POMELO-P3 (G063)

SERVICE MANUAL

[Controller]

1. INSTALLATION

Refer to the following materials.

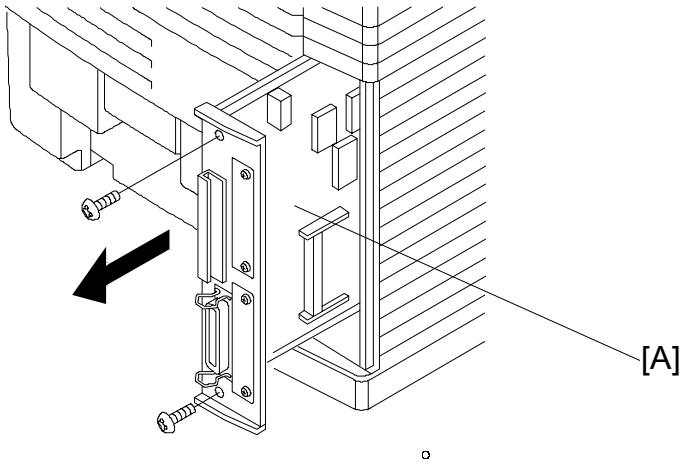
- For the printer: Quick Installation Guide
- For options: Operating Instructions – Setup Guide

2. PERIODIC MAINTENANCE

Refer to Section 2. Periodic Maintenance in the G063 engine service manual.

3. REPLACEMENT AND ADJUSTMENT

3.1 CONTROLLER BOARD REPLACEMENT



G063R092.WMF

1. Remove the printer controller board [A] (2 screws).

The following must be done after changing the board.

- Store the Printer ID (controller service mode S8)
- Store the network printer name (user mode)
- Do the gamma calibration (controller service mode S7)

3.2 REGISTRATION ADJUSTMENT

You can adjust the registration in the following three ways:

A. Controller's user menu (Menu → Maintenance → 4. Registration); refer to the operating instructions for more details
B. Controller's SP mode (S5. Registration)
C. Engine SP mode (43 Margin Adjust)

For tray 1, the leading edge and left side registrations can be adjusted either with engine SP mode 43 or with controller SP mode S5 (Registration).

For tray 2, leading edge and left side registrations can be adjusted with engine SP mode 43. The left side registration can also be adjusted with the controller user mode, and the leading edge registration can be adjusted with controller SP mode 5 (Registration).

For how to adjust the registration, refer to '5. Service Tables – 5.5.1. Adjusting the Leading Edge and Left Side Registrations' in the engine service manual.

3.3 IMAGE ADJUSTMENT

3.3.1 OVERVIEW

The table below lists the adjustable image parameters, with their corresponding adjustment procedures.

Item		Procedure
Brightness, Contrast, Saturation, Color Balance		In the Print Quality tab of the Windows printer properties, select the 'Custom' button and click 'Setting'. A range of adjustments is displayed. The results of the adjustments are reflected in the image data processing by the driver and controller.
Density	LD Power	Use either the user menu **[Menu]** →**[Maintenance]** →**[Toner Level]** or engine SP mode 45-1 (LP Tune Up). You can adjust the power for each CMYK color within a range of -1 to +13 with the user menu and in ±4 steps in engine SP mode. (For the actual procedures, refer to the operating instructions and the engine service manual). See '5.Service tables – 5.1.4 SP Mode Details' in this manual for the relationship between the settings in each of these modes. The settings made for this item are transferred to the engine and stored in NVRAM on the MCTL board. Note that the customer is able to adjust this.
	Development Bias	Use engine SP mode 45-3 (DBV Tune Up); refer to the engine service manual. You can adjust the bias for each CMYK color in ±4 steps. The settings made for this item are transferred to the engine and stored in NVRAM on the MCTL board.
	Transfer Bias	Use either controller SP mode S4 (Transfer Bias) or engine SP mode 45-2 (THV Tune Up). You can adjust in ±4 steps for plain paper, OHPs, and labels.
Service Gamma		Use controller SP mode S7 (Gamma Calib.). You can adjust each color for both text and photograph modes. The results of the adjustment are reflected in the gamma correction done by the controller (see '3. Replacement and Adjustment – 3.3.2 Service Gamma Adjustment' and 6. Detailed Descriptions – 6.1.2 Controller Gamma' in this manual for more information on how the controller does this).

3.3.2 SERVICE GAMMA ADJUSTMENT

NOTE: For problems related to color quality and gradation, clean the engine and replace supplies and other parts at first. Use this mode only when the customer insists on further fine adjustments (e.g., matching colors between machines).

Adjustment Menu (Controller SP, S7. Gamma Calibration)

The menu items under Gamma Calibration in controller SP mode are organized as shown below. See "5. Service tables – 5.1.3 SP Mode Menu Hierarch," in this manual for instructions on how to access the "S7. Gamma Calib. Color Correction" menu.

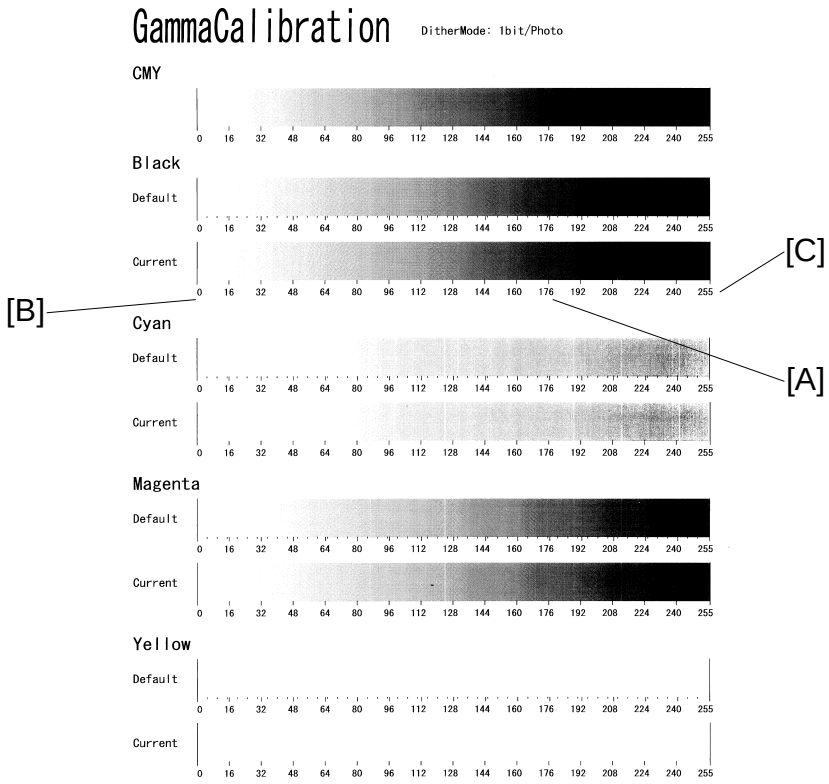
Layer 3	Layer 4	Layer 5	Layer 6
Load Setting	Default		
	Setting-Old		
	Setting-Current		
Mode Setting	1 bit/Photo		
	1 bit/Text		
Print Setting			
Gamma Setting	Black	K/01th.[xxx]	K/01th.=xxx/255
		↓	↓
		K/15th.[xxx]	K/15th.=xxx/255
	Cyan	Same as above	Same as above
	Magenta	Same as above	Same as above
	Yellow	Same as above	Same as above
	Save Settings		

(continued on the next page)

Adjustment Overview

To carry out this adjustment, select the print mode to adjust (text or photograph), then print out a color adjustment sheet. Make the gradation scales on the printout smooth from the lowest to the highest density. Adjust the CMY gradation scale at the top of the chart by balancing the density of the C, M, and Y gradation scales – the CMY gray scale should change smoothly from minimum to maximum, and there should be no coloration.

The color adjustment sheet is as follows.



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For each color, you can adjust 15 points (example [A]) between 0 (lowest density) [B] and 255 (highest density) [C]. For each point, you can adjust the density within 0 and 255.

The gradation scales marked ‘Default’ are printed according to the default gamma settings in the flash ROM in the controller. The gamma adjustment changes the densities at the adjustable points in the gradation scale. The gradation scale marked “Current” shows the current settings.

During the adjustment procedure, compare the “Current” gradation scale with the ‘Default’. Select the density for each of the 15 adjustable points, excluding points 0 and 255, from the ‘Default’ gradation scale.

The NVRAM holds three controller gamma settings, those saved this time (Setting-Current), those saved in the preceding adjustment (Setting-Old), and the factory settings (Default).

Adjustment Procedure

1. Select “Load Setting” and load the settings that will serve as the base for the adjustment.
2. Select “Mode Setting”, and select the print mode that you are going to adjust (text or photograph).
3. To review the image quality for these settings, choose “Print Setting” to print out a color adjustment sheet (Gamma Calibration at the top of the page).
4. Select “Gamma Setting”. Then select a color (K, C, Y, or M).
5. Adjust the color density at each of the 15 points.
   NOTE: To decide what density value to input, do the following.
   1. Look at the color adjustment sheet.
   2. For the color you are adjusting, look at the gradation scale entitled ‘Default’.
   3. Go along the scale until you reach the density that you wish to input.
   4. Read off the value on the scale and store it in the machine.
   5. Do the same for all 15 points.
6. When the density setting is complete for all colors, print out a color adjustment sheet again and make sure that the gradation scale for each printed color is smooth and that the CMY gradation scale is gray. Repeat the adjustment if there is an anomaly (normally, repeat this procedure 3 to 5 times).
7. If the adjustment results prove satisfactory, do the following:
   1) Execute “Save Settings”.
   2) Reset the controller (press the **[Reset]** key when the machine is off line”) to use the new settings.

NOTE: The new settings will not be saved in the controller NVRAM unless you reset the controller.

3.3.3 SOFTWARE UPGRADE PROCEDURE

Required Tool

- IC card Adapter (G0319350)
- IC card containing new firmware

The controller, RICOH-SCRIPT2 and network interface boards have a flash ROM for storing control software. This allows version upgrades using an IC card.

NOTE: Before starting an upgrade procedure, make sure that the software in the IC card is newer than the software in the controller, RICOH-SCRIPT2, or network interface board.
To check, print out a configuration page (user mode).

Follow the procedure shown below to upgrade the software:

1. Turn off the machine, and then unplug all cables from the parallel interface board(s) and network interface board, if connected.
2. Install IC card into IC card adapter.
3. Remove the controller board. Then install the IC card adapter in either optional bus I/F slot 1 or slot 2.
4. Put the controller board back in the machine.
5. Turn on the machine. The machine automatically copies the firmware from the IC card to the appropriate flash ROM (controller, RICOH-SCRIPT2, or network interface board).

CAUTION: 1) Do **not** turn off the machine while the software is being updated. Otherwise, the controller, NIB, or RICOH-SCRIPT2 module may be damaged.
2) Do **not** turn off the machine until at least 30 seconds after the message “OK!!OK!!” or “DOWNLOAD OK.” appears.

For the controller or RICOH-SCRIPT2:

The LCD display on the operation panel changes as shown below as the rewrite procedure proceeds. ('MELT' is displayed during the software upgrade for RICOH-SCRIPT2 since it involves a decompression process.)

```
(MELT ->) ERASE -> WRITE -> VERIFY -> OK!!OK!!
```

The appearance of the message "OK!!OK!!" indicates that the controller has received the data from the IC card. However, note that it takes about 30 seconds to rewrite the data in the controller or RICOH-SCRIPT2 after this message is displayed.

The message NG!!NG!!" is displayed if an error occurs during the rewrite process. If this condition occurs, reinstall the IC card and turn the power off and on again.

For the network interface board:

The appearance of the message "DOWNLOAD OK." indicates that the controller has received the data from the IC card. However, note that it takes about 30 seconds to rewrite the data in the network interface board after this message is displayed.

```
DOWNLOAD -> ############ -> DOWNLOAD OK.
```

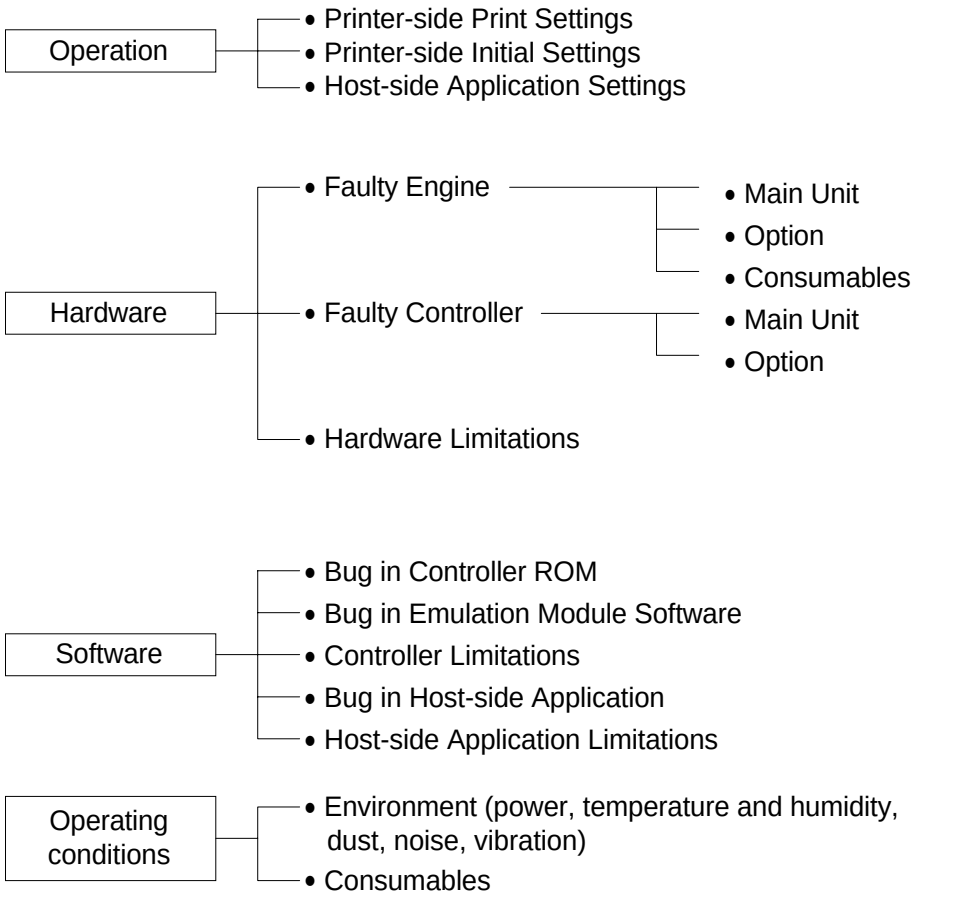
The message "DOWNLOAD NG." is displayed if an error occurs during the rewrite process. If this condition occurs, reinstall the IC card and turn the power off and on again.

4. When the rewrite ends, turn off the main unit, reset all DIP switches to OFF, and remove the IC card.
5. Replace the IC card cover. Turn the power on again and print the user mode configuration page.
6. Check the new software version and make sure that it matches the version on the IC card.

4. TROUBLESHOOTING

4.1 TYPES OF PROBLEMS

The problems can be classified as follows.



G063T500.WMF

4.2 TROUBLESHOOTING PROCEDURE

4.2.1 HARDWARE TESTS

1. Power-up self-diagnostics
   Turn on the power and check that an error code is not displayed.
   After the system starts, check for error messages on the configuration page that is automatically printed.
2. Detailed diagnostic test
   See “4.Service Tables - Detailed Self-diagnostics Mode” in this manual for the procedure.
3. Checking the configuration page output.
   Print out from the user menu: **[Menu]** → **[List Print]** → **[Config. Page]**. If error messages are included, check the relevant part of the machine and replace any defective components.
4. Connectivity test
   Make a test print from a computer.
   - Check that the correct cable is used (and connected properly).
   - Check the cable continuity.
   - Check the cable length (is it too long?).
   - Do not connect the printer to the computer through a printer selector switch – connect the printer to the computer directly.
   - If the optional parallel interface is installed, connect the computer to the parallel interface board that is being tested.

4.2.2 OPERATION-RELATED TESTS

Check the print conditions and initial settings.

Check the printer settings against the application settings. Check whether the current settings match the settings on the configuration page that the customer keeps.

NOTE: Ask the customer to print a configuration page at some time when the controller is working normally, and keep it for reference.

4.2.3 SOFTWARE-RELATED TESTS

Obtain information about the following:

- PC model
- OS type and version
- Configuration page
- Application software used, and the version
- Data file being printed when the problem occurred (if obtainable)
- RICOH-SCRIPT2 data file when the problem occurred
- Sample printouts when the error occurred and when the printer is normal
- Detailed operating procedure
- Controller system and emulation module version
- Firmware versions (engine, controller, NIB)

4.3 ERROR MESSAGES

4.3.1 OVERVIEW

The error messages that this unit can issue are classified as follows:

1. Controller Self-diagnostics Errors
   Errors detected while the unit performs power-up self-diagnostics/detailed self-diagnostics on the controller hardware.
2. Controller User Errors
   Errors caused because the controller software cannot process the job because of, for example, insufficient memory.
3. Internal Errors
   Errors caused because the controller's control function fails to function normally.
4. Engine User Errors (Cautionary)
   Errors that do not require user intervention to continue printing (the printer can still communicate with the PC over the interface). However, for the best printing quality, the user should correct the problem as soon as possible.
5. Engine User Errors
   Severe errors that cause the unit to stop printing, requiring the user to fix the problem before printing again.
6. Engine Service Codes (SCs)
   Severe errors that cause the unit to stop printing, requiring a technician to fix the problem before printing again.

Only one error message can be displayed at once. There is an order of priority for displaying the errors. This is as follows, starting with the highest priority: Internal Errors, Controller Self-diagnostics Errors, Engine Service Codes (SCs), Engine User Errors, Engine User Errors (Cautionary), Controller User Errors.

4.3.2 CONTROLLER SELF-DIAGNOSTICS ERRORS

When a controller self-diagnostics error occurs, the error code is displayed on the first line of the operation panel LCD.

The second line contains an 8-digit code that gives details of the error for designers to debug the error. For a memory error, the second line of the LCD indicates the address in which the error occurred. For errors other than memory errors, the second line always reads “FFFFFFFF”.

Code	Description	Location
00XX	Exception processing error	Controller
0101	Flash ROM sum check error	Controller
0201	Standard memory read/write error	Controller
0301/0401	Optional memory read/write error Non-fatal error (printed as B0 in the error log.)	Optional memory
060X	CPU exception self-diagnostics error	Controller
0D0X	ASIC timer error	Controller
0F0X	ASIC engine interface error	MCTL/Controller
11XX	ASIC Centronics interface error Non-fatal error (printed as B1 in the error log.)	Controller
1401	NVRAM error	Controller
1601	Font ROM error	Controller
170X	IC card error 1703 represents a non-fatal error (printed as B4 in the error log.)	IC card/Controller
1B0X	Optional Interface 1 Error	Controller
1C0X	Optional Interface 2 Error	Controller
1D0X	Optional parallel interface board Non-fatal error (printed as B6 in the error log.)	Optional parallel interface board
250X	Optional emulation module error Non-fatal error (printed as B5 in the error log.)	Emulation module/Controller
400X	FPU error	Controller
450X	ASIC compression/decompression error	Controller

4.3.3 CONTROLLER USER ERRORS

Display	Description	Location/action
85: Error	Graphics environment initialization error	Optional memory/Controller
86: Error	Invalid control code parameter	Incorrect printer driver or incorrect cable installed
91: Error	Font/image environment initialization error	Install additional memory.
94: Error	Download data error	Incorrect 'total memory size' setting in the driver
A3: Error	Receive buffer overflow	Increase the I/O buffer size using the system menu (user mode)
A6: Error	Overflow during compression	Install additional memory.
A7: Error	Error during drawing processing	Use a smaller font size or a less complex font, or replace the controller
A8: Error	Error during library drawing	Switch the machine off/on. If that does not work, replace the controller.
AB: Error	Print overrun	Install additional memory.
B0: Error	Optional memory error	Reinstall/replace optional memory.
B1: Error	Standard parallel interface error	Interface cable/controller
B3: Error	Invalid initial setup setting	Reset the printer settings using 'Menu reset' in the Maintenance menu (user mode).
B4: Error	IC card slot error	Controller/IC card
B5: Error	Optional emulation module error	Reset/replace emulation module.
B6: Error	Optional parallel interface board error	Reset/replace optional parallel interface board
B7: Error	Optional network interface board error	Reinstall/replace network interface board

4.3.4 INTERNAL ERRORS

When an internal error occurs, the message “Err Power Off/On” is displayed on the first line of the operation panel LCD. The internal error code is on the second line in the format “Error XXYY-ZZZZZZZZ” (“XX” denotes a classification code; “YY” denotes a process number, and “ZZZZZZZZ” indicates the program address where the error occurred).

The classification code portions (XX) and their descriptions are shown below. The “YY” and “ZZZZZZZZ” portions are for designer use only (for debugging).

Code (XX)	Description
00	Error in the TLB user area.
01	CPU TLB update exception
02	CPU mismatch exception (load or fetch)
03	CPU mismatch exception (store)
04	CPU address error exception (load or fetch)
05	CPU address error exception (store)
06	CPU bus error exception (load or fetch)
07	CPU bus error exception (store)
08	CPU system call exception
09	CPU break point exception
10	CPU reserved instruction exception
11	CPU coprocessor disabled exception
12	CPU operation overflow exception
13	CPU trap exception
14	Coherency (instruction) error
15	CPU floating-point operation exception
16	CPU timer interrupt
17	EAGLE level 4 interrupt (ART or Tim)
18	EAGLE level 3 interrupt (CP)
19	EAGLE level 2 interrupt (XINT1 or XINT0)
20	EAGLE level 1 interrupt (CBE, DBE, Dtc0, Verr, Fin, Vdtc, Fout)
21	EAGLE level 0 interrupt (Debug)
22	Software interrupt
23	Software interrupt
24	Other CPU exceptions
25	Memory allocation error
26	Overflow error
27	Frame allocation error
28	Card eject error
29	Printer engine error
30	Option board error
31	Session-to-network interface board communications error

4.3.5 ENGINE USER ERRORS (CAUTIONARY)

The unit can continue printing even when one of the messages listed below is encountered.

Display	Description	Number of sheets until warning state
Low on: XXX	Toner near end XXX denotes the color name (CMYK or their combination).	500 at a 5% image ratio (300 sheets for Black).
Chg. Cleaner	Fusing cleaner replacement time arrived	1,000 at a 5% image ratio
Fusing Oil	Fusing oil near end	30
Change PCU	Photoconductor unit replacement time arrived	Information only
Change 120K	120k maintenance requested	Information only
Change Fuser	Fusing unit replacement time arrived.	Information only

4.3.6 ENGINE USER ERRORS

The unit can no longer continue printing when one of the following messages is displayed:

Display	Description
Add Toner XXX	Toner end (XXX: Cyan, magenta, yellow, or black)
Waste Toner is Full	Waste toner bottle full
Fusing Oil	Fusing oil end
Paper Size Error	Paper size error
Change Fuser Cleaner	Fusing cleaner needs replacement.
Paper Type Error	Media mismatch
Load YYY tray XXX	Paper end (XXX denotes a tray name and YYY a paper size.)
Reset Paper Tray Correctly	No tray
Close Top Cover	Paper exit cover open
Close Front Cover	Front cover open
Reset XXX Toner Correctly	No toner cartridge (XXX denotes a color name.)
Close Rear Cover	Rear cover open
Reset Fusing Unit Correctly	No fusing unit
Reset PCU Correctly	No photoconductor unit
Reset Cleaning Roller Correctly	No fusing cleaner
Remove Misfeed from Tray XXX	Paper jammed

4.3.7 ENGINE SERVICE CODES

When an engine service call (SC) error occurs, an error message is displayed on the operation panel LCD in the format “Call Service SC: XX” where XX denotes an error code. The engine SC error codes and their descriptions are shown below.

For the troubleshooting procedures, refer to the engine service manual.

Display	Description
SC: EC	Engine communication error
SC: 22	Development motor error
SC: 23	Main motor error
SC: 24	Polygon mirror motor error
SC: 25	Charge corona voltage (CHV) error
SC: 31	Fusing thermistor error
SC: 33	Fusing temperature error (warming-up time error)
SC: 34	Fusing temperature error (temperature too low)
SC: 35	Fusing temperature error (temperature too high)
SC: 41	Beam sensor error
SC: 42	Laser power error
SC: 43	NVRAM error (MCTL)
SC: 44	Engine controller MCTL hardware error
SC: 45	Process timing clock error (main motor clock error)
SC: 51	Quenching lamp error
SC: 52	Toner end sensor error
SC: 53	Control fan error
SC: 54	Ozone fan error
SC: 55	Fusing fan error
SC: 61	Yellow development clutch error
SC: 62	Magenta development clutch error
SC: 63	Cyan development clutch error
SC: 64	Black development clutch error
SC: 65	HPSI signal error (retraction error for the black and yellow toner cartridges)
SC: 66	HPSI signal error (retraction error for the cyan and magenta toner cartridges)
SC: 71	Transfer drum rotational error
SC: 72	Transfer roller contact solenoid error
SC: 73	Cleaner contact solenoid error
SC: 74	Cleaner clutch error
SC: 75	Fusing unit clutch error
SC: 76	Belt sensor error
SC: 81	Duplex unit controller error
SC: 83	Duplex unit lower solenoid error
SC: 84	Duplex unit motor error
SC: 85	Duplex unit upper solenoid error
SC: 86	Duplex unit fan motor error

5. SERVICE TABLES

5.1 SP MODES

5.1.1 OVERVIEW

The printer has two types of SP modes:

1. Engine SP modes
2. Controller SP modes

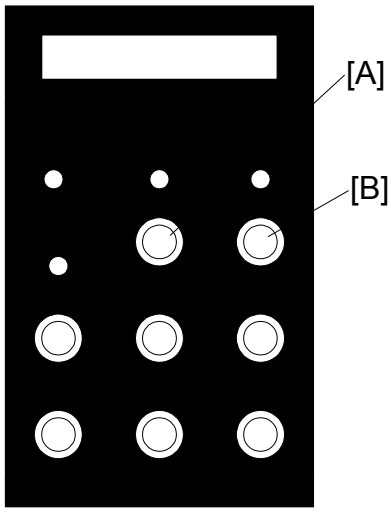
This section deals with controller SP modes.

5.1.2 ENGINE SP MODE

Refer to the service manual for the engine for how enter engine SP mode and use the engine SP modes.

5.1.3 CONTROLLER SP MODE

Entering and Exiting Controller SP Mode



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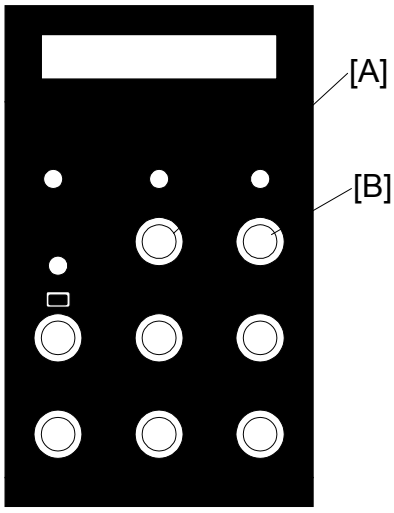


G063S001

To enter controller SP mode: Turn on the printer while holding down the **[On Line]** [A] and **[Reset]** [B] keys on the operator panel. Hold the keys down until all of the LEDs and the LCD turn on. Then after the printer completes its cycling, press the **[Menu]** key.

To exit controller SP mode: Turn the main switch off and, after a brief period, back on.

NOTE: When accessing controller SP mode, “SP” is displayed in the upper right corner of the display. Do not forget to exit SP mode after servicing. If inadequately left in controller SP mode, users could change settings or clear all settings by accident.

SP Mode Menu Hierarchy

The table below shows the controller SP mode menu hierarchy. The individual layers in the table below can be accessed in the controller SP mode by pressing the **[Enter]** key. When in SP mode, S1 to Sa are added to the Maintenance menu.

Layer 1	Layer 2	Layer 3	Layer 4
Maintenance	1.Toner Level	Cyan Magenta Yellow Black	
	2.Reinstall	Fuser Cleaner Photoconductor Unit	
	3.Menu Reset		
	4. Registration	L:Tray 2	
	5. Menu Protect	Off On	It can also be accessed if the **[Enter]**, **[Escape]**, and **[Menu]** keys are pressed in sequence when the printer is on line.
	S1.Maint. Page		
	S2.Color Chart		
	S3.Maint. Clear	Fusing Unit 120k	
	S4.Transfer Bias	Plain paper Thick paper OHP paper	
	S5.Registration	W:Tray 1/2 L:Tray 1	
	S6.Clear All Memo		
	S7.Gamma Calib.	Load Setting	Default Setting-Old Setting-Current
		Mode Setting	1 bit/Photo 1 bit/Text
		Print Setting	
		Gamma Setting	Black Cyan Magenta Yellow Save Settings
	S8.Printer ID		
	S9 Toner Limiter	Text Photograph	
	Sa Meter Click	Off Print/Jam Develop. Count Print Count	

5.1.4 SP MODE DETAILS

S1. Maintenance Page

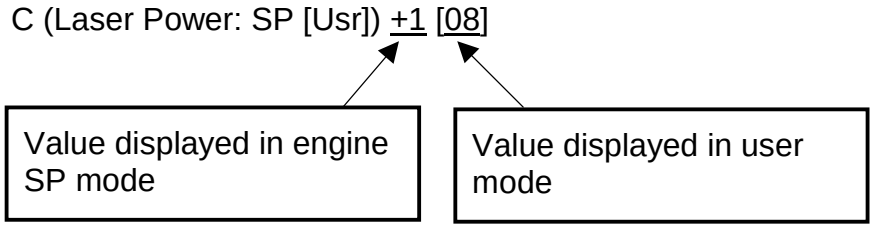
The table below explains the contents of the engine maintenance list printout. The controller obtains the data from the engine (MCTL).

Item	Description
MCTL firmware	The MCTL board firmware version number.
Registration setting	For tray 1, the leading edge and left side registrations can be adjusted either with engine SP mode 43 (Margin Adjust) or with controller SP mode 5 (Registration). For tray 2, the leading edge and left side registrations can be adjusted with engine SP mode 43 (Margin Adjust). The left side registration can also be adjusted with a controller user mode (Registration Adjustment), and the leading edge registration can be adjusted with controller SP mode 5 (Registration). For how to use this adjustment, see '5.Service Tables – 5.5.1 Adjusting the Leading Edge and Left Side Registrations' in the engine service manual. The registration values can be adjusted in 0.5 mm increments in either the controller or the engine SP mode. Whichever mode is used, the settings are stored in the NVRAM on the MCTL.
Toner density setting	Indicates the following: LD power setting for each toner color (CMYK) Transfer roller voltages for plain paper, thick paper, and OHPs Development bias for each toner cartridge (CMYK) These values can all be adjusted with engine SP mode. LD power can also be changed with the user menu (Density Setup) and the transfer bias values can be changed in controller SP mode (S4. Transfer Bias). See the explanation after this table for more about this part of the printout.
Total counter	Indicates the total number of printouts and the total number of toner images made in each of the CMYK toners. The counter is incremented when the paper exit sensor detects the completion of paper exit (regardless of paper size, type, and mono/color mode).
Maintenance counter	Indicates the following for the fusing cleaning roller, fusing unit, and 120k maintenance parts: Next life limit counter (expected number of prints remaining) Current value of the total counter Lifetime of the part (fixed), divided by 100 to get a % value on the report Amount of expected life time remaining Indicates the following for the belt cartridge: Next life limit counter (expected number of images remaining) Sum of the current values of the CMYK image counters Lifetime of the part (fixed), divided by 100 Amount of expected life time remaining The formula used is as follows: (Next Life Limit - Total Counter)/Life Period = Life remaining (%) The values of the next life limit counters, except for 120k maintenance, vary according to the image ratio or the job sizes during the life of the part. For details, see '5.Service Tables – 5.5.3 Setting the Next Life Limit Value' in the engine service manual.
Meter Click	The selected Meter Click mode is shown.
SC Logging	The latest 6 SC codes are shown. The codes in square brackets are internal engine error codes.

Item	Description
Jam Logging	The latest 6 jam codes are shown. 00: No Error (Initial stored data) 01: Entrance 02: Internal 03: Around the transfer drum 04: Exit 05: Duplex (Upper) 06: Duplex (Lower)

Toner density setting

The displayed value of the laser power when it is set in engine SP mode differs from when it is set from the user menu. Both values are included in the printout, as shown below. The following is an example for cyan (C).



The table below compares the density settings that are set from the user menu ("Toner level") with those set in engine SP mode.

As seen from the table, finer adjustments are possible with user mode.

User Mode Display Value	Engine SP Mode Display Value
-1	-4
0	-3
1	-3
2	-2
3	-2
4	-1
5	-1
6	0
7	0
8*	1*
9	1
10	2
11	2
12	3
13	4

*: Default setting

S2. Color Chart

This prints a color test chart, so that the image quality can be tested for all colors at various densities. This chart can be printed on all paper sizes supported by the machine (the layout of the print pattern varies from paper size to paper size).

S3. Maintenance Clear

This mode resets the maintenance counters for the fusing unit replacement or 120k maintenance parts (these counters are in the NVRAM on the MCTL board). Use it after doing the PM required for these units. See '4.Service Tables – Setting the Next Life Limit Value' in the engine service manual for information about how to use this SP mode.

S4. Transfer Bias

This mode adjusts the transfer roller voltages used for the three paper types (plain paper, thick paper and OHP transparency) supported by this unit. For each paper type, you can set the value in 4 increments. The settings are stored in the NVRAM on the MCTL board.

Default value: 0

S5. Registration

This mode adjusts the leading edge registration for trays 1 and 2 and the left side registration for tray 1. You can set each value in ±7 increments (1 step = 0.5 mm). The values are stored in the NVRAM on the MCTL board. See '4.Service Tables – Adjusting the Leading Edge and Left Side Registrations' in the engine service manual for information about how to use this SP mode.

NOTE: Engine service mode 43 (Margin Adjust) can be used to adjust all of the registrations, whereas controller SP mode S5 can only adjust a few of them.

S6. Clear All Memory

Executing this function resets the following user settings, stored in the NVRAM on the controller, to their initial values:

- Emulation/system initial setup items
- Printer ID
- Printer name on the network
- Gamma calibration

The "Menu Reset" clear function in the user menu only resets the emulation/system initial setup items to their initial values.

S7. Gamma Calibration

This mode adjusts the gamma tables used in text and photograph modes.

NOTE: For problems with color quality and gradation, clean the engine and replace consumables and other parts at first. Use this mode only when the customer insists on further fine adjustments (e.g., matching colors between machines)

See "3. Replacement and Adjustment – 3.3.2 Service Gamma Adjustment" in this manual for the adjustment procedure.

S8. Printer ID

The printer ID allows the RICOH-SCRIPT2 emulation module to identify the printer main unit. It is programmed in the NVRAM on the controller at the factory.

When replacing the controller, it is necessary to use this SP mode to re-input the printer ID since the printer ID for the old controller is required.

Follow the procedure given below to input the printer ID:

1. Select the first digit using the **[▼]** and **[▲]** keys.
2. Input the number by pressing the **[Enter]** key (you can use the **[Escape]** key to cancel the setting if you input an incorrect number).
3. Repeat these steps until the last digit is entered. Pressing the **[Enter]** key on the last digit returns you to the "S8. Printer ID" menu.
4. Print a configuration page and verify that the correct printer ID is defined.
5. Turn the power off and on again to exit SP mode.

S9. Toner Limiter

The maximum toner values can be adjusted from 100 to 400% for both Text and Photo Modes. The default value for both is 250%.

If this value is set high, the printed image appears more true to the original data. However, since a greater amount of toner is used, it is easy to scatter the toner around lines and text areas. If the value is set low, the color balance of low-density areas varies, however toner does not scatter as easily.

Sa Meter Click

In this mode, the counting method can be selected depending on the type of service contract.

When meter click mode is activated, the machine is affected as follows:

1. A new user mode, “Show Counter” displays the counter values.
2. The printer will stop printing when toner has run out. In addition, “Toner Empty” disappears from the Maintenance menu.
3. The configuration sheet includes the value for the counting method selected in Meter Click mode, not the total counter value. Both counter values are included in the engine maintenance sheet.
4. After selecting meter click mode, the counter value for the selected counting method is automatically set to 0. However, it cannot be reset to 0 after the machine begins counting.
5. All developments/prints are counted at paper exit.
6. Counting method:

   1) By developments

	B/W Image	1C image	2C image	3C image	Full color
Color Counter		+1	+2	+3	+3
Black Counter	+1				+1

   2) By prints

	B/W Image	1C image	2C image	3C image	Full color
Color Counter		+1	+1	+1	+1
Black Counter	+1				

7. The following are not counted:
   1) The final page when printing an odd number of pages in duplex mode.
   2) The engine maintenance sheet, color chart and gamma calibration sheets in controller SP mode.
   3) All sheets printed out in engine SP mode.
   4) The Low-Memory Error Sheet.
   5) A list of settings (B/W) if a non-fatal error is detected during Self-Diagnostics.

5.2 DETAILED SELF-DIAGNOSTICS MODE

Overview

In this mode, the controller tests components that are not tested during the power-up self-diagnostics. These are the memory, standard parallel interface, and options (optional interfaces, Memory slot and DIMM slot), if the devices are installed.

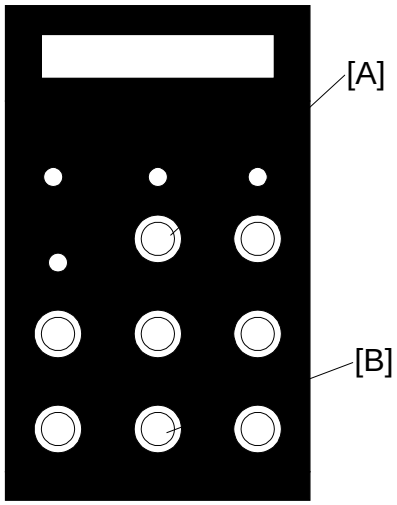
The following special tools are required to execute this mode:

Parallel Interface Loopback Connector

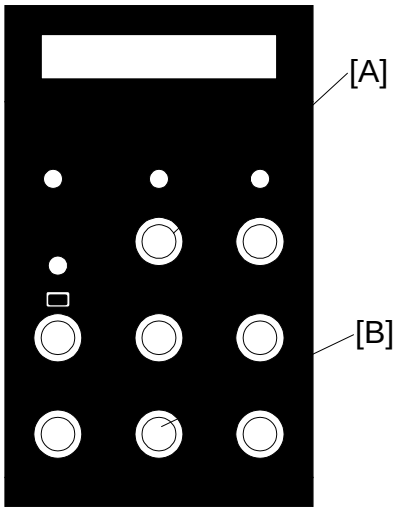
Part No.	Type of Interface	Remarks
G0219350	For the standard parallel interface board	If not used, the controller continues the test to the end, but flags a non-fatal error.
G0109350	For the optional parallel interface board	If an interface board is installed but the loopback connector is not, the controller continues the test to the end, but flags a non-fatal error.

NOTE: A decal with the part number is attached to each connector, to avoid confusing the two types.

Operating Procedure



G063S000.WMF



G063S001.WMF

To enter the detailed self-diagnostics mode, make sure that the devices that you wish to test are installed. Then do the following.

1. Switch off the power.
2. Connect the loopback connector to the parallel port. If the optional additional parallel interface has been installed, connect the loopback connector for this port also.
3. Turn on the power while simultaneously pressing and holding down the **[On Line]** [A] and **[Enter]** [B] keys on the operation panel. Hold the keys down until all of the LEDs and the LCD turn on.

Operation Panel Behaviour during Detailed Self-diagnostics

Immediately after power is turned on

The controller turns on all LEDs and the LCD.

