FRESA WIN (G024)
SERVICE MANUAL
[Controller]

⚠IMPORTANT SAFETY NOTICES

PHYSICAL INJURY PREVENTION

1. Before disassembling or assembling parts of the printer and peripherals, make sure that the power cord is unplugged.
2. The wall outlet should be near the printer and easily accessible.
3. Note that some printer components are supplied with electrical voltage even if the main switch is turned off.
4. If an adjustment or operation check must be made requiring the removal or opening of the exterior covers while the main switch is on, keep hands away from electrified or mechanically driven components.
5. The printer drives some of its components when it completes the warm-up period. Keep hands away from mechanical and electrical components when the printer starts operation.
6. The interior and metal parts for the fusing unit become extremely hot while the printer is operating. Do NOT touch these components with bare hands.

HEALTH SAFETY CONDITIONS

1. Never operate the printer without ozone filters installed.
2. Always replace the ozone filters with the specified replacement at the specified maintenance intervals.
3. Toner is non-toxic, but if it gets in your eyes by accident, it may cause temporary eye discomfort. Remove it with eye drops or flush eyes with water. If this is unsuccessful, get medical attention immediately.

SAFETY AND ECOLOGICAL NOTES FOR DISPOSAL

1. Do NOT incinerate toner cartridges, development toner magazine (DTM) or used toner. Toner dust may ignite suddenly when exposed to an open flame.
2. Dispose of used toner bottle and photoconductor unit (PCU) in accordance with local regulations. (These are non-toxic supplies.)
3. Dispose of replaced parts in accordance with local regulations.

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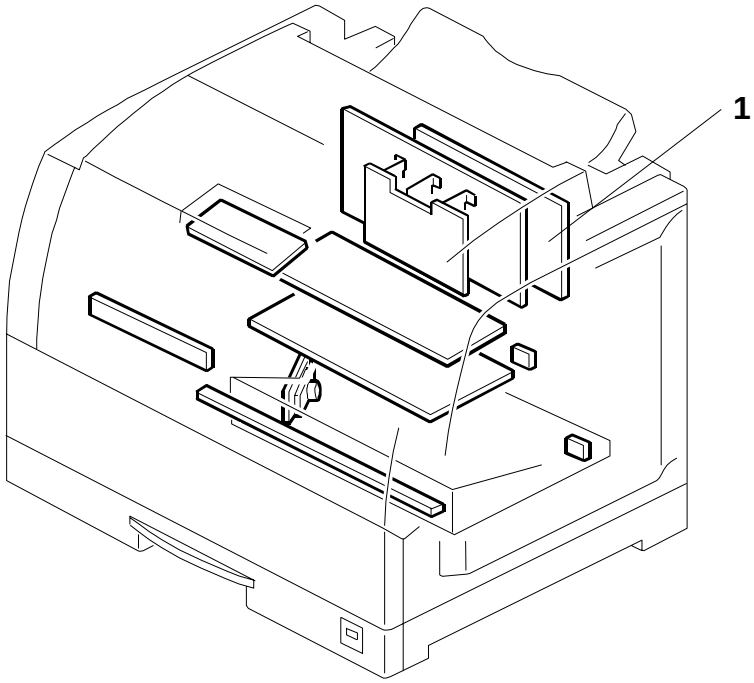
1. OVERALL MACHINE INFORMATION

1.1 SPECIFICATIONS

Page Description Language	IPDL-C Ricoh-Script 2 (Option)
Printer Driver	IPDL-C: Windows 98/95/3.1x/NT4.0 Ricoh-Script 2: Windows 98/95/NT4.0, Macintosh (PPD for LaserWriter 8)
Resolution	Controller: 600/300 dpi
Color Mode	Color (4 color mode only)/Monochrome (black only) Set by the printer driver
Gradation Mode	2 or 1 bit/pixel
Smoothing	Auto/Off (by a printer driver setting)
Toner Saving	On/Off (by a printer driver setting)
Color Correction	On/Off (by a printer driver setting) Default setting: Enabled
Interface	Standard: Bi-directional Parallel (IEEE1284: compatible and nibble mode supported)
	Option: Parallel (IEEE1284: only compatible mode supported), Ethernet (100Base-TX/10Base-T)
Network Protocol	NetWare, TCP/IP, AppleTalk (with Ricoh-Script 2)
Fonts	IPDL-C: Japanese fonts only - not used
	Ricoh-Script 2: 39 fonts
Memory	Standard: 32 MB Optional upgrades: 16 MB SIMM, 32 MB SIMM
SIMM Slot	2 (for optional memory)
DIMM Slot	1 (for optional Ricoh-Script 2)
Option Interface	2 (for optional network I/F board and optional parallel I/F)
Options	16 MB Memory
	32 MB Memory
	Network Interface Board
	IEEE1284 Parallel Interface
	Ricoh-Script 2 Emulation Module

1.2 LAYOUT



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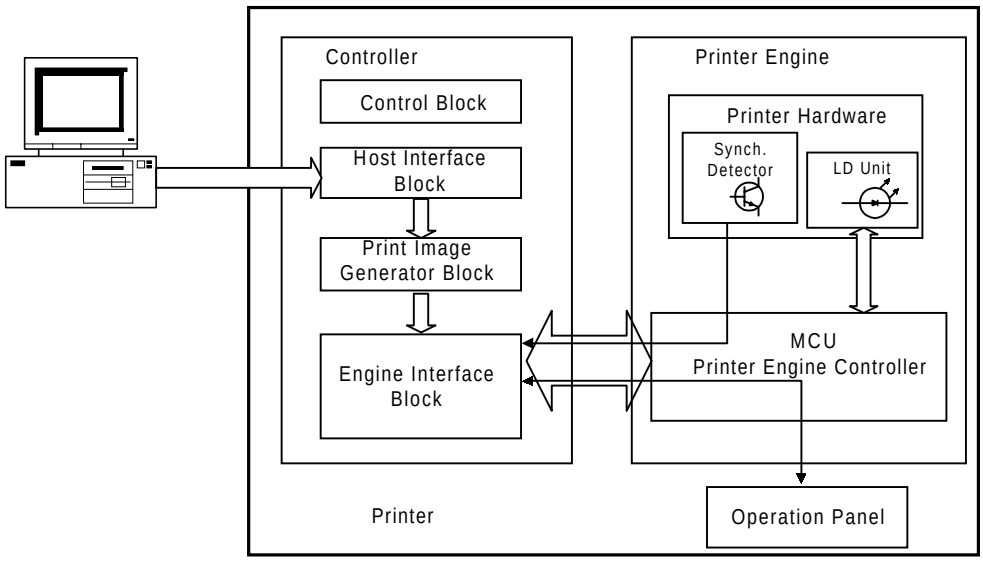
1. Controller

2. DETAILED DESCRIPTIONS

2.1 FUNCTIONAL OVERVIEW

2.1.1 BLOCK DIAGRAM



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The functions and characteristics of the various blocks in the controller are described below.

Control Block

1. Controls the controller and operation panel.
2. Stores the settings (system initial set-up items, printer settings, etc.) in NVRAM.

