RC-200 SERVICE MANUAL

(Machine Code: G528)

TABLE OF CONTENTS

1. OVERALL MACHINE INFORMATION

1.1 BASIC SPECIFICATIONS

Page Description Language:	IPDL-C (Intelligent Page Description Language for Color) RPS2 (RICOH-SCRIPT2)
Printer Driver:	• IPDL-C: Windows 95/98/NT 4.0 • RPS2: Windows 95/98//NT 4.0, Macintosh (PPD for LaserWriter 8)
Resolution:	600 x 600 dpi
Color Mode:	Color (2C or less/3C or more), B&W
Gradation Mode:	2/4/16 gradation levels (1/2/4 bits/pixel) Default setting: 4 gradation levels
Toner Saving:	On/Off (printer driver setting) Default Setting : Disabled
Color Correction:	On/Off (printer driver setting) Default setting: Enabled
Paper Size:	See next page
Print Speed:	• Color: 4 ppm (A4 sideways) • B&W: 14 ppm (A258 model) 18 ppm (A259/A260 models)
Interface:	• Parallel port (IEEE1284B: Compatible / Nibble / ECP supported) • 100 BASE-TX, 10 BASE-T
Fonts:	Ricoh-Script 2: 39 Roman fonts
CPU:	VR4310 176MHz
RAM:	96MB (Standard and maximum)
ROM:	2MB Flash ROM
Scanner Function:	Not supported

1.2 OTHER SPECIFICATIONS

LAN Interface:	100 BASE-TX, 10 BASE-T
Frame Type:	Ethernet II, IEEE802.2, IEEE802.3, SNAP
Network Protocol:	TCP/IP, IPX/SPX, NetBEUI, AppleTalk (with RPS2)
SNAP:	MIB-II, PrinterMIB, HostResourceMIB, RicohPrivateMIB

1.3 PAPER SIZE

Name	Paper Size	Paper Tray	Duplex	By-pass	10-, 20-bin sorters	3-bin sorter
DL+	12" x 18"	–	–	OK	**NOTE2**	OK
A3 (L)	297 x 420	OK	OK	OK	OK	OK
B4 (L)	257 x 364	OK	OK	OK	OK	OK
A4 (L)	210 x 297	OK	OK	OK	OK	OK
A4 (S)	297 x 210	OK	OK	OK	OK	OK
B5 (L)	182 x 257	OK	OK	OK	OK	OK
B5 (S)	257 x 182	OK	OK	OK	OK	OK
A5 (L)	148 x 210	OK	–	OK	–	OK
A5 (S)	210 x 148	–	–	OK	–	OK
B6 (L)	128 x 182	–	–	OK	–	OK
A6 (L)	105 x 148	–	–	OK	–	OK
Post Card		–	–	OK	–	OK
DLT(L)	11" x 17"	OK	OK	OK	OK	OK
LG(L)	8.5" x 14"	OK	OK	OK	OK	OK
F4(L)	8.5" x 13"	OK	OK	OK	OK	OK
	8.25" x 13"	–	OK	OK	OK	OK
	8" x 13"	–	OK	OK	OK	OK
LT (L)	8.5" x 11"	OK	OK	OK	OK	OK
LT (S)	11" x 8.5"	OK	OK	OK	OK	OK
HLT (L)	5.5" x 8.5"	OK	–	OK	–	OK
HLT (S)	8.5" x 5.5"	–	–	OK	–	**NOTE3**

OK: This paper size can be used.
– : This paper size cannot be used.

NOTE1: The auto duplex, sorter, and/or staple function cannot be used when paper is fed from the by-pass tray.

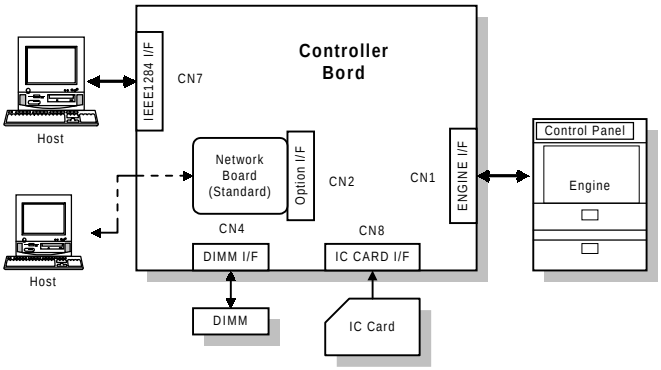
NOTE2: 12" x 18" paper can be used only with 20-bin sorter.

NOTE3: 8.5" x 5.5" paper cannot be used. (Paper can be fed, however, paper jam happens at sorter.)

2. DETAILED DESCRIPTIONS

2.1 FUNCTIONAL OVERVIEW

2.1.1 SYSTEM LAYOUT



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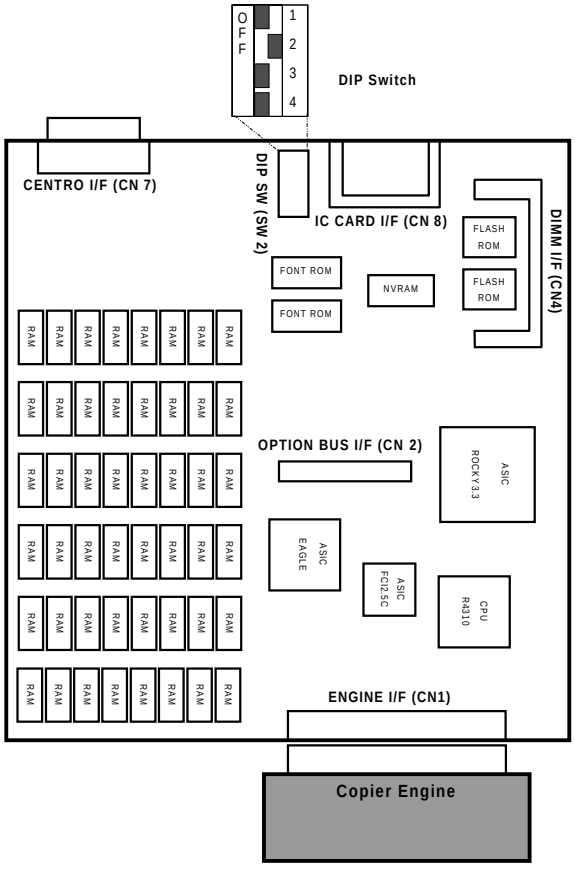
2.1.2 CONTROLLER BOARD LAYOUT



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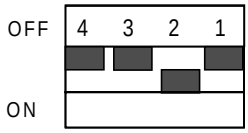
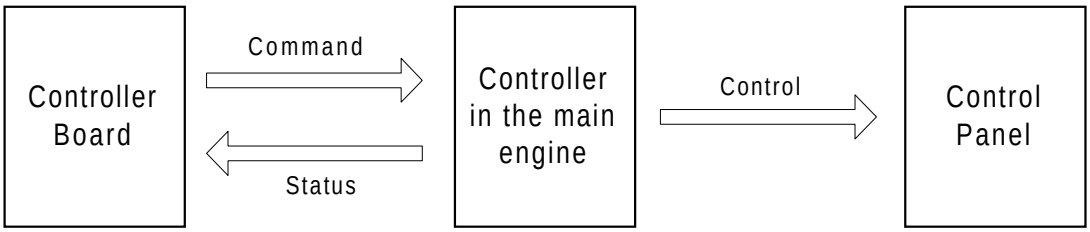
2.1.3 FUNCTION OF EACH DEVICE

<table>
<tr><th>Device</th><th>Function</th></tr>
<tr><td>CPU</td><td>VR4310-117 (176MHz)</td></tr>
<tr><td>ASIC ROCKY 3.3</td><td>This ASIC controls the following:
• Memory mapping
• Rest
• DRAM
• Data received from the parallel
• Interrupt
• Timer
• Parallel interface
• I/O Port</td></tr>
<tr><td>ASIC EAGLE</td><td>This ASIC controls the following:
• Image data compression & decompression
• Engine interface serial communications control
• DRAM
• Interrupt
• Data through function</td></tr>
<tr><td>ASIC FCI2.5C</td><td>Toner saving control</td></tr>
<tr><td>FLASH ROM</td><td>Stores program (2MB) The flash ROM is programmable via an IC card.</td></tr>
<tr><td>NVRAM</td><td>Stores the initial settings and printer parameters.
(8KB EEPROM)</td></tr>
<tr><td>FONT ROM</td><td>Stores internal printer fonts (Japanese fonts not used).
(Two 32-Mbit mask ROMs)</td></tr>
<tr><td>DRAM</td><td>• 48 16-Mbits DRAMs are installed as standard (96MB total)</td></tr>
<tr><td>DIP SW</td><td> 

G528D512.WMF
<table>
<tr><th>SW No.</th><th>Setting</th><th>Content</th></tr>
<tr><td rowspan="2">1</td><td>OFF</td><td>Boots up from the flash ROM.</td></tr>
<tr><td>ON</td><td>Boots up from the IC card.
This switch needs to be turned on when up-grading 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 - 4</td><td>OFF</td></tr>
</table></td></tr>
</table>

Device	Function
ENGINE I/F (CN1)	• Embedded CIVIC interface
PARALLEL I/F (CN7)	• Provides an interface that connects to a local host (IEEE1284 compliant).
OPTION I/F (CN2)	
DIMM SLOT (CN4)	• A 72-pin slot for accommodating the Ricoh-Script 2 emulation module. • The emulation module is programmable by flash ROM.
IC CARD SLOT (CN8)	Accommodates an IC card to upgrade firmware.

2.1.4 CONTROL PANEL



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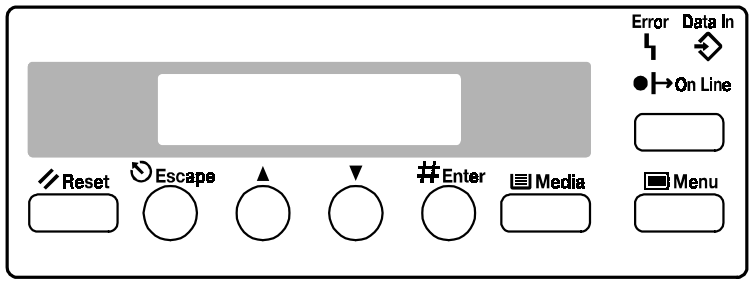


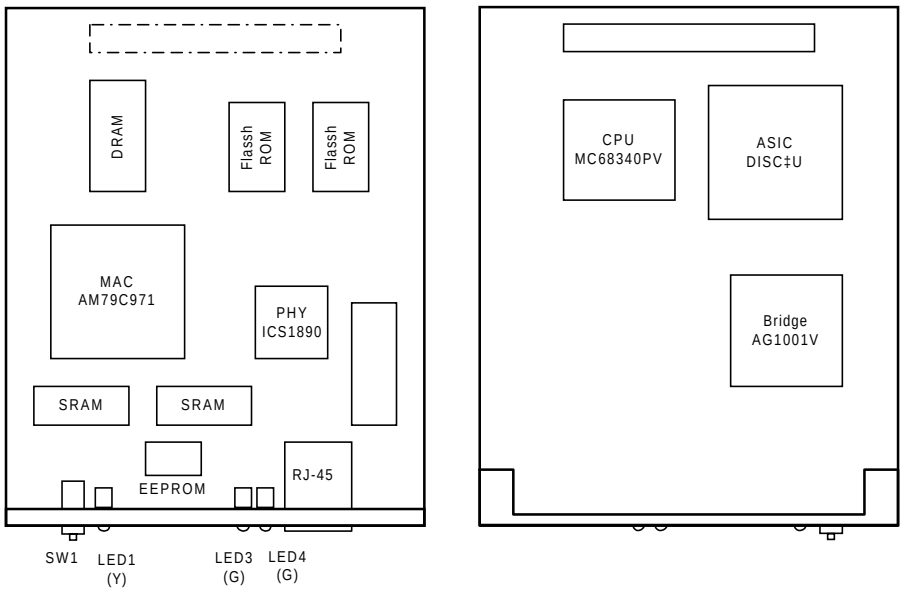
WINA-PANEL.WMF

The controller board does not control the control panel directly, but through the copier main board. When the main switch is turned on, the control panel will display the status on the screen after the machine initialization starts. (It is not possible to access the copier function from the control panel.)

The function of the indicators on the control panel is as follows:

Description	Color	Function	Status	Definition
On Line	Green	Displays the status of On- or Off-line.	Lit	On-line status
			Off	Off-line status
			Blinking	Status is changing from On-line to Off-line or vice versa.
Data In	Green	• Data transmission from the host • Presence of data in controller • Data processing.	Lit	Data remains in the printer or other condition except for the conditions defined for “Blinking”.
			Off	Conditions except for the conditions defined for “Lit” or “Blinking”.
			Blinking	Controller is receiving data from the host or is processing a command.
Error	Red	• Printer error • Copier requires something to start or resume printing	Lit	Error condition (Any operation on the controller or copier is required to operators or service technicians.)
			Off	Normal condition (Other conditions except for the condition defined for “Lit”.)

2.1.5 ETHERNET BOARD



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This network 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.

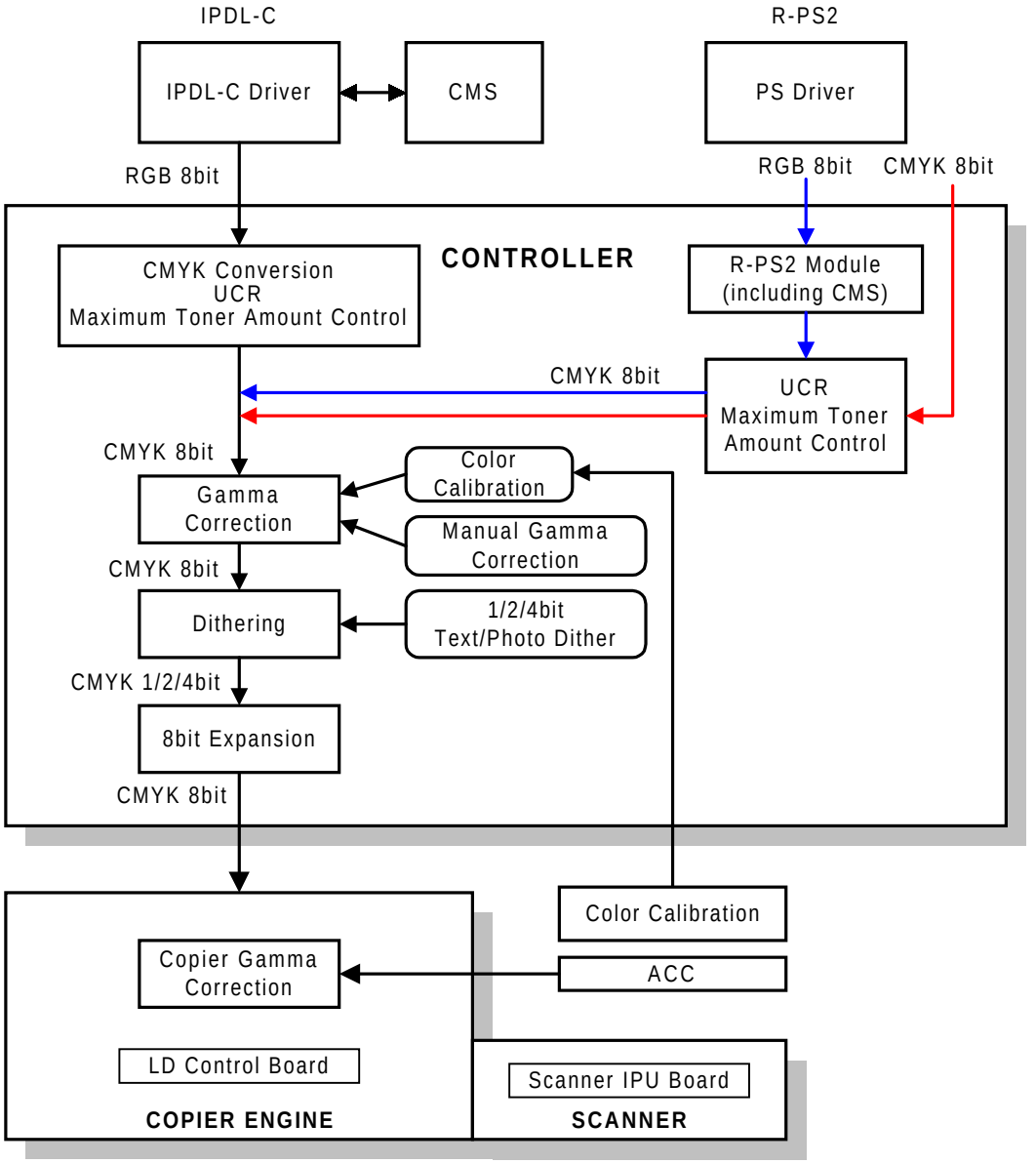
The controller board supplies the power source (+5V) and provides the reset signal. The controller board communicates with the network interface board through the option I/F connector.

The function of LED and SW is as follows;

	Functions
LED1	Displays the operating status. ON: Ready, OFF: Busy
LED2	Not used
LED3	Displays the LAN Type. ON: 100 BASE-TX, OFF: 10 BASE-T
LED4	Displays the link status. ON: Link safe, OFF: Link failure or Link disable
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 the controller specifications.

2.2 PRINT DATA PROCESSING

2.2.1 IMAGE DATA PROCESSING FLOW



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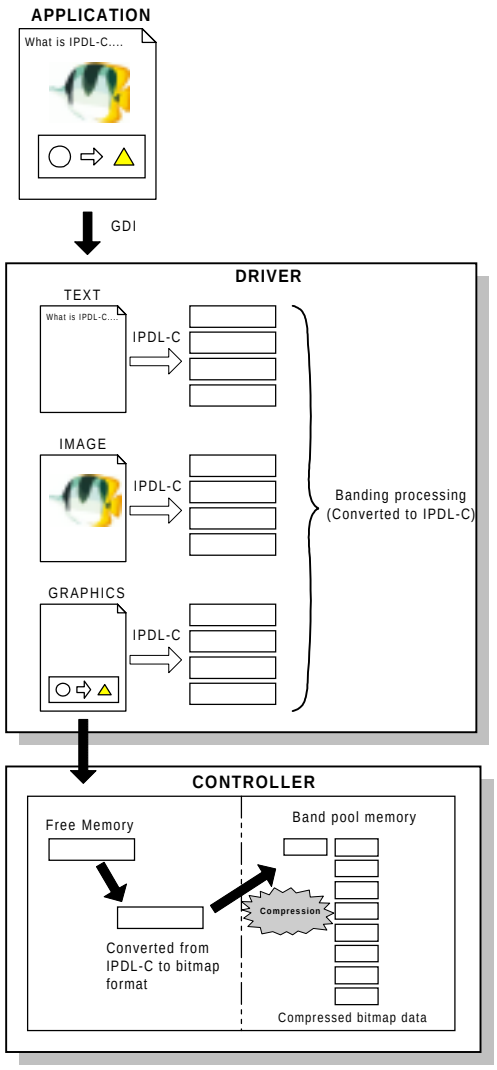
IPDL-C (Intelligent Page Description Language for Color)

The image data received from an application is separated into three elements: text, graphics, and images. Then, the data for each element is converted to IPDL-C. The data converted is not done for the whole page at once. Each band (area specified) is independently processed (banding processing) for the data conversion as shown in the figure.

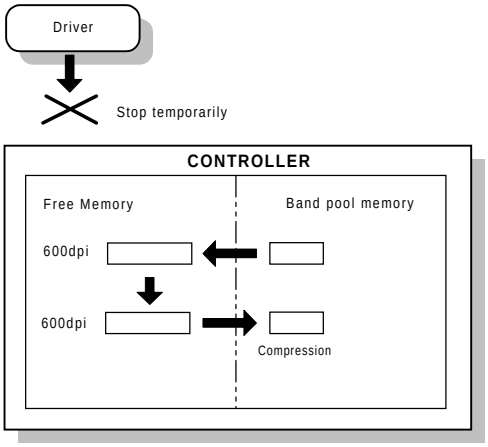
The IPDL-C conversion from each element is stored in free memory and converted to bitmap data. Bitmap data is compressed and stored into the band pool memory, DRAM.

After data processing is complete, the controller sends the decompressed data to the copier and the copier starts printing.



G528D508.WMF

If the band pool memory overflows while the IPDL-C command is converted to the bitmap data and if the image processing for a page cannot be completed, the controller stops converted the data to the bitmap temporarily. The controller decompresses the compressed bitmap data until the space will be free in the band pool memory, then, resumes data conversion.



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2.2.2 CMS (COLOR MANAGEMENT SYSTEM)

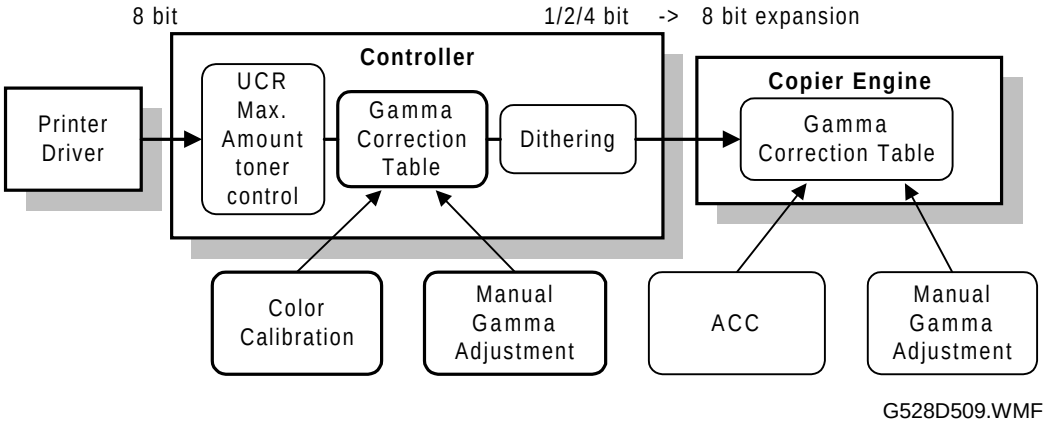
In IPDL-C, CMS converts differing RGB data to RGB' by using a profile, in the printer driver. The filename of the profile has extension `prf`, which is automatically installed in the /windows/system folder during printer driver installation. RGB' (color space) is designed based on the characteristics of the printer (copier); therefore, RGB' is a unique color space to optimize the print quality.

RGB' data sent to the controller is converted to the CMYK data. During the CMYK conversion, some amount of CMY data is replaced with K data by UCR (under color replacement) algorithm. At the same time, the maximum toner amount is controlled in order to prevent toner from being scattered around texts or lines printed.

In RPS2, CMS functions like the IPDL-C; but RGB conversion is done in the controller.

The controller performs gamma correction, RGB to CMYK conversion, and dithering.

Gamma Correction



The controller has a Color Calibration feature. Users can calibrate the controller in the same manner as the ACC function on the copier. In addition, the controller gamma can be customized in SP mode.

Color Calibration

This feature allows users to calibrate the controller to archive the optimum output. The algorithm for color calibration is the same as the ACC function on the copier. However, the gamma target of the controller is different from that of the copier. This is because of the different type of dithering used for the controller and copier.

Manual Gamma Adjustment

The gamma is customized by SP mode. See “5. Replacement and Adjustments” for the adjustment procedure.

The controller combines the Color Calibration result with the manual gamma in the gamma correction of the controller. When the gamma is customized in SP mode, the customized data is kept even if Color Calibration is done by the user. The data corrected in the controller’s gamma correction table is sent to the copier. The copier corrects the image data based on the copier’s gamma correction table, then, outputs the page.

Adjust the gamma for highlight, middle, shadow, and IDmax using an SP mode. Decreasing the actual IDmax from the controller is possible, but it cannot be increased because it is the copier’s maximum development capability. When changing the IDmax data on the controller, the whole gamma curve (highlight, middle shadow, and IDmax) shifts up down without exceeding the IDmax of the copier.

Dither Processing

Dither	1 bit	2 bit	4 bit
Photo	32 x 32	16 x 12	4 x 4
Text	24 x 24	12 x 12	4 x 4

As shown in the above table, there are 6 kinds of dither pattern. The dither pattern is prepared for the photo and text independently for 1-, 2-, and 4-bit modes. These dither patterns creates the illusion of 256 gradations for high quality prints.

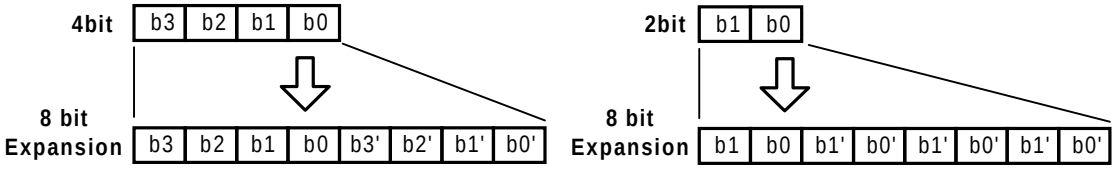
The optimum dither pattern is automatically selected based on the Text, Photographic, and Image elements on the pages.

2.2.3 COLOR ADJUSTMENT BY THE DRIVER

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

The driver does not perform RGB to CMYK conversion.

2.2.4 8 BIT EXPANSION



G528D510.WMF

When the controller sends the data to the copier, the controller expands the data to 8 bits to meet the image processing algorithm of the copier. When expanding 1/2/4 bit to 8 bit, add some of the same data to the original data as shown in the figure. Even when the data is expanded, dithering remains the same.

2.2.5 GRADATION & PRINTABLE DATA

The image can be printed with 1 bit, 2 bits (Default), or 4 bits in 600 dpi. However, a page cannot be printed and the job is automatically canceled if the memory for image processing overflows while converting the image data to bitmap format. This may happen depending on the mode selected or the image data size. If the memory overflows, resolution and/or gradation settings in the driver require changing.

The printable size (combination of resolution, gradation and page size) is as follows:

		DL+	A3	B4	A4	B5	A5	B6	A6
600 dpi	**Single**	1 bit	2 bit	2 bit	4 bit	4 bit	4 bit	4 bit	4 bit
	Duplex	-	1 bit	1 bit	2 bit	2 bit	4 bit	4 bit	4 bit
300 dpi	**Single**	4 bit	4 bit	4 bit	4 bit	4 bit	4 bit	4 bit	4 bit
	Duplex	-	2 bit	4 bit	4 bit	4 bit	4 bit	4 bit	4 bit

2.3 POWER-UP SELF-DIAGNOSTICS

2.3.1 OPERATION PANEL DISPLAY DURING POWER-UP SELF-DIAGNOSTICS

The controller has two types of self-diagnostic modes. One is the self-diagnostics automatically done at power on, the other is the detailed self-diagnostics that includes devices such as memory, ASIC, and standard parallel interface by installing the parallel interface loop-back connector. (See section 4, Service Table – Detailed Self-diagnostics.)

When the machine is turned on, the controller automatically starts the power-up self-diagnostics after the copier starts initialization. The control panel displays the message depending on the status as explained below.

Immediately after turning the power on

The controller turns on all LEDs for a second after the copier starts own initialization.

During power-up self-diagnostics

When the controller starts the power-up self-diagnostics, only the on-line LED starts blinking. At this time, all other LEDs turn off. Also, the panel screen displays “Please Wait”.

If the test completes normally

If an error is not detected during the self-diagnostics, the controller boots up the system. During the system boot-up, the on-line LED keeps blinking and the panel screen displays “Color Controller / RC-200”. After the system initialization is completed, the on-line LED stays on and the panel screen displays “IPDL-C / Ready”

If an error is detected

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

See section 6 (Troubleshooting) for tables on the different type of errors.

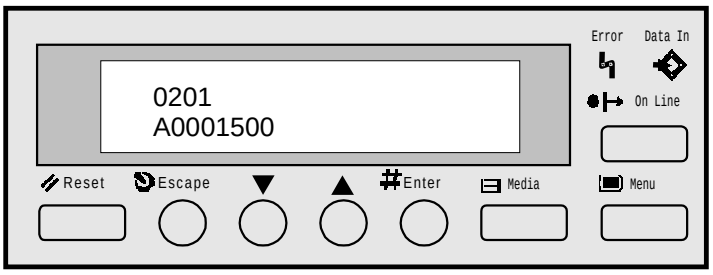
Non-fatal error (user error) detected

Since non-fatal errors do not adversely affect any print operation, the controller takes the following actions after detecting a non-fatal error and then enters normal mode.

- Boots up the system.
- All LEDs start blinking.
- Displays the same message as in normal mode.

When the controller is ready, the error LED turns on and the controller prints out the configuration page with error description in monochrome mode. (See section 7, Troubleshooting – Controller User Errors for the error codes.)

Fatal error detected



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Since the controller may not be able to print out configuration page when the fatal error is detected, the controller takes the following actions.

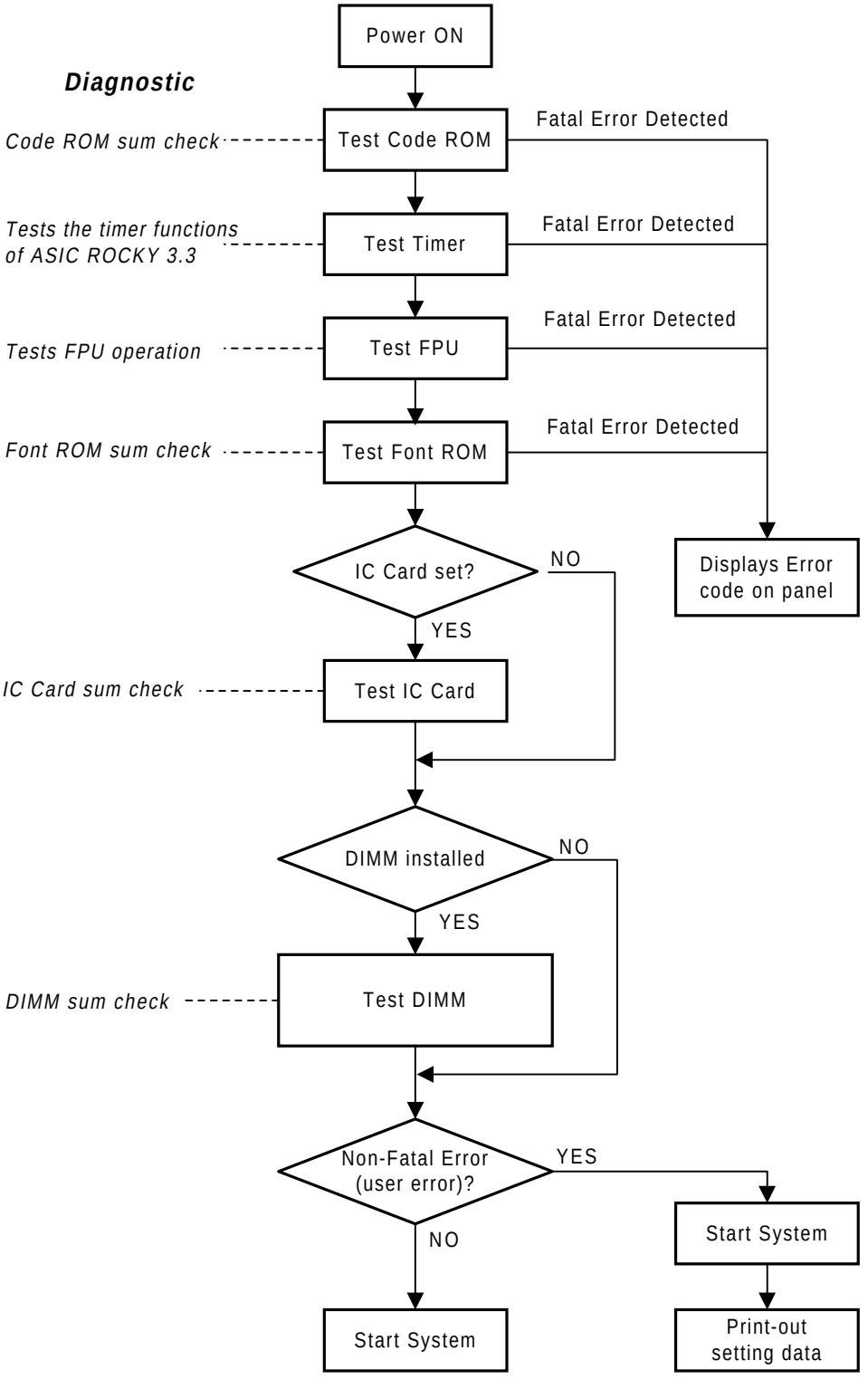
The error LED turns on. All other LEDs turn off.

The panel screen continues displaying the two types of error code detected.

The first line of the LCD screen contains a 4-digit code that identifies the error. The second line contains a 8-digit code that shows detailed content of the error.

(See section 6, Troubleshooting – Controller Self-diagnostics Errors for a description of the error codes.)

2.3.2 POWER-UP SELF-DIAGNOSTICS FLOW CHART (SUMMARY)



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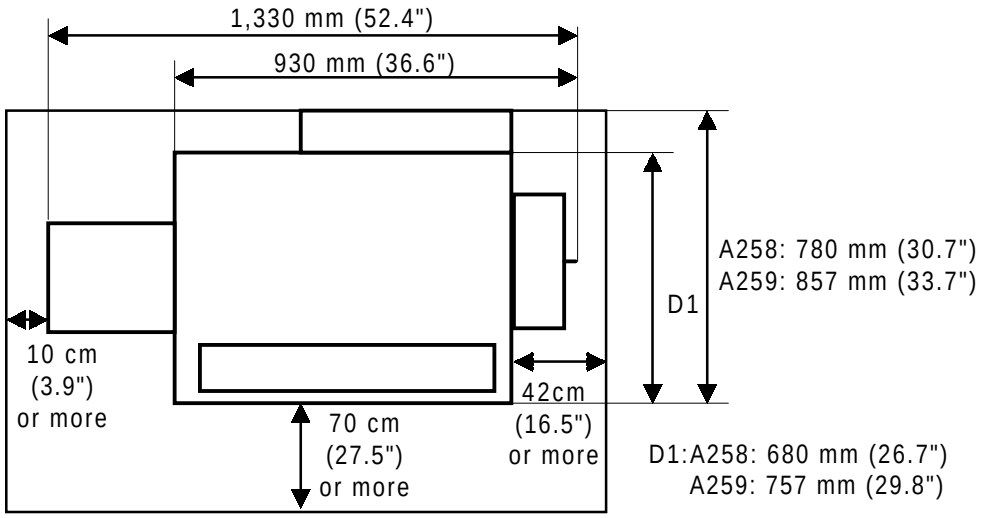
3. INSTALLATION PROCEDURE

3.1 MINIMUM SPACE REQUIREMENTS

Provide clearance for the copier, as shown below. If one or more options (such as the ADF or sorter stapler) are added to the copier, this clearance should be provided around the entire system. Please refer to the service manual of the copier for more details concerning the space required for the copier.



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NOTE: A space of at least 10 cm (3.9") at the rear of the machine is important for machine ventilation.

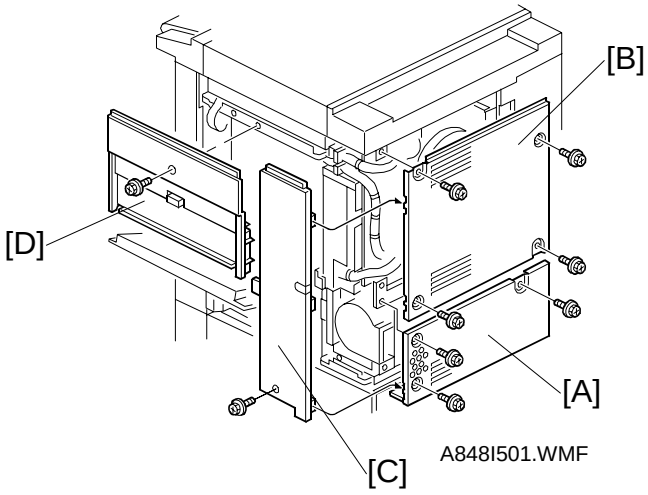
3.2 CONTROLLER INSTALATION

3.2.1 ACCESSORY CHECK

Check the quantity and condition of the accessories in the box with the following list:

Description	Q'ty
1. LCD Panel	1
2. CLD Harness	1
3. I/F Bracket	1
4. Harness Shield Plate	1
5. Snap Ring	1
6. Tapping Screw - M3x6	2
7. Tapping Screw - M4x6	7
8. Tapping Screw - M4x6	4
9. Screw - M4x8	2
10. Harness Clamp	3
11. CD ROM	1
12. Operating Instructions (G528-17) English	1
13. Operating Instructions (G528-27) English, German, French, Italian, Dutch	1
14. Installation Procedure (G528-17 only)	1

3.2.2 INSTALLATION PROCEDURE



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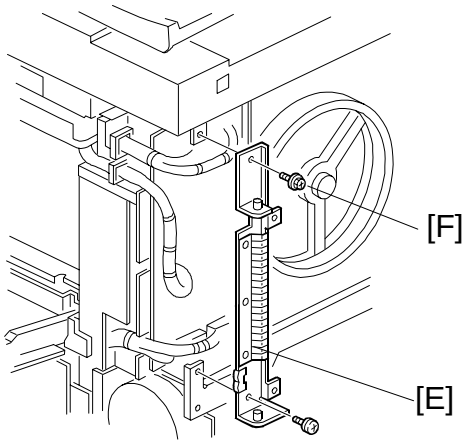

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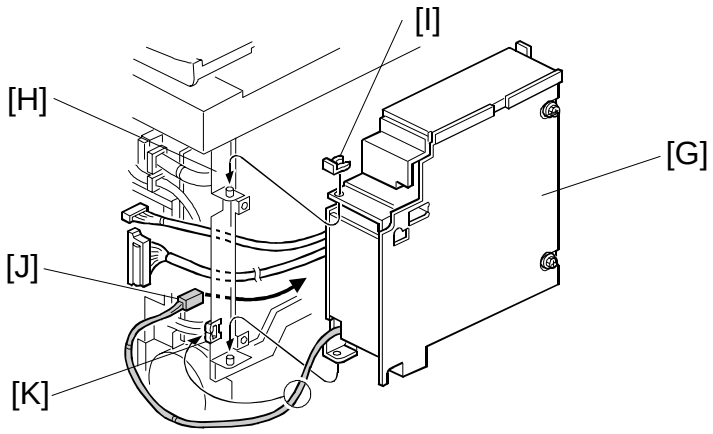

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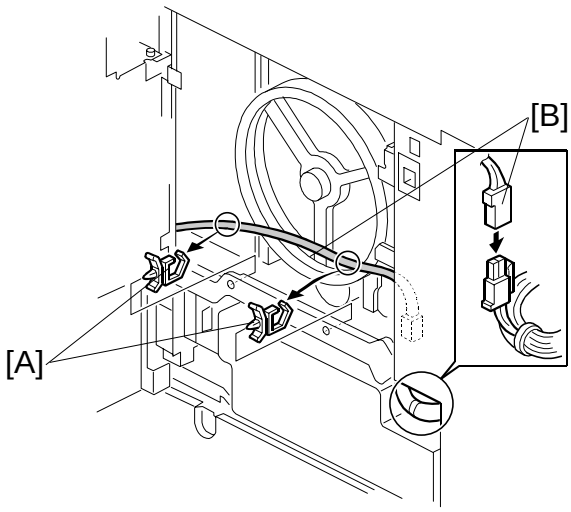
⚠CAUTION

Unplug the copier power cord before starting the following procedure.

1. Remove the lower rear cover [A]. (3 screws)
2. Remove the upper rear cover [B].(4 screws)
3. Remove the rear right cover [C]. (1 screw)
4. Remove the right cover [D]. (1 screw)
5. Install the I/F bracket [E] to right rear side of copier. (1 screw, 1 screw with washer [F])
6. Attach the I/F unit with controller [G] to the I/F bracket [H]. (1 snap ring [I])

NOTE: The power supply harness [J] should go to the rear side of copier. (1 clamp [K])



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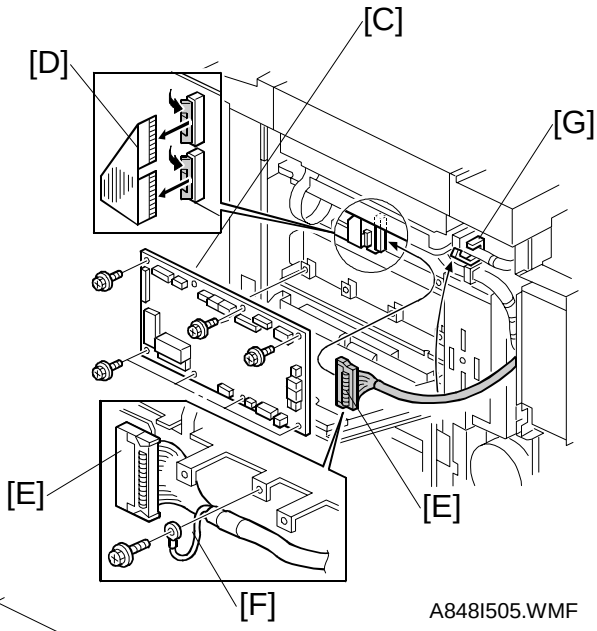

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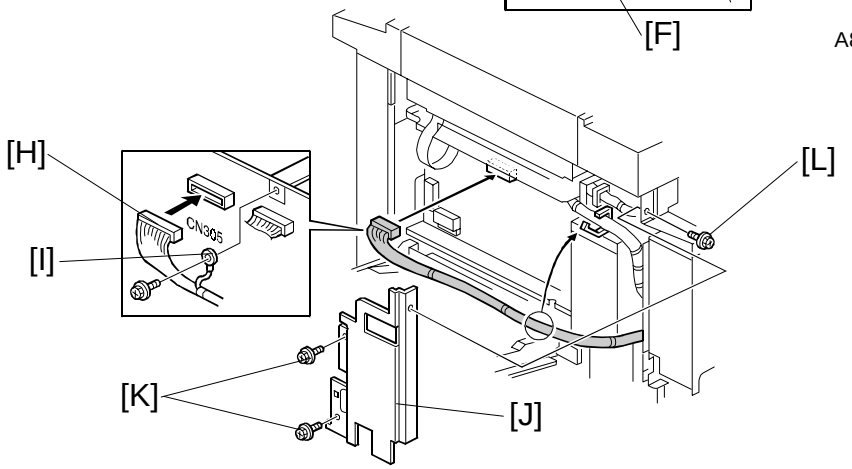

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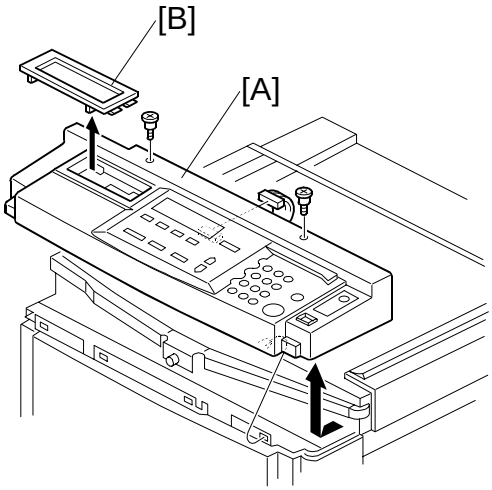
NOTE: If steps 11, 12, 14 are not properly done, it may cause SC326.

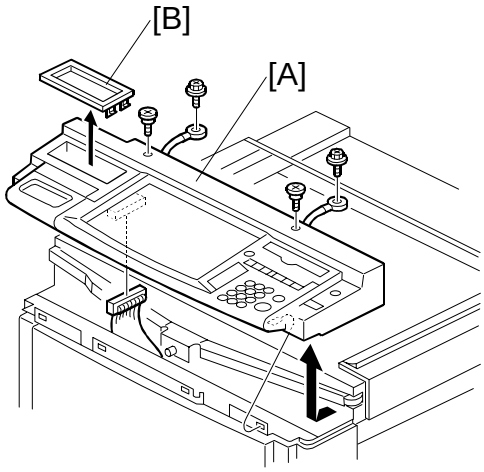
7. Install 2 clamps [A] to the rear bracket of copier.
8. Connect the power supply harness [B].
9. Remove the main board [C]. (A258: 11 connectors and 7 screws, A259/A260:14 connectors and 7 screws)
10. Remove the short cut harness [D].
    NOTE: Store this harness somewhere inside the machine because it may be needed again.
11. Connect the 100 pin shield cable [E] to the LD main board. (1 grounding wire [F], 1 clamp [G])
12. Reinstall the main board [C].
13. Connect the I/F harness [H] to CN305 on the main board and clamp the I/F harness as shown. (1 grounding wire [I] and 1 clamp)
14. Install the harness shield plate [J] (2 M4 x 6 screw [K] and 1 M3 x 6 screw [L]).

– A258 only –

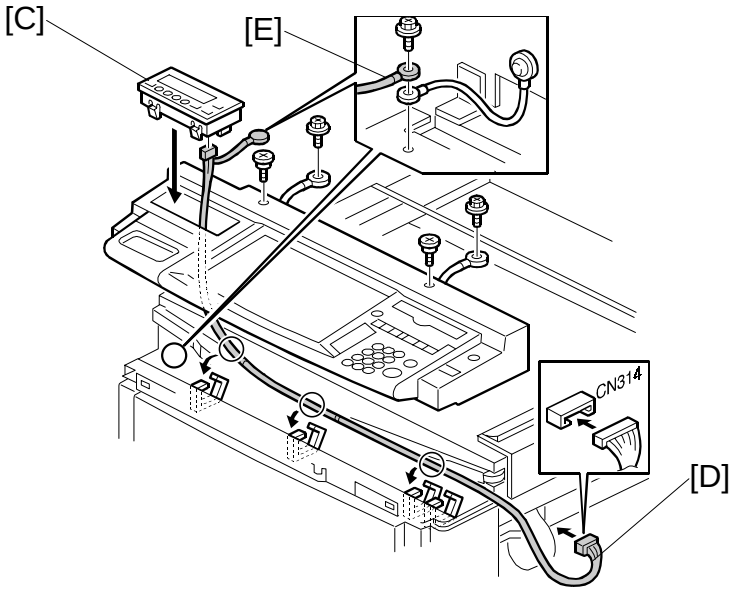


A848I512.WMF

– A259/A260 only –

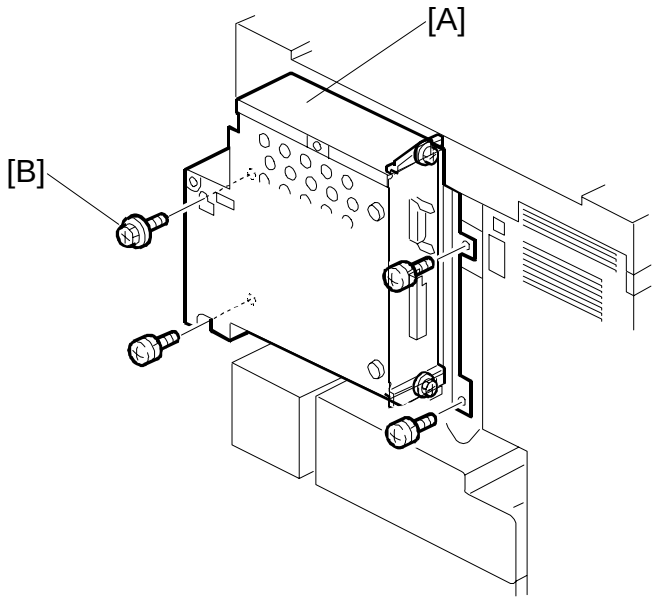


A848I511.WMF

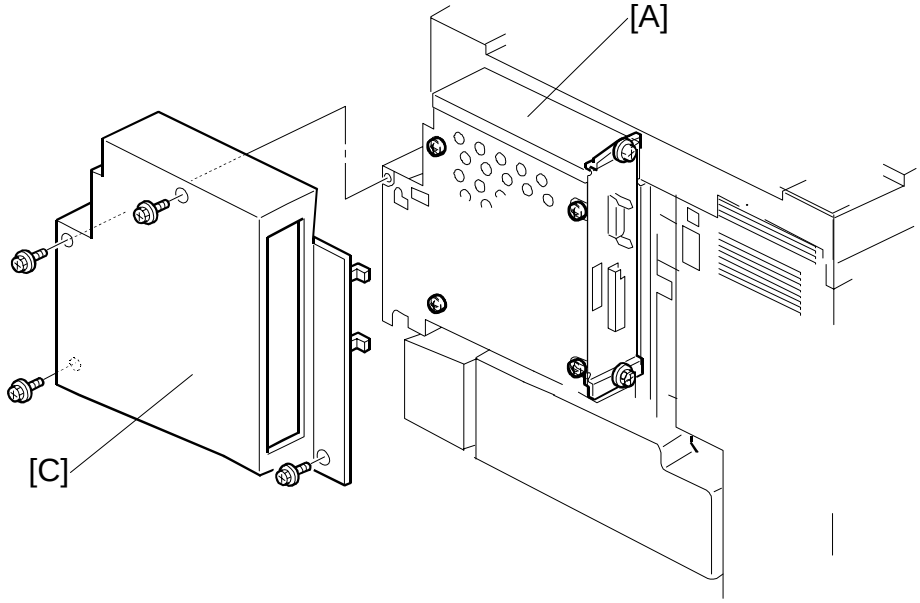


A848I508.WMF

15. Remove the operation panel [A]. (A258: 2 screws and 1 connector, A259/260: 2 screws, 2 connectors, 2 grounding wires, and 1 flat cable)
16. Remove the LCD cover [B].
17. Install the LCD panel [C].
18. Connect the LCD harness [D] to the LCD panel and CN314 on the main board and clamp the LCD harness. (3 clamps, 1 grounding wire [E])



A848I510.WMF



A848I509.WMF

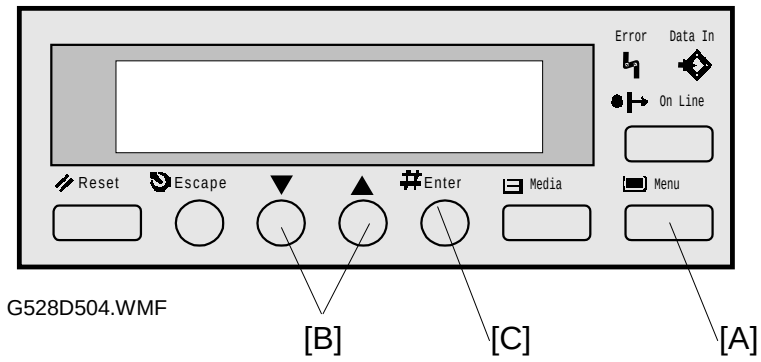
19. Fix the I/F unit with the controller [A] to the copier. (3 screws, 1 screw with washer [B])
20. Reinstall the operation panel (2 screws), the right cover (1 screw), and rear right cover (1 screw).
21. Install the I/F cover [C]. (4 screws)
22. Reinstall the lower rear cover. (3 screws)

3.2.3 INITIAL SETTING

1. After the controller installation is completed, check if the printer function works properly by printing out the configuration page.
2. Change the setting of SP3-125-00 from “0” to “2”.
3. Perform the forced process control self-check (SP3-126-01).
4. Perform the ACC for the printer mode on the copier.
5. Perform the Color Calibration on the controller. (See below for the detailed procedure.)

NOTE: Whenever performing the Color Calibration on the controller, the ACC for the printer mode on the copier should first be executed on the copier.

COLOR CALIBRATION PROCEDURE



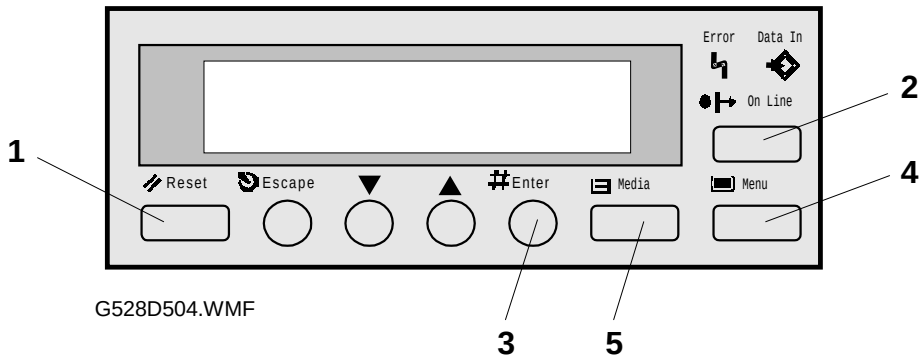
1. Press the Menu Key [A].
2. Scroll the display by pressing the arrow keys [B] and select the message, “Maintenance”. Then, press the Enter (#) key [C].
3. The message, “1. Color Calib.”, appears. Then, press the Enter (#) key.
4. The message, “1. 2 bit”, appears. Then, press the Enter (#) key.
5. The message, “1. Test Pattern” appears. Then, press the Enter (#) key.
6. The message, “Press # key” appears. Then, press the Enter (#) key.
7. The message, “printing… Test Pattern” appears and the test patter is printed out.
8. The message, “Set Pattern on Glass, Press #” appears. Then, place the test pattern on the exposure glass properly and press the Enter (#) key.
9. The message, “calibrating…” appears, then, “completed” appears after the calibration is completed.

10. The screen goes back to the initial message. “1. 2 bit”.
11. Perform Color Calibration for other modes, 4 bit and 1 bit.
12. Press the On Line key to return to the normal display.

4. SERVICE TABLES

4.1 SERVICE PROGRAM (SP) MODES

4.1.1 HOW TO ENTER SP MODE



G528D504.WMF

First press the Reset, On Line, (the screen will display "Offline"), and then press the Enter key as shown.

When accessing SP mode, the SP mode menu is added to the “Job Timeout”, “Maintenance” and “Media” menu. To exit the controller from SP mode, follow the procedure for entering SP mode or turn the main switch off and on. (This returns the controller to normal mode.)

NOTE: When accessing SP mode, “SP” is displayed on the screen as shown. Do not forget to exit SP mode after servicing, because users may change the settings or clear all the settings by accident.

4.1.2 SP MODE FUNCTIONS

Job Timeout Menu

The following menu is added to the Maintenance section.

Menu	Function
3. MinLineWidth [Minimum Line Width]	Prints lines with the dot (1 to 4 dots) selected. When a thin line is not clearly visible on output, this mode can change the thickness of the line. **NOTE:** • If the application does not support line command, this mode does not function. • If this mode is activated, this affects all kinds of line data and causes a side effect. Therefore, normally this mode should be off.

Maintenance Menu

The following menu is added to the Maintenance section.

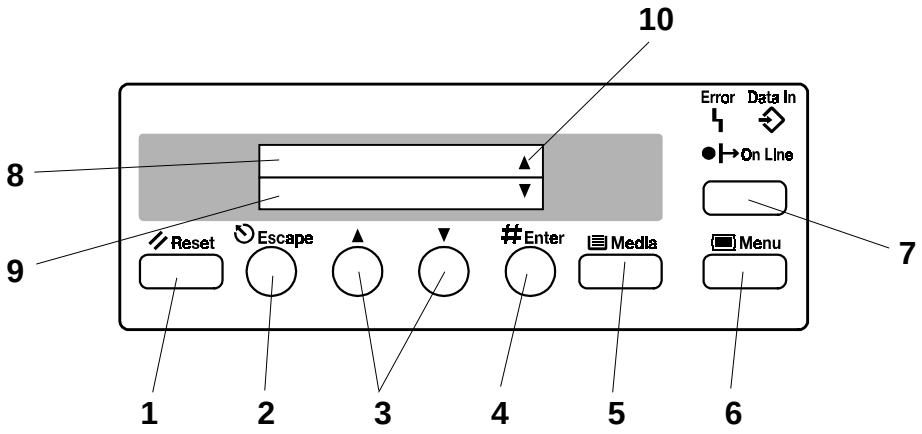
Menu	Function
S1. ColorChart [Color Chart]	Prints the color test chart stored in the controller. The dither mode can be selected by pressing the Media key. These color test charts are used for checking the image quality. Dither Modes: 1, 2 and 4 bit Photo and Text. • The color test chart can be printed on any supported paper size. • The pattern layout (size) differs depending on the selected paper size.
S2. ClearAllMem. [Clear All Memory]	Resets the all parameters stored in the NVRAM and network board to their default values. The Menu Rest in the User menu resets all settings and data only of User menu. **NOTE:** When clearing the memory, if you do not want to clear the network settings, execute the Clear All Memory after removing the network board.
S3. Gamma.Calib. [Gamma Calibration]	Adjusts the gamma for highlight, middle, shadow, and IDmax of CMYK independently. **NOTE:** When an image quality problem concerning the color balance or gradation happens, the copier needs to be checked or maintenanced first. Then, adjusts the printer gamma when users require fine-tuning.
S4. Printer ID	The printer ID is required to download fonts for RPS2 onto the HDD. However, this controller does not have an HDD. Therefore, the printer ID is not used.
S5. Toner Limiter	Sets the maximum toner amount for image development.

Media Menu

The following menu is added to the Media section.

Menu	Function
3. Summary	Displays the firmware version and memory capacity on the screen.

4.1.3 CONTROL PANEL OPERATION



WINA-PANEL2.WMF

KEY & LCD SCREEN FUNCTIONS

No.	Keys	Functions
1	Menu	• Accesses the menu for the printer setting.
2	Media	• Selects a paper tray. • Changes the paper size.
3	Enter	• Selects the setting or stores the data. (See **NOTE 1**.) • Activates the function selected.
4	Scroll-up Scroll-down	• Scrolls up or down the menu. • Increases or decreases a value of data.
5	Escape	• Goes back to the previous setting or menu
6	Reset	• Reboots the system when pressed in off-line mode. (See **NOTE 2**.) • Cancels the print job in on-line mode.
7	On Line	• Switches the printer on- or off-line. • Goes back to on-line mode directly from any menu selected.

	LCD	Function
8	1st line	Displays the title of a menu selected. This guides you where your are.
9	2nd line	Displays the selectable items or changeable data in the menu selected.
10	Arrow marks	The arrow marks means that there are some selectable items in the menu selected. The menu can be scrolled up or down.

NOTE 1:
When pressing the Enter key to select a setting, the ✻ mark is displayed at the front of the system setting selected. Then, the panel screen automatically goes back to the previous menu 0.5 seconds after pressing the Enter key.

NOTE 2:
When setting data is changed, it is immediately stored in the NVRAM or NIB after pressing Enter. (Items of Network described in the configuration list are stored on the network board. All other data and settings are stored in NVRAM.) However, the data changed only in the system menu and menu related to system setting such as Clear All Memory in SP mode, is not reflected in the current system unless the controller reboots. Therefore, the Reset key should be pressed after all the settings are completed in order to reflect the changes in the system.

4.1.4 SP MODE TABLE

When accessing SP mode, the SP mode menus are added to the User menus. The menus consist of some steps depending on menu. The following table shows the steps to access a menu and the selectable mode or data.

NOTE: 1) The bolded value or mode is the default setting.
2) Refer to the Operating Instructions for the detailed function of each User menu.
3) The bolded and Italic menus in step 2 are only accessible in SP mode.

1. Menu Key

1st step	2nd step	3rd step
IPDL-C	1. Job Timeout	**000 (Off)** to 999 seconds
	2. I/O Timeout	000 (Off) to 999 seconds **300Sec**
	3. MinLineWidth	**1** to 4 Dots
RPS2	1. Color Level	1 / 2 / 4 bit
	2. Color Mode	**Color** or B&W
	3. Color Set	Off / **Vivid** / Super Vivid / Fine / Super Fine
	4. Color Profile	Photograph / **Presentation** / