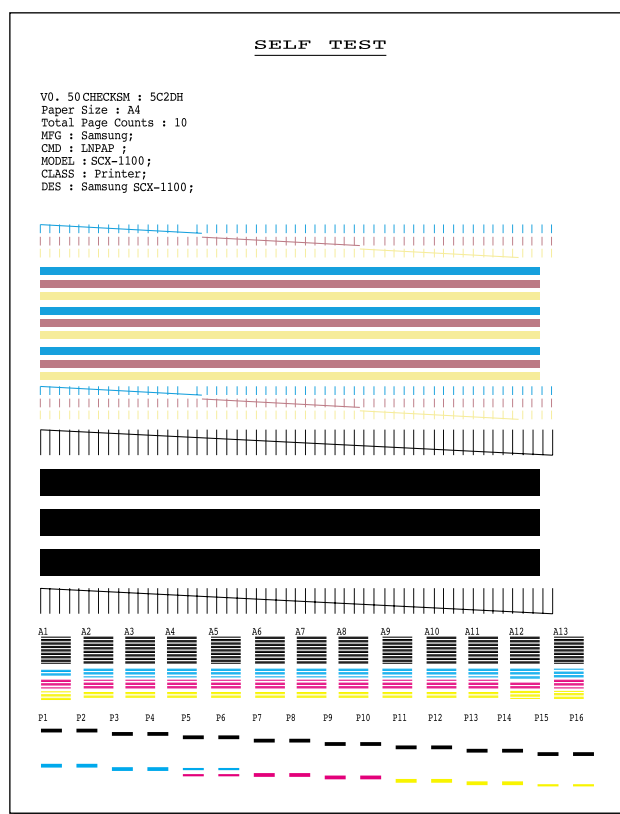
To enter the service mode, press ENTER, LEFT, RIGHT, LEFT, SETUP in sequence, and the LCD displays ' T ', the machine has entered service (Tech) mode.

To return to normal user mode, press ENTER, LEFT, RIGHT, LEFT, SETUP in sequence again, or turn the power off, then on by unplugging and plugging the power cord.

Because the explanation of the User Mode items is already mentioned at the User guide in detail, It will not be described at Service manual.

FACTORY SELFTEST

Using this pattern printout, you can check if the printer mechanism is functioning properly. Examine the pattern and look for a break in the diagonal line. If the diagonal lines are not broken, the printer mechanism is functioning properly.



PROGRAM DOWNLOAD

Use this feature to download a new upgraded ROM file from a PC which is connected to the machine with a parallel cable (IEEE 1284).

< Download >

1. Connect printer to PC with a parallel cable(IEEE 1284.)
2. Select the **PROGRAM DOWNLOAD** function at the TECH MODE.
3. Input **COPY/B FILENAME PRN** at the MS-DOS and push the ENTER key.
(filename : the latest ROM file name when the downloading)
4. After the download is completed, the system will be automatically initialized.

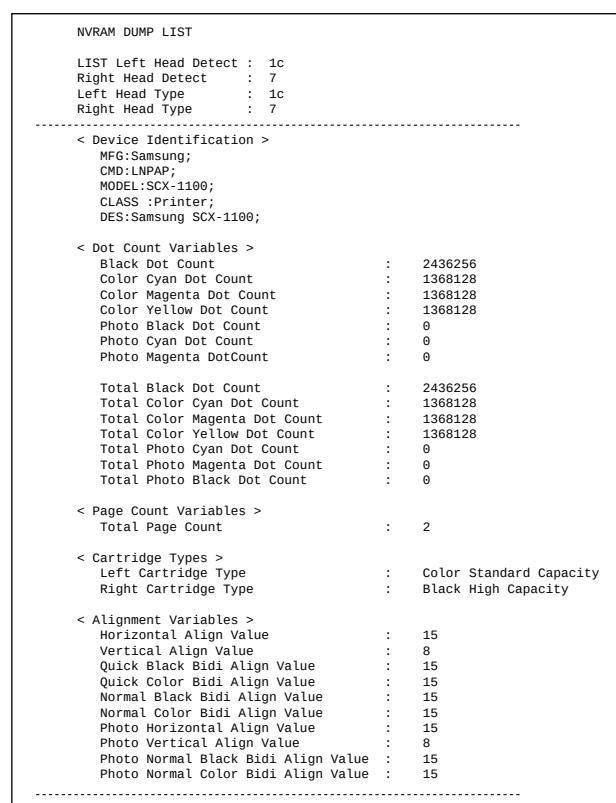
ROM TEST

Use this feature to test the machine'S ROM. The result and the software version appear in the LCD display.

PRINT NVRAM TEST

1. Press the SETUP button until "PRINT NVRAM DUMP" is displayed in LCD.
2. Press the START button when the NVRAM Test operation menu displayed. And then the machine prints the list for NVRAM testing.

The Remote Test feature can be enabled in order to allow a remote location to call up and run a diagnostic test on your machine. You may be instructed by a service representative to enable this feature.



PRINT CCD PATTERN

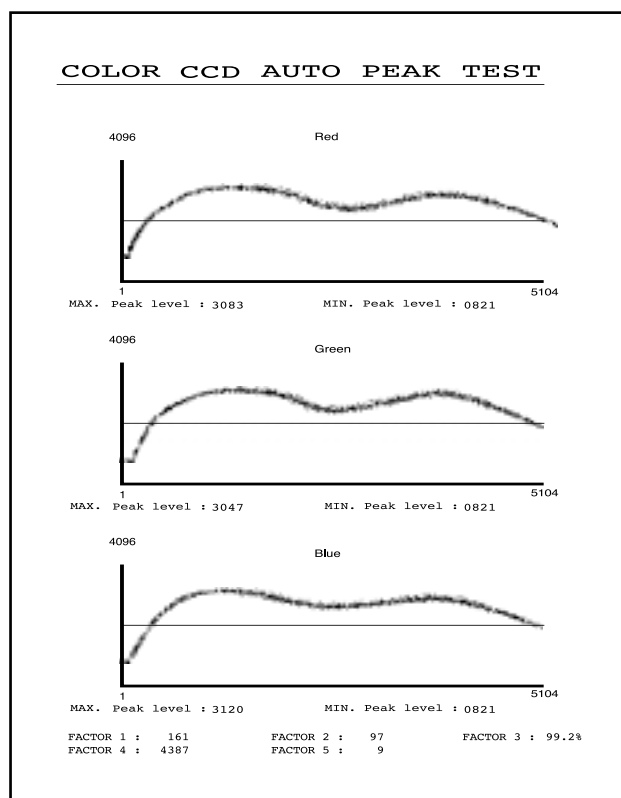
It is used to adjust the light of CCD. It is already set at CCD Test to get optimum quality.

▲NOTICE When you test CCD, make sure that the cover is closed.

1. Press the SETUP button until "Print CCD Pattern" is displayed in LCD.
2. Press the START button when the CCD Test operation menu displayed.
3. After scanner calibrating, wave form will be automatically printed out.

All the wave forms should be similar each other. CCD problems may occur, if:

- More than one of the wave forms are straight lines.
- All wave forms are positioned under the center line.



MEMORY ALL CLEAR

Initiating this function will put the system into the factory shipping state. The procedure is as follows :

1. Unplug power
2. Press and hold " SETUP" button
3. Plug power in
4. Continue holding " SETUP" button until CLEARING MEMORY message appears on LCD
5. Unplug power

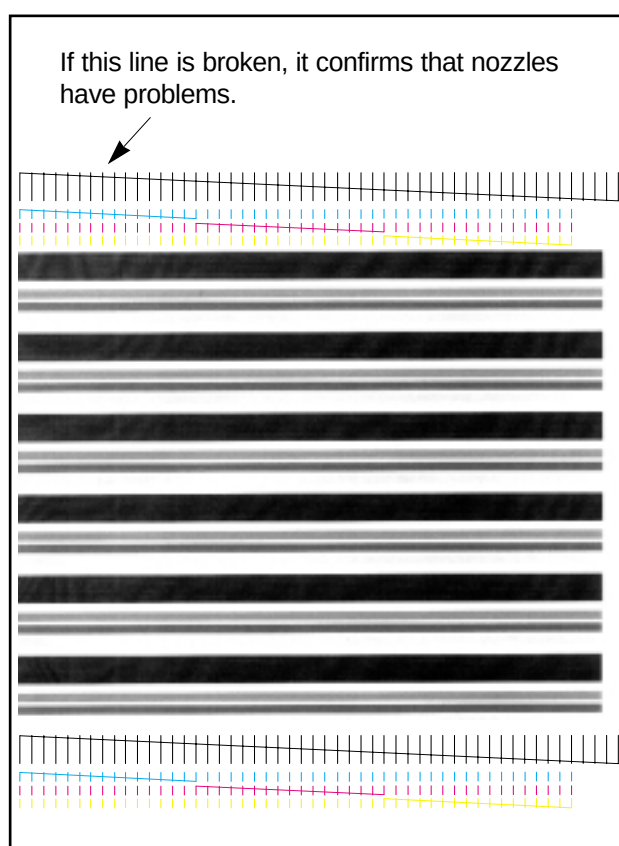
WHITE LINES ON LETTERS OR GRAPHICS

• Cause

If nozzles in print head has a problem, white lines are marked on the print. 'CARTRIDGE MAINTENANCE' will let you know if nozzles have fallen problems.

• Solution

- 1) Run 'print control panel' to "clean print nozzles" and check if nozzles have been blocked.
- 2) Wipe with soft cloth the contact surfaces of ink cartridge and carriage, and check if nozzles have been cleaned properly.
- 3) Separate ink cartridge from carriage and combine them. Repeat it about 5 to 6 times and check if connection is proper.
- 4) Replace ink cartridge and check whether there's a problem with the head.
- 5) Check if head cable is inserted well into the main circuit board and then check if nozzles have problems.
- 6) Check if head cable is broken or torn and then check if nozzles have problems.
- 7) Replace the main circuit board with a new one and check if nozzles have problems.



4-3. Troubleshooting

4-3-1	Defective PC Scan	page(4-5)
4-3-2	Defective Image quality of PC Scan	page(4-5)
4-3-3	Defective Operation (LCD WINDOW ■■■) Display	page(4-6)
4-3-4	No Power	page(4-6)
4-3-5	Defective LCD Operation	page(4-7)
4-3-6	Defective Operation of Key Button	page(4-7)
4-3-7	Paper Jam	page(4-8)
4-3-8	Defective Paper Feed (1)	page(4-8)
4-3-9	Defective Paper Feed (2) -Display of NO PAPER	page(4-9)
4-3-10	Multi-Feeding	page(4-9)
4-3-11	Defective Sensing-ink	page(4-10)
4-3-12	Defective Sensing-paper	page(4-10)
4-3-13	Defective Motor Drive (LF)	page(4-11)
4-3-14	Defective Motor Drive (CR)	page(4-11)
4-3-15	Defective Motor Drive (Scan)	page(4-12)
4-3-16	Blank Page Print Out (When Copying)	page(4-12)
4-3-17	Vertical Black Line (When Copying)	page(4-13)
4-3-18	Contaminated Stains on Paper	page(4-13)
4-3-19	Bad printed Image	page(4-14)
4-3-20	Vertical Lines are printed crookedly	page(4-14)
4-3-21	Bad Color (Intensity)	page(4-15)
4-3-22	The Printer is Not Working (1)	page(4-15)
4-3-23	The Printer is Not Working (2)	page(4-16)
4-3-24	Abnormal Printing	page(4-17)
4-3-25	Spool Error and Release of Spool Error	page(4-18)

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- The solutions of troubleshooting in this 'Service Manual' explain the expected causes and how to check according to each problem and describe how to replace the defected parts (unit of ASS'Y) if necessary.
 - The contents of this 'Service Manual' describe general ones only among many kinds of problems and causes while using the Product.
 - The contents of this 'Service Manual' describe mainly technical explanations of the Product H/W and parts on the assumption that there is no problem in S/W.
-

4-3-1 Defective PC Scan

• Description	The PC Scan is not functioning at all.		
• Location	1. UBS Cable of the Printer or Centronics Cable	2. Driver	3. Main B'd

Check and Cause	Solution
1. Check the Cable (USB or Parallel) 2. Check if the driver is installed properly.	1. If the PC and the cable are not connected properly, reconnect it. 2. After confirming that it is proper by performing a PC printing test related to driver setup, if it is not so, reinstall it. (Refer to User's Manual.)

4-3-2 Defective Image Quality of PC Scan

• Description	The image PC scanned is not clear or bad.		
• Location	1. CCD ASS'Y	2. Main B'd	

Check and Cause	Solution
1. Check the waveform form by performing a CCD test in TECH mode. (Refer to 4-1-3) 2. Check if the resolution is set too low in PC Scan options. (Refer to User's Manual.)	1. If the CCD waveform form is abnormal, try to replace CCD ASS'Y. 2. If the resolution is set to low, let the user be acquainted with the using method well.

4-3-3 Defective Operation (LCD WINDOW ■■■) Display

• Description	Strange characters are displayed on the OPE Panel and buttons are not operated.		
• Location	1.OPE ASS'Y	2.Connection between the Main B'D and OPE ASS'Y	3.Main B'D.

Check and Cause	Solution
1. Clear the memory. 2. Check if OPE HARNESS is connected to the Main Board correctly.	1. Try again after clearing the memory. 2. After confirming that OPE HARNESS is connected to the Main Board correctly, if it is so, then replace the OPE ASS'Y and Main Board in sequence.

4-3-4 No Power

• Description	While the power S/W is turned on, it does not work at all.		
• Location	1.Power code 3.Power ASS'Y	2.Connection between the Main B'D and Power HARNESS 4.Main B'D.	5.OPE Ass'y

Check and Cause	Solution
1. Check if the connection of power code is normal. 2. Check if DC +3.3V and +30V is supplied to POWER ASS'Y from MAIN B'd. 3. Check if POWER DOWN KEY in OPE ASS'Y is working regularly.	1. Try to replace the power code. 2. If all the connections are correct, try to replace the power ASS'Y and the Main B/D in sequence. (+3.3V and +30V is supplied to POWER ASS'Y from MAIN B'd) 3. Replace OPE ASS'Y

4-3-5 Defective LCD Operation

• Description	The LCD screen is not turned on or has a strange display.		
• Location	1.LCD	2.OPE Ass'y	3.Main B'd

Check and Cause	Solution
1. Clear the memory. (Refer to page 4-1). 2. Confirm to catch a click sound, while a key on the OPE panel is pressed on. 3. Check the status of Harness between LCD and OPE Panel, replace in order of Main B'd/LE Motor.	1. The key is wrong itself or wrongly assembled. 2. Even after the key or harness has been replaced, it is still wrong, try to replace the OPE ASS'Y and the Main B'D in sequence.

4-3-6 Defective Operation of Key Button

• Description	The button of the OPE Panel is not operated..		
• Location	1. OPE ASS'Y	2. Main Board	

Check and Cause	Solution
1. Confirm to catch a click sound while the key is pressed on. 2. Check if a specific key is pressed by another equipment.	1. If you cannot catch a click sound, the key is wrong itself or wrongly assembled. 2. Even after the key has been replaced, it is still wrong, try to replace the OPE ASS'Y and the Main B'D in sequence.

4-3-7 Paper Jam

• Description	The paper is jammed inside the set and not exited from.
• Location	ASF ASS'Y

Check and Cause	Solution
1. Check if the paper is crumpled or preprinted. 2. Check if too many sheets of recording paper are put into ASF (Automatic Sheet Feeder). (Standard : up to 100 sheets). 3. Check if the remaining papers are stuck in the frame base.	1. If the papers jammed or pieces of the paper are stuck inside the set, remove them and then try it again. 2. If the problem still exists, try to replace ASF ASS'Y.

4-3-8 Defective Paper Feed (1)

• Description	A recording paper is tilted while feeding.
• Location	ASF ASS'Y

Check and Cause	Solution
1. Check if the paper guide of ASF (Automatic Sheet Feeder) is set up properly with the width of recording paper. 2. Check if too many sheets of recording paper are put into ASF (Automatic Sheet Feeder). (Standard: up to 100 sheets). 3. Check if the recording paper is crumpled or preprinted.	1. After all have been checked, the problem still exists, try to replace the ASF ASS'Y.

4-3-9 Defective Paper Feed (2)-Display of NO PAPER

• Description	paper does not feed into the printer.		
• Location	1. ASF ASS'Y	2. Main B'd	3. LF Motor

Check and Cause	Solution
1. Press ENTER button to check.	1. Even if the ENTER button is pressed, a recording paper is not drawn into, then try to replace the ASF ASS'Y. 2. Even if the ASF Ass'y or harness has been replaced, it is still wrong, try to replace the Main B'd and the LF Motor in sequence.

4-3-10 Multi-Feeding

• Description	Multiple-sheets of recording paper are fed at once.
• Location	ASF ASS'Y

Check and Cause	Solution
1. Adjust the paper guide of ASF to the width of paper correctly. 2. Check if the recording paper is preprinted or crumpled. 3. Check if too many sheets of recording paper are put into ASF (Automatic Sheet Feeder). (Standard: up to 100 sheets).	1. Blow several times of puff into the paper in order to prevent static electricity. 2. Even after the papers are loaded correctly, if multiple sheets of paper are still fed at once, then try to replace the ASF ASS'Y.

4-3-11 Defective Sensing-ink

• Description	The ink is put in the set, but it cannot sensed.	
• Location	1.Cartridge ASS'Y	2.Main B'D

Check and Cause	Solution
1. Check if the cartridge is installed in the cartridge box properly. (It makes a click sound normally when it is normal.) 2. Check if the cartridge box is operated normally. 3. Check if there is an alien matter in the Dimple contact point of HEAD of CARTRIDGE BOX	1. Even after the cartridge is installed normally, it still cannot sense, then try to replace the Main B'D. 2. In case the cartridge box is not moved from side to side, check the Flat Cable connection between the Main PBA & Frame Home Unit, and even after being connected properly, if it is still not improved, then try to replace the cartridge ASS'Y.

4-3-12 Defective Sensing-paper

• Description	The recording papers are put in already, but it cannot be sensed.	
• Location	1.Main B'D	2. LF Motor

Check and Cause	Solution
1. Check if the ENTER key on the OPE panel is pressed.	1. Refer to "Defective Paper Feed". 2. Even if the ENTER key on the OPE panel is pressed, it still cannot sense, then try to replace the Main B'D and LF Motor in sequence. Notes: The SCX-1100 Product has no paper sensor, instead it displays ERROR when it cannot pick up the paper.

4-3-13 Defective Motor Drive (LF)

• Description	The motor drive of Line Feeder is not working.	
• Location	1.Main B'D	2.LF Motor

Check and Cause	Solution
1. Check if the connector of LF Motor is connected to the Main B'D normally.	1. Try to replace the Main B'D and the LF Motor ASS'Y in sequence.

4-3-14 Defective Motor Drive (CR)

• Description	The drive of CR Motor is not working.	
• Location	1.Main B'D	2.CR Motor

Check and Cause	Solution
1. Check if the connector of CR Motor is connected to the Main B'D normally.	1. Try to replace the Main B'D, the CR Motor ASS'Y in sequence.

4-3-15 Defective Motor Drive (SCAN)

• Description	The Scan Motor is not driven.	
• Location	1.Main B'D	2.Scan Motor

Check and Cause	Solution
1. Check if the connector of Scan Motor is connected to the Main B'D normally.	1. Try to replace the Main B'D and the Scan Motor ASS'Y in sequence.

4-3-16 Blank Page Print Out (When Copying)

• Description	Blank page is printed out when copying.	
• Location	1.CCD ASS'Y	2.Main B'D

Check and Cause	Solution
1. Check if the recording papers are inserted reversely.	1. Insert the paper with the copy side to be faced down.
2. Perform the CCD test in the service mode. (Refer to 4-1-3)	2. In case the output waveform is abnormal in the CCD test, replace the CCD ASS'Y, while replace the Main B'D in normal.

4-3-17 Vertical Black Line (When Copying)

• Description	Vertical black lines occur in the printing.
• Location	1.CCD ASS'Y 2.Main B'D.

Check and Cause	Solution
1. Check the alien matter of flat glass face. 2. Perform a CCD Test to check if the waveform is normal. (Refer to 4-1-3.) 3. Clean the cartridge nozzle.	1. If there are some stains on the surface of CCD, wipe them off with alcohol (IPA). 2. If the CCD waveform is abnormal, replace the CCD ASS'Y. 3. Clean the nozzle and confirm again. 4. After confirming the CCD waveform and cleaning the nozzle, if the vertical black lines still occur, then try to replace the Main B'D.

4-3-18 Contaminated Stains on Paper

• Description	Contaminated stains on the copied paper occur in the printing.
• Location	1.CCD ASS'Y 2.Main B'D.

Check and Cause	Solution
1. Check the status of document. 2. Check the waveform by performing a CCD test. (Refer to 4-1-3)	1. If the CCD waveform is abnormal, try to replace the CCD ASS'Y. 2. In case the CCD waveform is normal but the print quality is bad, try to replace the Main B'D.

4-3-19 Bad Printed Image

• Description	The copied image is light or bad.
• Location	1.CCD ASS'Y

Check and Cause	Solution
1. Check the CCD waveform. (Refer to 4-1-3) 2. Test and check the cartridge arrangement. (Refer to 4-2) 3. Clean the cartridge nozzle. (Refer to 4-2)	1. In case the CCD waveform is good, clean the outlet of cartridge. 2. In case the CCD waveform is abnormal, try to replace the CCD ASS'Y. 3. Even after cleaning the outlet of nozzle, the received data image is still bad, then replace the cartridge. 4. Try to replace the Main B'D.

4-3-20 Vertical Lines are printed crookedly

• Description	The vertical lines are printed crookedly.
• Location	Cartridge

Check and Cause	Solution
1. Test and check the cartridge arrangement. (Refer to 4-2)	1. Perform the cartridge arrangement to set up black/color newly. Repeat it several times until you get the sufficient condition.

4-3-21 Bad Color (Intensity)

• Description	The color is different from the original document in the printing.
• Location	1.Capacity of Ink Cartridge 2.CCD ASS'Y.

Check and Cause	Solution
1. It may occur when the amount of specific ink in the ink cartridge (color) is deficient. 2. Check the waveform by performing a CCD test. (Refer to 4-1-3)	1. After checking if the capacity of ink cartridge is deficient, try to replace it. 2. After having performed a CCD shading test, if it is not still improved, then try to replace the CCD ASS'Y.

4-3-22 The Printer is Not Working (1)

• Description	While the power is turned on, the printer is not working at all by the PRINT command from the computer.
----------------------	---

Check and Cause	Solution
1. Perform the Printer Self-Test. 2. Check if the PC and the printer cable are properly connected. 3. Check if the printer driver is correctly installed.	1. Check the power source of the printer first and perform the Printer Self-Test. If the test results in printing, it is considered as there is no problem in the printer itself. If the printer is not working, the function may be defective (not due to SW), so take another proper measure. 2. Check the status of the printer connection, and if it is defective, replace the printer cable (USB or Parallel). 3. Check the connection between PC and printer port (USB port or LPT port). Check if the printer driver at the Printers on the Control Panel is installed. If the printer driver is properly setup, check in which program the printing is not working. The best way is to try printing from the Memo pad, the WINDOWS basic program. Sometimes, the print out is normal within the WINDOWS basic programs, but it may not work in a specific program. In such case, reinstall the printer driver.

4-3-23 The Printer is Not Working (2)

• Description	Even after the Print command, there is no response at all or the printing speed is low.
----------------------	---

Check and Cause	Solution
It may be due to wrong setup of the environment rather than malfunction of the printer itself. And in case that abnormal characters are printed out, also check the environment setup. 1. Secure the hard disk space. 2. Printing error occurs even if there is enough space in the hard disk. 3. Reboot the system, and try printing again.	1. Not working with the message 'Insufficient memory' means that the hard disk space to store the print information is insufficient rather than the RAM insufficiency. In this case, secure more space for the hard disk. Secure more space for C drive by using the Disk utilities program at 'PROGRAM - ACCESSORIES - SYSTEM TOOL' from the Start menu. 2. The connection of the cable or printer port is not properly setup. 3. If characters are printed abnormally, the cable or the printer driver may be defective. Turn the PC and printer off, and reboot the system to try printing again. If the problem still exists, double click to install the printer from My Computer and right-click the mouse, then click 'Test Print' button at the bottom of the file information tab. If normal characters are not printed again, the cable must be defective so replace the cable with a new one.

4-3-24 Abnormal Printing

- | | |
|----------------------|---|
| • Description | The printing is not working properly even when the cable has no problem.
(even after the cable is replaced)
If the printer won't work at all or strange characters are only printed,
it may be the printer driver problem. |
|----------------------|---|

Check and Cause	Solution
1. Printer driver error 2. Error due to insufficient memory. (The printing job sometimes stops during proceeding or not completed due to insufficient memory.)	1. Check 'My Computer - Printers'. (If the printer driver is installed not compatible with the printer currently installed or an error occurs in the driver file, remove the existing driver and reinstall the printer driver by using the 'Printer Add' menu. 2. This is because of an insufficient virtual memory. (It does not mean the actual capacity of RAM but the space of hard disk.) Delete unnecessary files to secure enough space of the hard disk and try printing again.

Name of Printer Port :

To reinstall the printer driver, do after removing the current driver.

- While installing the driver, Set and PC should be connected.
(The printer setup may be wrong if they are not connected during installing.)
- The SCX-1100 Model supports all the USB/Parallel Print, select the USB Port when using the USB, while select the LPT Port when using the Parallel.

4-3-25 Spool Error and Release of Spool Error

• Description

pool (Simultaneous Peripheral Operations Online) refers to process the document to be read and stored in the hard disk or the mass storage media, and then to be printed at more convenient time. While the printer is outputting other file, the file requested to output is undergone to be spooled in the hard disk, the spool error may occur if a problem occurs in this process. First, delete the Spool Data if the Spool Error occurs.

Check and Cause	Solution
1. Insufficient space of the hard disk set as the default spool directory. 2. If the previous printing out error is not solved. 3. In case a collision with other program is expected. 4. When an application program or the printer driver file is damaged. 5. If some of OS related files are damaged or malfunctioning due to virus infections. 6. The memory is less than that recommended by the OS.	1. Delete unnecessary files to provide more hard disk space and try printing job. 2. Since there may be some journal files with the extension **.jnl, delete them and reboot the WINDOWS to restart printing job. 3. Exit all other programs except the program currently using, if possible, and print again. 4. Delete the printer driver completely and reinstall it. 5. After rebooting the computer, check viruses, restore the damaged files and reinstall the program, then try printing again. 6. Add memory to the PC.

How to delete the data in the spool manager :

In the spool manager, the installed drivers and the list of all the documents waiting to be printed are shown. Select the data of the document to be deleted and select Document menu --> Delete.

If you intend to delete the current document being printed, the data being transferred to the printer will be printed out and then the document will be removed. Before choosing the document data, the document menu is still inactive.

Or Hold the document in the waiting list and repeat the routine as the above or exit the Spool manager

5. Exploded View and Parts List

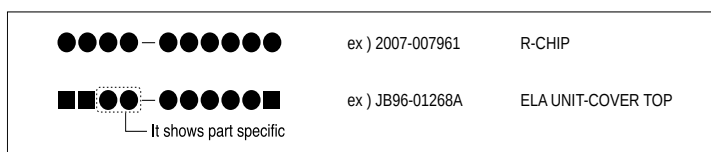
5-1 Main Assembly Exploded view	page(5-2)
5-2 Main Cover Assembly Exploded view.....	page(5-4)
5-3 Scanner Assembly Exploded view	page(5-6)
5-4 OPE Unit Exploded view.....	page(5-8)
5-5 Engine Ass'y Exploded view.....	page(5-10)
5-6 ASF Unit Exploded view	page(5-12)
5-7 Screw	page(5-14)
5-8 SMPS Parts Lists	page(5-14)

- Deal drawings and service parts are declared for the items with higher rate of inferiority and replaceable in the level of service description only.
- If inferiority occurs, you can replace the parts by the unit declared in deal drawings and service items.

Way to observe Part Code & Description

Part code and Description is quoted and controlled by determined standard. Refer to this determined standard, it will help with ordering Part.

- There are two kinds of Part code inscription type.



(● : figure, ■ : character (alphabet))

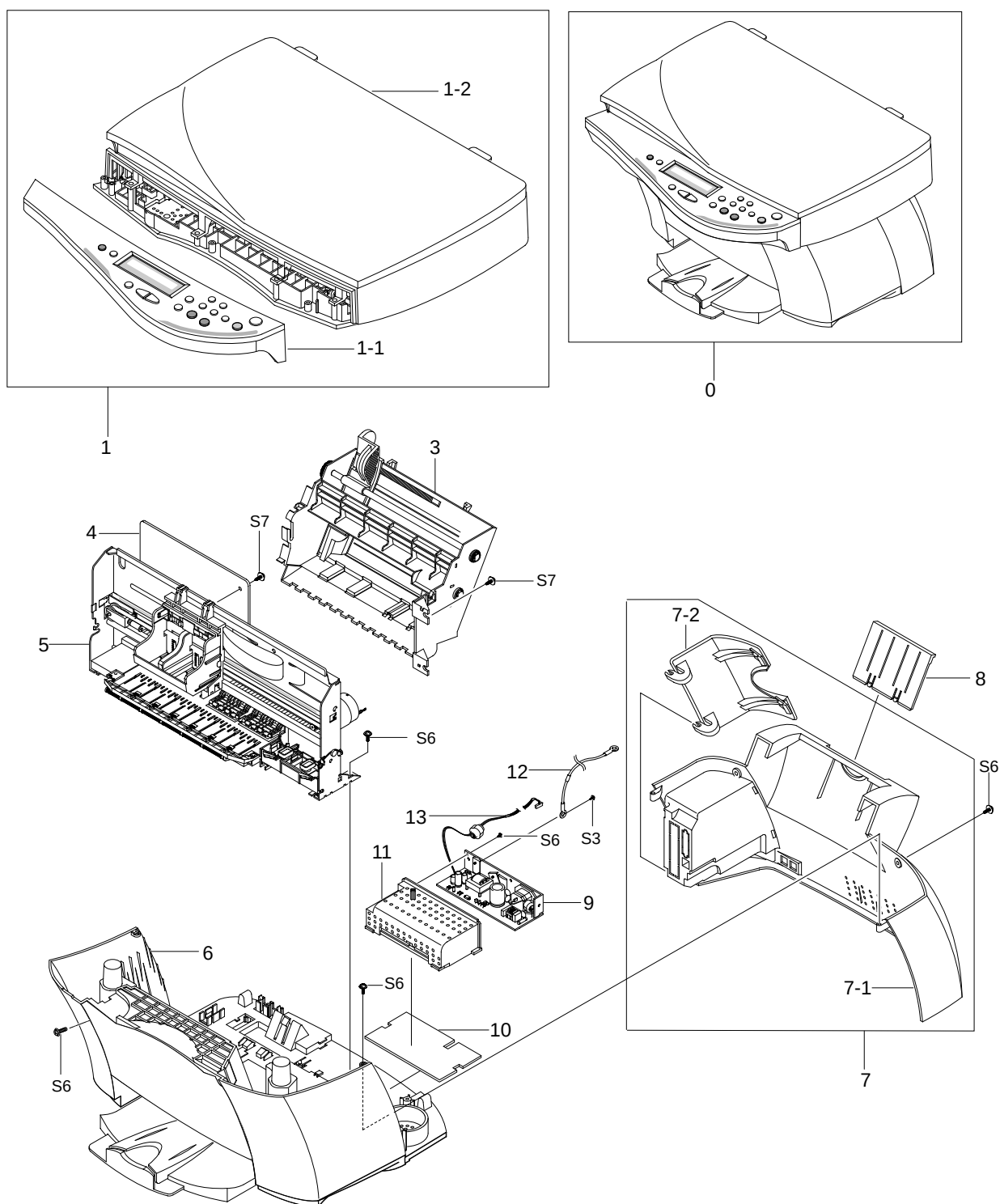
Type 1 : Controlled by Company : It can be commonly used for all kinds of product SEC produce. Mostly, electronics Parts.

Type 2 : Controlled by Division : It is used on one produce. Mostly, Mostly, mechanical Parts.

- **A/S privately used part :** It is only used for A/S .
- **Ass'y part :** Assembled by more than 2 Parts. If necessary part is not A/S Part, Ass'y part including necessary part can be used. It is shown in the diagram and drawing of SVC manual.
- Ass'y part and A/S privately used Part is distinguished by part Code and Description. They are inscription type 2. It is recognized by Part character and front side of description.

DIVISION	PART CODE	DESCRIPTION
A/S Private	**81_***** (JB81-00039A)	AS-***** (AS-USE)
ASS'Y Part	**75_***** (JB75-00068A)	MEC-***** (MEC-CHUTE)
ASS'Y Part	**92_***** (JB92-01131A)	PBA ***** (PBA MAIN-CONTROLLER)
ASS'Y Part	**97_***** (JB97-01089A)	MEA ***** (MEA UNIT-PULLEY IDLE)

5-1 Main Assembly Exploded view



< Main Assembly Parts List >

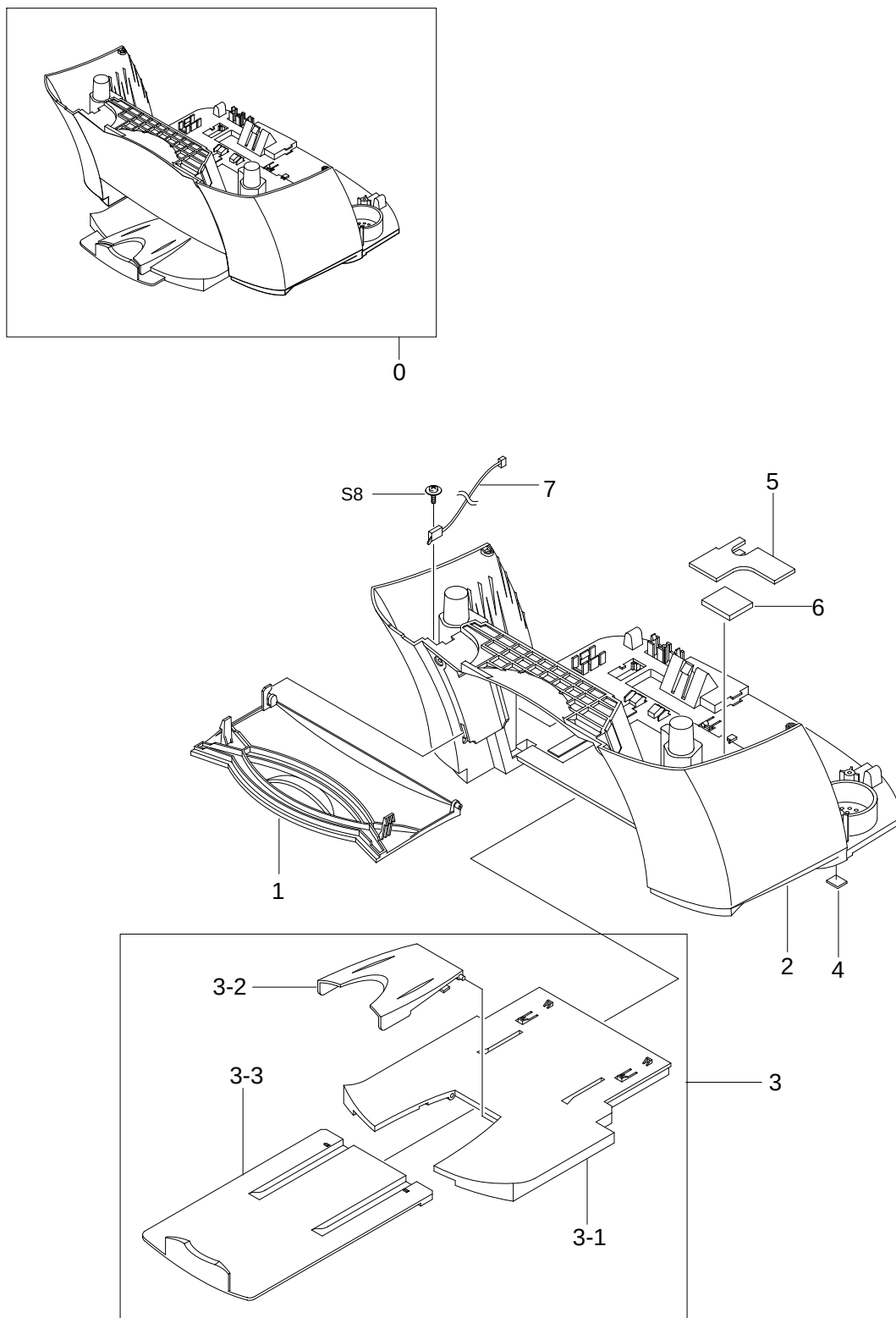
SA. : Service Available

NO	DESCRIPTION	SEC CODE	Q'TY	SA	REMARK
0	SCX-1100			X	
1	ELA-UNIT-OPE/SCANNER ASS'Y	Refer to table below	1	O	
1-1	ELA UNIT-OPE ASS'Y(1100)	Refer to table below	1	O	
1-2	ELA-UNIT-UNIT SCANNER(1100)	*	1	X	
3	MEA UNIT-FEEDER	JB97-01535A	1	O	
4	PBA MAIN-MAIN	JB92-01201A	1	O	
5	ELA UNIT-ENGINE ASS'Y	JB96-01330A	1	O	
6	MEA-COVER MAIN	JB97-01539A	1	O	
7	MEA-COVER REAR	*	1	X	
7-1	PMO-COVER REAR	*	1	X	
7-2	PMO-DOOR SIDE	*	1	X	
8	PMO-GUIDE EXTENSION	JB72-01140A	1	O	
9	SMPS-MAGIC	JB44-00017A	1	O	110/220 VAC
10	LABEL SHEET-SMPS	*	1	X	
11	PMO-COVER SMPS	JB72-01146A	1	O	
12	CBF HARNESS-POWER GND	*	1	X	
13	CBF HARNESS-MAIN POWER	JB39-00129A	1	O	
S3	SCREW-TAPPING	*	2	X	M 3 X 8 mm
S6	SCREW-TAPTITE	*	9	X	M 3 X 10 mm
S7	SCREW-TAPTITE	*	5	X	M 3 X 6 mm

O: Service available X: Service not available

MODEL	ELA-UNIT-OPE/SCANNER ASS'Y	ELA UNIT-OPE ASS'Y
SCX-1100/XEF	JB96-01343D	JB96-01342D
SCX-1100/XEP	JB96-01343E	JB96-01342E
SCX-1100/XEU	JB96-01343A	JB96-01342A
SCX-1100/XFA	JB96-01343F	JB96-01342A
SCX-1100/XIL	JB96-01343B	JB96-01342B
SCX-1100/XIP	JB96-01343F	JB96-01342F
SCX-1100/XSH	JB96-01343F	JB96-01342F
SCX-1100/XSS	JB96-01343F	JB96-01342F
SCX-1100D/XSH	JB96-01343F	JB96-01342F

5-2 Main Cover Assembly Exploded view



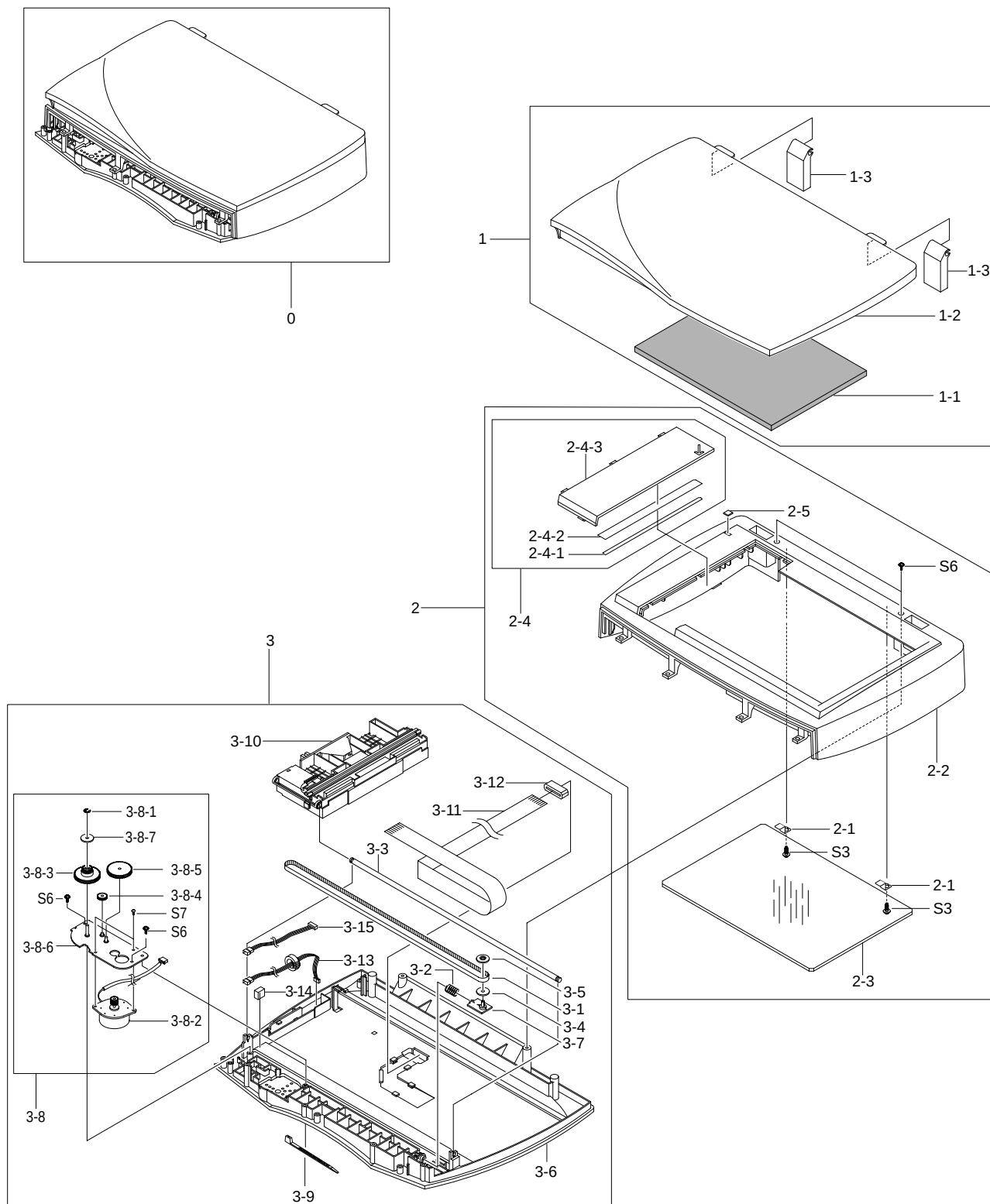
< Main Cover Assembly Parts List >

SA. : Service Available

NO	DESCRIPTION	SEC CODE	Q'TY	SA	REMARK
0	MEA-COVER MAIN	JB97-01539A	1	O	
1	PMO-DOOR FRONT	JB72-01144A	1	O	
2	PM-COVER MAIN	*	1	X	
3	MEA-STACKER	*	1	X	
3-1	PMO-BASE STACKER	JB72-01143A	1	O	
3-2	PMO-EXIT TRAY MIDDLE	JB72-00978C	1	O	
3-3	PMO-EXIT TRAY EXTENSION	JB72-00982C	1	O	
4	FOOT-RUBBER	JB61-40901A	2	O	
5	MPR-FELT UPPER	JB74-00014A	1	O	
6	MPR-FELT LOWER	JB74-00015A	1	O	
7	CBF HARNESS-MAIN_COVER OPEN	JB39-00116A	1	O	
S8	SCREW-SPECIAL	*	1	X	M3 X 8 mm

O: Service available X: Service not available

5-3 Scanner Assembly Exploded view



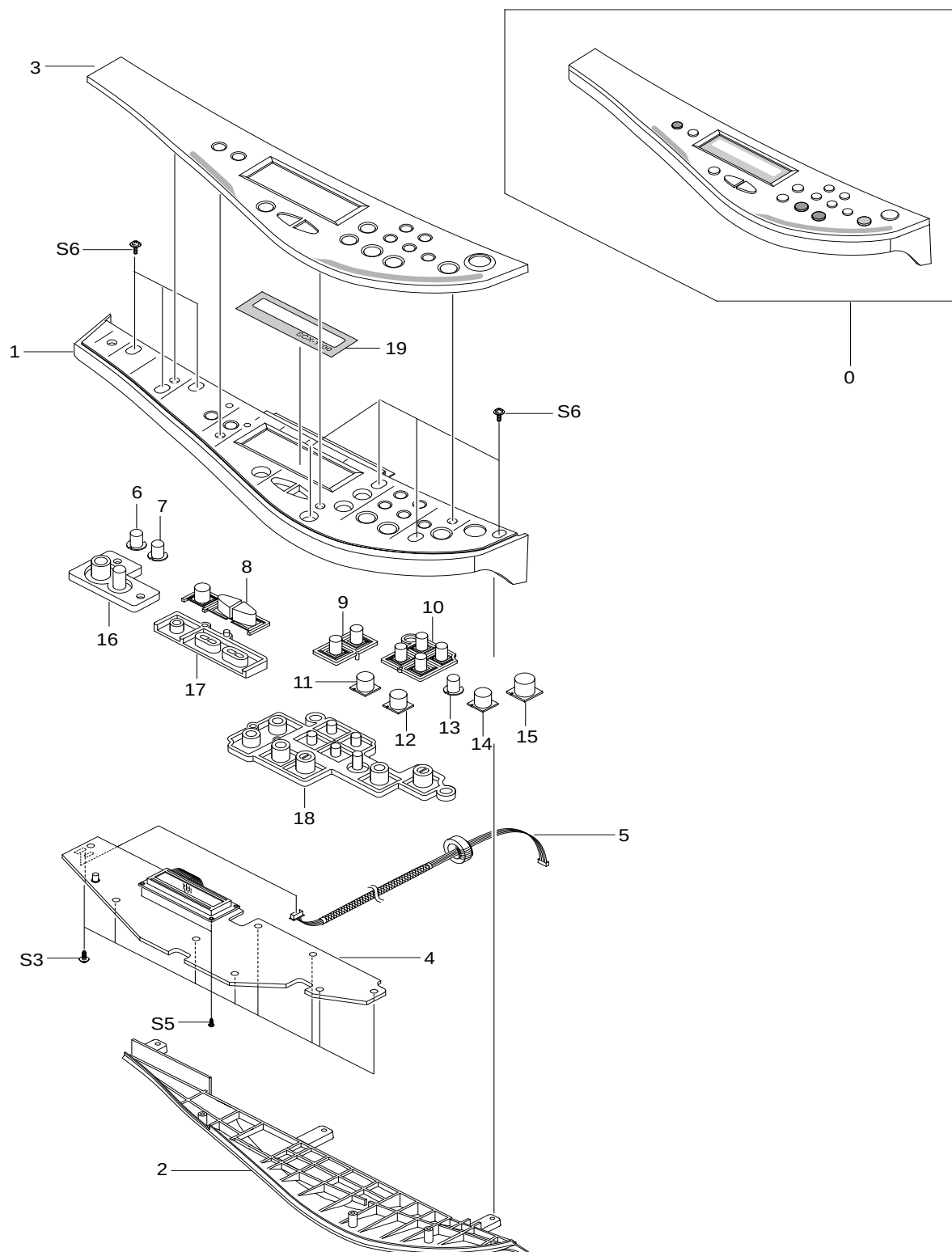
< Scanner Assembly Parts List >

SA. : Service Available

NO	DESCRIPTION	SEC CODE	Q'TY	SA	REMARK
0	ELA UNIT-SCANNER	*	1	X	
1	MEA-COVER PLATEN	JB97-01560A	1	O	
1-1	MPR-WHITE SPONGE SHEET	*	1	X	
1-2	PMO-COVER PLATEN(1100)	*	1	X	
1-3	PMO-HINGE (3 IN 1)	*	2	X	
2	MEA-SCAN UPPER	*	1	X	
2-1	IPR-HOLDER GLASS	*	2	X	
2-2	PMO-SCAN UPPER	*	1	X	
2-3	MCT-SCAN GLASS	*	1	X	
2-4	MEA-DUMMY (3 IN 1)	*	1	X	
2-4-1	TAPE-DOUBLE FACE	*	1	X	
2-4-2	LABEL(P)-SHADING	*	1	X	
2-4-3	PMO-SCAN DUMMY(3IN1)	*	1	X	
2-5	LABEL(P)-ACTUATOR (3 IN 1)	*	1	X	
3	MEA-SCAN LOWER	*	1	X	
3-1	BELT-TIMING GEAR	6602-001067	1	O	
3-2	SPRING-BELT	*	1	X	
3-3	ICT-SHAFT CCD	*	1	X	
3-4	PMO-PULLEY	*	1	X	
3-5	PMO-HOLDER BELT	*	1	X	
3-6	PMO-SCAN LOWER	*	1	X	
3-7	PMO-HOLDER BELT	*	1	X	
3-8	ELA ETC-BRKT SCAN MOTOR	JB96-01344A	1	O	
3-8-1	RING-E	*	2	X	
3-8-2	MOTOR-SCAN	JB31-00011A	1	O	
3-8-3	GEAR-TIMING	*	1	X	
3-8-4	GEAR-IDLE	*	1	X	
3-8-5	GEAR-REDUCTION	*	1	X	
3-8-6	IPR-BRKT SCAN MOTOR	*	1	X	
3-8-7	PMO-HOLDER BELT	*	1	X	
3-9	CABLE-TIE	*	1	X	
3-10	ELA MODULE-SCANNER(MUAX)	JB96-01317A	1	O	
3-11	CBF-FLAT CBL-CCD	JB39-00132A	1	O	
3-12	CORE-FERRITE	*	1	X	
3-13	CBF-HARNESS-MAIN OPE	JB39-00148A	1	O	
3-14	CUSHION PAD-DAMPER	JB69-00186A	1	X	
3-15	CBF-HARNESS-SCAN MOTOR	JB39-00147A	1	O	
S3	SCREW-TAPPING	*	2	X	M3 X 8 mm
S6	SCREW-TAPTITE	*	4	X	M3 X 10 mm
S7	SCREW-TAPTITE	*	2	X	M3 X 6 mm

O: Service available X: Service not available

5-4 OPE Unit Exploded view



< OPE Unit Parts List >

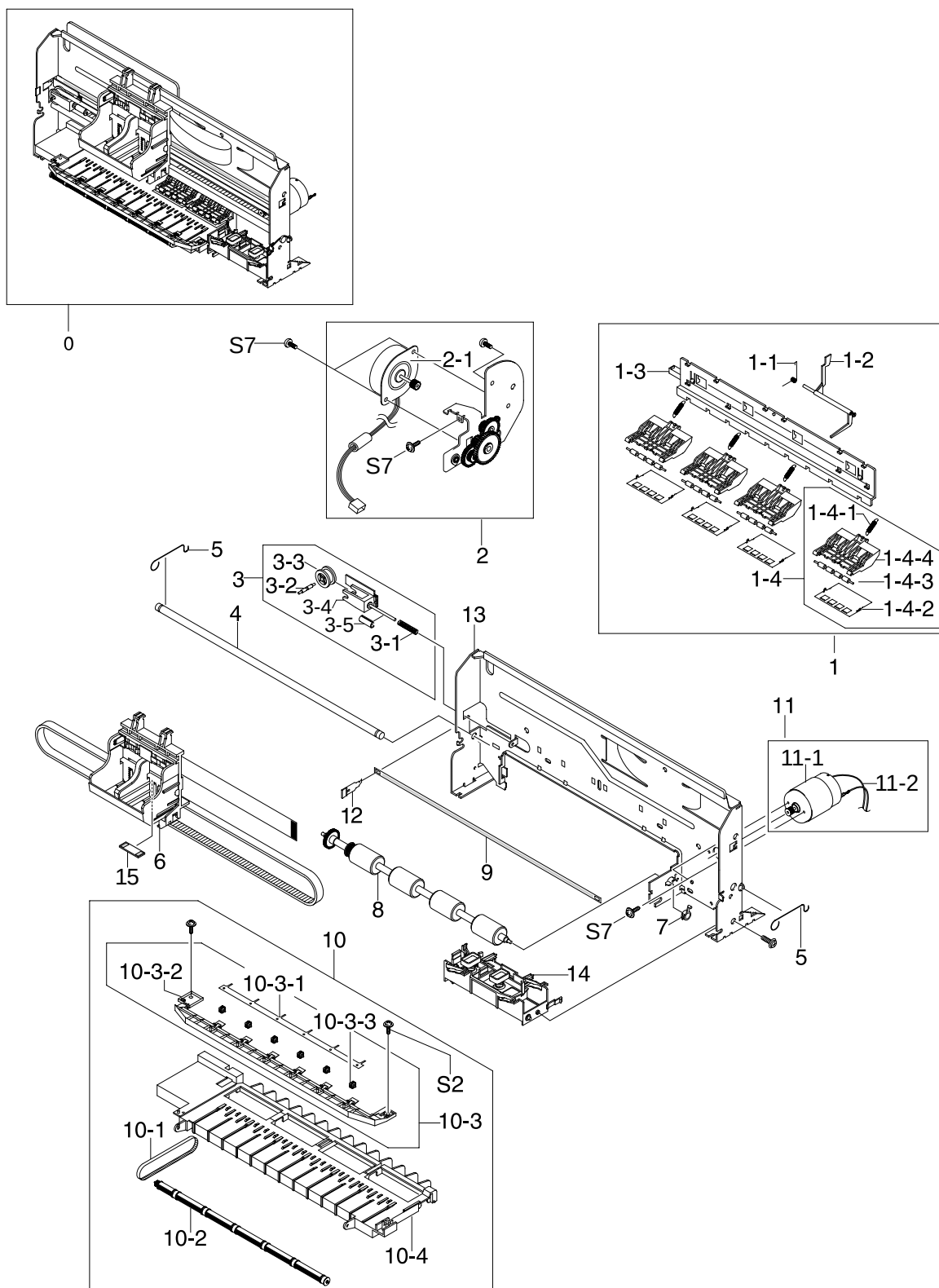
SA. : Service Available

NO	DESCRIPTION	SEC CODE	Q'TY	SA	REMARK
0	ELA UNIT-OPE ASS'Y(1100)	Refer to table below	1	O	
1	PMO-OPE UPPER	*	1	X	
2	PMO-OPE LOWER	*	1	X	
3	PMO-OPE PANEL(1100)	Refer to table below	1	O	
4	PBA-MAIN-OPE	JB92-01202A	1	O	
5	CBF HARNESS-MAN OPE	*	1	X	
6	PMO-KEY ANSWER	*	1	X	
7	PMO-KEY SAVE(1100)	*	1	X	
8	PMO-KEY SCROLL	*	1	X	
9	PMO-KEY ENTER(1100)	*	1	X	
10	PMO-KEY ZOOM	*	1	X	
11	PMO-KEY BLACK	*	1	X	
12	PMO-KEY COLOR	*	1	X	
13	PMO-KEY SPECIAL(1100)	*	1	X	
14	PMO-KEY SCAN	*	1	X	
15	PMO-KEY POWER(1100)	*	1	X	
16	RMO-RUBBER SAVE(1100)	*	1	X	
17	RMO-RUBBER SETUP(1100)	*	1	X	
18	RMO-RUBBER COPY(1100)	*	1	X	
19	SHEET-LCD	*	1	X	
S3	SCREW-TAPPING	*	8	X	M 3 X 8 mm
S5	SCREW-TAPPING	*	2	X	M 2.5 X 5 mm
S6	SCREW-TAPTITE	*	6	X	M 3 X 10 mm

O: Service available X: Service not available

MODEL	ELA-UNIT-OPE ASS'Y	PMO-OPE APANEL
SCX-1100/XEF	JB96-01342A	JB72-01196A
SCX-1100/XEP	JB96-01342B	JB72-01196B
SCX-1100/XEU	JB96-01342D	JB72-01196D
SCX-1100/XFA	JB96-01342E	JB72-01196E
SCX-1100/XIL	JB96-01342A	JB72-01196A
SCX-1100/XIP	JB96-01342F	JB72-01196F
SCX-1100/XSH	JB96-01342F	JB72-01196F
SCX-1100/XSS	JB96-01342F	JB72-01196F
SCX-1100D/XSH	JB96-01342F	JB72-01196F

5-5 Engine Ass'y Exploded view



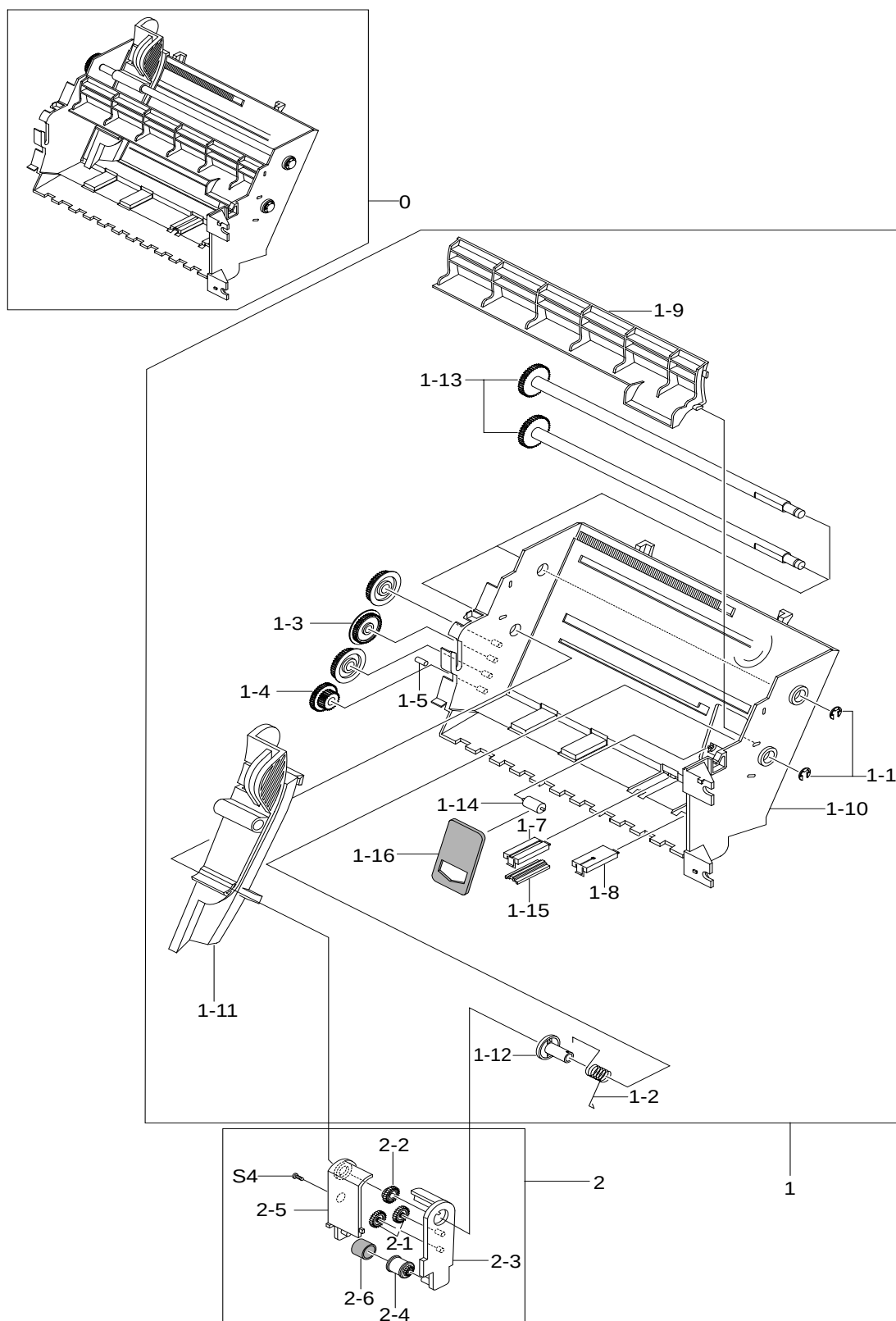
< Engine Ass'y Parts List >

SA. : Service Available

NO	DESCRIPTION	SEC CODE	Q'TY	SA	REMARK
0	ELA UNIT-ENGINE ASSY	JB96-01330A	1	O	
1	MEC-HOLDER ROLLER	JB75-11111A	1	O	
1-1	SPRING-ES ACTUATOR	JB61-70919A	1	O	
1-2	PMO-ACTUATOR FEED	JB72-40993A	1	O	
1-3	PMO-HOLDER ROLLER SUB	*	1	X	
1-4	MEC-FRIC ROLLER	*	4	X	
1-4-1	SPRING-ES FRICTION	*	1	X	
1-4-2	IPR-DEFLECTOR	*	1	X	
1-4-3	ICT-FRICTION ROLLER	*	1	X	
1-4-4	PMO-HOLDER F/R	*	1	X	
2	MEA UNIT-BRKT LF	JB97-01536A	1	O	
2-1	MOTOR-STEP LF(V)	JB31-00007A	1	O	
3	MEC-PULLEY IDLE	JB75-11110A	1	O	
3-1	SPRING-CS PULLEY	*	1	X	
3-2	ICT-SHAFT PULLEY IDLE	*	1	X	
3-3	PMO-PULLEY IDLER	*	1	X	
3-4	PMO-HOLDER PULLEY	*	1	X	
3-5	PMO-STOPPER PULLEY	JB72-41212A	1	O	
4	ICT-SHAFT CR	JB70-40906A	1	O	
5	SPRING-SHAFT CR	JB61-70913A	2	O	
6	MEA UNIT-C/R/SEC	JB96-01303A	1	O	
7	BEARING-FEED R	JB66-10002A	1	O	
8	MEC-ROLLER FEED	JB75-11112A	1	O	
9	PRP-ENCODER STRIP(V)	JB72-00662A	1	O	
10	MEC-FRAME BASE	JB75-00170A	1	O	
10-1	BELT-EXIT	JB75-00171A	1	O	
10-2	MEC-EXIT ROLLER	JB75-10917A	1	O	
10-3	MEC-HOLDER EXIT	*	1	X	
10-3-1	IPR-SPRING WHEEL	*	1	X	
10-3-2	PMO-HOLDER WHEEL	*	1	X	
10-3-3	MEA UNIT-WHEEL STAR	*	6	X	
10-4	MEC-SUB FRAME BASE	JB75-11126A	1	O	
11	ELA UNIT-C/R MOTOR	JB96-01312A	1	O	
11-1	MOTOR-DC CARRIAGE	JB31-00005A	1	O	
11-2	CBF-HARNESS-DC MOTOR	JB39-00094A	1	O	
12	SPRING-PS ENCODER	JB61-70917A	1	O	
13	MEC-FRAME MAIN	JB75-00349A	1	O	
14	MEC-FRAME HOME	JB75-00174A	1	O	
15	MPR-SHEET ENCODER	JB74-00024A	1	O	
S1	SCREW-MACHINE	*	1	X	
S2	SCREW-TAPPING	*	3	X	M3 X 10 mm
S6	SCREW-TAPTITE	*	1	X	M3 X 10 mm
S7	SCREW-TAPTITE	*	2	X	M3 X 6 mm

O: Service available X: Service not available

5-6 Feeder Unit Exploded view



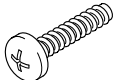
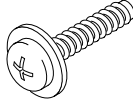
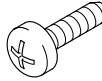
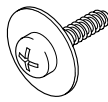
< Feeder Unit Parts List >

SA. : Service Available

NO	DESCRIPTION	SEC CODE	Q'TY	SA	REMARK
0	MEA UNIT-FEEDER	JB97-01535A	1	O	
1	MEA UNIT-ASF W/O PICKUP	*	1	X	
1-1	RING-E	*	2	X	
1-2	SPRING-TORSION AC	*	1	X	
1-3	GEAR-IDLER ASF	*	3	X	
1-4	GEAR-DRIVER ASF	*	1	X	
1-5	ICT-PIN ASF BOSS	*	1	X	
1-6	PMO-COVER PCB	*	1	X	
1-7	PMO-HOUSING BUCKLER	*	1	X	
1-8	PMO-BUCKLER JAG	*	1	X	
1-9	PMO-COVER ASF	*	1	X	
1-10	PMO-ASF FRAME	*	1	X	
1-11	PMO-PAPER GUIDE	*	1	X	
1-12	PMO-PAPER CAPACITY	*	1	X	
1-13	PMO-SHAFT PICKUP	*	2	X	
1-14	PMO-ROLLER IDLER	*	1	X	
1-15	RMO-BUCKLER FRICTION	JB73-00019A	1	O	
1-16	MPR-PAD FRICTION	*	1	X	
2	MEA UNIT-PICKUP ROLL	JB97-00965A	1	O	
2-1	GEAR-PICKUP IDLER	*	2	X	
2-2	GEAR-DRIVE PICKUP	*	1	X	
2-3	PMO-HOUSING R	*	1	X	
2-4	PMO-PICKUP ROLL	*	1	X	
2-5	PMO-HOUSING L	*	1	X	
2-6	RMO-PICKUP RUBBER	*	1	X	
S4	SCREW-TAPPING	*	1	X	M2.6 X 6 mm

O: Service available X: Service not available

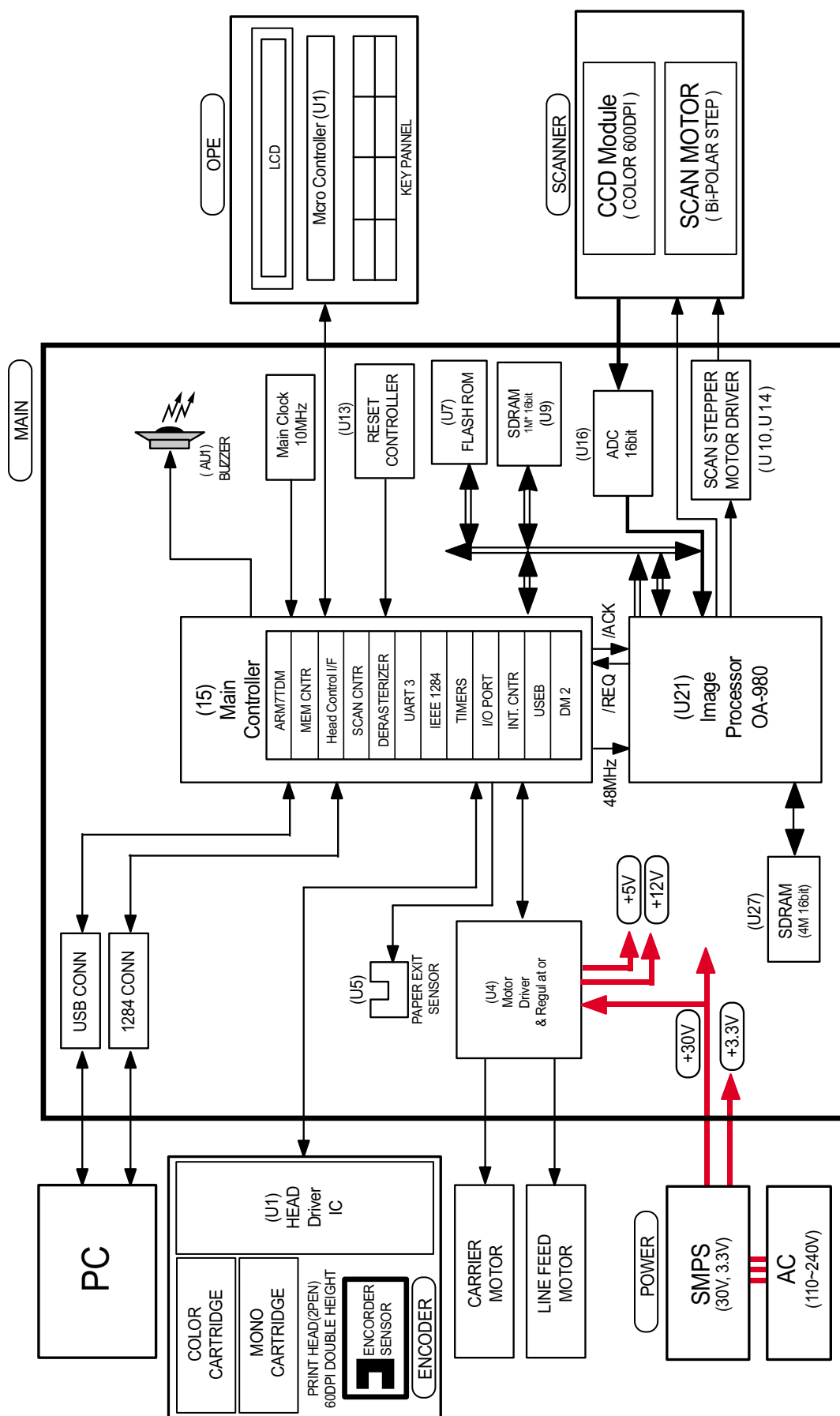
5-7 Screw

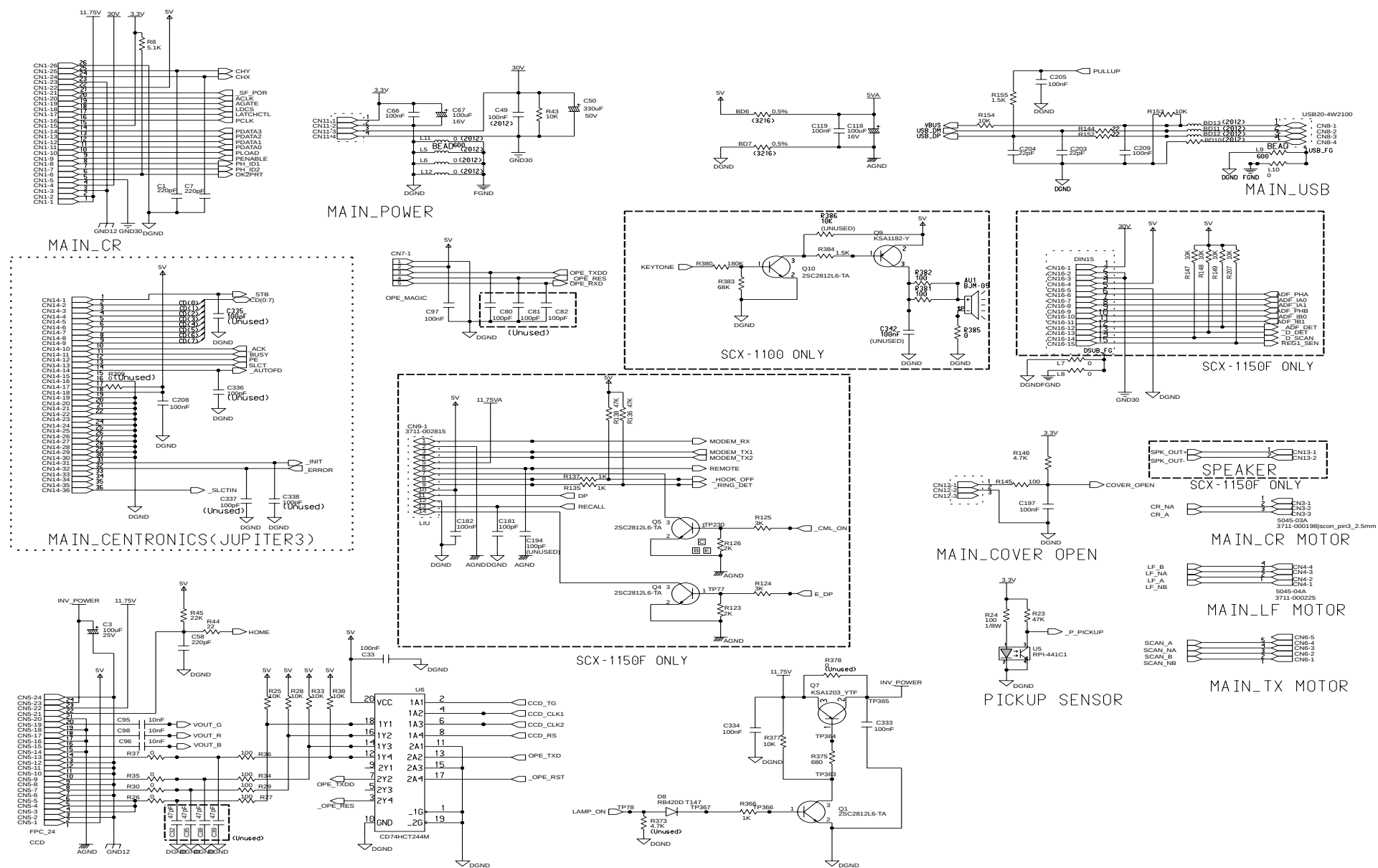
NO	DESCRIPTION	SEC CODE	SPEC	
S1	6001-000485	SCREW-MACHINE	PH,+,M2.6,L4,ZPC(YEL),SM20	
S2	6002-000101	SCREW-TAPPING	BH,+,2,M3,L10,ZPC(BLK),SM2	
S3	6002-000175	SCREW-TAPPING	PWH,+,2,M3,L8,ZPC(YEL),SM2	
S4	6002-000308	SCREW-TAPPING	PH,+,2,M2.6,L6,ZPC(YEL),SM	
S5	6002-001065	SCREW-TAPPING	PWH,+,2,M2.5,L5,ZPC(YEL),SM2	
S6	6003-000196	SCREW-TAPTITE	PWH,+,B,M3,L10,NI PLT,SWRC	
S7	6003-000269	SCREW-TAPTITE	BH,+,S,M3,L6,ZPC(YEL),SWRC	
S8	6009-001251	SCREW-SPECIAL	SM20C,P12,+,M3,L8,ZPC(YEL),MACHIN	

5-8 SMPS Parts Lists

DESCRIPTION	SEC. CODE	Q'TY	SPECIFICATION	LOCATION NO.
TR-SMALL SIGNAL	0501-000010	2	"KSC1008,NPN,800mW,TO-92,TP,120-240"	"Q3,Q4"
AS-FET	JB81-00229A	1	"SCX-1100,FQU2N60,600V, 2A,-,-,-,-,-"	Q2
AS-DIODE_SCHOTTKY	JB81-00231A	1	"SCX-1100,SR204,40V, 2A,-,-,-,-,-"	D4
AS-DIODE_FR	JB81-00232A	1	"SCX-1100,ER502,200V, 5A,-,-,-,-,-"	D5
AS-DIODE_ZENER	JB81-00233A	1	"SCX-1100,MTZ9.1B,500MW (8.57V~9.01V),-,-,-,-,-"	ZD1
AS-DIODE_ZENER	JB81-00234A	1	"SCX-1100,1N4753A,1W 36V,-,-,-,-,-"	ZD4
AS-DIODE_BRIDGE	JB81-00235A	1	"SCX-1100,2KBP06M,600V, 2A,-,-,-,-,-"	BD1
AS-TRANSFORMER	JB81-00237A	1	"SCX-1100,MAGIC-V3,EE2525W ; MAGIC-V3,-,-,-,-,-"	T1
AS-FUSE	JB81-00239A	1	"SCX-1100,50T,250V 2.0A,-,-,-,-,-"	F1
AS-FET CHIP SILICON	JC81-00020A	1	"ML-7000,IRF9540(N),TO-220,-100V,-17A,0.2OHM,-,-,-"	FOR_Q1
REACTOR-INR 10D-561K	JC81-00407A	1	"SF-5100,INR 10D-561K,VARISTOR,-,-,-,-,-"	TNR1
AS-R WIRE WOUND	JC81-11404A	2	"SF6000,RWN1W 0.42J,-,-,-,-,-"	"R17,R4"
AS-Q1	JF81-10908A	1	"ALPS-V2,SSP5N80A,800V,5A,-,-,-,-"	Q1

6. Block Diagram



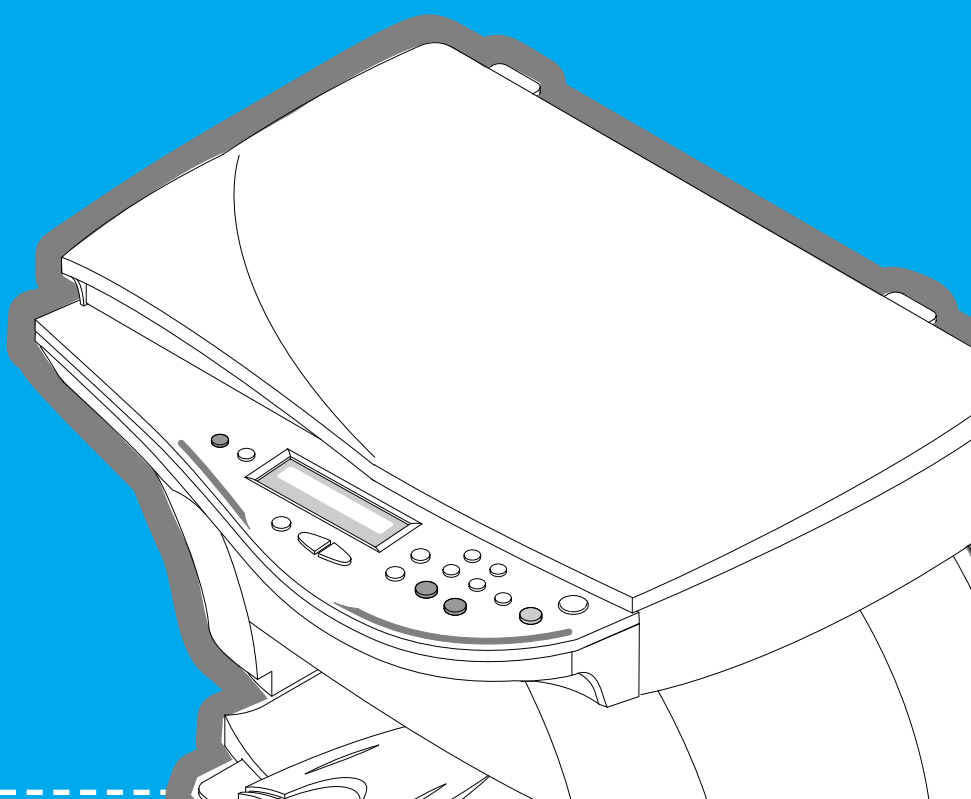


Repair Manual

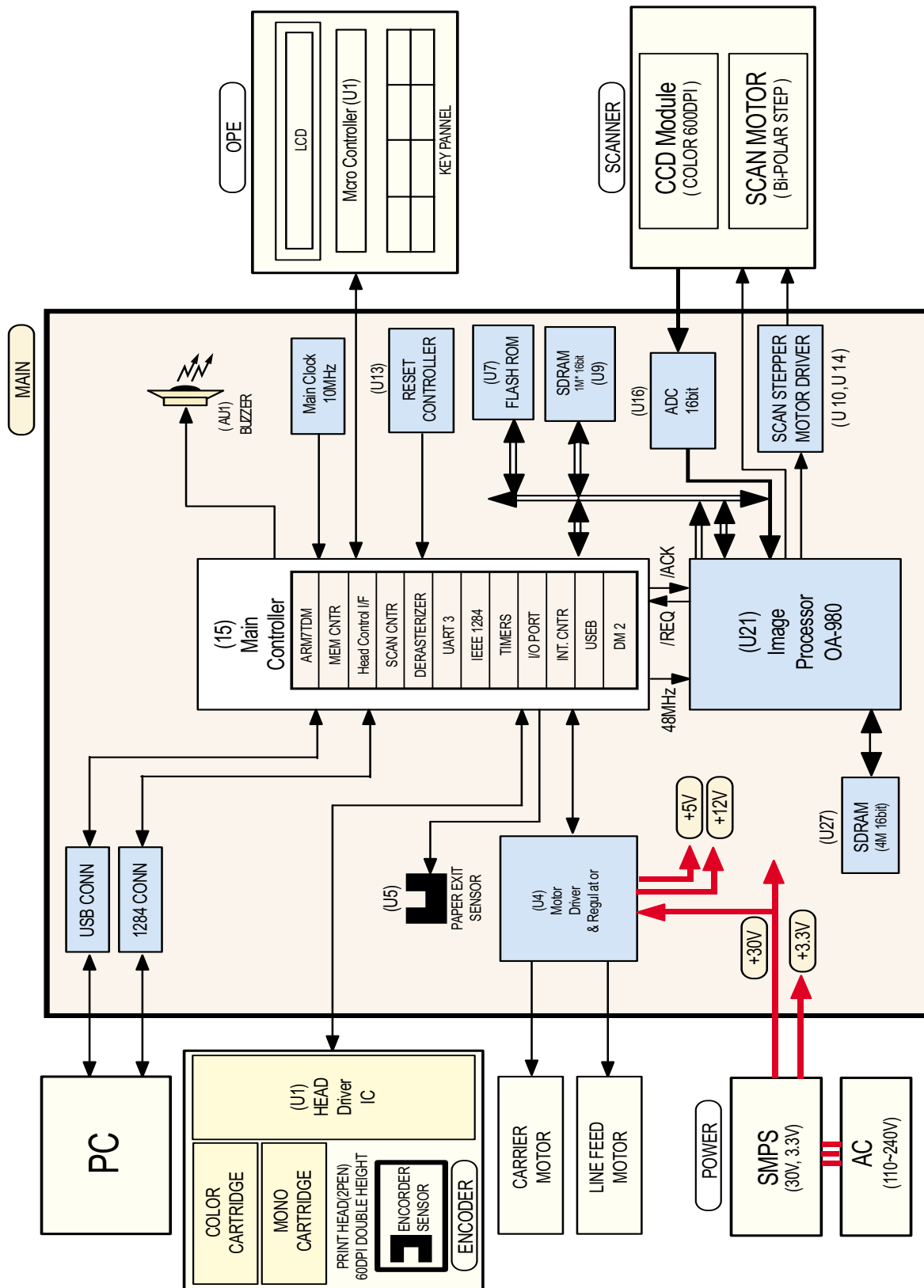
INKJET RINTER(MFP) SCX-1100

CONTENTS

1. Block Diagram
2. Connection Diagram
3. Circuit Description
4. Schematic Diagrams



1. Block Diagram



2. Connection Diagram

- Reffer to the Schematic diagram(see page 4-2)
.....

3. Circuit Description

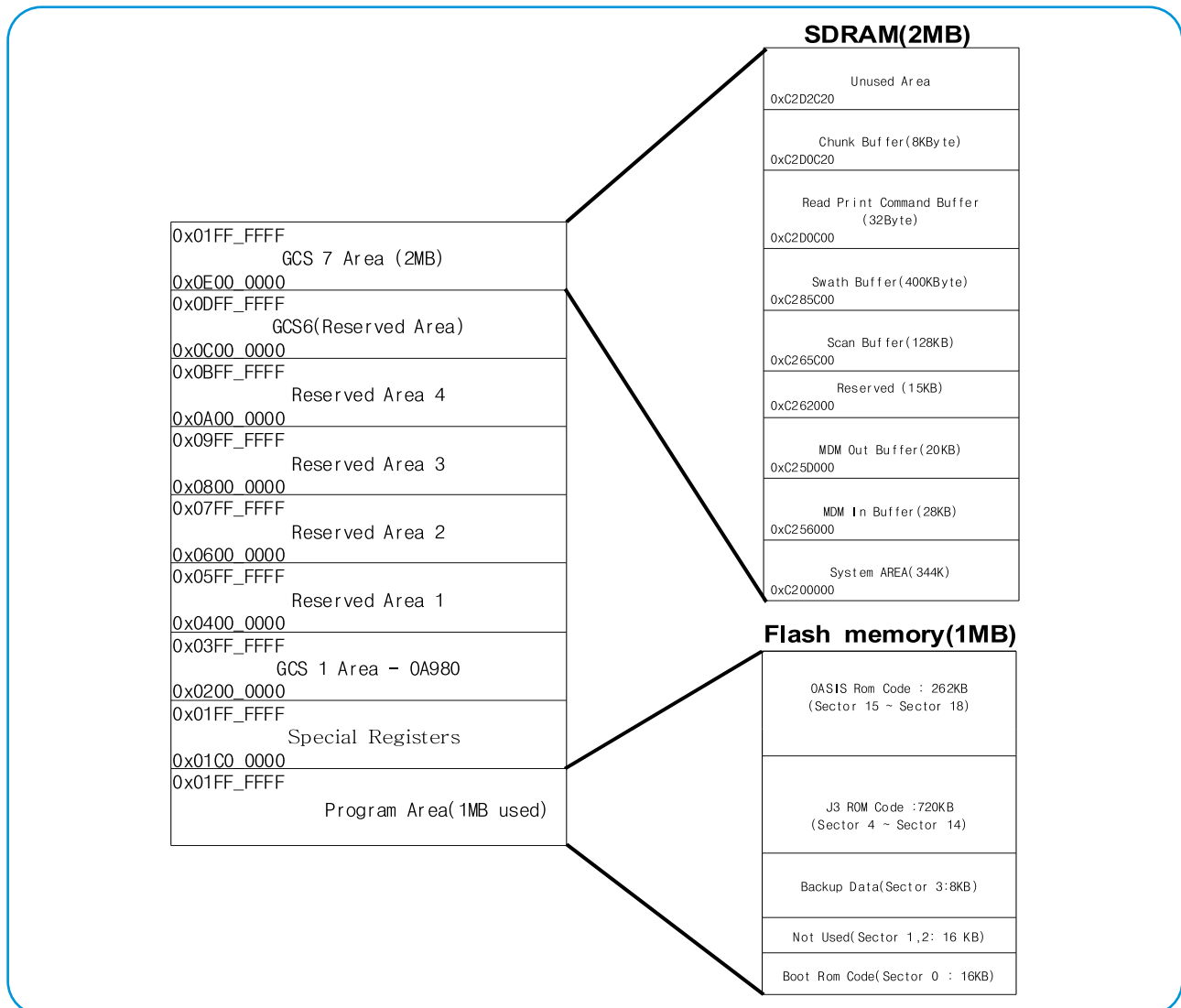
◇ MAIN PBA

3-1. GENERAL DESCRIPTION

Main circuit consists of mainly consists of CPU and the controller part with various types of built-in I/O device driver(built-in RISC Processor Core: ARM7TDMI), system memory part, OA980 controlling input of image received from media and conversion, CF(COMPACT storage card) interface part. The following nomenclatures by section is the same as those listed in the circuit diagram.

3-2. MEMORY MAP

The entire Addressing area provided by MAIN CONTROLLER(S3C46MOX(Jupiter3)) is 256MBytes from 0x00000000 to 0x10000000, and the Max. Address Range for each External Chip Select is 32M Byte or Half word from 0x000000 to 0x01FFFFFF and embodied with Big-Endian Bus interface. MEMORY area is divided into EXTERNAL ROM and RAM areas(See (Figure 1)), and the areas actually used are 2M/8M BYTES SDRAM and 1M BYTES ROM(FLASH MEMORY). In case of SDRAM, it uses 0xC200000h ~ 0xC3FFFFFFh(2MB), and ROM uses 0x0000000h ~ 0x0FFFFFFh area.



<Figure 1. S3C46MOX(Jupiter3) MEMORY MAP>

3-3.DETAILED DESCRIPTION

3-3-1 BLOCK DIAGRAM and MAIN CONTROLLER description

3-3-1-1 GENERAL DESCRIPTION

MAIN CONTROLLER(S3C46MOX(Jupiter3),U15) consists of this system consists of CPU(ARM7TDMI RISC PROCESSOR), 8K BYTES CACHE, DATA and ADDRESS BUS, PLL deriving input frequency and CLOCK CONTROL part, SERIAL COMMUNICATION part supporting UART, PRINT HEAD control part, PARALLEL PORT INTERFACE part, USB INTERFACE part, External DMA part for receiving data from external COLOR IMAGE PROCESSOR(OA-980,U21), MEMORY and EXTERNAL BANK control part, SYNCHRONOUS SERIAL INTERFACE control part for interfacing Thunderbolt, and LF/CR Motor drive control and general purpose I/O control parts.(See Figure 2)

3-3-2 S3C46MOX(Jupiter3) FUNCTION DESCRIPTION

3-3-2-1 SYSTEM CLOCK

There are two ways of Clock input method. One is the method to make Master Clock(MCLK) at the internal PLL by connecting X-tal and Capacitor to the outside, and another method is to use MCLK(When inputting 40MHz) directly, which supplies maximum 40MHz Clock to the EXTCLK terminal(PIN65). The range of frequency being input in case of using X-tal is limited to 4MHz~10MHz. This system uses SSCG(FS781) with a 10MHz X-tal outside to make MCLK, and supplies Clock to the XIN terminal(PIN67) of ASIC by expanding Spectrum with bandwidth about 1.5% in comparison with the basic frequency by using this IC. Inside the ASIC, the PLL makes 66MHz MCLK signal, which is the basic operation frequency of the System. Also, this PLL makes 48MHz, the operation frequency of USB Controller.

3-3-2-2 DATA AND ADDRESS BUS CONTROL

1. /RD & /WR

/RD & /WR SIGNAL are synchronized with the inside MCLK(66MHZ) and becomes active to Low. These signal are Strobe Signal used to Read or Write data when each Chip Select becomes active connected to /RD,/WR PIN of RAM, ROM, OA-980.

2. CHIP SELECT (/ROMCS, /IP_CS,/MED_CS,/SCS0,/SCS1)

- /ROMCS : FLASH MEMORY(U7) CHIP SELECT (LOW ACTIVE)
- /IP_CS : OA-980(U21) CHIP SELECT (LOW ACTIVE)
- /SCS1 : SDRAM(OPTION)(U12) CHIP SELECT (LOW ACTIVE)

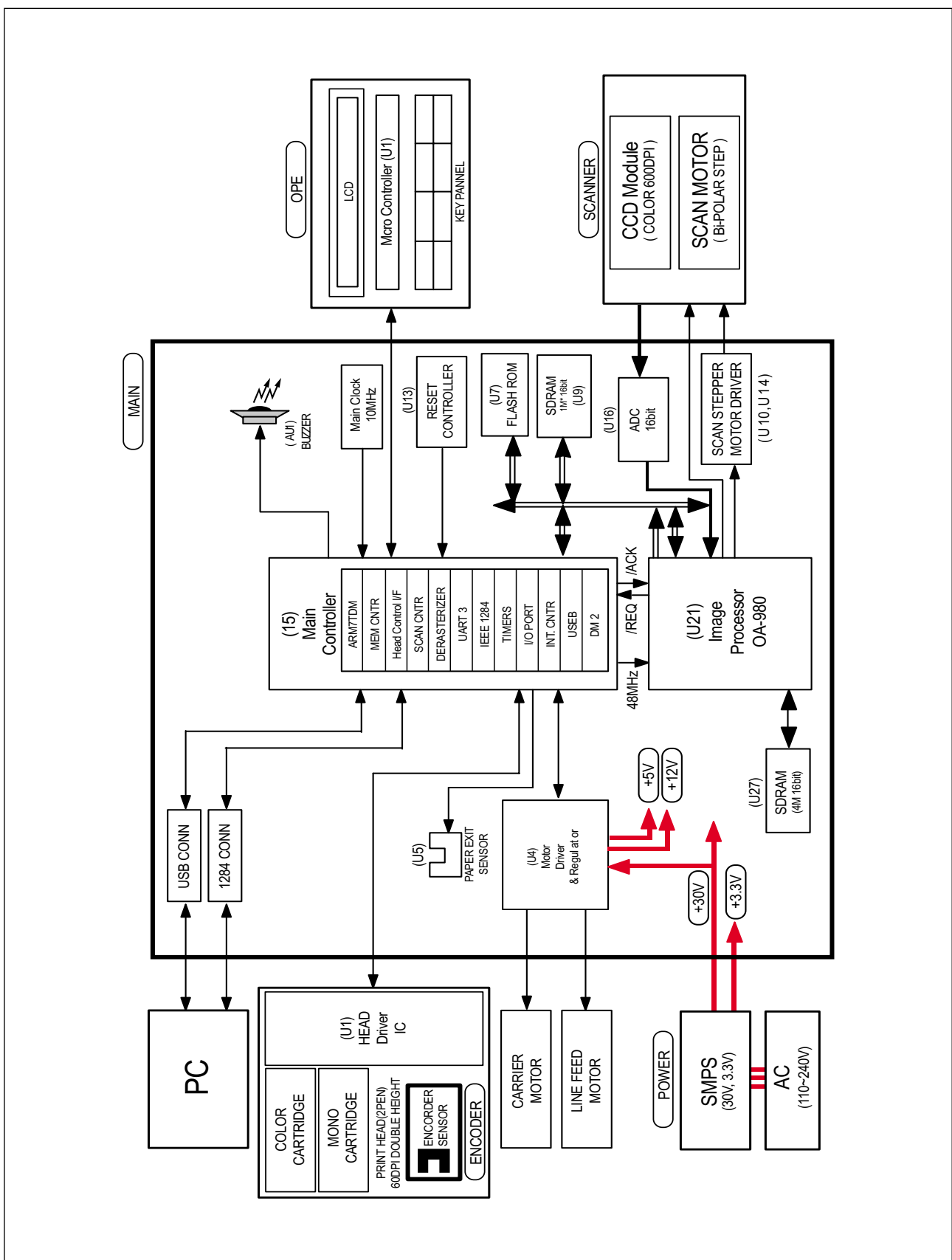
In case each Chip Select is low, it may Read or Write data.

3. D0 ~ D15

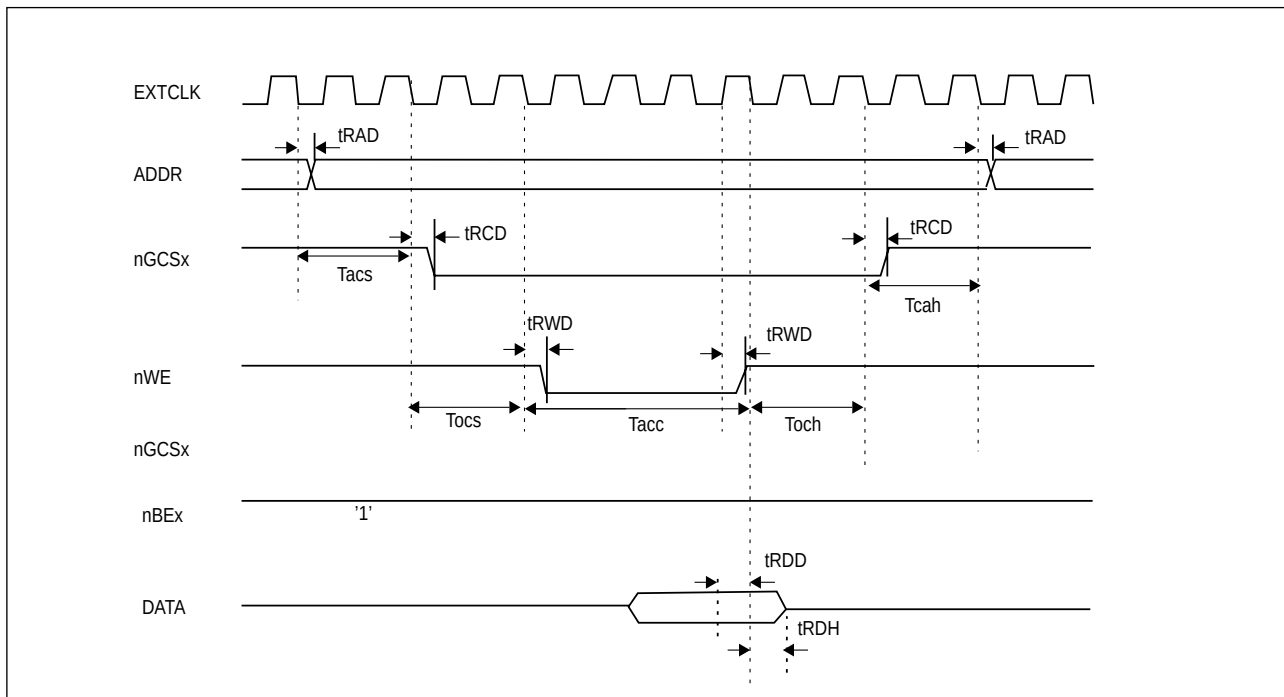
- 16BIT DATA BUS

4. A0 ~ A24

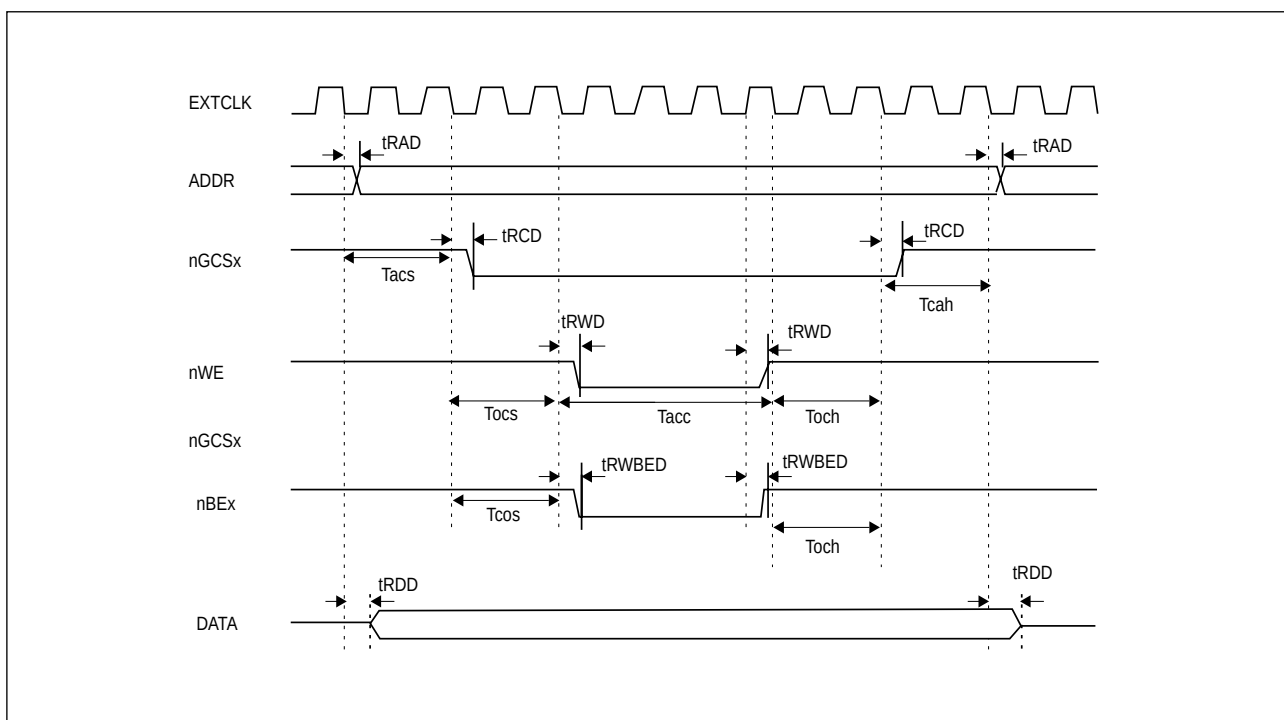
- ADDRESS BUS (A23 ~ A24 RESERVED)



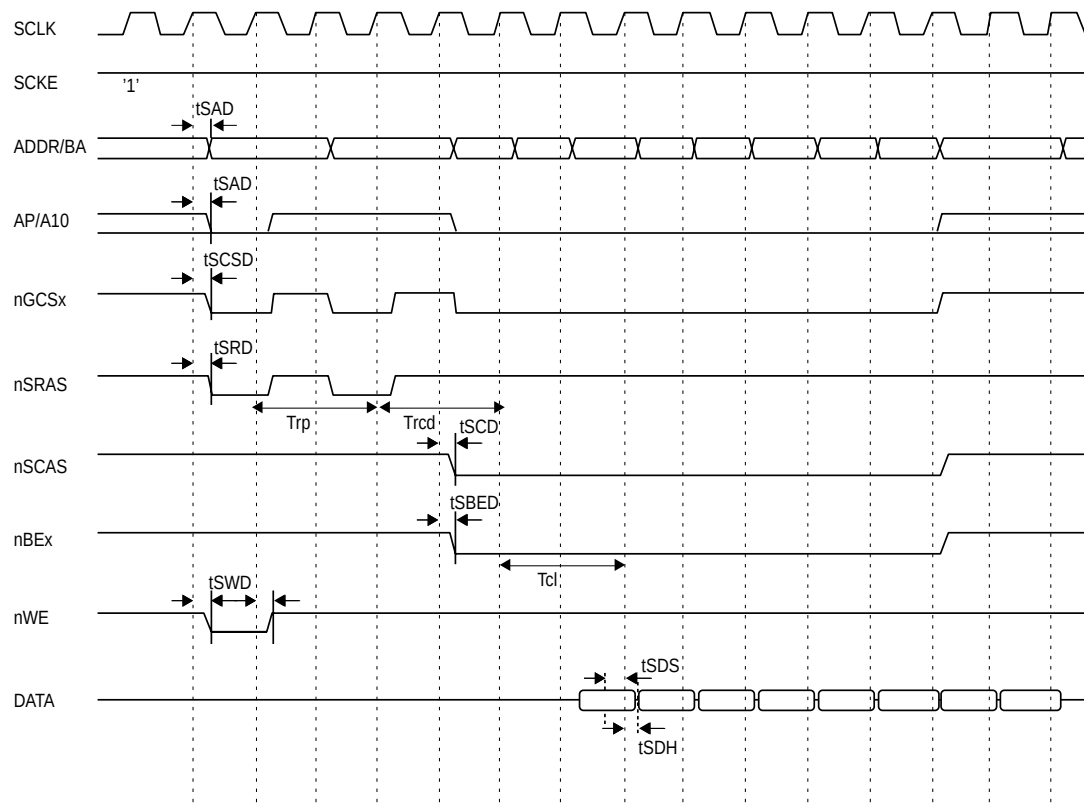
<Figure 2. Block Diagram of Main Part>



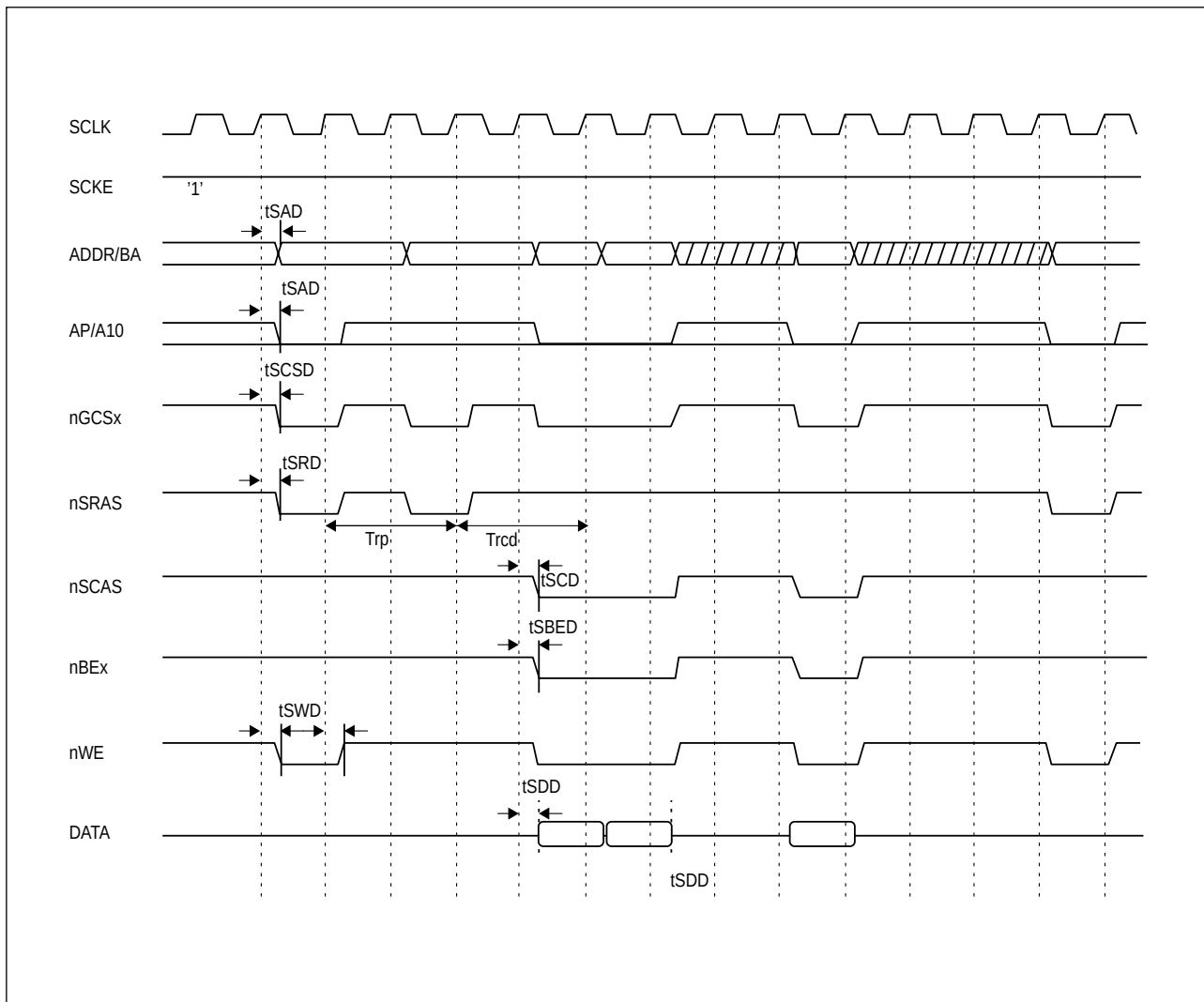
<Figure 3. Flash Memory Read Timing>



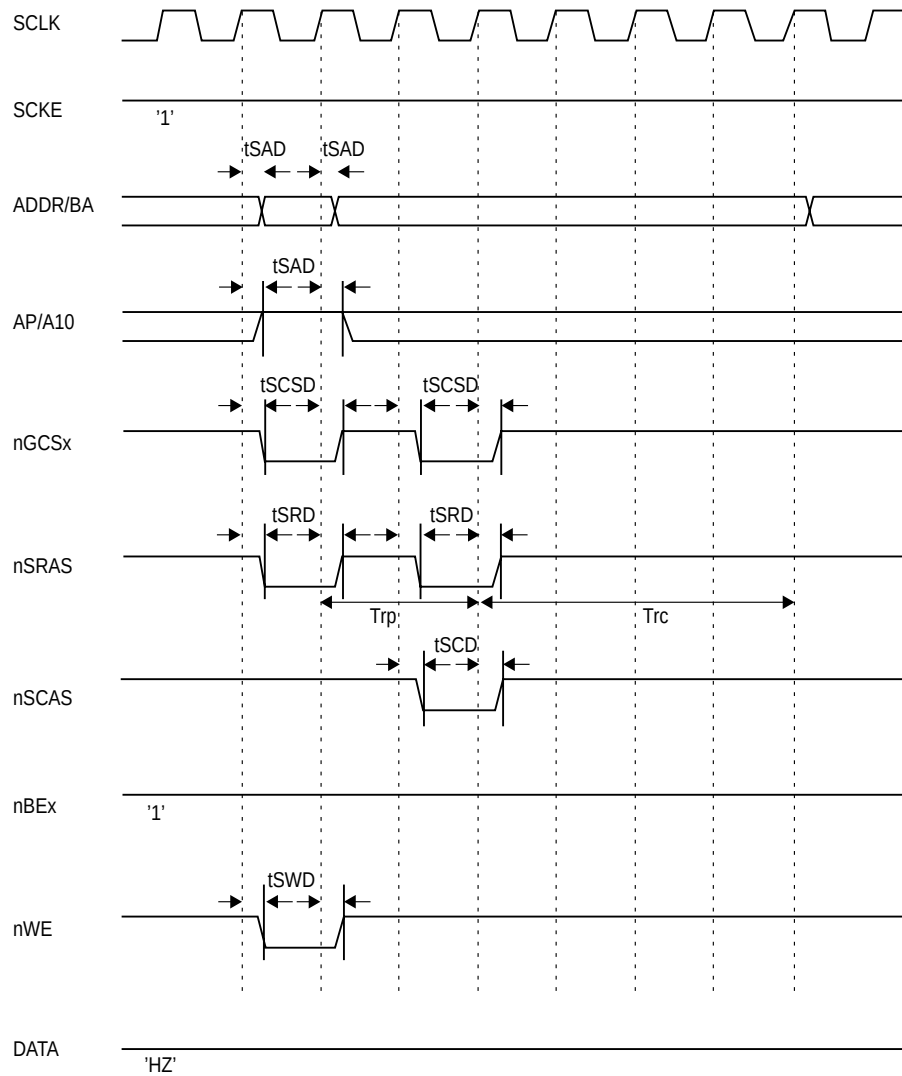
<Figure 4. Flash Memory Write Timing>



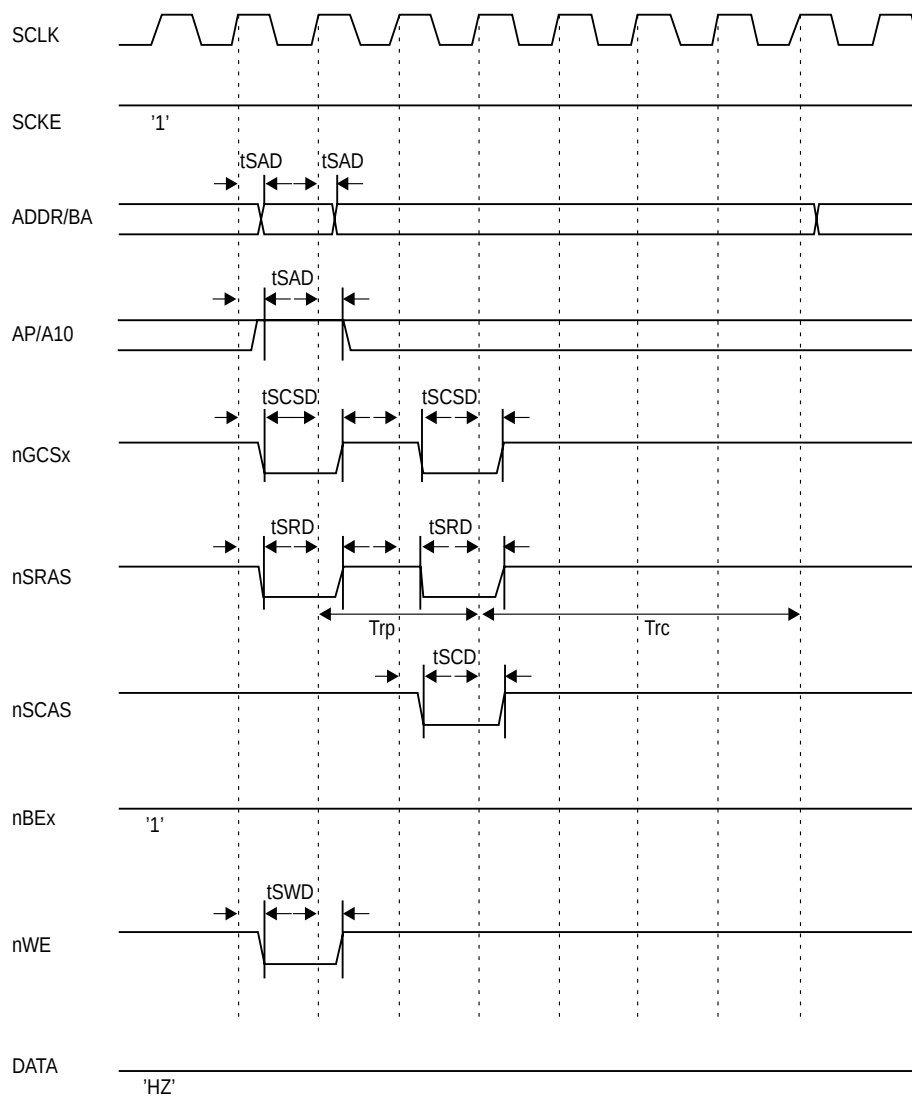
<Figure 5. SDRAM Read Timing>



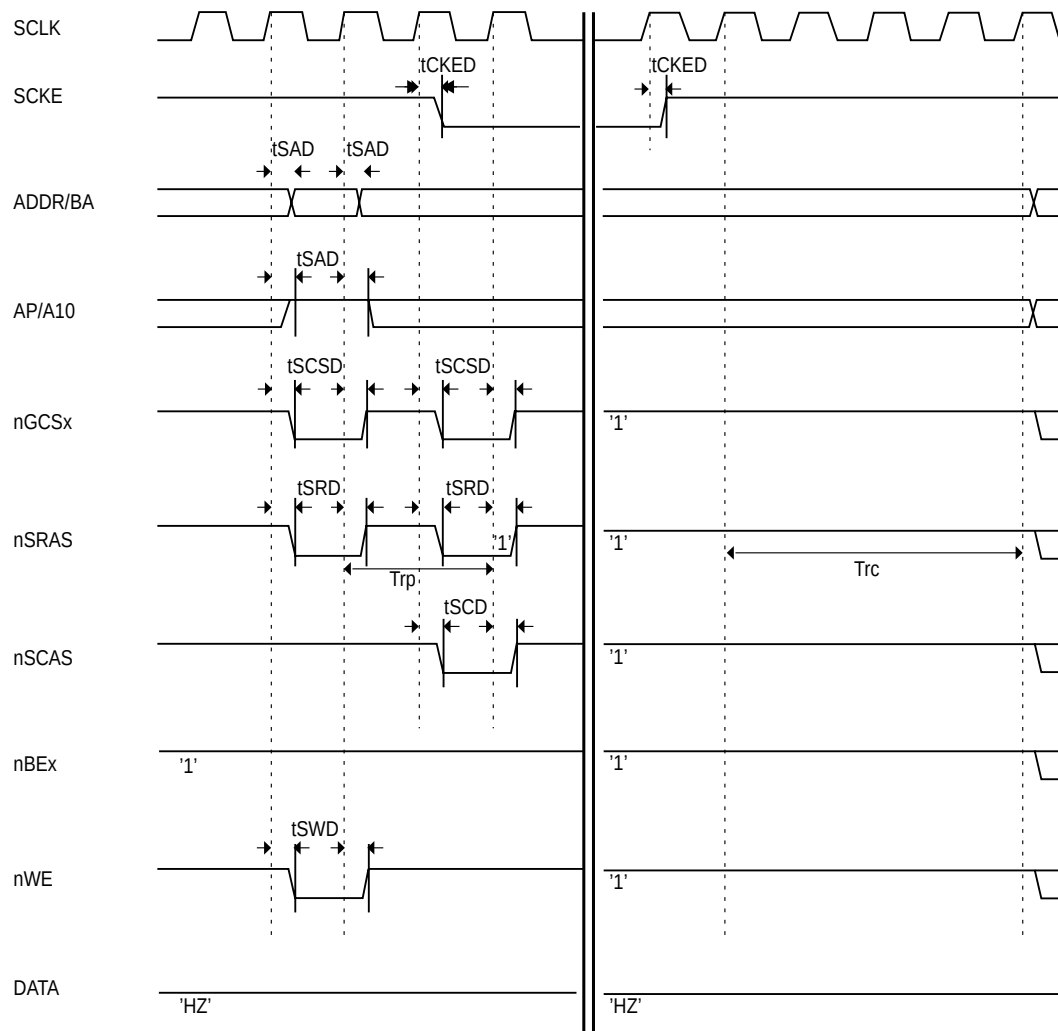
<Figure 6. SDRAM Write Timing>



<Figure 7. SDRAM Write Timing>



<Figure 8. SDRAM auto Refresh Timing>



<Figure 9. SDRAM Self Refresh Timing>

Parameter	Symbol	Min	Typ.	Max	Unit
ROM/SRAM Address Delay	t_{RAD}	-	12	-	ns
ROM/SRAM Chip select Delay	t_{RCD}	-	11	-	ns
ROM/SRAM Output enable Delay	t_{ROD}	-	11	-	ns
ROM/SRAM read Data Setup time	t_{RDS}	-	1	-	ns
ROM/SRAM read Data Hold time	t_{RDH}	-	5	-	ns
ROM/SRAM Byte Enable Delay	t_{RBED}	-	13	-	ns
ROM/SRAM Write Byte Enable Delay	t_{RWBED}	-	14	-	ns
ROM/SRAM output Data Delay	t_{RDD}	-	14	-	ns
ROM/SRAM external Wait Setup time	t_{WS}	-	1	-	ns
ROM/SRAM external Wait Hold time	t_{WH}	-	5	-	ns
ROM/SRAM Write enable Delay	t_{RWD}	-	14	-	ns
DRAM Address Delay	t_{DAD}	-	12	-	ns
DRAM Row active Delay	t_{DRD}	-	11	-	ns
DRAM Read Column active Delay	t_{DRCD}	-	11	-	ns
DRAM Output enable Delay	t_{DOD}	-	12	-	ns
DRAM read Data Setup time	t_{DDS}	-	1	-	ns
DRAM read Data Hold time	t_{DDH}	-	5	-	ns
DRAM Write Cas active Delay	t_{DWCD}	-	14	-	ns
DRAM Cbr Cas active Delay	t_{DCCD}	-	12	-	ns
DRAM Write enable Delay	t_{DWD}	-	13	-	ns
DRAM output Data Delay	t_{DDD}	-	14	-	ns
SDRAM Address Delay	t_{SAD}	-	4	-	ns
SDRAM Chip Select Delay	t_{SCSD}	-	4	-	ns
SDRAM Row active Delay	t_{SRD}	-	4	-	ns
SDRAM Column active Delay	t_{SCD}	-	4	-	ns
SDRAM Byte Enable Delay	t_{SBED}	-	5	-	ns
SDRAM Write enable Delay	t_{SWD}	-	5	-	ns
SDRAM read Data Setup time	t_{SDS}	-	4	-	ns
SDRAM read Data Hold time	t_{SDH}	-	0	-	ns
SDRAM output Data Delay	t_{SDD}	-	8	-	ns
SDRAM Clock Enable Delay	t_{CKED}	-	5	-	ns

< ROM/SRAM Bus Timing Constants >

(V_{DDP} : 3.3V, V_{DDI} : 2.5V, Ta = 25°C, PLCAP=70pf, Max/Min=typ. ±30%)

3-3-2-3 EXTERNAL DMA part

The function of this part is to bring data from external DEVICE(OASIS:U21) by using GENERAL DMA. If DMA REQUEST(/IP_REQ) is sent from external DEVICE to S3C46MOX(JUPITER3:U15), DMA ACKNOWLEDGE SIGNAL(/IP_ACK) is activated and the GENERAL DMA is driven, so READ STROBE(/RD) in the external DEVICE to bring data from the external DEVICE requiring CHANNEL. To transfer this DATA to the DESTINATION MEMORY, the ADDRESS of the DESTINATION MEMORY, CHIP SELECT and WRITE STROBE(/WR) are generated to store.

That is, if the EXTERNAL DMA is required by the external DEVICE, S3C46MOX(Jupiter3:U15) responds to drive the inside DMA CONTROLLER and then allocate GENERAL DMA to external CHANNEL so that the data may be transferred to MEMORY TO MEMORY or external DEVICE TO MEMORY.

- For more details, see the circuit description, see the circuit description part of IMAGE PROCESSOR (5.3).

3-3-2-4 DRAM control part

Since S3C46MOX(Jupiter3) has the DRAM CONTROLLER build-in, it may be used by connecting DRAM with external memory.

The Control mode of DRAM CONTROLLER provided by S3C46MOX(Jupiter3) is available for EARLY WRITE, NORMAL READ, PAGE MODE, and BYTE/HALF WORD ACCESS, and is supported even by EDO DRAM, and SDRAM as well as, Fast page DRAM.

This system uses SDRAM, and the signal used for READ/WRITE uses /RD,/WR signal used for SYSTEM BUS CONTROL. It is supported with auto REFRESH and also by the Self-refresh mode for DRAM BACK UP. It consists of 2 Banks connected to common /SCS[1:0], /SCAS, /SRAS, /SCLK, /SCKE, /DQM[1:0], each of them may use up to 2M ~ 32M HALF WORD.

In this system, 2 MB is applied as system memory. The area of DRAM is specified in the DRAM MEMORY MAP of Fig. 1, while the related TIMING DIAGRAM in Fig. 5, 6, 7, 8, 9.

3-3-2-5 RTC (REAL TIME CLOCK) part

The RTC related circuit part is not applied because the fax function is not applied, in this system.

3-3-2-6 PARALLEL PORT INTERFACE division

S3C46MOX(Jupiter3) has the Parallel Port Interface part enabling Parallel Interface with PC.

This part is connected to PC through Centronics Connector in this system, which consists of /ERROR, PE, BUSY, /ACK, SLCT, /INIT, /SLCTIN, /AUTOFD, /STB and 245DIR as the part generating the main control signal used to drive PARALLEL COMMUNICATION. Data transmission method between this part and PC supports the method specified in P1284 Parallel Port Standard (<http://www.fapo.com/ieee1284.html>) of IEEE.

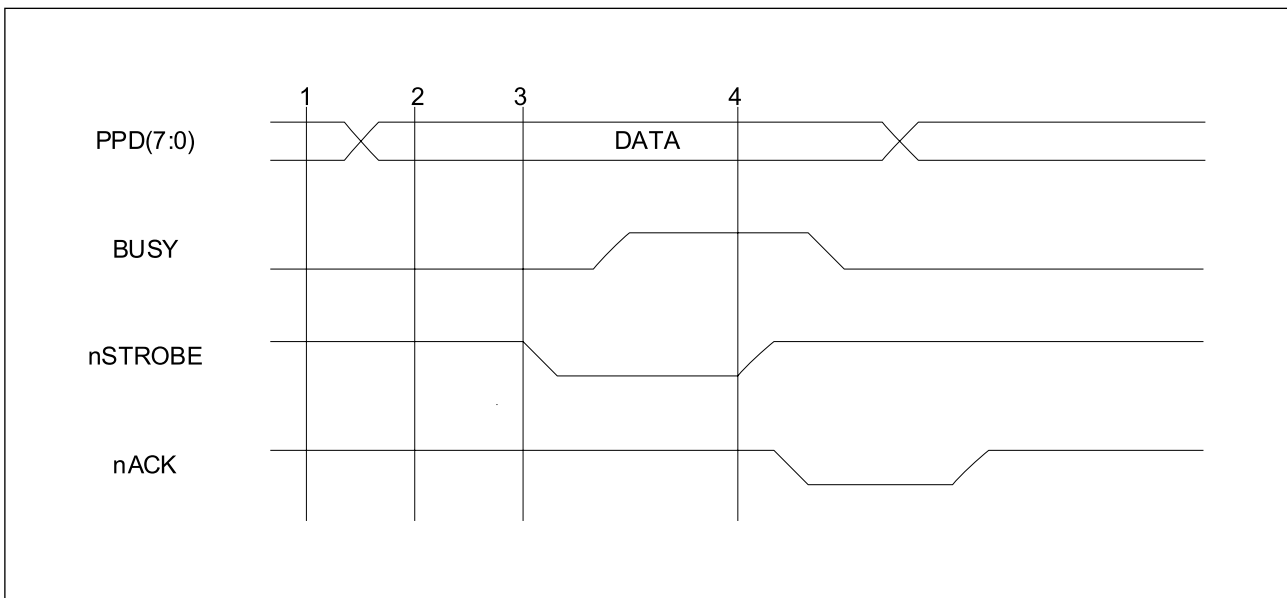
That is, the Compatibility mode, the fundamental transmission method of print data, supports the Nibble Mode(4bits data) supporting the Data Uploading to PC, Byte Mode(8bits data), and ECP(Enhanced Capabilities Port : 8 bits data transmission & receiving) supporting two-way high speed transmission to PC. The Compatibility mode and ECP mode may be simply explained as follows.

The Compatibility mode is generally called Centronics mode and is the protocol used for transmitting data by most of PC. The ECP mode provides two-way high speed communication as the protocol suggested for improved communication with peripheral equipments such as printer and scanner.

The ECP mode provides two types of cycles in two-way transmission. They are data and command cycles. Command cycle again has Run-length count and Channel addressing types.

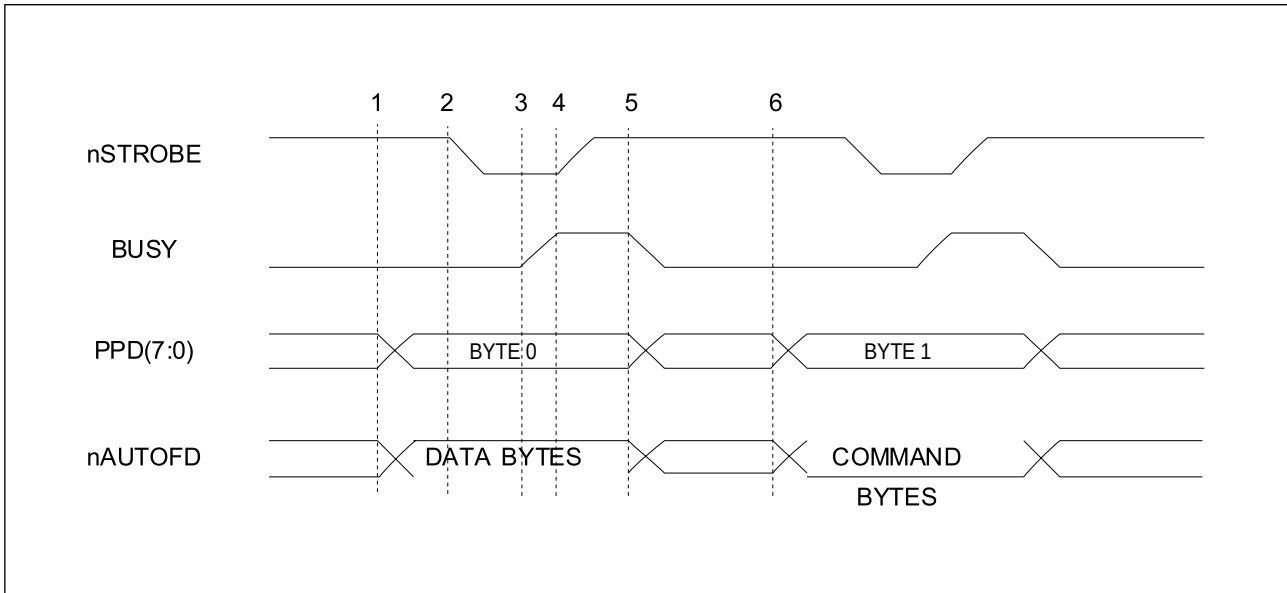
First, RLE (Run Length Encoding) type, having 64-fold compressibility, is available for the real time data compression, and is used usefully for printer and scanner, which have to transmit large capacity of raster image having a series of same data. Next, Channel Addressing is proposed for addressing single structure of multi-device.

For example, although the printer channel is processing the printer image when the fax/printer/scanner have one structure like this system, they may use parallel port for another use. This system does not apply to the parallel port Interface.



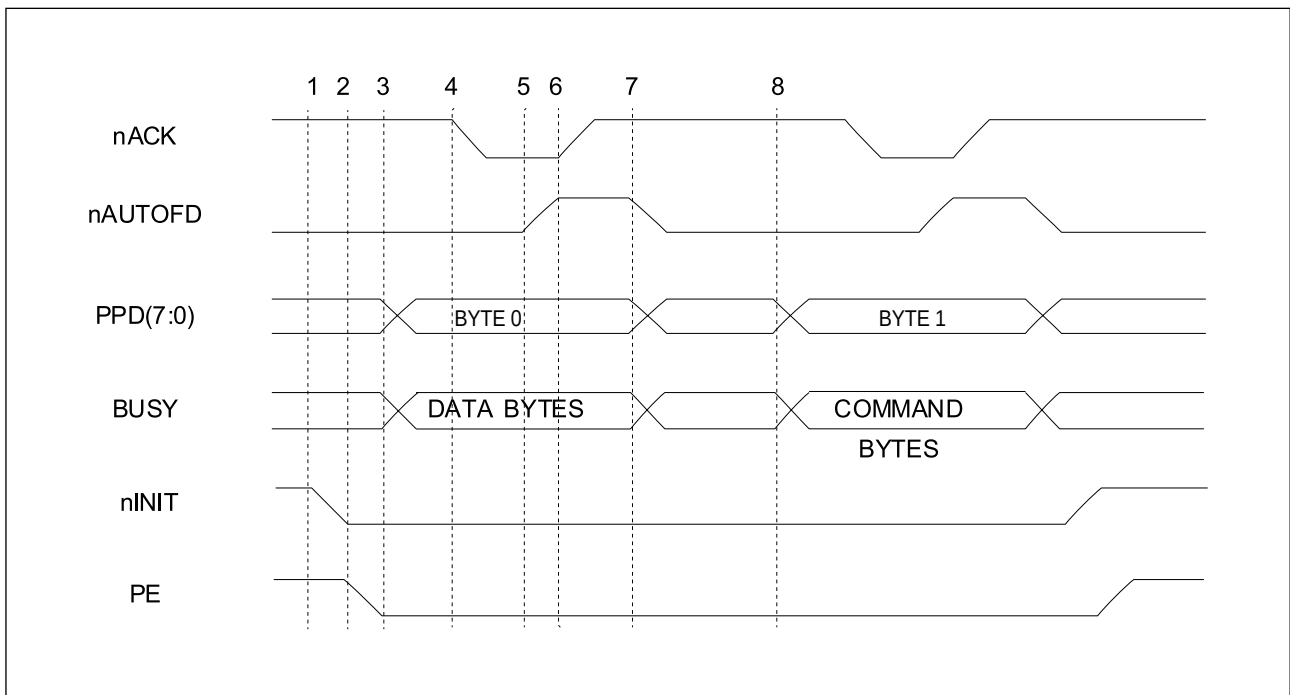
<Figure 10. Compatibility Hardware Handshaking Timing>

1. Write the data to the data register.
2. Program reads the status register to check that the printer is not BUSY.
3. If not BUSY, then Write to the Control Register to assert the STROBE line.
4. Write to the Control register to de-assert the STROBE line.



<Figure 10-1. ECP Hardware Handshaking Timing (forward)>

1. The host places data on the data lines and indicates a data cycle by setting nAUTOFD.
2. Host asserts nSTROBE low to indicate valid data.
3. Peripheral acknowledges host by setting BUSY high.
4. Host sets nSTROBE high. This is the edge that should be used to clock the data into the Peripheral.
5. Peripheral sets BUSY low to indicate that it is ready for the next BYTES.
6. The cycle repeats, but this time it is a command cycle because nAUTOFD is low.



<Figure 10-2. ECP Hardware Handshaking Timing (reverse)>

1. The host request a reverse channel transfer by setting nINIT low.
2. The peripheral signals that it is OK to proceed by setting PE low.
3. The peripheral places data on the data lines and indicates a data cycle by setting BUSY high.
4. Peripheral asserts nACK low to indicate valid data.
5. Host acknowledges by setting nAUTOFD high.
6. Peripheral sets nACK high. This is the edge that should be used to clock the data into the host.
7. Host sets nAUTOFD low to indicate that it is ready for the next BYTES.
8. The cycle repeats, but this time it is a command cycle because BUSY is low.

3-3-2-7 USB INTERFACE PART

1. USB function description

As the mode of implementing low cost express PC Interface, USB was applied. At USB, PC plays the role of route hub simultaneously by existing in the highest level as the host. That is, the device supporting each USB is connected centering on PC.

The device is available for Interface for the maximum of 127. USB cable is composed of total of a set of twisted pair and 2 power lines. Cables have two types.

One is used for express transmission of 12Mbps and may be extended as long as 5m. The part for implementing USB function is included in S3C46MOX(Jupiter3).

For Interface of USB, pull-up of 15K Ω is interfaced to the data line of high level instruments, and, among data lines of lower level instruments, pull-up resistance of 1.5K Ω is interfaced to any one.

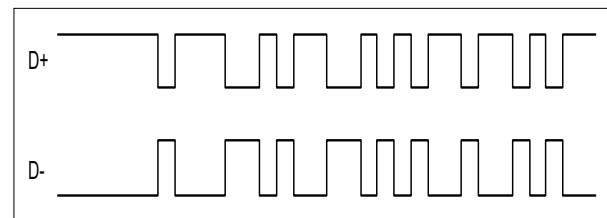
At this time, D+ line is pulled up for Full Speed device, and, for Low Speed device, D-line is pulled up. For upper level instruments(Host, HUB) speed of device is classified interfaced to low level by detecting any one among D+ and D-. If both lines are in the level of GND at the same time, device is judged that low device is not interfaced. In the transmission mode of USB, there are

- (1) Control transmission,
- (2) Interrupt transmission,
- (3) Bulk transmission, isochronous transmission.

Control transmission is for Host to find out configuration information from USB device. This is conducted when device is interfaced. Interrupt transmission is used when small quantity of data is sent periodically. Interval value may be known from device in the case of initial setting. Bulk transmission is valid in case of trying to transmit data in large quantities or in case of transmitting them accurately. Isochronous transmission should be assured of bandwidth, and is used when transmitting large quantities of information. Data in voice is used where delay is not allowed but small error is allowed. At USB coding mode and bit stuffing are being conducted. First, in case original data is 1, bit shall not change, and only when original data is 001, it shall be inverted. Only while data is 1, 1 and 0 shall be repeated. Also, in case 1, original data, is continued in 6 bit, 0 shall be inserted, Also, in the 1st phase of packet, data in the synchronized pattern shall be sent. About more detailed information regarding USB, see <http://www.usb.org>.

2. operation description

This system, when Host and USB cables are connected, and when +5V is detected in power detector inside chip and Vbus(U15-98), 3.3V comes out through Pull-uP terminal. This is also connected to D+ in pattern of hardware and supports Full-speed. Utilizing Configuration Endpoint, EPO, in USB controller, Plug & Play function is operated. Exchange of information between PCs is accomplished through D+(U15-95) and D-(U15-96) terminals. This terminal decides transmission speed depending on connection of regulator output in USB controller, and decides size of signal following USB and SPFC. Signal of general D+ and D- terminals are same as Figure 10-3.



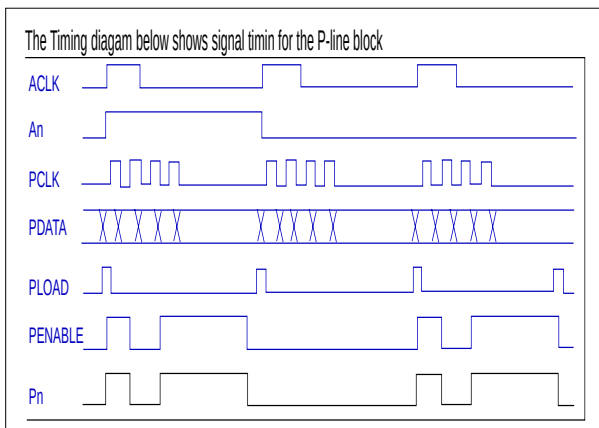
< Figure 10-3. USB Signal Line DIAGRAM >

3-3-2-8 HEAD control part

1. Entire description

As part to drive INKJET HEAD, it is composed of ACLK, AGATE, LDCS, LATCHCTL, PCLK, PDATA[3:0], PLOAD, PENABLE signals for controlling Spitfire of CR B'D generating signal, which is driving Nozzle of Head, and PH_ID[1:0] and OK2Print signals receiving from Spitfire.

Here, HEAD being used here is DOUBLE HEIGHT PRINT HEAD, and MONO is configured with 208 NOZZLE, and COLOR is with 192 NOZZLE.



<Figure 11 HEAD Control Part Timing Diagram>

2. A-LINE driving circuit

13 Address Lines are input into 13 Address Counters in sequence at Rising edge of ACLK signal, which is input serially into Spitfire. Output of this Counter was connected to each A-line driver, and this driver output becomes A-line signal. The sequence of signal input into Address Counter is decided by ADIR, and if it is ADIR=0, it is input in sequence of A13A1, and if it is ADIR=1, in sequence of A1 => A13. AGATE signal is used to reset Address Counter. If it becomes AGATE=1, A-Line output becomes Low state. The cycle of ACLK is 1.5 μ s; in minimum, and Sink current of each Driver is 60mA.

3. P-LINE drive circuit

P-Line values are clocked to 4-bit Serial to Parallel Shift Register Clock in Spitfire ASIC, and ASIC shall clock-in P-line NO. of fitting value at Rising Edge of PCLK. These values are latched to Holding register at Rising Edge of PLOAD. PLOAD Pulse Duration is 50n, and P-line value of Holding Register is done AND with PENABLE signal in order to generate appropriate Fire Pulse. PCLK is available for handling as much as 4MHz. Drive Current of P-line is 400mA. Data of P1~P4 is shifted to PDATA0, that of P5-P8 shifted to PDATA1, that of P9-P12 shifted to PDATA2, and that of P13-P16 shifted to PDATA3.

4. Control Signal

- The signal loaded on PDATA0 - PDATA2 at Rising edge of LATCHCTL(Latch Control Nibble) is used as function as follows in Spitfire.

- PDATA0 == ADIR → Low : ACLK is operated in Count Down, High : ACLK is operated in Count Up.
- PDATA1 == When Fault Test → High, check whether P-Line of Head became short with GND.
- PDATA2 == When Print Head ID Check → high, make sure that Check mode is set, and, after that, by using the PDATA0~PDATA2 Line, make A1-A3 signal for sending, and Head ID shall come out with PH_IDn output. At this time ID could be displayed only if each Substrate heater is turned on.

- The signal loaded into PDATA0-PDATA3 at Rising edge of LDCS(LoadHtrcs) signal is used in the following functions in Spitfire.

- PDATA0 == BLKHTR → High : Turn on Substrate Heater of Mono Head.
- PDATA1 == COLHTR → High : Turn on Substrate Heater of Color Head.
- PDATA2 == nHSM → Low : Enable Select Signal of Mono Head.
- PDATA3 == nHSC → Low : Enable Select Signal of Color Head.

When Substrate Heater is turned on, Over-current Check circuit is operated, automatically, and, if the current is above 750mA, the printer stops operation after OK2PRT becomes low.

3-3-2-9 SYNCHRONOUS SERIAL INTERFACE part

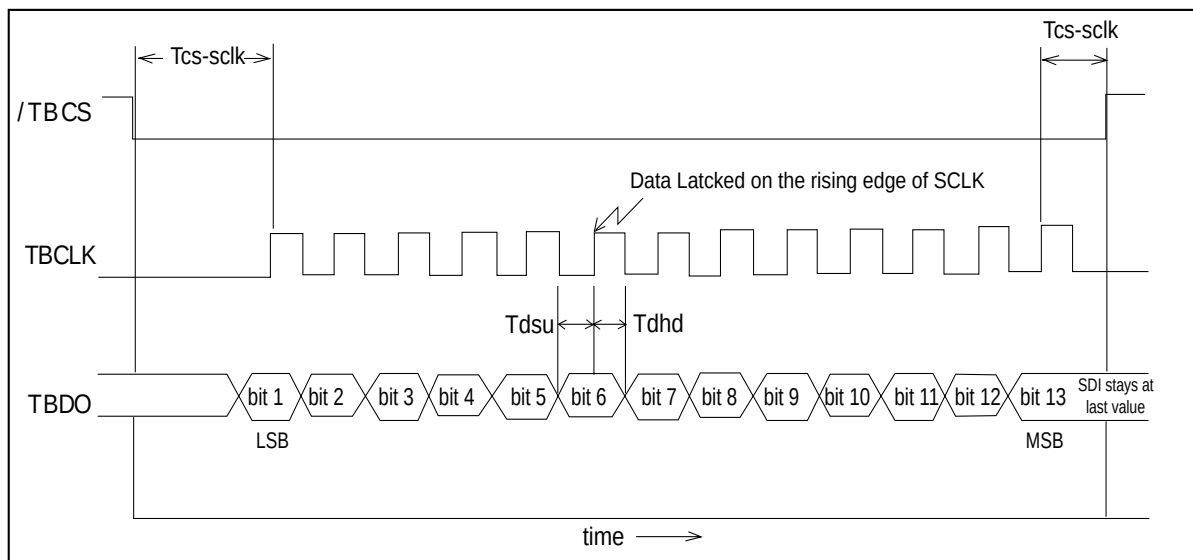
As the part interfacing with THUNDERBOLT ASIC, it consists of /TBCS, TBCLK, TBDO. In sending SERIAL DATA of 13 BIT to Thunderbolt ASIC, meaning of each bit is as follows. BIT 1 is the bit to do On/Off VPH(+11.82V), BIT [2:7] is the bit for driving MOTOR 1, BIT [8:13] is the bit to drive MOTOR 2. MOTORS are available for being used as STEPPER MOTOR and DC MOTOR respectively.

3-3-2-10 MOTOR control part

(DIR, PWM, LFPHA, LFPHB, LFIA[0:1], LFIB[0:1])

S3C46MOX(Jupiter3) is arranged to support one Step motor and one DC motor. This system does not use the Motor control part provided by S3C46MOX(Jupiter3).

	STEPPER MOTOR	DC MOTOR
BIT 1	VPH_ENABLE	VPH_ENABLE
BIT 2	MOTOR1_CURR_I1_PHASEB	Not used in this mode.
BIT 3	MOTOR1_CURR_I0_PHASEB	Not used in this mode.
BIT 4	MOTOR1_DIR_PH_B	Not used in this mode.
BIT 5	MOTOR1_CURR_I1_PHASEA	Not used in this mode.
BIT 6	MOTOR1_CURR_I0_PHASEA	Not used in this mode.
BIT 7	MOTOR1_DIR_PH_A	MOTOR1_DIRECTION
BIT 8	MOTOR2_CURR_I1_PHASEB	Not used in this mode.
BIT 9	MOTOR2_CURR_I0_PHASEB	Not used in this mode.
BIT 10	MOTOR2_DIR_PH_B	Not used in this mode.
BIT 11	MOTOR2_CURR_I1_PHASEA	Not used in this mode.
BIT 12	MOTOR2_CURR_I0_PHASEA	Not used in this mode.
BIT 13	MOTOR2_DIR_PH_A	MOTOR2_DIRECTION



< Figure 12 SYNCHRONOUS SERIAL INTERFACE TIMING DIAGRAM >

3-3-2-11 GENERAL PURPOSE I/O PORT of S3C46MOX(Jupiter3)

1. J3 Assigned GCS Ports

PORT NAME	PIN NO	I/O	SIGNAL NAME	DESCRIPTION	
				H	L
nGCS0	136	O	nROM_CS	FLASH MEMORY CHIP SELECT	
nGCS1/GOP16	137	O	nIP_CS	OA-980 CHIP SELECT	
nGCS2/GOP17	138	O	reserved	-	
nGCS3/GOP18	139	O	reserved	-	
nGCS4/GOP19	141	O	reserved	-	
nGCS5/GOP15/PDE	142	O	245DIR	P1284 DIRECTION CONTROL	
nGCS6:nRAS0:nSCS0 /GOP13	34	O	reserved	-	
nGCS7:nRAS1:nSCS1 /GOP14	35	O	nSCS1	SDRAM1(16Mb) CHIP SELECT	

2. J3 Assigned GPI Ports

PORT NAME	PIN NO	I/O	SIGNAL NAME	DESCRIPTION	
				H	L
GPI0/TMS	42	I	TMS	TMS for JTAG	
GPI1/nAUTOFD	75	I	nP_AUTOFD	P1284 CONTROL SIGNAL	
GPI2/nSLCTIN	71	I	nP_SLCTIN		
GPI3/nINIT	74	I	nP_INIT		
GPI4/nSTROBE	72	I	nP_STB		
GPI5/RXD1/SCLK1	104	I	OK2PRT	OK2PRINT INPUT	
GPI6/RXD0	101	I	OPE_RXD	UART RXD for OPE	
GPI7/CRY/LFPHA_IA0	89	I	nP_PICKUP	P_EXIT SENSOR INPUT	
GPI8/CRX/LFPHA_IA1	88	I	COVER_OPEN	COVER_OPEN SENSOR INPUT	
GPI9/LSU_nFSYNC /CHY/CRPHA_IA0	122	I	CHYY	CHX for CR ENCODER	
GPI10/PVC_nHSYNC /CHX/CRPHA_IA1	121	I	CHXX	CHY for CR ENCODER	
GPI11/nXDREQ0	133	I	nIP_REQ	DMA REQUEST for OA-980	
GPI12/nXDREQ1	135	I	PH_ID2	COLOR HEAD DATA INPUT	
GPI13/EINT0	129	I	nIP_INT	-	OA-980 INTERRUPT REQUEST
GPI14/EINT1	130	I	reserved	-	-
GPI15/EINT2	131	I	PH_ID1	MONO HEAD DATA INPUT	
GPI16/nWAIT	99	I	reserved	-	-

3. J3 Assigned GPO

PORT NAME	PIN NO	I/O	SIGNAL NAME	DESCRIPTION	
				H	L
GOP0/ nRESET_OUT	106	O	nF_POR	Watchdog Reset Out & FLASH RESET OUT	
GOP1/ TONE_OUT	120	O	KEY_CLICK	KEYCLICK	
GOP2/ nFAULT	76	O	nP_ERROR	P1284 CONTROL SIGNAL	
GOP3/ PERROR	78	O	P_PE		
GOP4/ SELECT	77	O	P_SLCT		
GOP5/ nACK	80	O	nP_ACK		
GOP6/ BUSY	79	O	P_BUSY		
GOP7/ TXD0	100	O	OPE_TXD	UART TXD for OPE	
GOP8/ PLOAD	118	O	PLOAD	PLOAD for SPITFIRE	
GOP9/ nXDACK0	132	O	nIP_ACK	DMA ACK. for OA-98	
GOP10/ SCKE	38	O	SCKE	SDRAM CLOCK ENABLE	
GOP11 /nBE0:nWE0: DQM0	39	O	DQM0	SDRAM0 MASK SIGNAL	
GOP12 /nBE1:nWE1: DQM1	40	O	DQM1	SDRAM1 MASK SIGNAL	
GOP13 /nGCS6:nRAS0: nSCS0	34	O	reserved	-	
GOP14 /nGCS7:nRAS1: nSCS1	35	O	nSCS1	SDRAM1(16Mb) CHIP SELECT	
GOP15/nGCS5/ PDE	142	O	245DIR	P1284 DIRECTION CONTROL	
GOP16/ nGCS1	137	O	nIP_CS	OA-98 CHIP SELECT	
GOP17/ nGCS2	138	O	reserved	-	
GOP18/ nGCS3	139	O	reserved	-	
GOP19/nGCS4	141	O	reserved	-	
GOP22/ ADDR22	29	O	reserved	64Mb SDRAM BA1 SIGNAL	
GOP23/ADDR23	30	O	nOPE_RST	OPE RESET OUT	
GOP24/ADDR24	31	O	nIP_RST	OA-980 RESET OUT	

3-3-3 RESET CIRCUIT

This system is configured with PRIMARY RESET(/POR) of Power Reset, Reset by WATCH DOG TIMER, external PRIMARY RESET, and SECOND RESET(/F_POR) which was done AND. PRIMARY RESET SYSTEM is used for resetting MAIN CONTROLLER(U15) when System Power is authorized, and SECOND RESET resets FLASH MEMORY(U7). Figure 15 below is BLOCK DIAGRAM related to the reset of entire system.

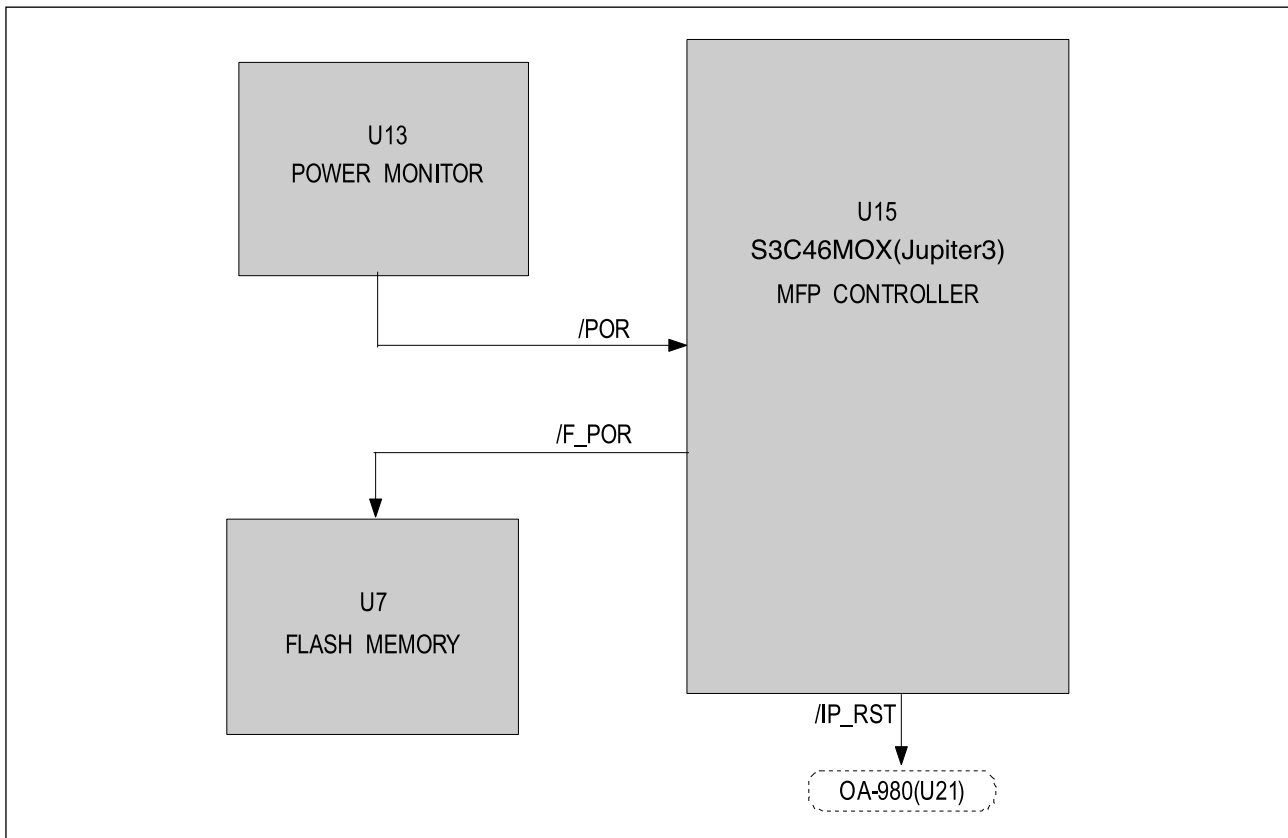
When +3.3V reaches 3.1V so that system may operate, POWER MONITOR(U13) moves to High(+3.3V) after maintaining low(0V) in the degree of 50mS-200mS output while monitoring it. This Reset signal is input into MFP CONTROLLER(S3C46MOX(Jupiter3 : U15) right away, and MFP CONTROLLER becomes awake. And it releases /F_POR after MCLK 1 clock.

3-3-3-1 POWER MONITOR (U13)

Since +3.3V power supplied to XC61FN3112MR is unstable, when it becomes 3.1V(3.038V~3.162V), it is checked as the POWER FAILURE. And the output terminal of XC61FN3112MRF becomes LOW(0V), it is applied to S3C46MOX(Jupiter3)(U15), and RESET(LOW ACTIVE) is operated. When S3C46MOX(Jupiter3) Reset is cancelled, FLASH MEMORY connected to /F_POR of S3C46MOX(Jupiter3) is Reset together. Output terminal of XC61FN3112MRF is pulled up 100KΩ in the structure of Open drain.

3-3-3-2 WATCH DOG OUTPUT (/F_POR)

Since WATCH DOG TIMER, which is Programmable Counter in S3C46MOX(Jupiter3) is set as disable for INITIAL STATE, it shall be set as Disable so that it won't operate, and after it is initialized for operation, it shall be reused by setting it Enable. When Watch Dog Reset occurs, it is about 10mS depending on the value set at the initial stage. And Counter value of Watch Dog Timer is changed by the program. Reset signal (/F_POR,U15-106) shall be generated, and entire system shall be Reset and initialized.



< Figure 13. POWER RESET BLOCK DIAGRAM >

3-4 MEMORY

3-4-1 GENERAL DESCRIPTION

MEMORY applied in this system are FLASH MEMORY(U7) of 1MB, SDRAM(U9) of 2MB.

3-4-2 MEMORY CONFIGURATION

By each CHIP SELECT (/ROM_CS, /SCS1, /SCS0, /SD_RAS, /SD_CAS), FLASH MEMORY and SDRAM are selected, and DATA is accessed by HALF WORD unit.

3-5 Image processing part (U21)

3-5-1 GENERAL DESCRIPTION

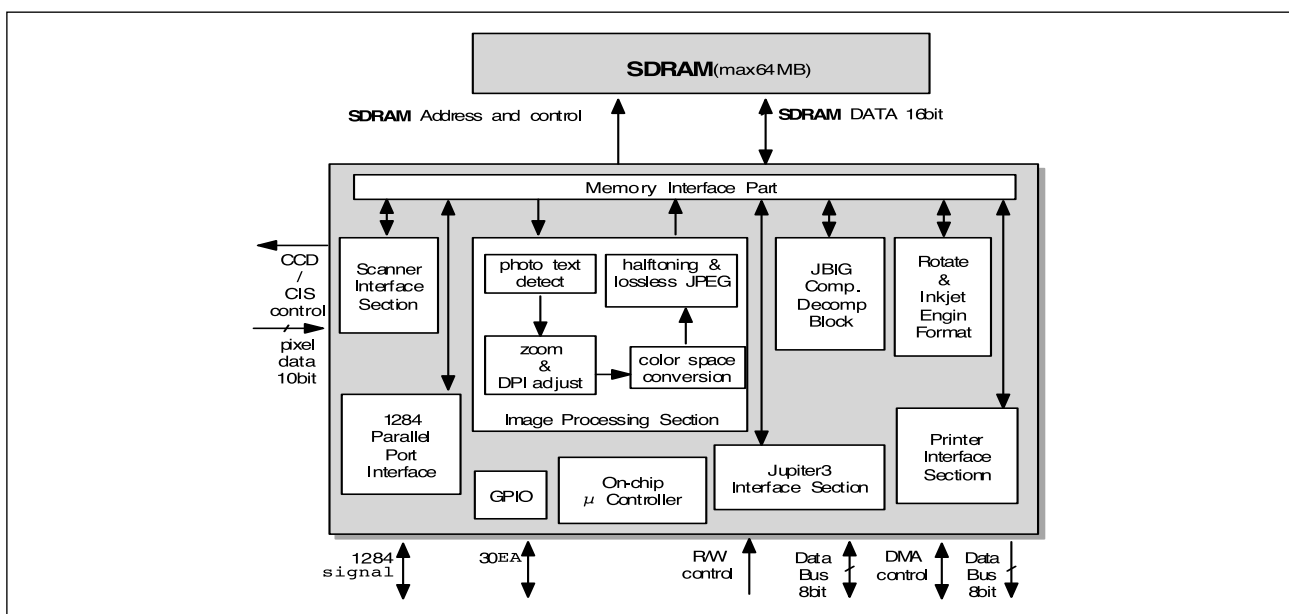
Image Processor OA-980(U21) is mainly configured with On-chip μ Controller(8bit), Scanner Interface Section(PI), Image Processing Section(IP), Memory Interface Section(MI), JBIG Comp & Decomp Section, Rotate and Inkjet Engine Section, Printer Interface Section(PO), 1284 Parallel Port Interfaced and Host Interface Section(HI). (See Figure 14)

3-5-1-1 Physical

Core	Process	Drive power /frequency	Package	Design
8bit Micro-controller	0.35U CMOS	3.3V 75MHz	208pin QFP	OASIS

3-5-1-2 Features & Functions

- 10bit scanning interface
: Supports CIS and CCD interface.
Needs external ADC(up to 16bit).
- Image processing Section
: Full quality RGB to CMYK or 6 color conversion
Photo/Text detect allows mixed documents.
Arbitrary image scaling using true interpolation.
Automatic contrast and brightness correction.
Error diffusion or programmable dither arrays.
- JBIG compression block
: JBIG/MH/MR/MMR Comp. & Decomp.
- Inkjet engine format
: Rotates data to suit the Lexmark engine format
- Printer Interface section
: Supports a single byte DMA with 150MHz clock speed.
- Microcontroller interface part
: 8bit multiplexed bus acts as address and data bus
- General purpose input and output port
: 30 GPIO pins.



<Figure 14. OA-980 Block Diagram>

3-5-2 OA-980 DESCRIPTION BY FUNCTIONS

3-5-2-1 Clock Control Section

Internal drive frequency operates classified into two parts. Almost all On-chip μ Controller(8bit) Module drives by Main_clock, and Printer Interface Section(PO) only drives by Base_clock. Main_clock and Base_clock may be set with frequency each desires by receiving Clock supplied from outside by PLL Logic.

At present, system Main_clock and Base_clock are each set in 48MHz, and may be checked at SDRAM_CLK of SDRAM(U27). Clock supplied from outside does not use separate crystal, but 48MHz is supplied by IP_CLK, CLK_Out of Jupiter3(U15).

The one which pulled up Main_EXT(pin46) and Base_EXT(pin43) is the Option using internal PLL, and, at the time of Pull-up, it does not use internal PLL, but just use Clock supplied to Main_CLK(pin45) and Base_CLK(pin42) as Main_clock and Base_clock.

3-5-2-2 Internal Microcontroller

8bit RISC Microcontroller is built-in, and Address area which Micro-controller control is 64kbyte. At the same time when cache is built in for control of more efficient SDRAM, it possesses Hook function, namely the internal Boot ROM 256byte required for self-initialization function, too.

1. Memory Map	Boot ROM
0x0100	SDRAM program store
....	and
0xfbff	SDRAM stack
0xfc00 0xffff	HW registers

2. Power On/Off Reset

• Power On Reset

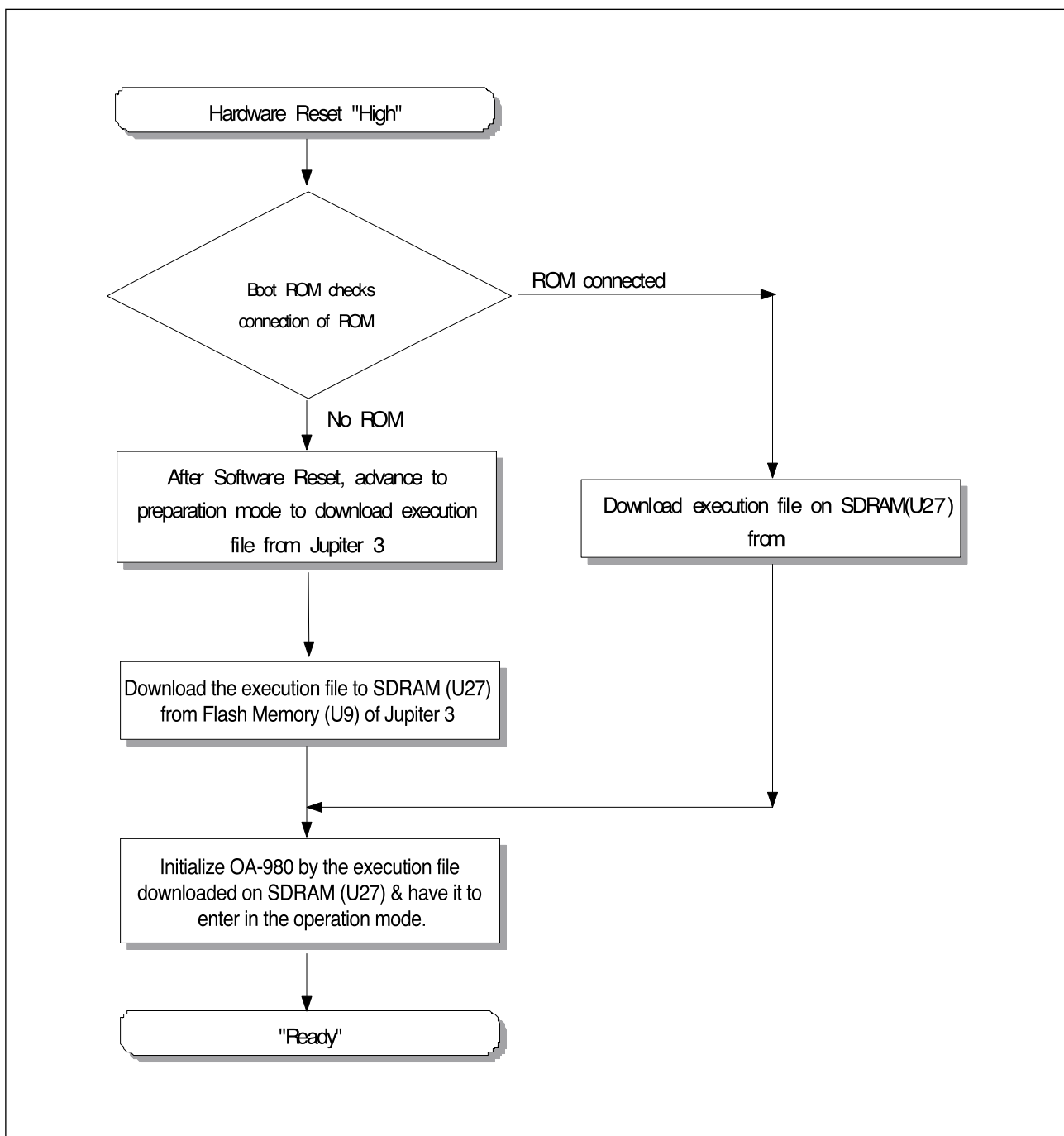
Depending on the signal state of Reset_L(pin35), OA-980 may be reset in the manner of hardware. Reset is on at "Low" state and, at "High" state, Reset is Off. Accordingly, in order for OA-980 to operate normally, after the System initialization, the /IP_RST of Jupiter3(U15-31) shall be converted to "High" state. In order for safe Hardware Reset to be accomplished, it should be maintained in "Low" state for more than 1000 Main_clock(10uS).

• Power Off Reset

PWR_down(pin107), for SDRAM(U27) to advance to the Self Refresh Mode Reset_L(pin35) at the Power Safe Mode, shall advance to the Reset Mode earlier than the minimum of 1uS. This System does not use it.

3. Hook function : Self-initialization function

In case self ROM is connected to OA-980 as in Figure (15), although the execution file is downloaded to SDRAM, the execution file is initialized by receiving download from Memory. This execution file is the ROM File supporting so that all functions of Image processing related to OA-980 as well as register setting value required for initialization(Copy, PC scan, MultiMediaCard Print) may operate normally.



<Figure 15. Boot Code Flow Diagram>

3-5-2-3 Host Interface Section (HI : Jupiter3 interface section)

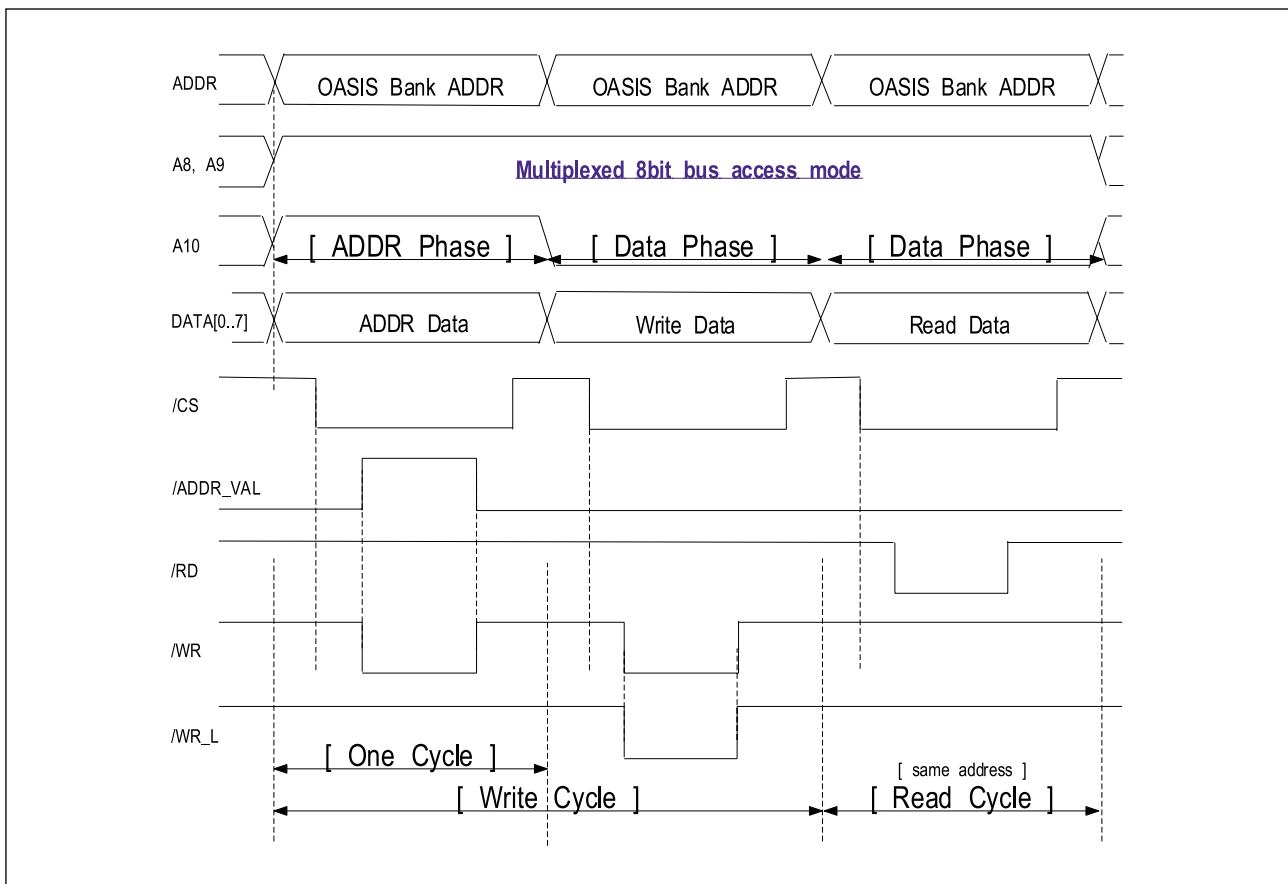
Unlike the existing DuoIP sequence, OA-980 exchanges Command and data with Jupiter 3 in the Multiplexed 8bit Bus(data & address) mode. Namely, it does not receive Address and Data simultaneously, but receive data after receiving Address first using Data Bus of Jupiter3.

HI Section also supports the data movement in the DMA mode. Accordingly, when transmitting large capacity of Image data(RGB data of MultiMedCard), it uses the DMA mode.

1. Multiplexed 8bit Bus(data & address) mode

nce Jupiter3 may not support Multiplexed 8bit Bus(data & address) mode used by OA-980, it configured a circuit additionally so that mutual Interface may be possible by making required signal using two NOR GATE(UR16) and one OR Gate(U40).

As REG_ADDR_VAL(pin27) signal is the signal for OA-980 to play a role of informing that value input into 8bit of OA-980 Bus is not Data but Address value, when ADDR(10) is "High" and /IP_CS, /WR "Low," "High" shall be generated as shown in the circuit diagram. See figure (16). At this time, since /WR_L(pin31), the Write signal of OA-980, should be maintained in "High," the signal shall be generated in case actual Write is accomplished with one OR Gate(U18), namely, only when ADDR(10) is "Low," When REG_ADDR_VAL (pin27) is "High," input the Address value of OA-980, and when "Low, from the standpoint of Jupiter3, it may Read or Write One Byte Data using two Cycles by Reading or Writing relevant Data of (to) Address.



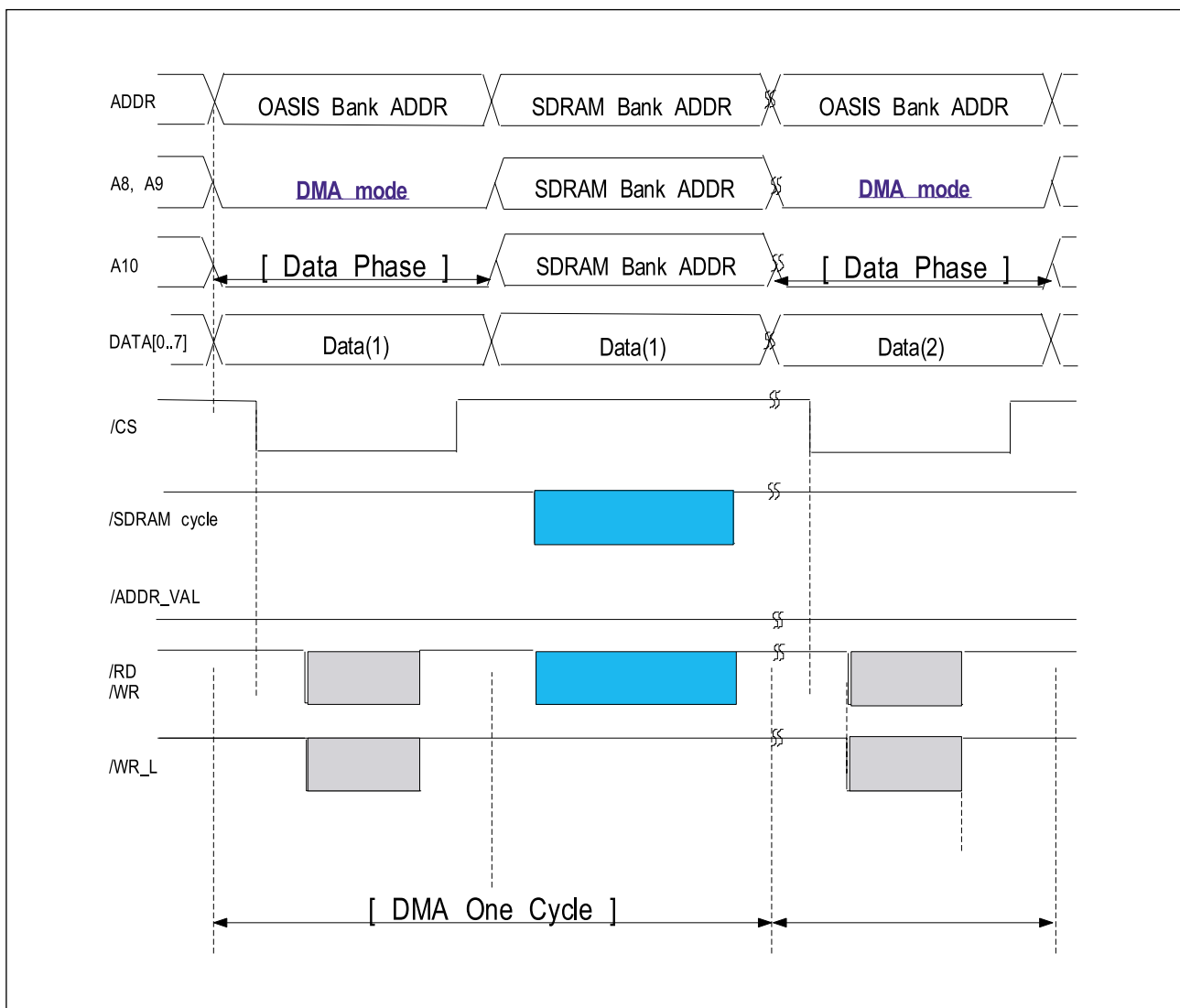
<Figure 16. HI Block Timing diagram(1)>

2. DMA mode

DMA mode is the method of Reading or Writing Data in Block unit by activating two DMA Channels of OA-980 respectively. When A8 or A9 is "Low" and when /IP_CS is "Low," GDMA of Jupiter3 Reads or Writes in Memory mode, as the appropriate DMA Channel is activated. See Figure (17). Of course, it performs required DMA register setting in Multiplexed 8bit Bus(data & address) mode before DMA is accomplished.

3-5-2-4 Scanner Interface Section(PI)

It directly controls 16bit ADC and 600dpi color CCD connected to CCD, processes Shading and Gamma correction, the basic course required for Image process of RGB 12bit(8+4bit) data transferred from ADC, then performs the function of storing the data in SDRAM of OA-980 through MI Block.



<Figure 17. Hi Block Timing diagram(2)>

3-5-2-5 Image Processing Section(IP)

After performing color compensating required for the System for RGB digital data input, it conducts the role of converting to CMYK data printable. IP Block consists of four Modules mainly.

- Photo text detect
- Zoom and dpi adjust
- Color space conversion
- Half toning and loss less JPEG

3-5-2-6 Memory Interface Section(MI)

MI Block consists of four Channels, located between external SDRAM(U27) and blocks inside OA-980, and is controlled so that the flow of all data may be accomplished more efficiently.

3-5-2-7 JBIG Comp & Decomp Section

By condensing Image data processed at Blocks into JBIG algorithm and save them in external SDRAM(U27), it shall have Memory domain used more efficiently. Naturally, even when moving Image data which was condensed to JBIG, to other block, it is conveyed to Image data freed from condensation.

3-5-2-8 Rotate and Inkjet Engine Section

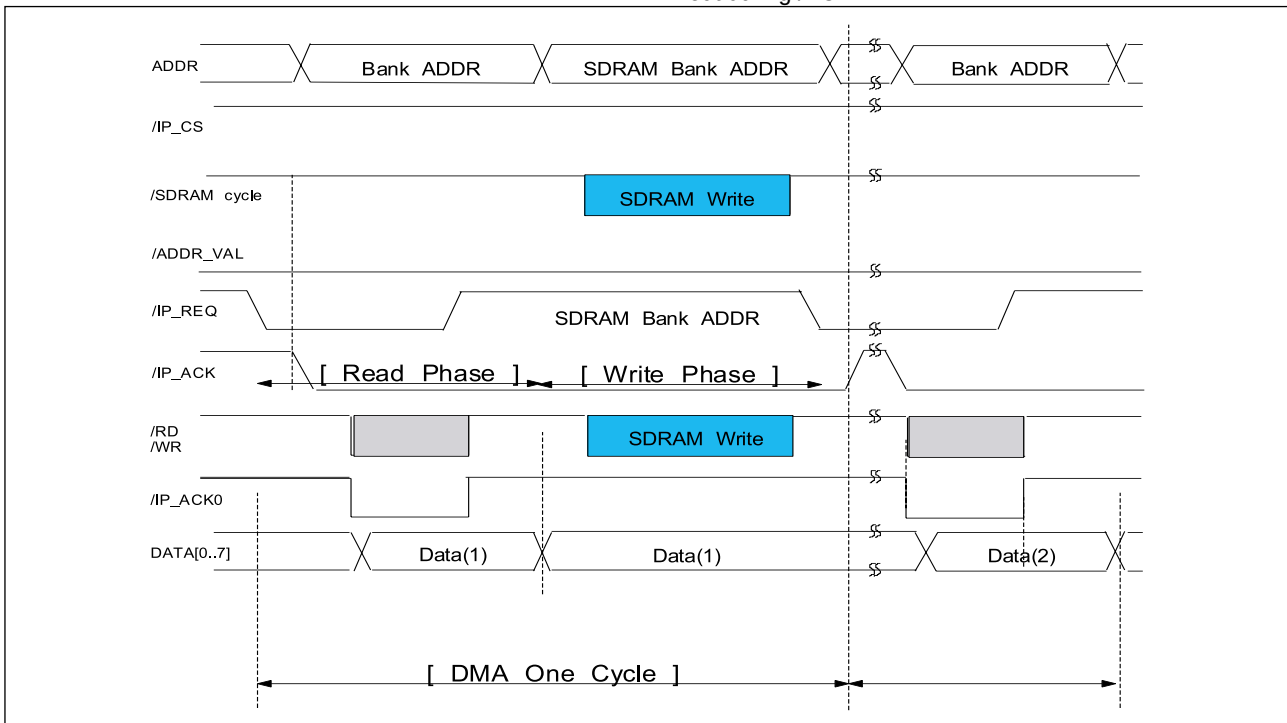
After Image CMYK Data which ended all image processing is converted to Format so that Inkjet Printer Engine may print, it plays the role of saving them on the external SDRAM(U27).

The Data stored in the external SDRAM(U27) is transferred to Head Control Part of Jupiter3 through MI and HI Block of OA-980 by DMA of Jupiter3, and then printed by Spitfire.

3-5-2-9 Printer Interface Section(PO)

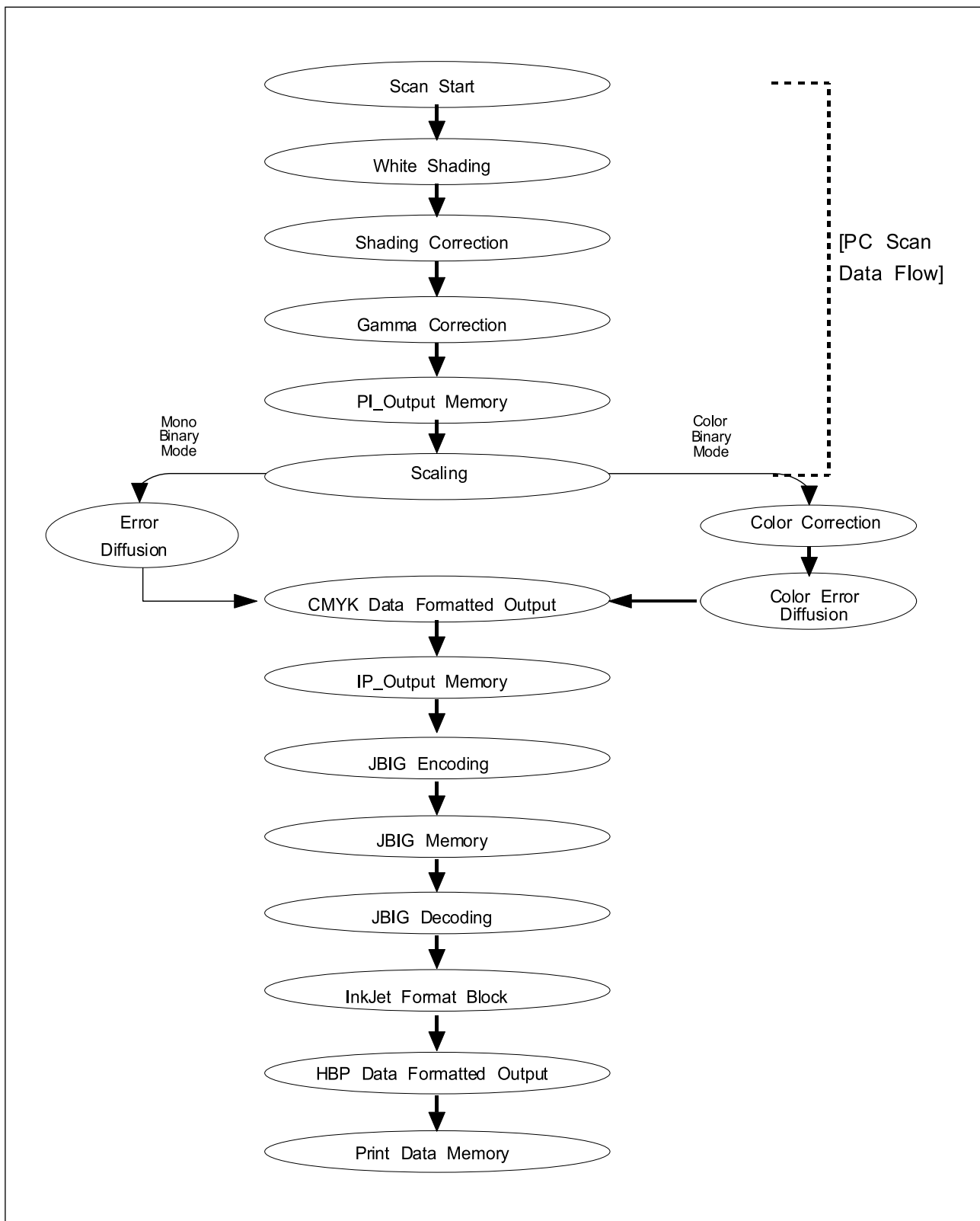
When the Image process required for PC Scan (See Fig. 19) is completed, OA-980 requests that /IP_REQ signal in PO_Block should take the Scan Image Data from the External DMA Block of Jupiter3(U15). The External DMA Block of Jupiter3(U15) generates not only /IP_ACK signal to bring Data by Byte as the unit but also /RD signal to bring the Data. The External DMA Block of Jupiter3(U15) stores the Data in SDRAM(U9) and then restore /IP_ACK as "High" to receive a next Data/.

As DMA Timing properties between Jupiter and OA-980 do not match, /IP_ACK0 is separately created to prevent BUS collision by using one OR-Gate(U18-3) so that OA-980 may use the BUS only in /RD in the way of inputting the /ACK signal into OA-980 only when /RD is actually produced, while Jupiter3 may use in /WR, as shown in the Timing of Fig. 18. That is, since OA-980 sends Data to BUS during /ACK signal section, BUS collision occurs between DMA of Jupiter3 and /WR section, where /RD, /WR are all carried out during /ACK.



<Figure 18. PO Block DMA Timing Diagram>

3-5-3 COPY DATA FLOW FOR OA-980



3-5-4 OA-980 I/O PORT

PORT NAME	PIN NO	I/O	SIGNAL NAME	DESCRIPTION	
				H	L
GP_A0	190	I	HOME	INSIDE OF HOME POSITION	OUTSIDE OF HOME POSITION
GP_A1	193	B	reserved	-	-
GP_A2	194	B	reserved	-	-
GP_A3	195	B	reserved	-	-
GP_A4	196	B	reserved	-	-
GP_A5	197	B	reserved	-	-
GP_A6	198	O	nSF_POR	Spitfire Reset Off(Idle)	Spitfire Reset On
GP_A7	201	B	reserved	-	-
GP_B0	202	O	ADC_SDI	SIO DATA OUTPUT TO ADC	
GP_B1	203	O	ADC_SEN	ADC SIO ENABLE	ADC SIO DISABLE
GP_B2	204	O	ADC_SCK	SIO CLOCK OUTPUT TO ADC	
GP_B3	205	B	reserved	-	-
GP_B4	206	B	reserved	-	-
GP_B5	207	O	LAMP_ON	CCD LAMP ON	CCD LAMP OFF
GP_B6	3	B	reserved	-	-
GP_B7	4	B	reserved	-	-
GP_C0	5	B	reserved	-	-
GP_C1	6	B	reserved	-	-
GP_C2	7	B	reserved	-	-
GP_C3	8	B	reserved	-	-
GP_C4	9	B	reserved	-	-
GP_C5	12	B	reserved	-	-
GP_C6	13	B	reserved	-	-
GP_C7	14	B	reserved	-	-
GP_D0	80	O	SCAN_PHA	SCAN MOTOR PHASE A	
GP_D1	81	O	SCAN_PHB	SCAN MOTOR PHASE B	
GP_D2	82	O	SCAN_IA0	SCAN MOTOR CURRENT CONTROL A0	
GP_D3	83	O	SCAN_IA1	SCAN MOTOR CURRENT CONTROL A1	
GP_D4	84	O	SCAN_IB0	SCAN MOTOR CURRENT CONTROL B0	
GP_D5	85	O	SCAN_IB1	SCAN MOTOR CURRENT CONTROL B1	

PORT NAME	PIN NO	I/O	SIGNAL NAME	DESCRIPTION	
				H	L
PI_TGEN0	177	B	reserved	-	
PI_TGEN1	176	O	CCD_CLK1	CCD CLK1	
PI_REQ_TGEN2	173	O	CCD_CLK2	CCD CLK2	
PI_ACK_TGEN3	172	O	CCD_RS	CCD RS	
PI_TGEN4	171	O	reserved	-	
PI_WR_TGEN5	170	O	ADC_CLK	ADC CLOCK	
PI_TGEN6	169	O	ADC_VSMP	ADC VIDEO SAMPLE CLOCK	
PI_TR_TGEN	168	O	CCD_TG	CCD TG	
PL_LINE_SYNC	167	B	reserved	-	
PL_DATA0	189	I	reserved	-	
PL_DATA1	188	-	reserved	-	
PL_DATA2	187	-	ADC_DATA0	ADC 8bit DATA BUS	
PL_DATA3	186	-	ADC_DATA1		
PL_DATA4	185	I	ADC_DATA2		
PL_DATA5	184	I	ADC_DATA3		
PL_DATA6	181	I	ADC_DATA4		
PL_DATA7	180	I	ADC_DATA5		
PL_DATA8	179	I	ADC_DATA6		
PL_DATA9	178	I	ADC_DATA7		
PO_WR	93	B	reserved		
PO_DONE	92	B	reserved		
PO_ACK	91	O	nIP_REQ	DMA REQ. for OA_980	
PO_REQ	90	I	nIP_ACK0	DMA ACK. for OA-980	
PO_DATA0	103	O	DATA0	DMA DATA BUS	
PO_DATA1	102	O	DATA1		
PO_DATA2	101	O	DATA2		
PO_DATA3	100	O	DATA3		
PO_DATA4	99	O	DATA4		
PO_DATA5	98	O	DATA5		
PO_DATA6	97	O	DATA6		
PO_DATA7	94	O	DATA7		

3-6 CCD MODULE and ADC Part

3-6-1 CCD MODULE GENERAL DESCRIPTION

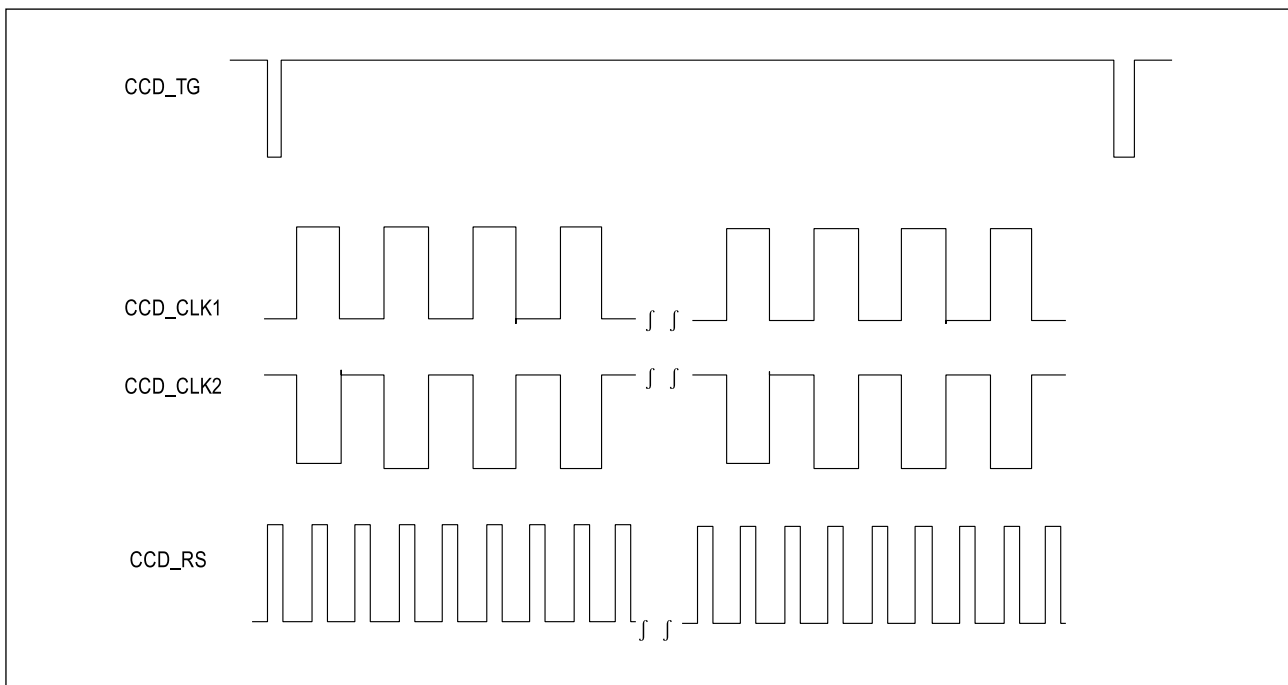
CCD Module has the structure transferring RGB data to be converted into the digital signal through ADC on the basis of the level of analog signal to OA-980, the Image Processor, which divides the signals reflected by emitting light to document into R, G, B data according to each frequency.

The voltage used in the CCD Module are 11.75V for analog signal of RGB, 5V as input for CCD and other elements. The input part of CCD Module consists of CCD_TG, CCD_CLK1, CCD_CLK2 and CCD_RS, the output of OA-980(U21), CCD_TG controls the scan line, which is set variously according to copy mode, color and mono, and scan resolution. CCD_CLK1 and CCD_CLK2 are clocks by each pixel, CD_RS is reset signal of each pixel. Since the pixel of 1/2 cycle of CCD_CLK1 and CCD_CLK2 is sampled, color signal sends RGB data to output for 1/2 cycle, and controls the pixel of 1/2 cycle for mono. Therefore, the output signal from the CCD Module classifies the signals received by RGB channel according to each frequency band and uses each video signal(CN1) as the input data of ADC(U16).

TG, CLK,RS TO BE USED ARE AS FOLLOWS.

	Color Copy	Mono Copy
CCD_TG	5mS	2.5mS
CCD_CLK1,CCD_CLK2	1.6uS	800uS
CCD_RS	800uS	400uS

< TG, CLK,RS >



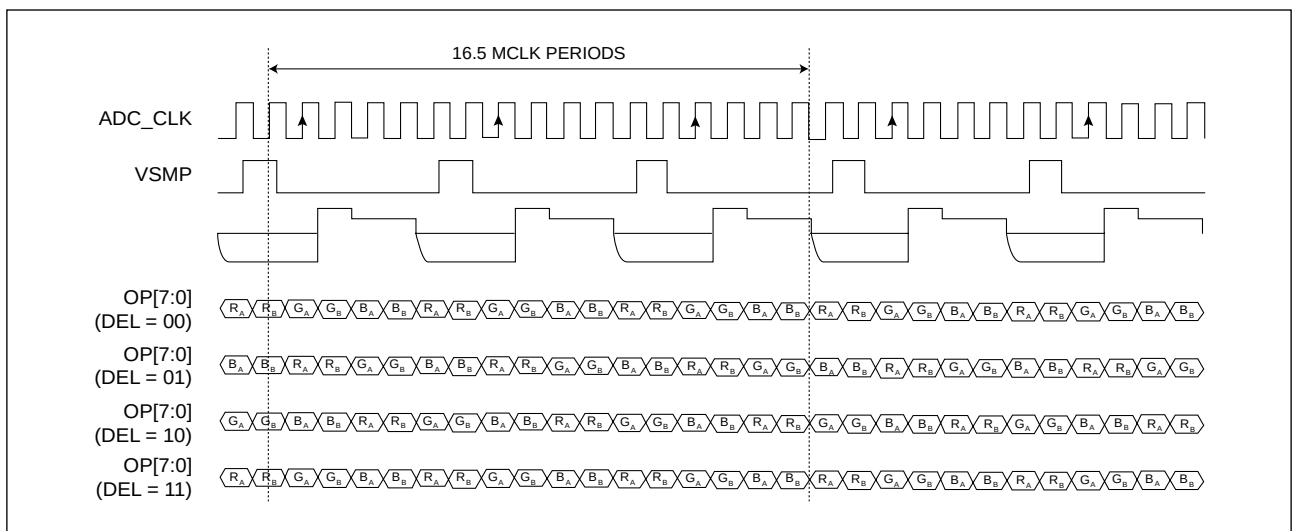
< TG, CLK,RS >

3-6-2 ADC

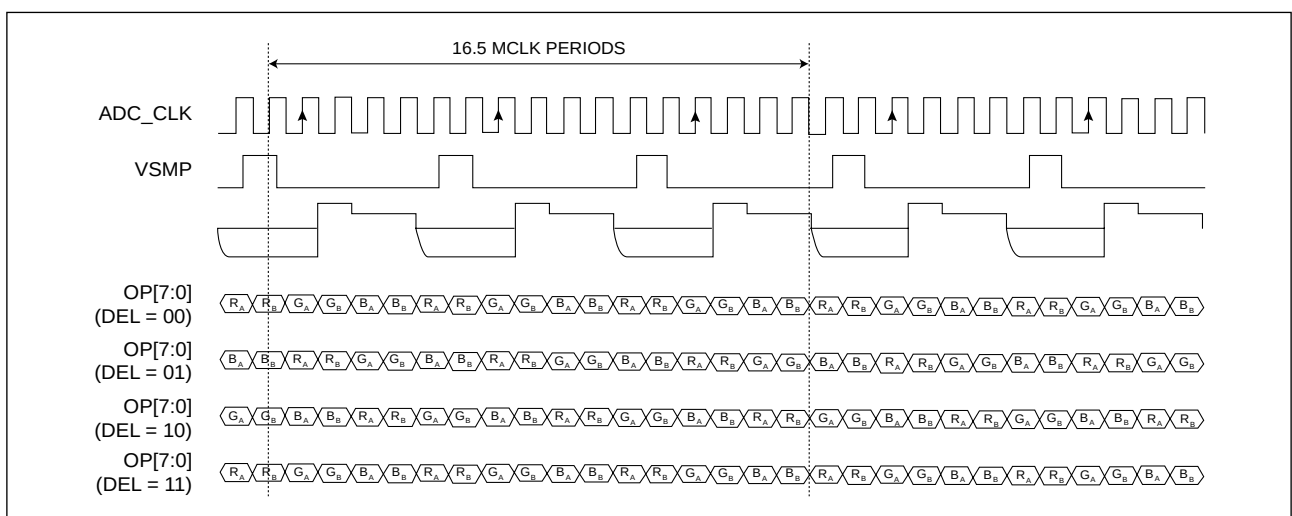
Description ADC(U16) is the input data that change the analog signal of RGB to the digital signal of 16bit (8bit + 8bit) so that it may be used as the input of OA-980(U21), image processor, while VSMP(_ADC_VSMP) is used as a sampling signal for each pixel of RGB. That is, it controls the signal for one pixel like CLK1,CLK2 of CCD and its maximum sampling rate is of color 2MHz mono 4MHz. MCLK(ADC_CLK) is CLK for the signal of VSMP, the relation between MCLK and VSMP is as follows.

	Color	Mono
VSMP	800ns(1.25MHz)	400ns(2.5MHz)
ADC_CLK	133ns(7.5MHz)	133ns(7.5MHz)
VSMP:MCLK	1:6	1:3

The relations among SCK(ADC_SCK), SDI(ADC_SDI) and SEN(ADC_SEN) are equivalent to the control bit for register setting to mode, output signal appears in 8bit unit from OP0 to OP7, and 5V/3.3V will be used as the power source.



<Figure 20. Color mode MCLK, VSMP>



<Figure 20-1. Color mode MCLK, VSMP>

3-7 THUNDERBOLT ASIC DESCRIPTION

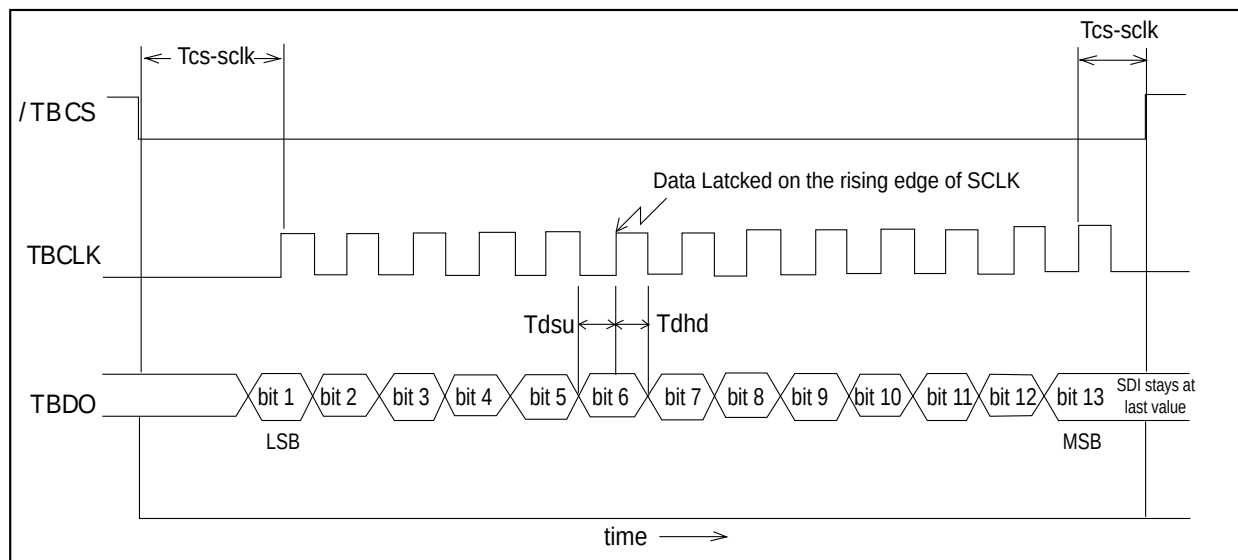
3-7-1 ENTIRE DESCRIPTION

THUNDERBOLT ASIC is configured with SERIAL INTERFACE INPUT PORT interfacing Main controller, 2 DC-DC Converter Controllers, Power On Reset Generation Circuit, and Motor drive part.

3-7-2 THUNDERBOLT FUNCTION DESCRIPTION

3-7-2-1 SERIAL INTERFACE INPUT PORT

To MAIN CONTROLLER(S3C46MOX(Jupiter3)), /TBCS, TBCLK, TBDO are connected with MAIN CONTROLLER (S3C46MOX (Jupiter3)), and see the figure for Timing.



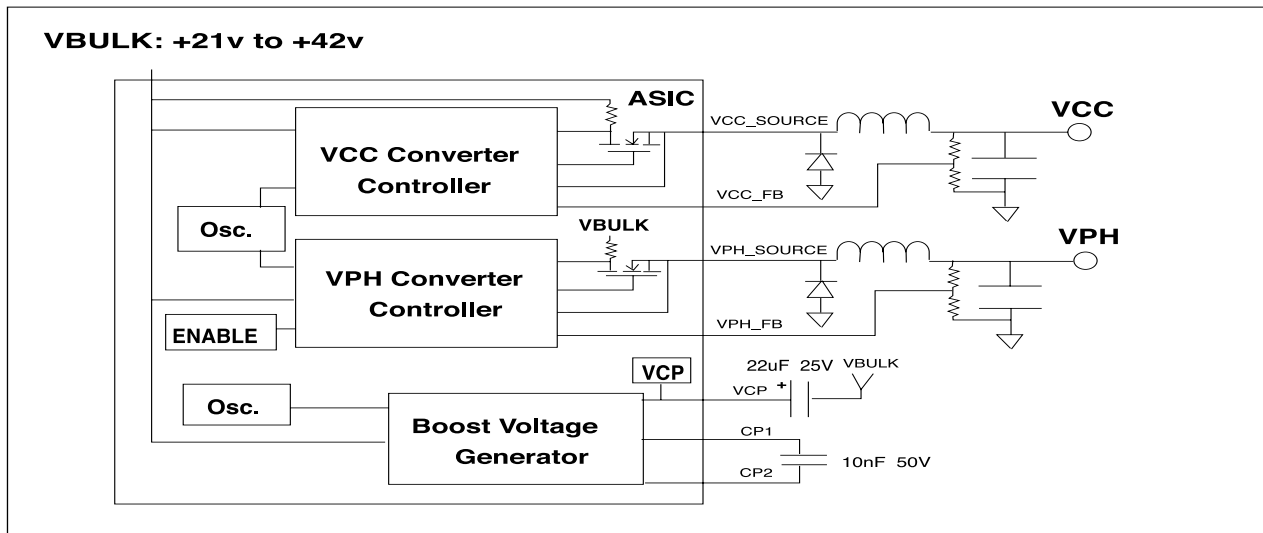
< Figure 21. SERIAL INTERFACE INPUT Timing Diagram >

Parameter	Description	Min	Typ	Max	Units
Fclk	Serial clock frequency		2.5	4	MHz
Tclh	SCLK high width	125	200	-	nsec
Tcll	SCLK low width	125	200	-	nsec
Tcs-sclk	Delay nCS falling to first SCLK rising	250	800	-	nsec
Tsclk-cs	Delay last SCLK rising edge to nCS rising	250	400	-	nsec
Tdsu	Data valid to SCLK set up time	125	200	-	nsec
Tdhd	Data hold time	125	200	-	nsec
Trd	SDI rise time	5		20	nsec
Tfd	SDI fall time	5		20	nsec
Trc	SCLK rise time	5		20	nsec
Tfc	SCLK fall time	5		20	nsec

< Figure 21-1. SERIAL INTERFACE INPUT Timing Specification >

3-7-2-2 DC-DC Converter Controller

This System uses VCC by converting it to +5V, and +3.3V, the power source of the system, is obtained from the +5V converted by using REGULATOR IC to use. VPH is used as the head power by converting it to +11.82V.



< Figure 22. DC-DC Converter Controller Diagram >

3-7-2-3 Power On Reset Generation Circuit

This System does not use Power On Reset Generation Circuit.

3-7-2-4 Motor drive part

This System uses DC Motor for CR(Carriage Return) MOTOR, and Stepper motor for LF(Line Feed) motor.

- CR(Carriage Return) MOTOR drive circuit description

1 CR MOTOR specification

CR MOTOR performs reciprocating movement of CARRIAGE from side to side so that INK CARTRIDGE may print on the paper.

- MOTOR TYPE : PM DC MOTOR "declination"
- Drive voltage : +30VDC
- Winding line resistance : $12\Omega \pm 2\Omega$
- Driver IC : Thunderbolt

2. CR MOTOR drive

2-1. DC Motor operation

DC Motor drive uses positive phase terminal(+) and anti-phase terminal(-) bound together respectively using 2nd Motor Driver(MD2) of Thunderbolt ASIC inside, and controls two-way operation of DC motor, by receiving input of "DIR_DCM," 7th bit among "PWM"(DC-motor Pulse Width Modulation) signal, output of Jupiter-III, and 13Bit Serial Port Inputs("TBDO" Signal) coming into Thunderbolt ASIC transmitted from Jupiter-III. This Driver is driven by VBULK power source(+30V), and on terms of Motor Stall not being generated, it is designed to supply 750mA current, and 2.4A current to output terminal for maximum length of 100ms.

2-2. Driver Spec.

1) Absolute Maximum Rating

Name	Description	Condition	Min	Max	Units
Vout	DC Motor Driver Output Voltage			42	Volts
Iout	DC Motor Driver Output Current			2.4	A

2) DC Specification

Name	Description	Condition	Min	Max	Units
I peak	Peak DC Motor Driver Output Current	Not Stalled		0.75A	Volts
I out	DC Motor Driver Sustaining Current	On Time=100ms	1.6	2.4	A

3) AC/Transient Specifications

Name	Description	Condition	Min	Nom	Max	Units
f _{PWM}	PWM frequency	Ta = 25C	19	20	21	KHz

4) Truth Table

DIR_DCM	PWM	#NAME?	#NAME?	#NAME?	#NAME?
0	0	On	Off	On	Off
0	1	Off	On	On	Off
1	0	On	Off	On	Off
1	1	Off	Off	Off	On

3. LF(Line Feed) MOTOR drive circuit description

3-1. LF MOTOR

- MOTOR TYPE : 2-2 Bi-polar Stepper Motor
- Drive Voltage : +30V
- Spherical line resistance : $5\Omega \pm 7\%$
- Driver IC : Thunderbolt

3-2. LF Motor Operation

LF Motor(Stepper Motor) drive uses the first Motor Driver(MD1) in Thunderbolt ASIC, and Drive Pulse is output from 4 terminals of A+, A-, B+, and B-. two H letter type Drivers. Drive Pulse controls size and flow direction of current(A+ => A- or A- => A+) according to bit7-bit No.13 signals among 13Bit Serial Port Inputs("TBDO" Signal) coming into Thunderbolt ASIC transmitted from Jupiter-III. This Driver is driven by VBULK power source (+30V), and on terms of motor stall not being generated, it is designed to supply current of 600mA, maximum 700A current to each phase of motor.

3-3. Driver Spec.

1) Absolute Maximum Rating

Name	Description	Condition	Min	Max	Units
V out	DC Motor Driver Output Voltage			42	Volts
I out	DC Motor Driver Output Current			0.7	A

2) DC Specification

Name	Description	Condition	Min	Max	Units
I peak	Peak DC Motor Driver Output Current	Not Stalled		0.6A	Volts

◇ OPE

3-8 Basic concept

3-8-1 OVERVIEW

OPE BOARD is separated from the Main Board functionally, and operates entire Micom(HT48C5A-000Z) in the Board. OPE and Main exchange mutual information using UART(universal asynchronous receiver/transmitter) channel. Also, Resetting of OPE is designed to control at the Main. Micom in OPE performs key-scanning and LCD, LED display control, and senses document detect, Scan position and so on. When information is generated from OPE(key touch, sensor level change, etc.), it sends specific code coping with the situation to Main, and the Main operates system by analyzing this code. If the Main tries to display data on OPE, the Main sends data to OPE via UART line on the basis of the format specified, and OPE displays it to LCD.

- This system does not apply document detect and SCAN position.

3-8-2 UART

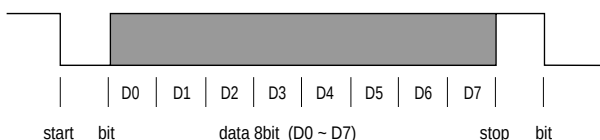
OPE and MAIN exchange information mutually by using asynchronous communication mode(UART), and in full duplex. Band rate is 9600bps, and uses 7.37MHz resonator as oscillating element. It engages in communication with 8bit data without parity bit. UART line has two lines for Tx and Rx, and the default level is in the 'high' state. For communication, the start bit(low level) is transmitted before 8bit data. When the data transmission(8bit) is completed, the high state is maintained as the stop bit(high level) is transmitted. Data is transmitted from LSB(D0), and MSB(D7) is transmitted lastly.

3-9 UART operation

3-9-1 UART COMMUNICATION

1) UART TX FORMAT

Codes for change of KEY, TOUCH, SENSOR LEVEL and so on are transmitted in single code without PRE/POST DATA, and OK or Error messages to check if communication is performed properly are also transmitted in single code. Provided that, in case the Main requested a certain value(LCD, other register) particularly, data requested is transmitted followed by sending Post Data('EOH') first.



2) UART RX FORMAT

Data being received will be arranged to be received according to the following specified format to know what data they are.

a)	Type of data received
b)	Number of data (n+1) received after.
c)	DATA(N)
d)	Check sum(1)

DATA are received in the sequence of A,B,C, and D, and the Check sum to check if the transmission is made properly will be found by doing XOR data from A to C.

3-9-2 UART COMMUNICATION DATA

1) UART transmission DATA(received by the Main side)

Types	Status	DATA	used port	Level	Remarks
key data	ON	11H~ 88H	PORT PC0~PORT PC7	L	
	OFF	af H		H	
SCAN POSITION sensor	ON	a5 H	PORT PB3	H	SCX-1100 not applied
	OFF	a4 H		L	
DOC. detector sensor	ON	a1 H	PORT PB-5	L	SCX-1100 not applied
	OFF	a0 H		H	
For initial use of initial OPE		ee H			After power on, generated only once
UART communication	OK	b0 H			(Note 2)
	ERR	c0 H			
LCD interface of OPE	OK	df H			When failed in the interface once & when succeeded first(Note 2)
	ERR	d0 H			
Self initial generation of OPE		e2 H			LCD data keeps status quo
Send data requested by the Main		e0 H			Data types:LCD, other(Note 3)

- (Note) 1. After this, keep waiting until there is response from the Main.
 2. The case of longer time(longer than 10ms) elapsed longer than waiting time required for Interface is regarded as fail
 3. After this code went out, then data requested it goes out.

• KEY MATRIX

	(1_H)	(2_H)	(3_H)	(4_H)	(5_H)	(6_H)	(7_H)	(8_H)
(_1H)	INK	RESERVED	RESERVED	RESERVED	CONTRAST	RESERVED	RESERVED	RESERVED
(_2H)	PAPER	RESERVED	RESERVED	RESERVED	COPY PAGE	RESERVED	RESERVED	RESERVED
(_3H)	SET UP	RESERVED	RESERVED	RESERVED	ZOME RETE	RESERVED	RESERVED	RESERVED
(_4H)	SCROLL NOLUM-UP	RESERVED	RESERVED	RESERVED	BLACK COPY	RESERVED	RESERVED	RESERVED
(_5H)	SCROLL NOLUM-DOWN	RESERVED	RESERVED	RESERVED	COLOR COPY	RESERVED	RESERVED	RESERVED
(_6H)	CANCEL	RESERVED	RESERVED	RESERVED	SPECIAL	RESERVED	RESERVED	RESERVED
(_7H)	ENTER	RESERVED	RESERVED	RESERVED	SCAN TO	RESERVED	RESERVED	RESERVED
(_8H)	QUALITY	RESERVED	RESERVED	RESERVED	POWER	RESERVED	RESERVED	RESERVED

<SCX-1100 OPE B'D KEY MATRIX>

2) Received DATA(transmitted by MAIN)

1. DATA TYPE

DATA types	Meaning	Remarks
a1 H	LCD DISPLAY DATA(FULL LINE)	
a2 H	LCD DISPLAY DATA(1'ST LINE)	
a3 H	LCD DISPLAY DATA(2'ST LINE)	
a4 H	LED DATA	
b1 H	Change of LCD types	

2. NO. OF DATA

- In case DATA is N BYTE, N+1

3. DATA

In case DATA TYPE is LCD DATA, it is configured with ASCII CODE to be displayed.

In case DATA TYPE is LED DATA, it is 1 BYTE.

LED DATA BIT ASSIGNMENT:

DATA BIT	BIT 0	BIT 1	BIT 2	BIT 3	BIT 4	BIT 5	BIT 6	BIT 7
LED NO.	LED 0	LED 1	LED 2	LED 3	LED 4	LED 5	LED 6	LED 7

4. CHECK SUM

The value done XOR all of them from DATA TYPE to DATA.

5. Change of LCD types

<2 LINE * Change to 16 character LCD>

DATA TYPE : b1 H
 NO. OF DATA : 2
 DATA : 26 H
 CHECK SUM : b1h XOR 2 XOR 16h = a5 h

<1 LINE * Change to 16 character LCD>

DATA TYPE : b1 H
 NO. OF DATA : 2
 DATA : 26 H
 CHECK SUM : b1h XOR 2 XOR 26h = 95 h
 DEFAULT : 2 LINE 16 Character LCD

In case the MAIN does not change the LCD types, it is the Default LCD state of OPE MICOM.

* SCX-1100 uses 1 LINE LCD.

3-10 I/O PORT configuration and use usage

It has 32 I/O Ports, and 24 Ports of them are arranged to decide I/O direction with Software Control, and the rest 8 Ports are arranged to be used for Input or Output only. All of I/O Ports are classified into four Blocks according to the characteristics of I/O Control, and each Block consists of 8 Ports.

Type	I/O Control	I/O direction	USE	Remarks
PA X	Byte Control	I/O => Output	LED Control	Used as LCD VCCCONTROL in SCX-1100.
PB X	Byte Control	In : 4, Out : 4	UART, LCD, Sensor	SCX-1100 SENSOR not applied.
PC X	Byte Control	I/O => Input	Key Input	
PD X	Byte Control	I/O => Output	LCD Data, Key Scan	

1) Assignment of Port PAX

- PA0 : LCD VCC CONTROL SIGNAL (POWER ON/OFF)
- PA1 : LED 1
- PA2 : RESERVED
- PA3 : RESERVED
- PA4 : RESERVED
- PA5 : RESERVED
- PA6 : RESERVED
- PA7 : RESERVED

2) Assignment of port PBX

- PB0(Output) : LCD Enable
- PB1(Output) : LCD R/W
- PB2(Output) : LCD RS
- PB3(Input) : GND
- PB4(Input) : Unused (Pull-up)
- PB5(Input) : GND
- PB6(Output) : UART TXD in Main UART
- PB7(Input) : UART RXD from Main UART

LCD ON/OFF

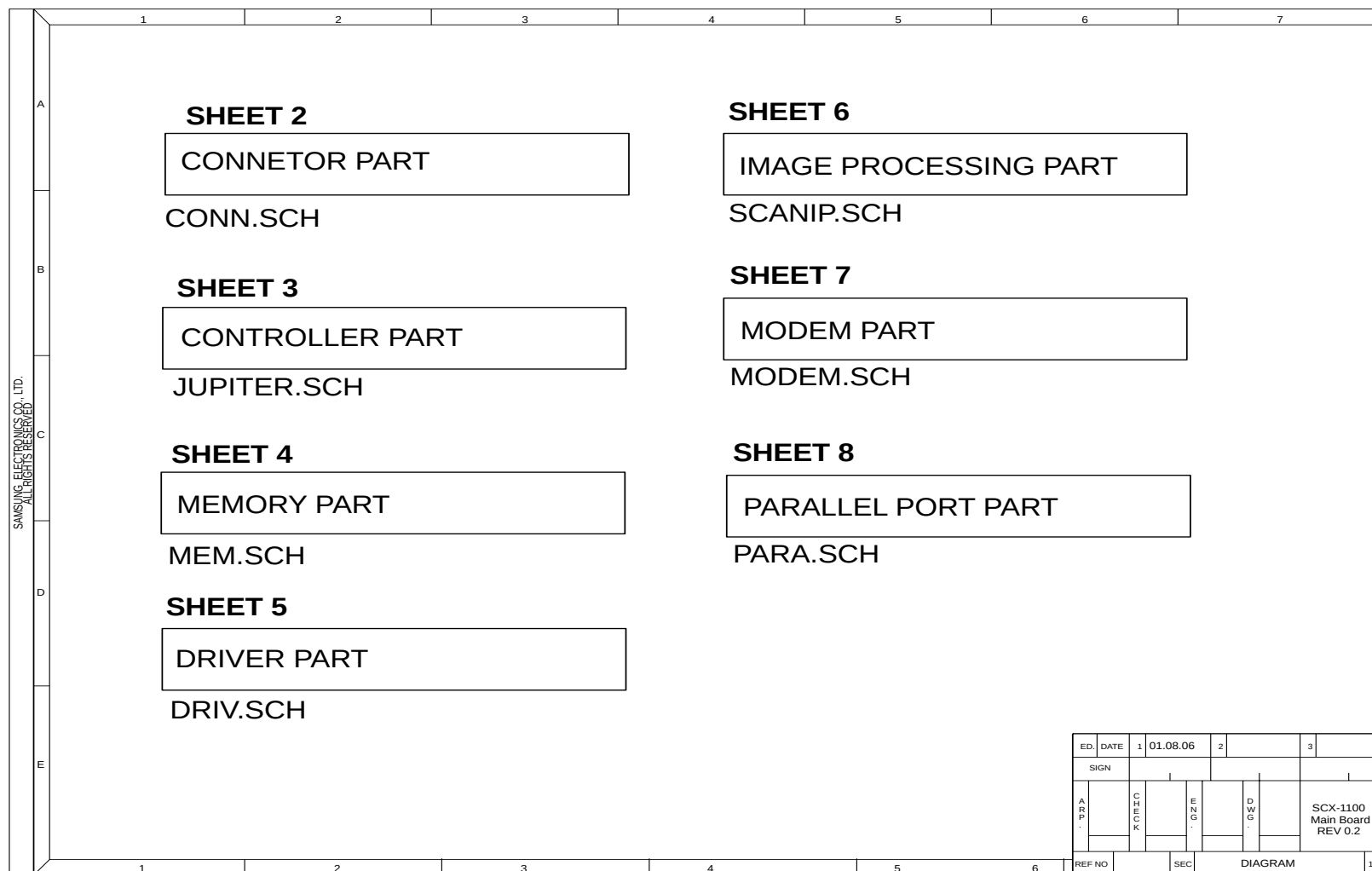
In case of VCC applied to LCD No. 3 PIN (BACKGROUND LEVEL), all the LCD screen will be erased. When the power is applied, MICOM PA0~7 are Default High LEVEL, so LCD will be OFF. From Jupiter3, LCD will be ON simultaneously with OPE reset.

Q1, Q2 have the function of simply doing On/off only.

When pressing the Power Key, actual power is not turned Off but 11.75V terminal of Thundervolt Off in the Main, while simply the LCD DISPLAY should not appear in OPE. At this point, Micom should be operated normally to recognize the Key when pressing the Power key again. [The same effect as Power save]

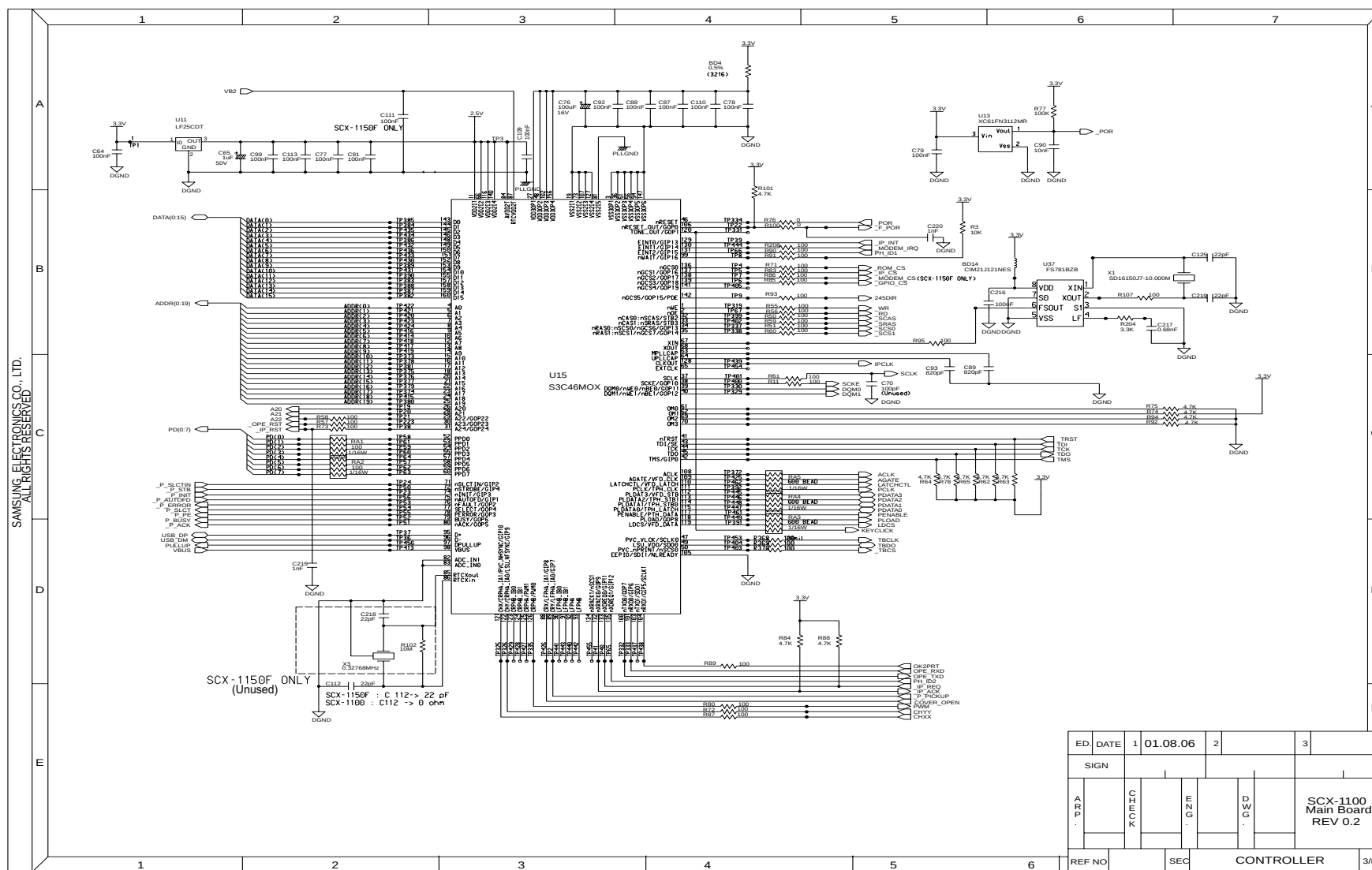
4. Schematic Diagrams

4-1 Main Circuit Diagram (1/8)

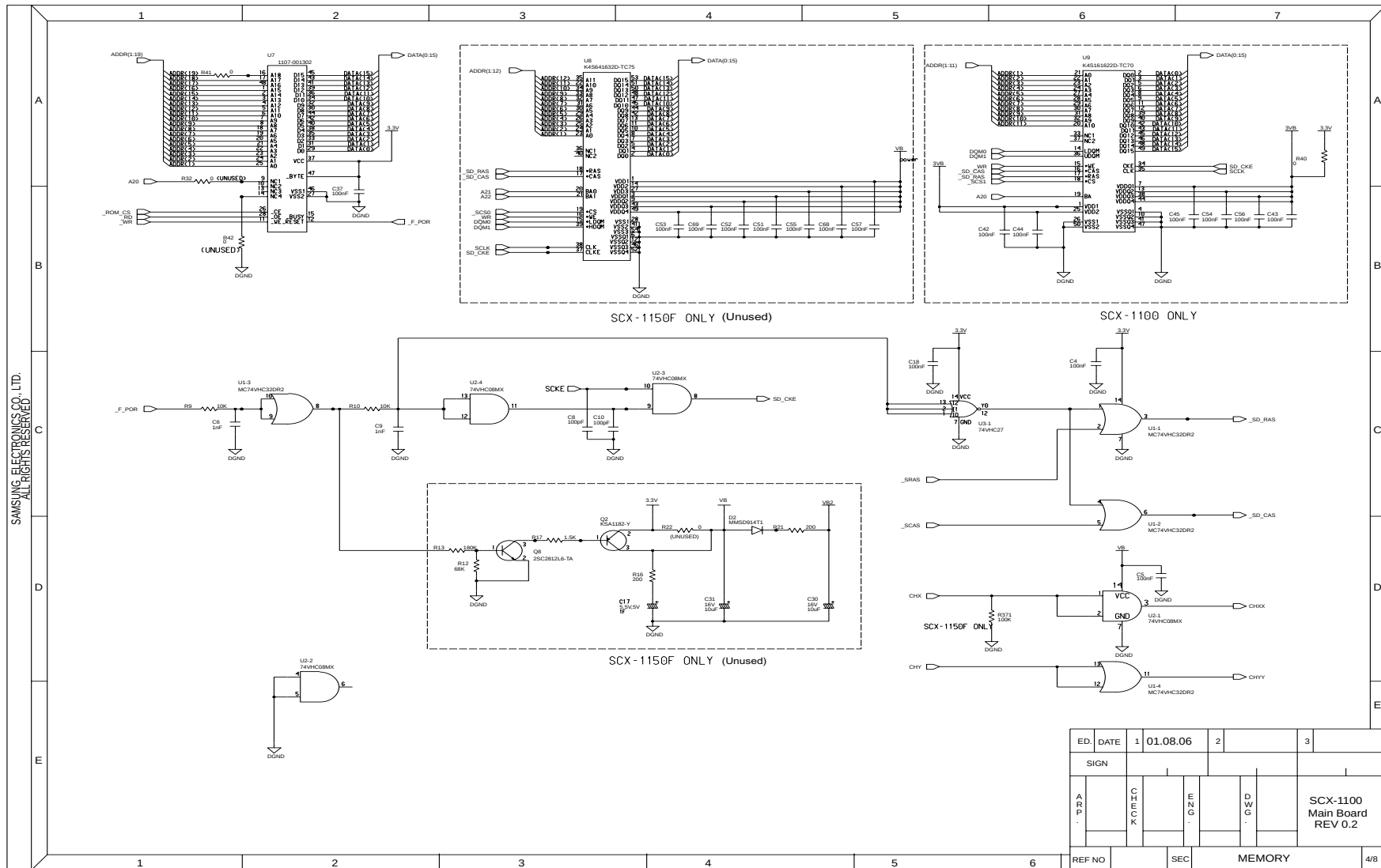




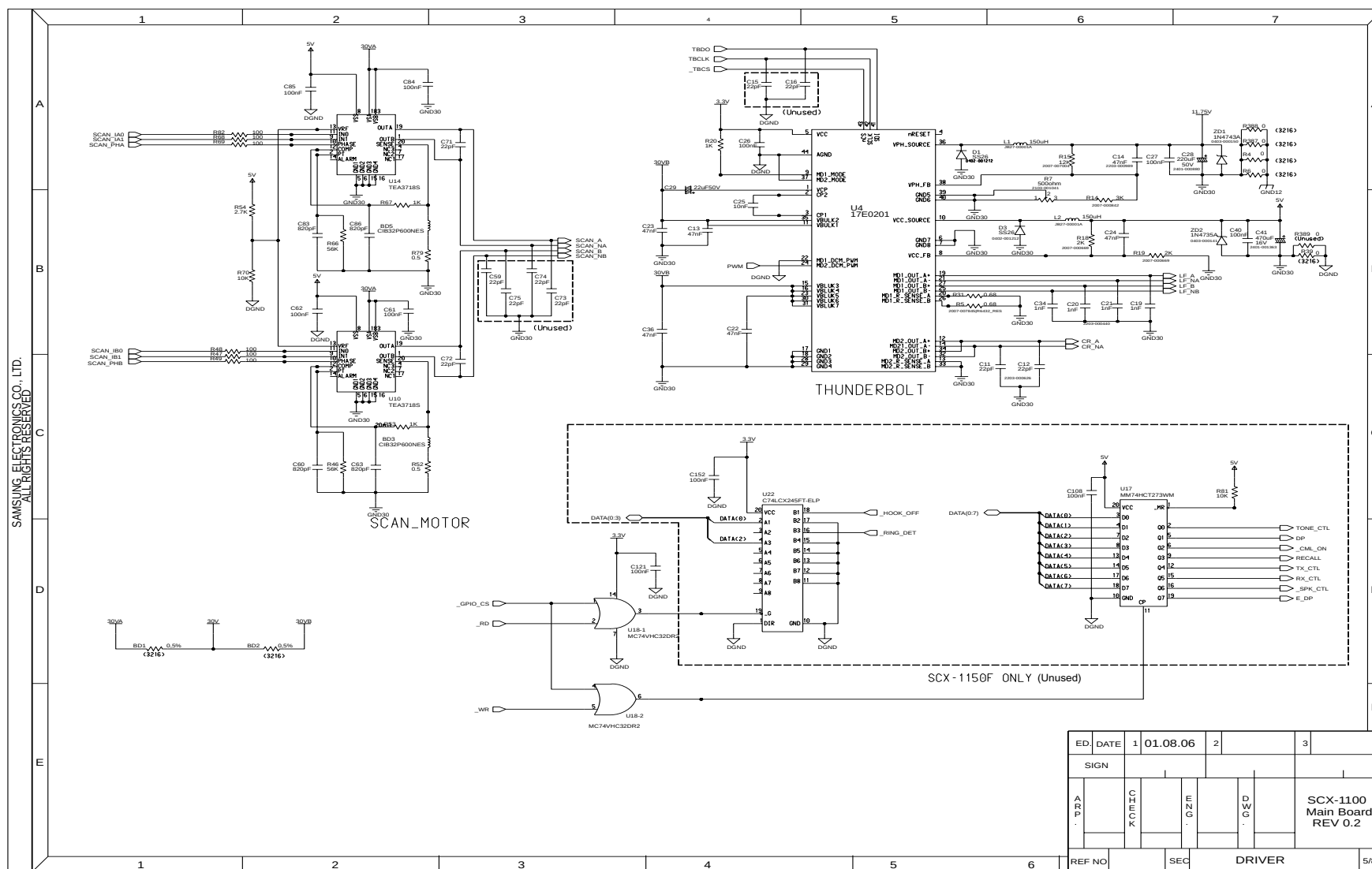
Main Circuit Diagram (3/8)



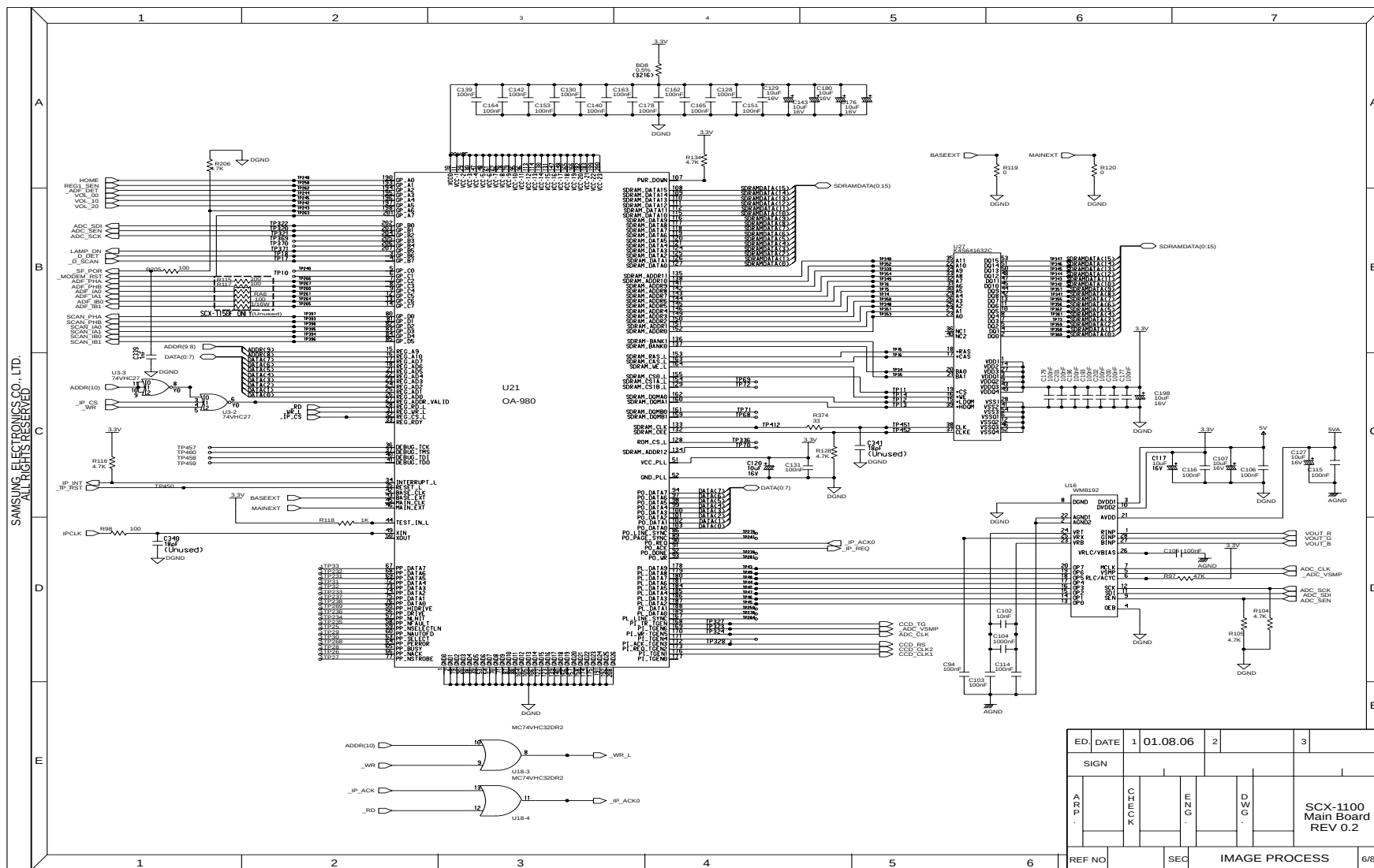
Main Circuit Diagram (4/8)



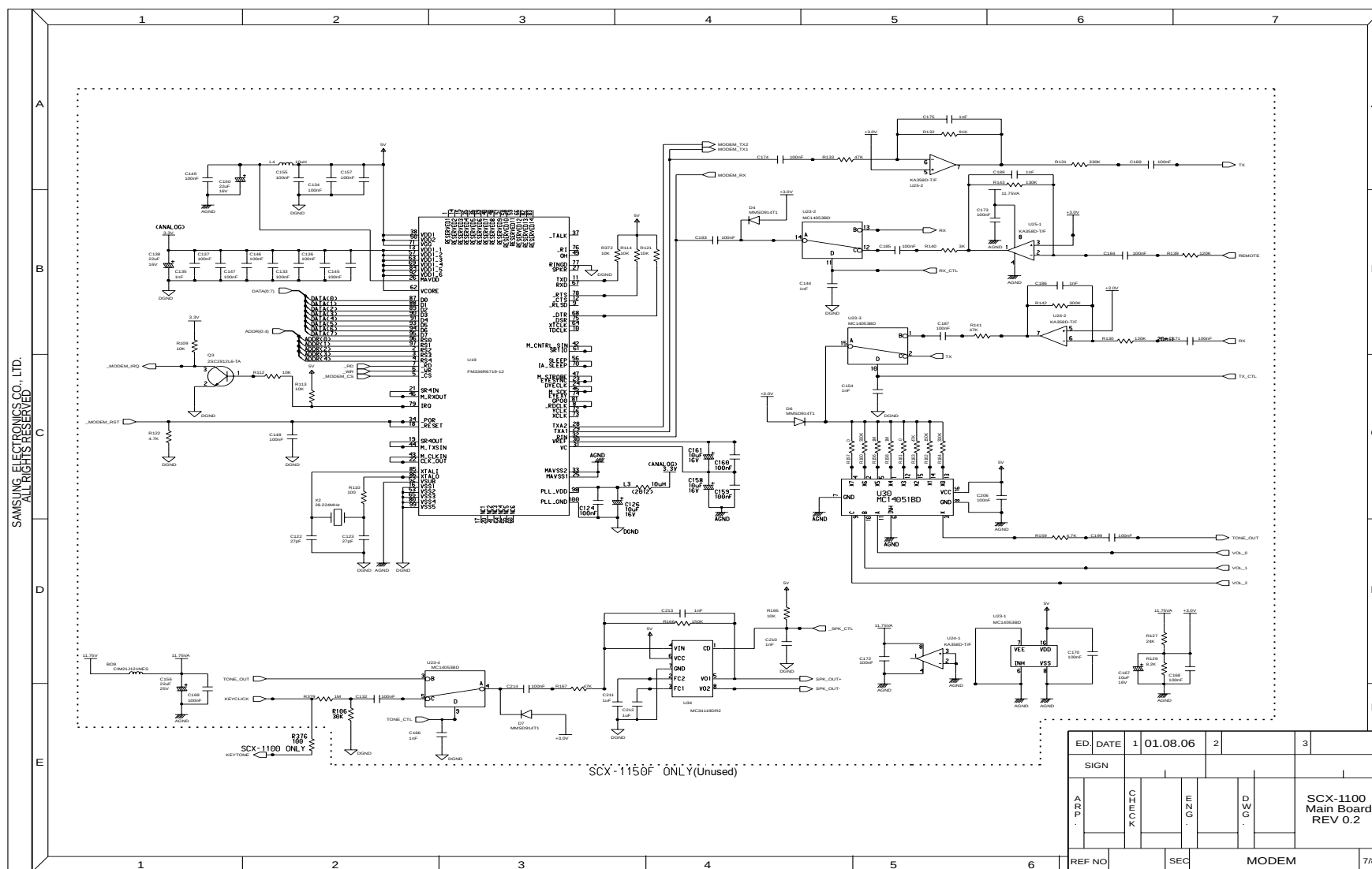
Main Circuit Diagram (5/8)



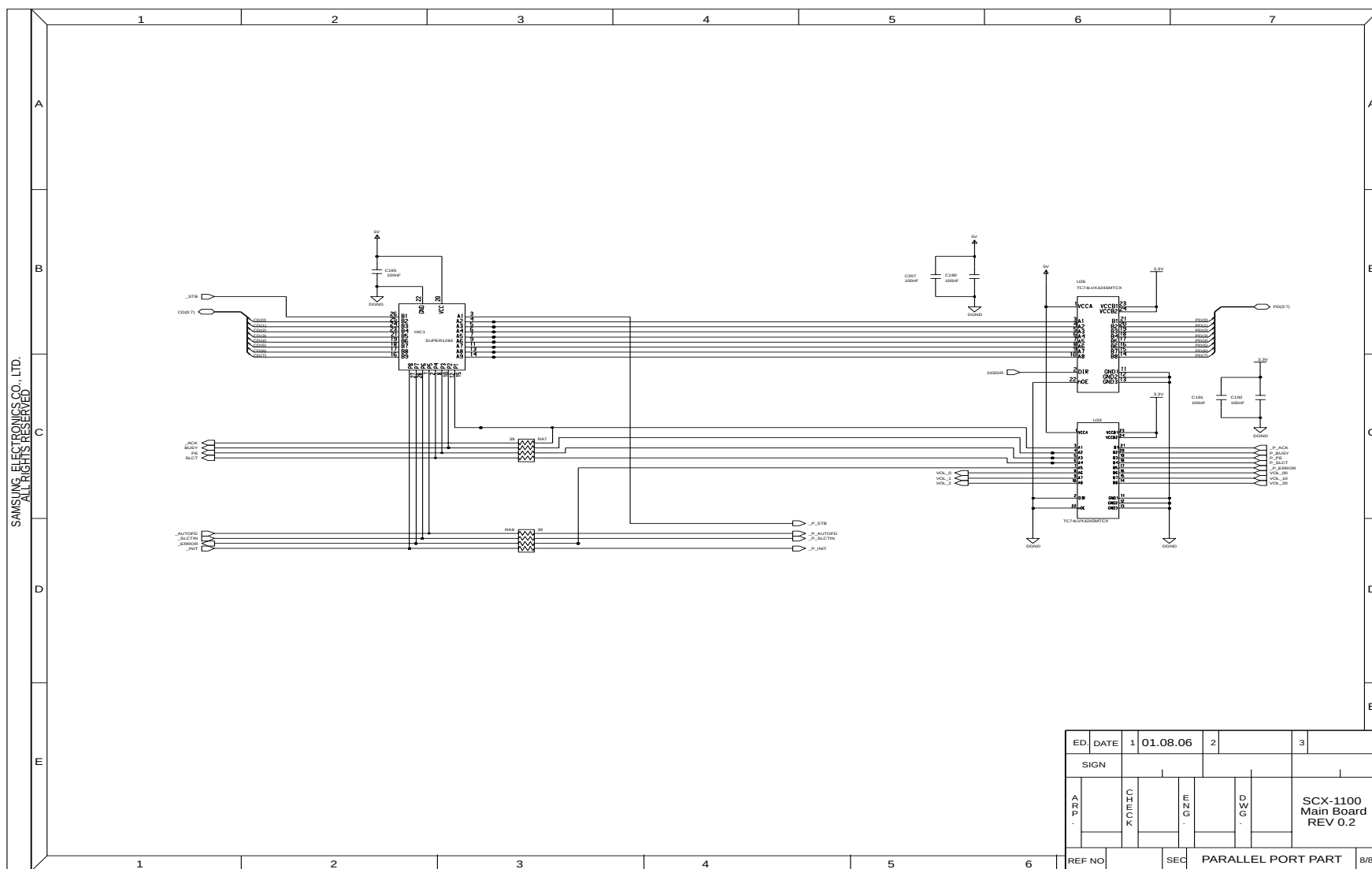
Main Circuit Diagram (6/8)



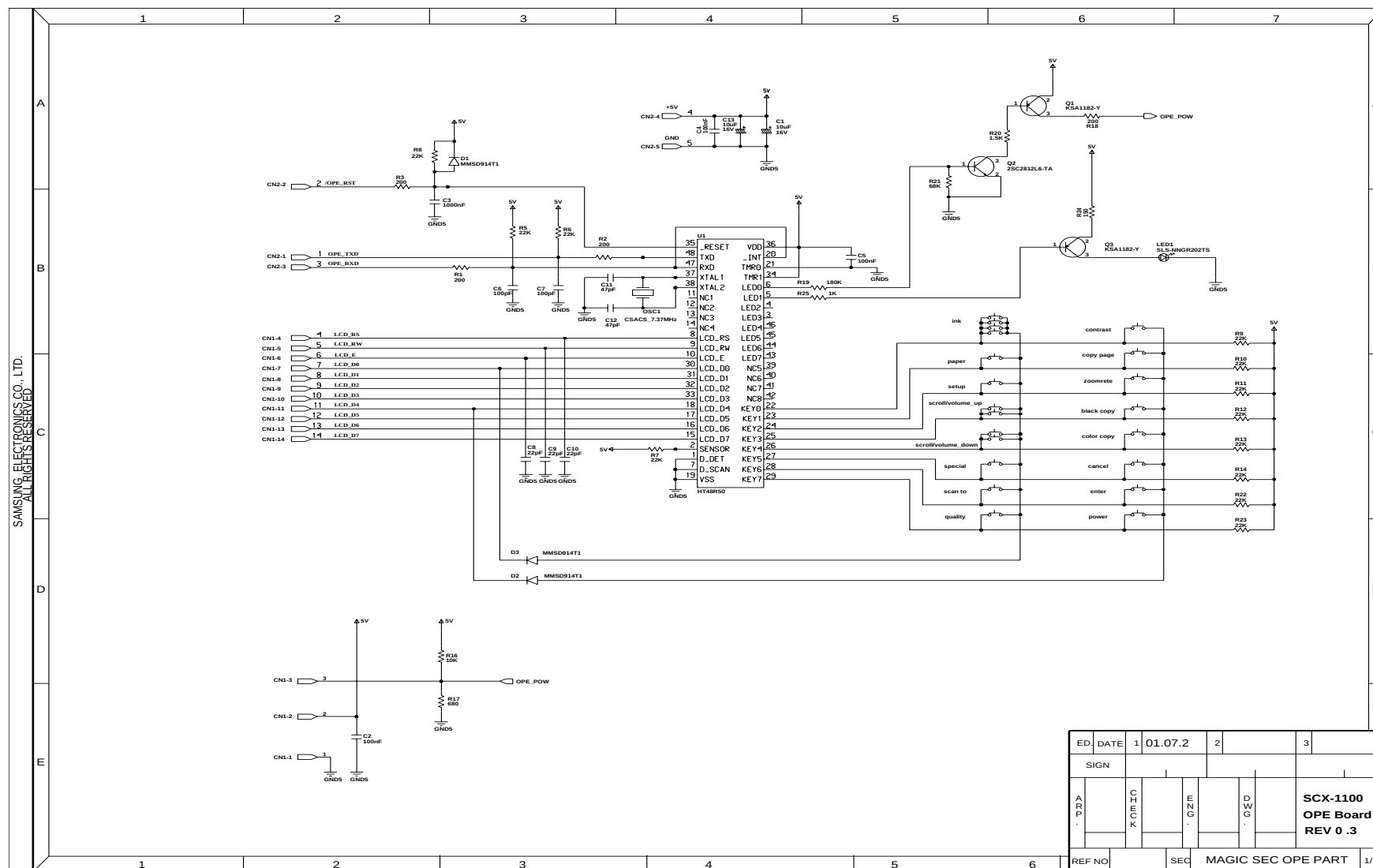
Main Circuit Diagram (7/8)



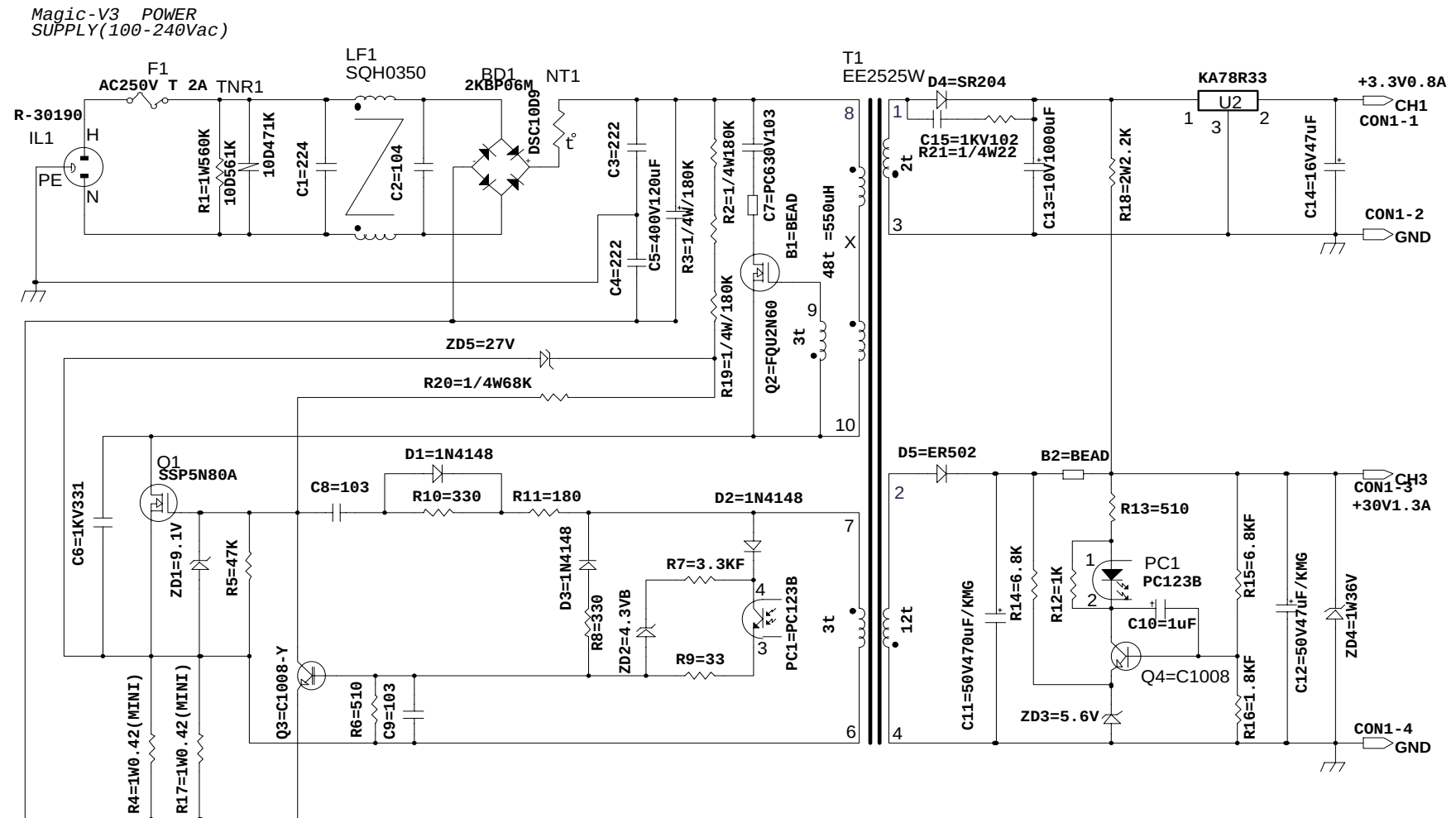
Main Circuit Diagram (8/8)



4-2 OPE Circuit Diagram



4-3 SMPS Circuit Diagram



Title		
MAGIC POWER SUPPLY CIRCUIT DIAGRAM (Magic-V3)		
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The Samsung logo, consisting of the word "SAMSUNG" in white capital letters inside a dark blue oval.

*This manual is made and
described centering around
circuit diagram
and circuit description needed
in the repair center
in the form of appendix.*

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