Host Interface Block

1. Receives the print and control data (commands) from the host.
2. The interface settings depend on the controller settings.
3. Can accommodate optional interface boards (one parallel and one network interface).

Print Image Generator Block

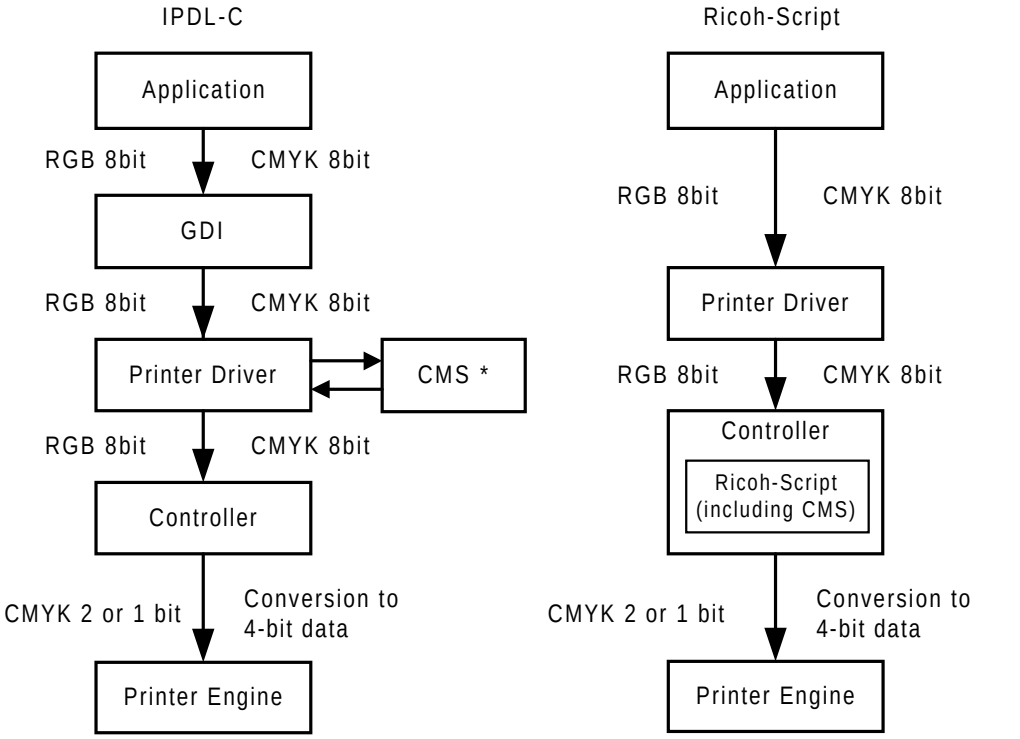
1. Converts the data received from the host into a print image and writes this image into the memory (the image conversion method depends on the controller settings).

Engine Interface Block

1. After converting the image data into 4-bit data, sends the image data in parallel on a 4-bit/pixel basis in synchronization with the synchronization signal and clock from the engine.
2. Receives status data from the engine and passes it to the controller.
3. Sets up the operating mode for the engine.

2.1.2 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.



* CMS: Color Management System

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CMS (Color Management System)

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

A file known as a 'profile' is automatically installed in the \windows\system\ folder with file name extension 'rcm' (unique to this printer) during the printer driver installation. This file contains instructions for CMS on how to compensate 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, and Gamma Correction by the Controller

The controller performs RGB-to-CMYK conversion, and gamma (γ) correction.

2.1.3 GAMMA CORRECTION

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

Controller gamma (γ) (not adjustable)

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

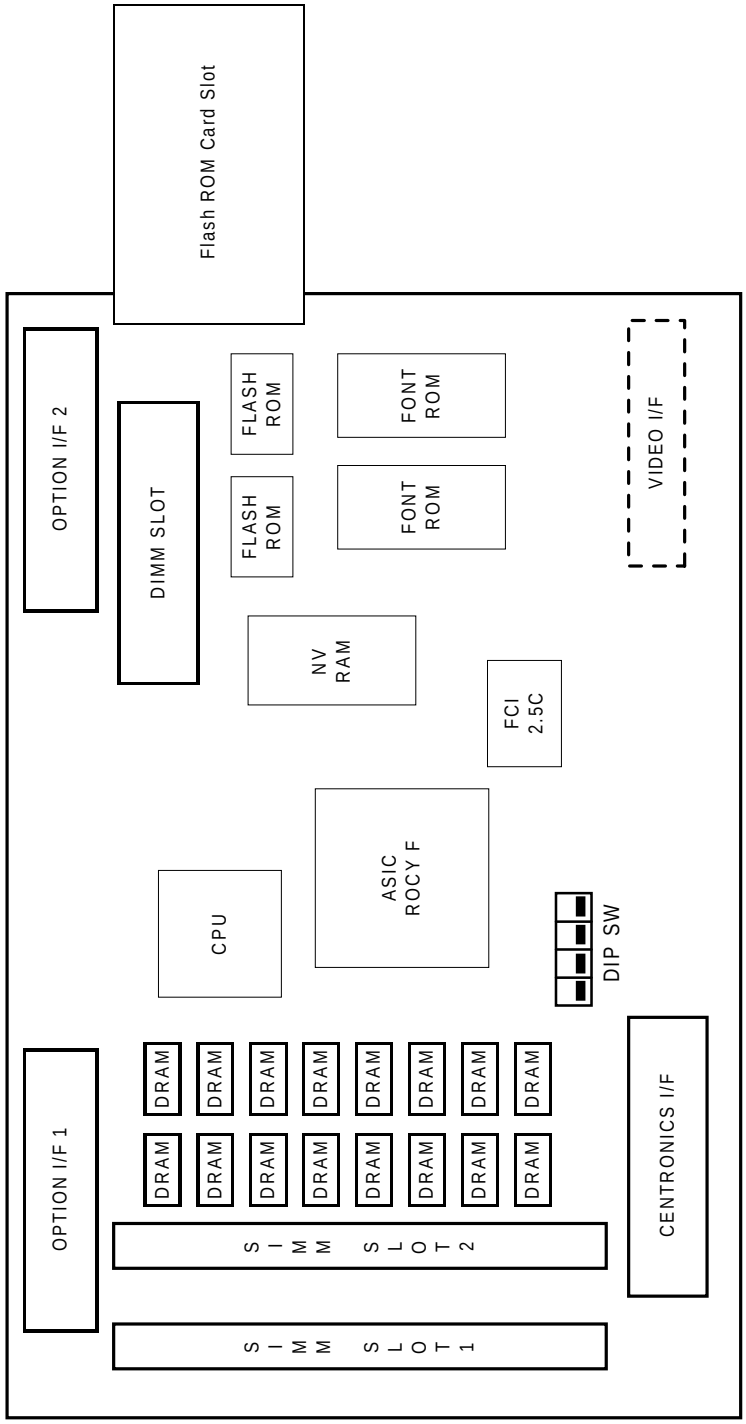
Service gamma (γ)

This gamma is stored in the NVRAM in the controller. It can be adjusted using the controller SP mode (S5. Gamma Calibration). See "Section 6.2.2 Service Gamma Adjustment," for the adjustment procedure.

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

2.2 FUNCTIONAL DESCRIPTION

2.2.1 CONTROLLER LAYOUT



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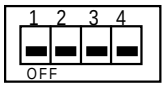
2.2.2 FUNCTIONS OF COMPONENTS

<table>
<tr><th>Device</th><th>Description/Function</th></tr>
<tr><td>CPU</td><td>• VR4310-177 MHz</td></tr>
<tr><td>ASIC ROCKY F</td><td>• DRAM control
• Timeout monitoring
• Parallel interface
• Timer control
• I/O port control
• Engine interface serial communications control
• Image data decompression
• Interrupt control</td></tr>
<tr><td>FLASH ROM</td><td>• For storing programs (2 MB)
• Programmable via a Flash ROM card.</td></tr>
<tr><td>NVRAM</td><td>• Stores initial set-up settings and printer parameters.
• Uses a 2 KB EEPROM.</td></tr>
<tr><td>ASIC FCI2.5C</td><td>• Smoothing
• Toner saving</td></tr>
<tr><td>FONT ROM</td><td>• Uses two 32-Mbit mask ROMs (8 MB total).
• Stores internal printer fonts (Japanese fonts only - not used).</td></tr>
<tr><td>DRAM</td><td>• Sixteen 16-Mbit DRAMs are installed as standard (32 MB total).</td></tr>
<tr><td>DIP SW</td><td> 

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<table>
<tr><th>SW No.</th><th>Setting</th><th>Purpose</th></tr>
<tr><td rowspan="2">1</td><td>OFF</td><td>The controller boots from the flash ROM on the board (normal setting).</td></tr>
<tr><td>ON</td><td>The controller boots from the Flash ROM card (when upgrading the controller, NIB, or Ricoh-Script 2 software).</td></tr>
<tr><td>2 to 4</td><td></td><td>Always set to OFF. For designers' use only.</td></tr>
</table></td></tr>
<tr><td>VIDEO I/F</td><td>• Interfaces the controller with the printer engine.</td></tr>
</table>

Device	Description/Function
PARALLEL I/F	• Provides an interface that connects to a local host (IEEE1284 compliant).
OPTION I/F 1,2	• Two slots; each can hold either an optional network interface or a parallel interface board. You cannot install two boards of the same type. • The optional board type can be identified from the unique ID built into it.
DIMM SLOT	• A 72-pin slot for accommodating the optional Ricoh-Script 2 emulation module. • The emulation module is a programmable flash ROM.
SIMM SLOT	• Two slots for optional expansion memory boards. • SIMM specifications: 16 MB or 32 MB SIMM, 60 ns access speed
FLASH ROM CARD SLOT	• For accommodating a Flash ROM card for upgrading the software.

2.3 POWER-UP SELF-DIAGNOSTICS

2.3.1 OPERATION PANEL DISPLAY DURING POWER-UP SELF-DIAGNOSTICS

The controller starts power-up self-diagnostic tests when the printer power is turned on.

Immediately after turning the power on

The controller turns on all LEDs and the LCD.

During power-up self-diagnostics

When the controller starts self-diagnostics, it turns off all LEDs except the Power LED, which it causes to blink. It displays the message “Warming UP” on the lower 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. The controller starts the system immediately afterwards.

If an error is detected

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

See “Section 7.3.2 Controller Self-Diagnostics Errors” for tables of the different types of errors.

Non-fatal 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 7.3.2 Controller User Errors”).

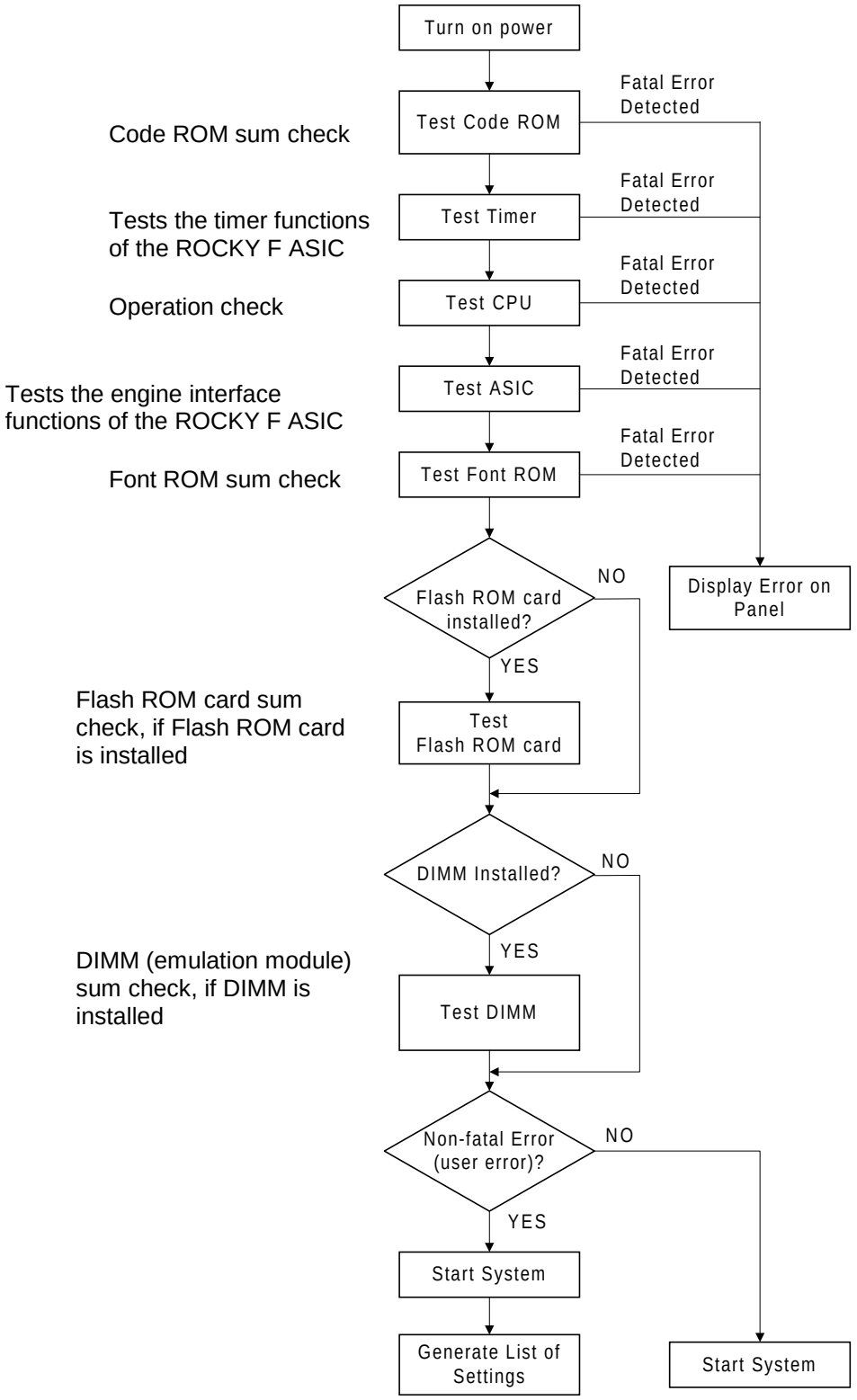
After printing the above list of settings, the system returns to the normal state and enables all devices except the failed one.

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 7.3.2 Controller Self-diagnostics Errors” description of the error codes).

2.4 POWER-UP SELF-DIAGNOSTICS FLOW CHART



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3. INSTALLATION

Refer to the following materials.

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

4. SERVICE TABLES

4.1 SP MODES

4.1.1 OVERVIEW

The printer has two types of SP modes:

1. Engine SP modes
2. Controller SP modes

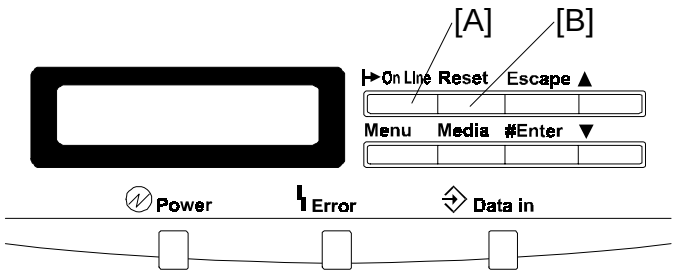
This manual deals with controller SP modes.

4.1.2 ENGINE SP MODE

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

4.1.3 CONTROLLER SP MODE

Entering and Exiting Controller SP Mode



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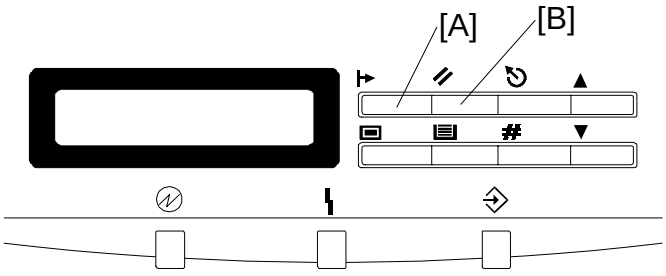

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To enter controller SP mode: Turn on the printer while holding down the **[On Line]** [A] and **[Reset]** [B] keys on the operator panel. Hold the keys down until all of the LEDs and the LCD turn off.

To exit controller SP mode: Turn off the unit.

NOTE: Be sure to exit from SP mode when you are finished.

SP Mode Menu Hierarchy

The table below shows the controller menu hierarchy. The menus in the table can be accessed in the controller SP mode. When in SP mode, S1 to S7 are added to the Maintenance menu.

Layer 1	Layer 2	Layer 3	Layer 4
IPDL-C Menu	1.Job Timeout	Off 0 – 999 seconds	
	2.I/O Timeout	0 – 999 seconds	
System Menu	1.Paper Tray	Tray 1 Bypass Tray 2 Tray 3	"Tray 2 and 3" are selectable if an optional paper feed unit is installed.
	2. Tray Size [*]	8.5 x 13 A5 B4 JIS B5 JIS 5.5 x 8.5 8 x 13 8.25 x 15	
	3.I/O Buffer	16 kB 32 kB 64 kB 128 kB 256 kB 512 kB	
	4.Energy Saver	Off 5 minutes 15 minutes 30 minutes 45 minutes 60 minutes	
	5. Energy Level	Level 1 Level 2	
	6.Transfer	Hi-speed Normal	
	7.Image Memory	Off On	
	8.Parallel 1	ACK inside ACK outside STB down	
	9.Parallel 2	ACK inside ACK outside STB down	
	10.Bi-direction	Original Mode Standard	
	11. OHP Slip	ON OFF	
	12. Printer Language	IPDL-C Option	Emulation name is displayed if an emulation module is installed.

Layer 1	Layer 2	Layer 3	Layer 4
System Menu	13.Language	English French German Italian Dutch Japanese	
	32.IP ADDRESS to 39.Active PTL.		Displayed if an optional network interface board is installed.
Maintenance	1.Toner Select	Cyan Magenta Yellow Black	
	2. Toner level		
	3.Menu Reset		
	4. Registration (Only when optional tray is installed.)		
	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. Sheet		
	S2.Color Chart		
	S3.Maint. Clear	Fusing Unit	
	S4.Clear All Mem.		
	S5.Gamma Calib.	Load Setting	Default Setting-Old Setting-Current
		Mode Select	1 bit/photo, 2 bit/photo, 300 dpi/1bit. 1 bit/Text, 2 bit/text, 300 dpi/2 bit
		Print Sheet	
		Gamma Select	Black Cyan Magenta Yellow Save Settings
	S6.Printer ID		
	S7.Brand	RICOH.EXP SAVIN nashuatec Rex-Rotary Gestetner RICOH.JPN	Before installation, this also can be accessed by sales staff by pressing the [▼], [▲] and **[Menu]** keys in sequence.
List Print	Config. Page Color Sample		

Controller SP Mode Functions

Controller SP mode adds special menu items to the 'Maintenance' user menu.

Additional Maintenance menu

Menu Item	Function/Use
S1. Maint. Page	Directs the controller to read and print the engine firmware version and the following items from the NVRAM on the MCU: • Image density • Registration values • Total counter values • SC Logging • ID sensor PWM value • Etc.
S2. Color Chart	Prints out the image quality check chart (this chart is included in the controller software).
S3. Maint. Clear	Resets the maintenance counters for the fusing unit.
S4. Clear All Memo	Resets the parameters in the controller NVRAM to their default values.
S5. Gamma Calib.	Performs a service gamma (γ) adjustment. It is possible to adjust service gamma (γ) in both text and photograph modes for each color.
S6. Printer ID	Input this ID if the NVRAM on the controller board has been cleared or replaced.
S7. Brand	Sets the brand name. This ensures that the LCD display and the configuration page header show the correct model name. This must be done before the printer is passed to a customer.

Controller SP mode adds special menu items to the user menu accessed from the **[Media]** (access by pressing the **[Media]** key, then scroll through the menu on the display) menu.

Media Menu ([Media] key)

Menu Item	Function/Use
3. Summary	Displays the currently installed versions of the controller system, emulation modules, and engine (MCU) firmware, and the amount of memory installed in the controller.

4.1.4 MENUS AND DISPLAY

Navigate through the SP mode menu and operate the SP modes in the same way as the user menu.

Key manipulation

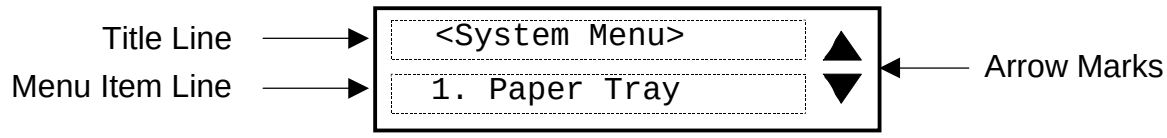
[▼] and [▲] keys: Used to scroll through the menu. Pressing these keys for a numeral set-up menu item changes the displayed value in minimum increments.

[Enter] key: When the selected item has a lower-level menu, use this key to enter the lower-level menu. When scrolling through a set of values, use this key to select the displayed setting.

[Escape] key: Used to move to a higher-level menu. When pressed before selecting a value with the **[Enter]** key, the old value remains valid.

[On Line] key: Exits the menu and returns to the online mode. This key can be used at any menu level.

LCD display



Title line:	Shows the menu title, indicating your location in the menu hierarchy.
Menu item line:	Shows a menu item. Press the [▼] or [▲] key to scroll through the menu items. When the [▼] or [▲] key is pressed at the last menu item, the display wraps around to the first menu item. When displaying settings, the current setting is identified by an asterisk (*) to its left. When the **[Enter]** key is pressed, the item in the display is selected and the display goes up one level in the menu hierarchy.
Arrow marks:	Scrolls through the menu items. These marks do not appear if the menu has only one menu item.

4.1.5 SP MODE DETAILS

S1. Maintenance Sheet

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

Item	Description
MCTL version	The MCU board firmware version number.
Registration	Side registrations from Optional tray can be adjusted with Maint. Menu by customers. And leading edge registration can be done with engine SP mode (1. Margin). These values are stored in NVRAM on the MCU.
Toner density	Toner density can be adjusted via the Maintenance. Menu by customers. Adjusted values are stored in NVRAM on the MCU.
Total counter	Indicates the total number of printouts. The counter is incremented when the paper exit sensor detects paper exit completion (regardless of paper size, type, and mono/color mode).
Color	Counter value printed in color mode.
Mono color	Counter value printed in mono color mode.
PCU counter	PCU replacement is indicated when this value reaches 60000. This value is incremented by 4 in color mode printing and by 1 in Black mode printing except A3/DLT. When printing with A3/DLT, double counting occurs.
Fusing unit	Fusing unit replacement is indicated when this value reaches to 60000. This counter is incremented by 2 for A3/DLT size printing and by 1 for other size printing.
Fusing unit/Counter reset time	Number of Fusing unit resets with controller SP mode (S3).
A3/DLT, A4/LT, LG, B4 and etc. Size counter	Number of each size paper that passed the exit sensor.
Feed Jam, Transfer Jam and Eject Jam counter	Number of paper jams in each section.
SC counter	Number of SCs
SC Logging	The most recent 3 SC codes.
Jam Logging	The most recent 10 jamming codes and the total counter value at the time. 000: At paper cassette 001: At paper pass 002: At paper exit
Process-control error Logging	The most recent 3 errors while process control and the total counter value at the time. Not all of the errors are indicated as SC errors.
P sensor PWM	The value set with engine SP mode, 9: ID Sensor PWM.

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 fusing unit counter (this counter is in the NVRAM on the MCU board). Use it after replacing the unit.

S4. Clear All Memory

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

- Initial set-up items with System Menu
- Printer ID
- Printer name on the network
- Gamma (γ) calibration

The “Menu Reset” clear function in the user menu only resets the Initial set-up items with System Menu to their initial values.

S5. Gamma (γ) Calibration

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

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

See “Section 6.2.2 Service Gamma (γ) Adjustment” for the adjustment procedure.

S6. Printer ID

Input this ID if the NVRAM on the controller board has been cleared or replaced.

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 to return to the “S6. 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.

S7. Brand (Default Setting: RICOH.EXP)

Use this mode to specify the brand. This sets up the machine to display the correct model name on the LCD and in the configuration page header.

NOTE: This must be done before delivering the printer to the customer.

4.2 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 1 and 2, SIMM slots, DIMM slot, and Flash ROM card slot), if the devices are installed.

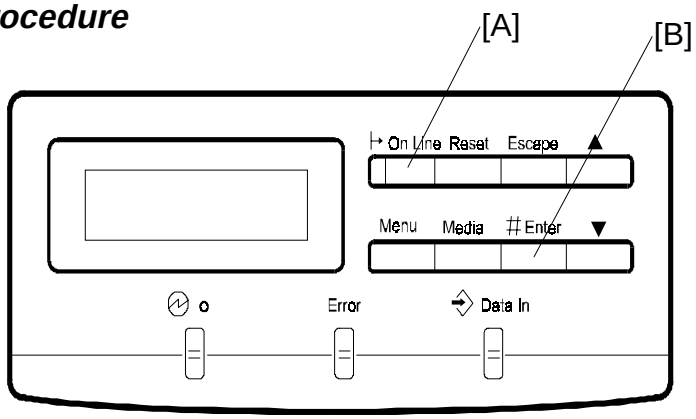
The following special tools are required to execute this mode:

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



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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 off.

Operation Panel Behavior During Detailed Self-diagnostics

Immediately after the power is turned on

The controller turns on all LEDs and the LCD.

During detailed self-diagnostics

When the controller starts 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. 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 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 “Section 7.3.3 Controller User Errors” for the error codes).

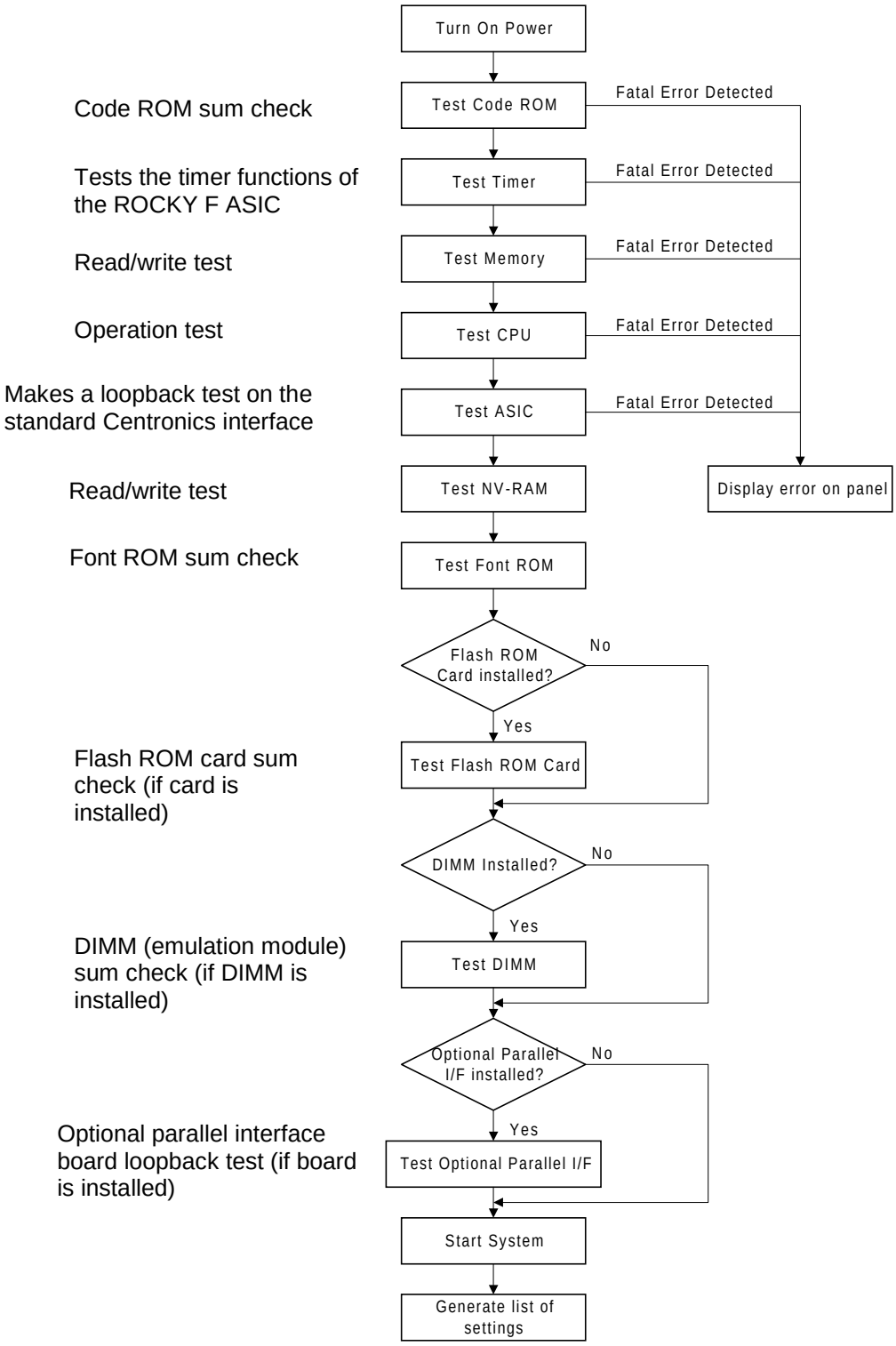
  After printing a list of settings, the system returns to the normal state and sets up all devices except the failed one.

- 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 “Section 7.3.2 Controller Self-diagnostics Errors” for a description of the error codes).

Detailed Self-diagnostics Flow Chart



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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”.

5. PERIODIC MAINTENANCE

Refer to Section 5 Periodic Maintenance in the engine service manual.

6. REPLACEMENT AND ADJUSTMENT

6.1 CONTROLLER BOARD REPLACEMENT

1. Remove the printer controller board. Refer to section 6.5.1 Controller Board of the Engine Service manual for the replacement.

6.2 IMAGE ADJUSTMENT

6.2.1 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 are displayed. The driver and controller reflect the results of the adjustments in the image data processing.
Density	Development Bias	This can be adjusted by customers via the Maintenance Menu and stored in NVRAM on the MCU. The development bias is automatically adjusted by referring to stored value.
	Transfer Bias	This can be adjusted in Engine SP mode. Refer to SP mode in the Engine manual.
Service Gamma		Use controller SP mode S5 (Gamma Calib.). You can adjust each color for each gamma (γ) table. The results of the adjustment are reflected in the gamma (γ) correction done by the controller.

6.2.2 SERVICE GAMMA (γ) 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, S5. Gamma (γ) Calibration)

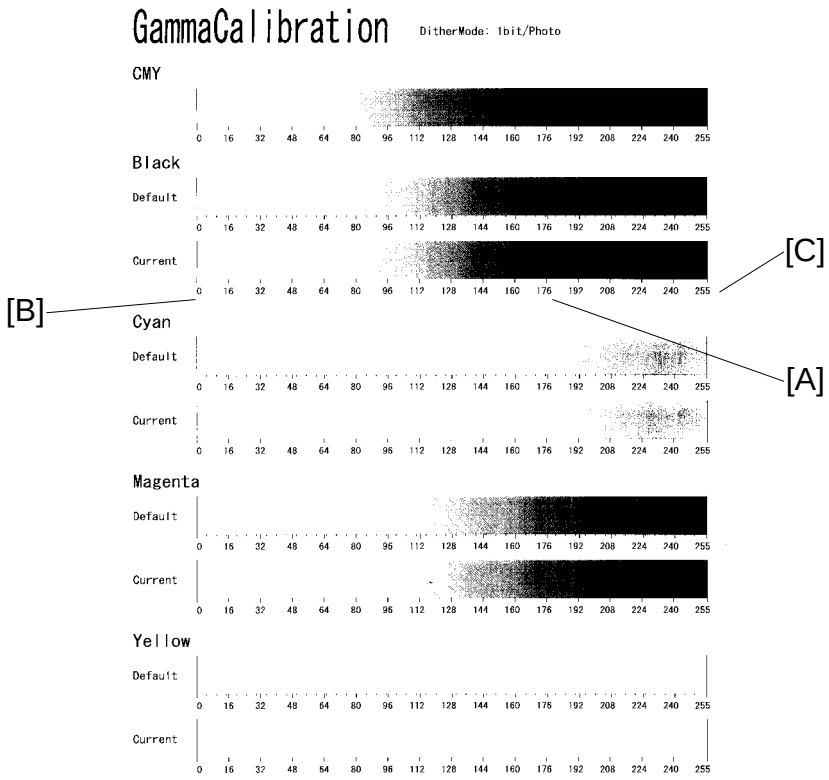
The menu items under Gamma Calibration in controller SP mode are organized as shown below.

Layer 3	Layer 4	Layer 5	Layer 6
Load Setting	Default		
	Setting-Old		
	Setting-Current		
Mode Select	1 bit/Photo		
	2 bit/Photo		
	1 bit/Text		
	2 bit/Text		
	300 dpi/1 bit		
	300 dpi/2 bit		
Print Sheet			
Gamma Select	Black	K/01th. [xxx]	K/01th. = xxx/255
		↓	↓
		K/15the. [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		

Adjustment Overview

To carry out this adjustment, select the print mode, to be adjusted 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.



G024O013.BMP

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 (γ) settings in the flash ROM in the controller. The gamma (γ) 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 (γ) 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 Select”, and select the print mode that you are going to adjust.
3. To review the image quality for these settings, choose “Print Select” to print out a color adjustment sheet (Gamma (γ) 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.

6.2.3 SOFTWARE UPGRADE PROCEDURE

The controller, Ricoh-Script 2, and network interface boards have a flash ROM for storing control software. This allows version upgrades using a Flash ROM card.

The engine firmware cannot be upgraded in this way. See the engine service manual for details on how to change this board.

NOTE: Before starting an upgrade procedure, make sure that the software in the Flash ROM card is newer than the software in the controller, Ricoh-Script 2, or network interface board.
To check, do one of the following:

- Print out a configuration page (user mode).
- Enter controller SP mode and execute “3. Summary” with the **[Media]** key. The software version is shown on the operation panel LCD.

Follow the procedure shown below to upgrade the software:

1. Turn off the machine, and then unplug all cables from parallel interface boards and network interface board, if connected.
2. Remove the controller board and Flash ROM card cover. Then install the upgrade Flash ROM card in the card slot.
3. Set DIP switch 1 on the controller board to ON and put the controller board back in the machine.
4. Turn on the machine. The machine automatically copies the software from the Flash ROM card to the appropriate flash ROM (controller, Ricoh-Script 2, or network interface board).

CAUTION: 1) Do **NOT** turn off the machine while the software is being updated. Otherwise, the controller, NIB, or Ricoh-Script 2 module may be damaged.