During detailed self-diagnostics

When the controller starts the self-diagnostics, it turns off all LEDs except the Power LED and causes the Power LED to blink. It displays the message “Service diag” on the LCD.

When the tests terminate normally

When an error does not occur during the self-diagnostic test, the controller causes the blinking Power LED to stay on and turns off all the other LEDs and the LCD. The controller starts the system immediately afterward and prints out a list of settings in color mode.

When an error is detected

Errors are divided broadly into non-fatal errors and fatal errors. The controller takes different actions and gives different status information for different types of errors.

- When a non-fatal error (user error) is detected

  The controller turns the blinking Power LED on, turns off all of the other LEDs and the LCD, and restores the standby display. Since non-fatal errors do not adversely influence any print operation, the controller starts the system immediately after it takes these actions.

  The system turns on the Error LED and prints out a list of settings with error descriptions in monochrome mode (see 4. Troubleshooting – 4.3.3 Controller User Errors in this manual for the error codes).

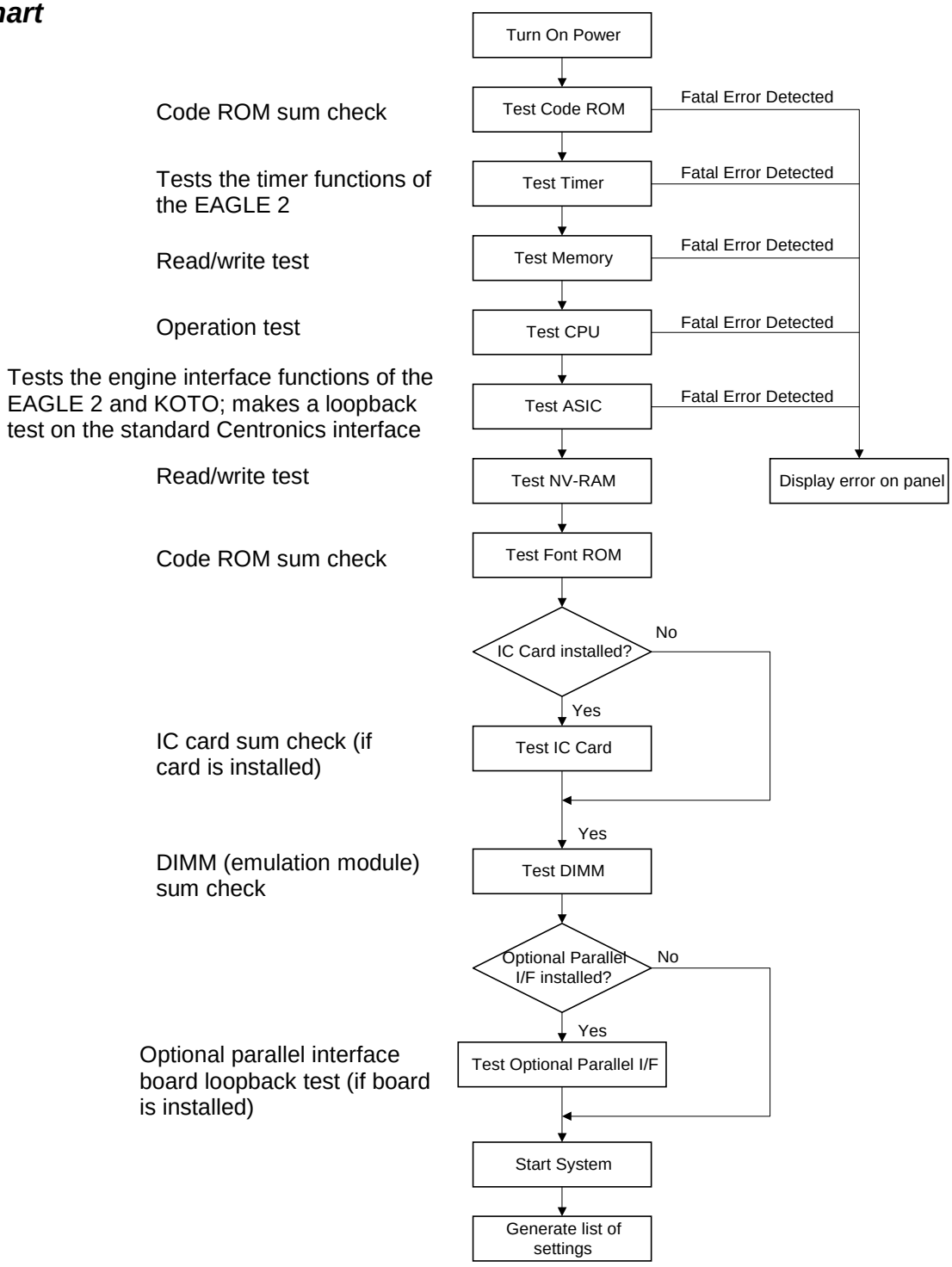
  After printing a list of settings, the system returns to the normal state and sets up all devices except the failed device.

- When a fatal error is detected

  Since there is no guarantee that the system can generate a list of settings after detecting a fatal error, the system turns off the Power LED and turns on the Error LED. At the same time, it displays an error message on the LCD until the power turns off.

  The first line of the LCD contains a 4-digit code that identifies the error and the second line contains an 8-digit code that gives details of the error for designers to debug the error (see 4. Troubleshooting – 4.3.2 Controller Self-diagnostics Errors in this manual for a description of the error codes).

Detailed Self-diagnostics Flow Chart



G063M503.WMF

Test Results Printout when No Fatal Errors Occur

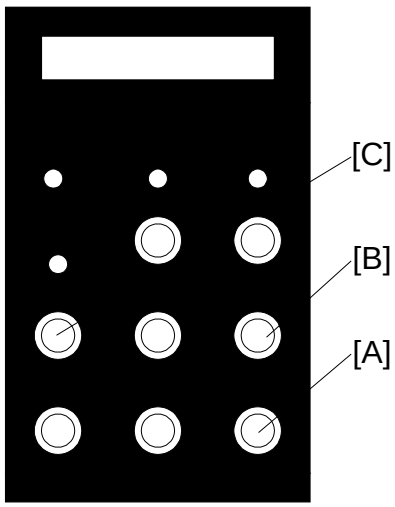
If a non-fatal error occurred, the report is printed in black and white. The “Error Log” section at the bottom of the printout explains the non-fatal errors that occurred.

If no error occurred, the report is printed in color. The “Error Log” section contains “None”.

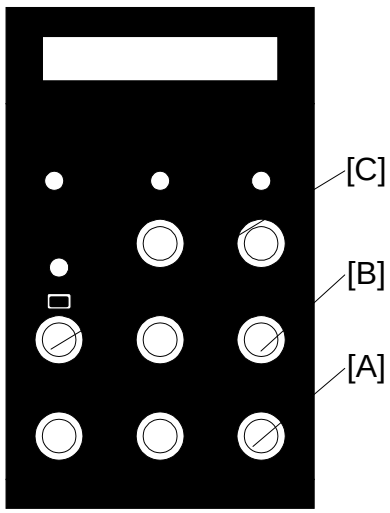
The right side of the sample printout contains gradation patterns in the following colors, from the top, C, M, Y, K, R, G, B, and CMY.

5.3 BRAND SETTING

Operating Procedure



G063S000



G063S001

1. Press the **[▼]**[A], **[▲]** [B], and **[Menu]** [C] keys sequentially.
2. Select “S1. Brand” in the Maintenance menu.

Layer 1	Layer 2	Layer 3	Layer 4
Maintenance	S1.Brand	RICOH JPN **RICOH EXP**(Default) SAVIN Gestetner NRG	

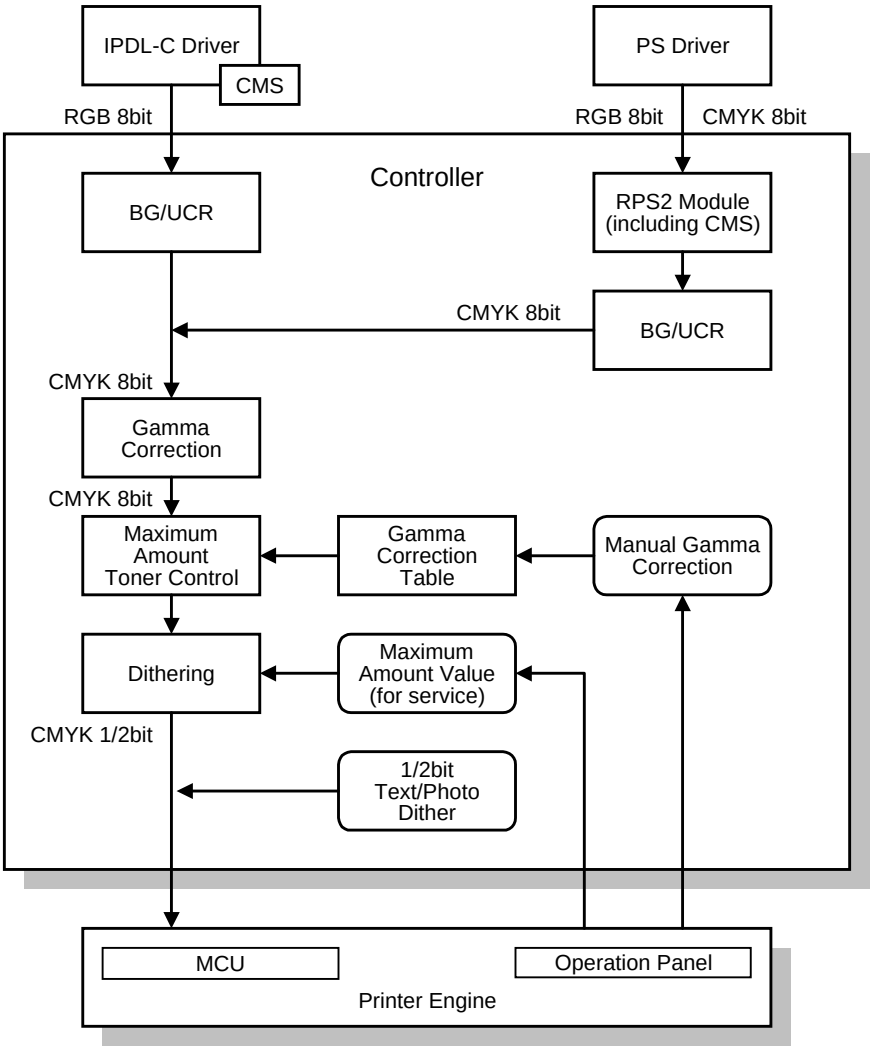
3. Press the [Reset] key to reboot the machine.

6. DETAILED DESCRIPTIONS

6.1 FUNCTIONAL OVERVIEW

6.1.1 PRINT DATA PROCESSING

The diagram below shows the print data processing path. The boxes in the diagram represent function blocks and the text next to the arrows indicates the data type. The diagram is followed by a brief description of color processing by the printer driver.



G063D500.WMF

NOTE: 1-bit color for 600 x 600 dpi printing and 2-bit color for 1200 x 600 dpi mode printing

CMS (Color Management System)

CMS adjusts the RGB values of the colors in the application data in preparation for RGB to CMYK conversion, which is done in the controller.

A file known as a 'profile' (filename extension 'prf') is automatically installed in the \windows\system\ folder during printer driver installation. This file contains instructions for CMS on how to convert the colors in the print data produced by the application.

CMS is used whenever the color correction setting in the printer driver is set to any value other than "Off".

Color Adjustment by the Driver

The driver adjusts the following parameters in accordance with the driver settings made by the user: Brightness, Contrast, Saturation, and Color Balance.

The driver does not perform RGB to CMYK color conversion.

Color Conversion, Gamma Conversion, and Dithering by the Controller

The controller performs gamma conversion (see Gamma Correction), RGB-to-CMYK conversion, and dithering.

6.1.2 GAMMA CORRECTION

Gamma correction in this model has two components: controller gamma (non-adjustable) and service gamma (adjustable).

Controller gamma

This gamma is programmed into the flash ROM in the controller. If there has been no service gamma adjustment in the machine so far since installation, the controller gamma is the only gamma that is used (i.e., service gamma = 0).

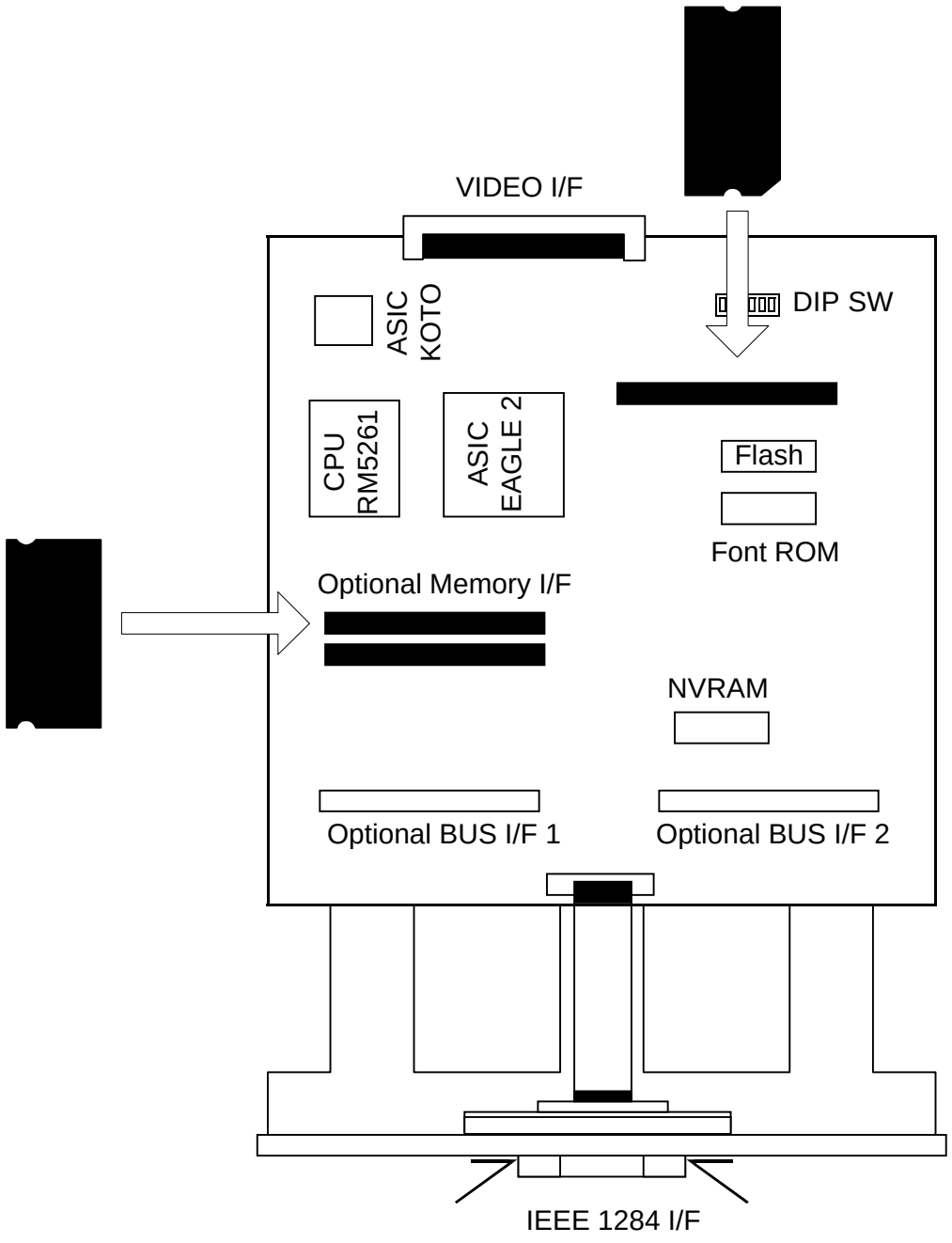
Service gamma

This gamma is stored in the NVRAM in the controller. It can be adjusted using controller SP mode (S7. Gamma Calibration). See "3. Replacement and Adjustment – 3.3.2 Service Gamma Adjustment" in this manual for the adjustment procedure.

The controller combines the service gamma (the default setting is zero) with the controller gamma when doing gamma correction.

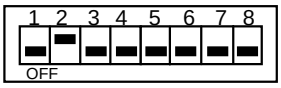
6.2 FUNCTIONAL DESCRIPTION

6.2.1 CONTROLLER LAYOUT



G063D501.WMF

6.2.2 FUNCTIONS OF COMPONENTS

<table>
<tr><th>Device</th><th>Function</th></tr>
<tr><td>CPU</td><td>RM5261-250</td></tr>
<tr><td>ASIC EAGLE 2</td><td>This ASIC controls the following:
• Memory mapping
• Reset
• DRAM
• Data received from the parallel
• Video DMA
• PvDMA
• Interrupt
• Serial communication with engine
• IEEE1284 interface
• Timer
• I/O Port</td></tr>
<tr><td>ASIC KOTO</td><td>Video data interface</td></tr>
<tr><td>FLASH ROM</td><td>Stores program (2 MB) The flash ROM is programmable via an IC card.</td></tr>
<tr><td>NVRAM</td><td>Stores the initial settings and printer parameters.
(8 KB EEPROM)</td></tr>
<tr><td>FONT ROM</td><td>Stores internal printer fonts.
(One 64-Mbit mask ROM)</td></tr>
<tr><td>Program ROM</td><td>RICOH-SCRIPT2 Emulation Module
The emulation module is programmable by IC card.</td></tr>
<tr><td>DIP SW</td><td> 

G063C004.WMF
<table>
<tr><th>SW No.</th><th>Setting</th><th>Content</th></tr>
<tr><td>1</td><td>OFF</td><td>Set this switch ON when downloading MCTL firmware.</td></tr>
<tr><td>2</td><td>ON</td><td rowspan="2">Do not touch these switches in the field.</td></tr>
<tr><td>3-8</td><td>OFF</td></tr>
</table></td></tr>
<tr><td>Video I/F</td><td>Interface the controller with the printer engine.</td></tr>
<tr><td>IEEE1284 I/F</td><td>Provides an interface that connects to a local host (IEEE1284 compliant).</td></tr>
<tr><td>Option Bus I/F</td><td>• Two slots; each can hold either an optional network interface or a parallel interface board. You cannot install two boards of the same type.
• IC card adapter for downloading the Controller and MCTM firmware.</td></tr>
<tr><td>Option RAM I/F</td><td>A slot for accommodating the memory.</td></tr>
</table>

6.3 POWER-UP SELF-DIAGNOSTICS

6.3.1 OPERATION PANEL DISPLAY DURING POWER-UP SELF-DIAGNOSTICS

The controller starts power-up self-diagnostic tests when the printer power is turned on. It shows the test status on the panel as the self-diagnostics proceed.

Immediately after turning the power on

The controller turns **on** all LEDs and the LCD.

During power-up self-diagnostics

When the controller starts the self-diagnostics, it turns **off** all LEDs except the Power LED, which it causes to blink. It displays the message “Warming UP” on the first line of the LCD.

If the test terminates normally

If an error is not detected during the self-diagnostic test, the controller turns the blinking Power LED **on** and turns **off** all the other LEDs and the LCD. The controller starts the system immediately afterwards.

If an error is detected

Errors are divided broadly into fatal and non-fatal (user) errors. The controller takes different actions and gives different status information for different types of errors.

See section 4 (Troubleshooting) for tables of the different types of errors.

Non-fatal error (user error) detected

The controller causes the blinking Power LED to stay **on**, turns **off** all of the other LEDs and the LCD, and restores the standby display state. Since non-fatal errors do not adversely affect any print operation, the controller starts the system immediately after it takes these actions.

The system turns **on** the Error LED and prints out a list of settings with error descriptions, in monochrome mode (see section 4 Troubleshooting – 4.3.3. Controller User Errors in this manual for the error codes).

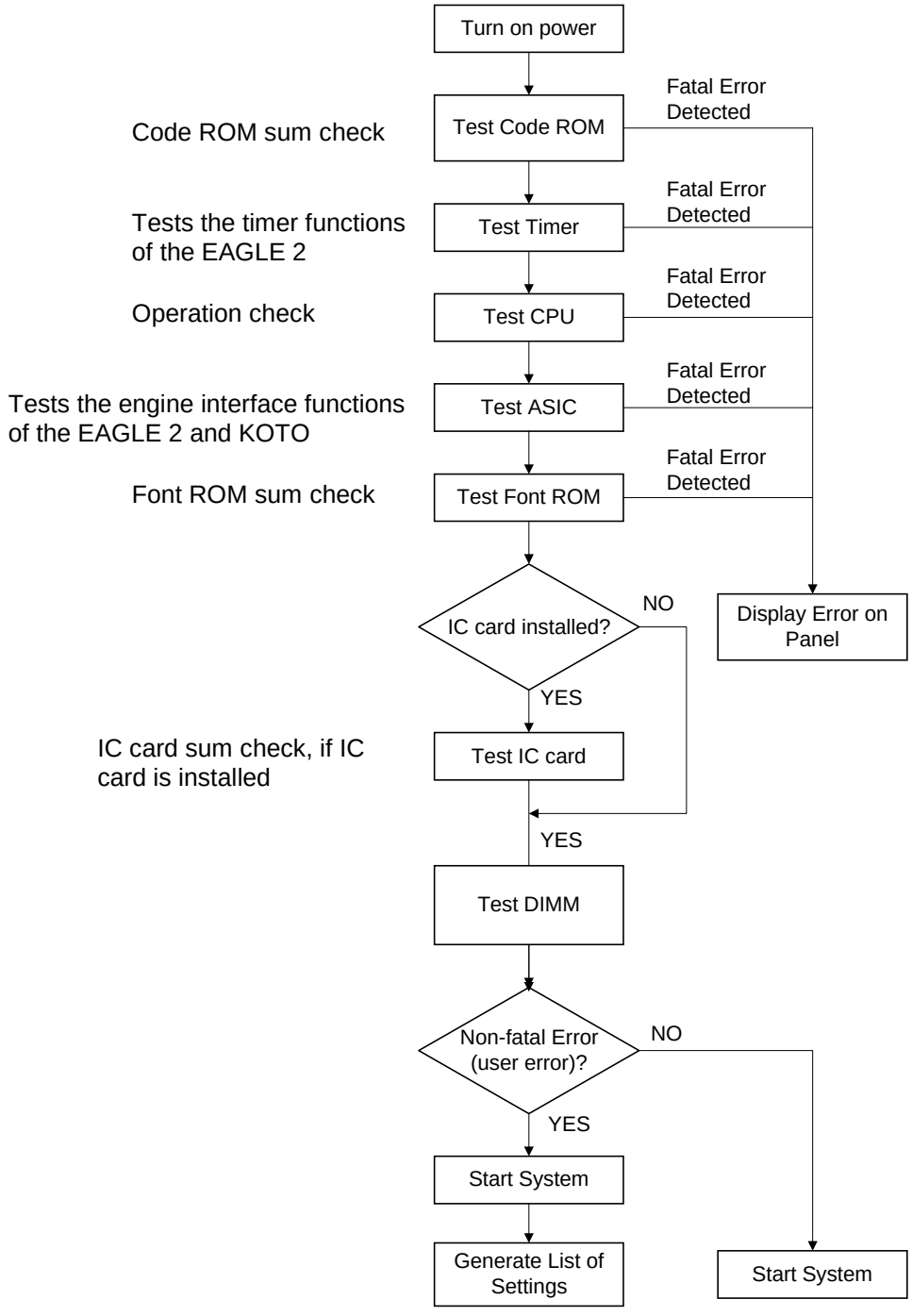
After printing the above list of settings, the system returns to the normal state and enables all devices except the failed device.

Fatal error detected

Since there is no guarantee that the system can generate a list of settings when the error detected is fatal, the system turns **off** the Power LED and turns **on** the Error LED. At the same time, it displays and keeps an error message on the LCD until the power is turned off.

The first line of the LCD contains a 4-digit code that identifies the error. (see section 4 Troubleshooting – 4.3.2 Controller Self-diagnostics Errors in this manual for a description of the error codes).

6.4 POWER-UP SELF-DIAGNOSTICS FLOW CHART



G063M057.WMF