For the controller or Ricoh-Script 2:
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-Script 2 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 Flash ROM card. However, note that it takes about 30 seconds to rewrite the data in the controller or Ricoh-Script 2 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 Flash ROM 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 Flash ROM 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.
```

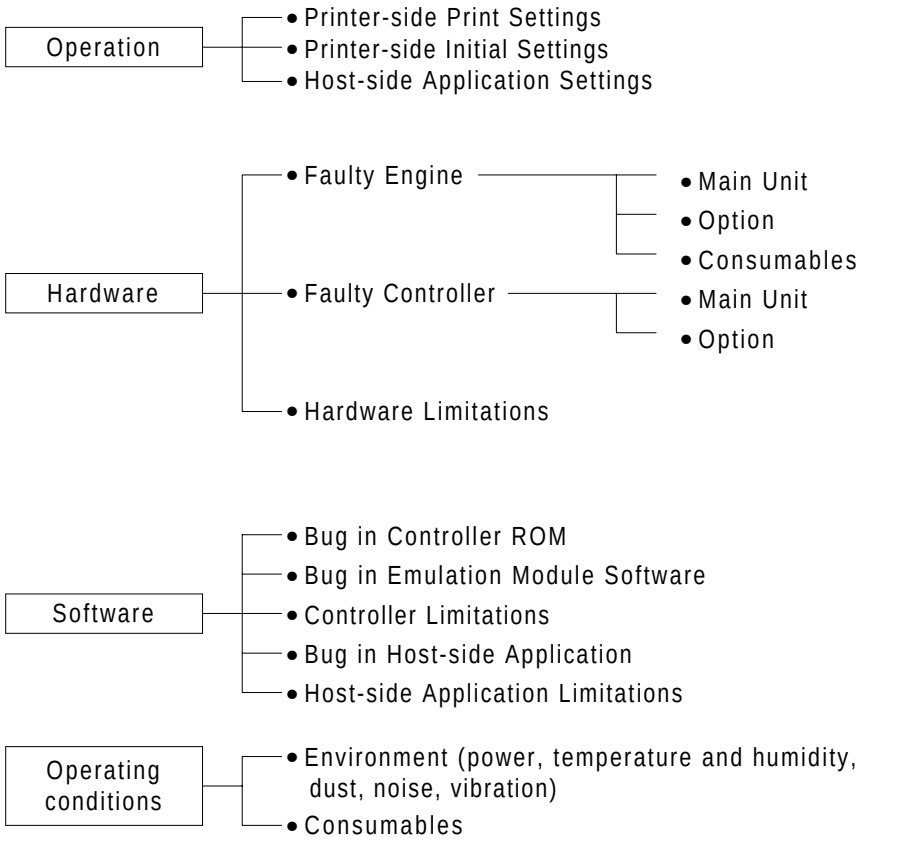
The message “DOWNLOAD NG.” is displayed if an error occurs during the rewrite process. If this condition occurs, reinstall the Flash ROM card and turn the power off and on again.

4. When the rewrite ends, turn off the main unit, reset all DIP switches to OFF, and remove the Flash ROM card.
5. Replace the Flash ROM 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 Flash ROM card.

7. TROUBLESHOOTING

7.1 TYPES OF PROBLEMS

The problems can be classified as follows:



G024O014.WMF

7.2 TROUBLESHOOTING PROCEDURE

7.2.1 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 automatically prints.
2. Detailed diagnostic test
   See “Section 4.2 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 wire conduction
   - 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.

7.2.2 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.

7.2.3 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-Script 2 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
- Engine firmware version

7.3 ERROR MESSAGES

7.3.1 OVERVIEW

The error messages for this unit are classified as follows:

1. Controller Self-diagnostic 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 a time. There is an order of priority for displaying 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), and Controller User Errors.

7.3.2 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. For a memory error, the second line of the LCD indicates the address where 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
11XX	ASIC Centronics interface error Non-fatal error (printed as B1 in the error log.)	Controller
1401	NVRAM error (Read/Write)	Controller
1601	Font ROM error (Sum)	Controller
170X	Flash ROM card error 1703 represents a non-fatal error (printed as B4 in the error log.)	Flash ROM card/Controller
1B0X	Optional Interface 1 Error	Controller
1C0X	Optional Interface 2 Error	Controller
1D0X	Optional parallel interface board error 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	CPU error	Controller
450X	ASIC compression/decompression error	Controller
460X	FCI error Non fatal error (printed as B9)	Controller

7.3.3 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 set-up setting	Reset the printer settings using 'Menu reset' in the Maintenance menu (user mode).
B4: Error	Flash ROM card slot error	Controller/Flash ROM 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
B9: Error	FCI read/write error	Controller

7.3.4 INTERNAL ERRORS

When an internal error occurs, the message “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	ROCKY level 4 interrupt (ART or Tim)
18	ROCKY level 3 interrupt (CP)
19	ROCKY level 2 interrupt (XINT1 or XINT0)
20	ROCKY level 1 interrupt (CBE, DBE, Dtc0, Verr, Fin, Vdtc, Fout)
21	ROCKY 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

7.3.5 ENGINE USER ERRORS (CAUTIONARY)

Refer to the Troubleshooting section in Operating Instructions.

7.3.6 ENGINE SERVICE CODES

Refer to the Troubleshooting section in Engine Service manual.

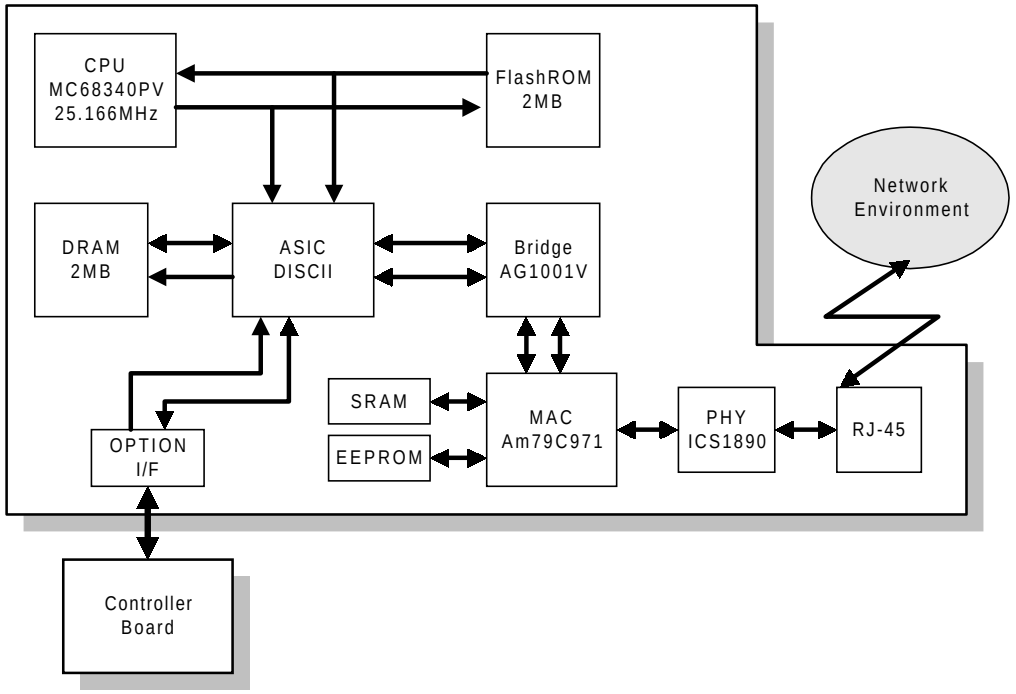
8. NETWORK INTERFACE BOARD

8.1 OVERVIEW

8.1.1 SPECIFICATIONS

Configuration:	Embedded
LAN Interface:	100BASE-TX/10BASE-T
Frame Type:	Ethernet II (*1), IEEE802.3, IEEE802.2, SNAP
	*1: Only Ethernet II for TCP/IP
Network Cable:	STP (Shielded Twisted Pair) (*2), Category 5
	*2: If UTP (Unshielded Twisted Pair) cable is used too much EMI (Electro-magnetic Interference) is emitted exceeding the required emission standard. Also, the ferrite core must be properly installed to the STP cable. Refer to the Operating Instructions Manual for details.
Protocol:	TCP/IP, AppleTalk (*3), NetWare
	*3: Only possible when equipped with RICOH-SCRIPT2.
SNMP Support:	IP and IPX SNMP support of MIB-II

8.1.2 BLOCK DIAGRAM

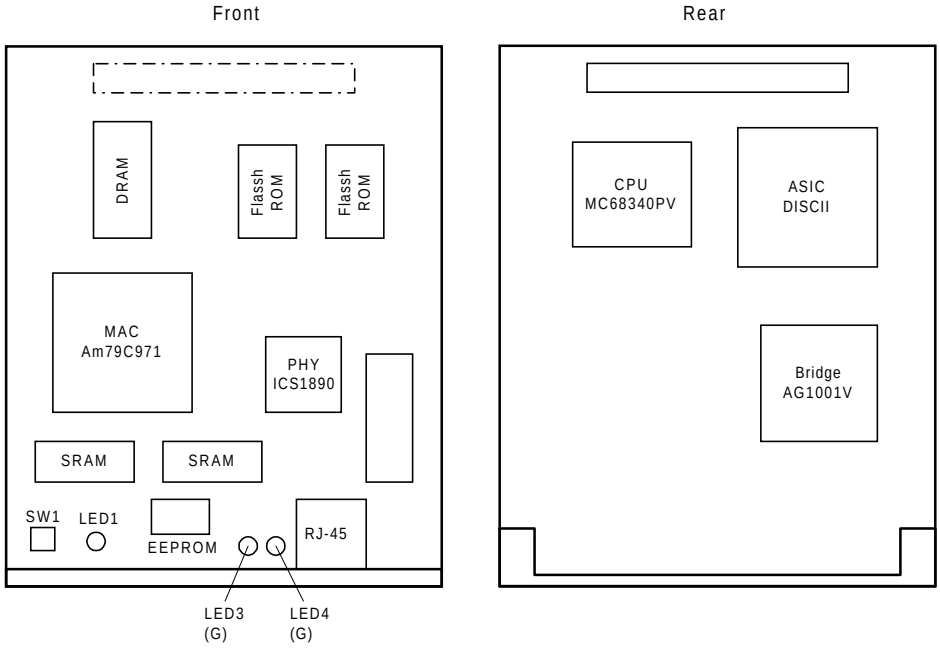


G024O005.WMF

Options

8.2 COMPONENT LAYOUT

8.2.1 NETWORK INTERFACE BOARD DIAGRAM



G024O006.WMF

8.2.2 DEVICES

Device	Description
CPU	MC68340PV25 (25.166MHz)
Memory	Flash ROM MBM29F800B-90PFTN (1 MB x 2)
DRAM	TC5118160AJ-60 (2 MB x 1)
SRAM	CY7C199 (256kbit x 2)
EEPROM	ST93C46CB1 (1kbit x 1)
ASIC	Gate array MBCG24243 (DISCII)
Bridge	AG1001V
MAC	Am79C971KC "PCnet-FAST"
PHY	ICS1890

8.3 BASIC OPERATIONS

8.3.1 OVERVIEW

This network interface board can manage both 100BASE-TX and 10BASE-T. It has a maximum data transfer speed of 100Mbps.

The auto-negotiation function automatically switches the communication speed.

The controller board supplies the power source (+5V) and provides the reset signal. The controller board communicates with the network interface board through the option I/F connectors.

8.3.2 LED FUNCTIONS

The LEDs on the network interface board show the operating state.

1. LED1: Displays the operating status.
   On: Ready
   Off: Busy
   This LED blinks while the firmware is downloading.
2. LED2: Not used.
3. LED3: Displays the LAN type.
   On: 100BASE-TX
   Off: 10BASE-T
4. LED4: Displays the link status.
   On: Link safe
   Off: Link failure or link disabled

8.3.3 SWITCH FUNCTION

SW1 resets the NVRAM on the network interface board.

NOTE: This board has the hardware to execute a "Summary Printout". However, it does not function on this printer due to controller specifications.

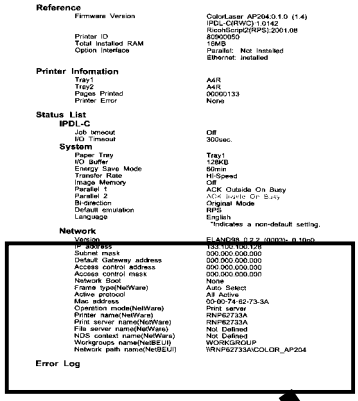
NVRAM Reset Procedure

This procedure resets all the network settings to the defaults.

- IP address, Subnet Mask, Default Gateway Address, Access Control Mask, Network Boot, Frame Type (NetWare), Active Protocol, and so on

1. Turn on the main switch while pressing SW1. Keep pressing SW1 for 15 seconds.
2. Release SW1 for 3 seconds, press it again for 3 seconds, and then release it.
3. Turn the main switch off/on to complete the NVRAM reset procedure.
   NOTE: There is a margin of less than 1 second for error. Use a watch to measure the time periods as accurately as possible.
4. Print out the configuration page, and then check the settings. If the procedure failed, the previous settings remain. Repeat the above procedure until the old settings have been cleared.

8.3.4 NETWORK SETTING INFORMATION



G024O007.BMP

Bi-direction	Original Mode
Default emulation	RPS
Language	English
	*Indicates a non-default setting.
Network	
Version	ELAND98 0.2.2 (0003)- 0.10p0
IP address	133.100.100.128
Subnet mask	000.000.000.000
Default Gateway address	000.000.000.000
Access control address	000.000.000.000
Access control mask	000.000.000.000
Network Boot	None
Frame type(NetWare)	Auto Select
Active protocol	All Active
Mac address	00-00-74-62-73-3A
Operation mode(NetWare)	Print server
Printer name(NetWare)	RNP62733A
Print server name(NetWare)	RNP62733A
File server name(NetWare)	Not Defined
NDS context name(NetWare)	Not Defined
Workgroups name(NetBEUI)	WORKGROUP
Network path name(NetBEUI)	\\RNP62733A\COLOR_AP204
Error Log	

G024O007.BMP

Since the controller does not support the "Summary Printout" function for the network interface board, check the network setting information by printing out a user mode configuration page.

NOTE: Even though NetBEUI parameters are displayed on the various configuration pages, the NetBEUI protocol is not supported on this unit.

Options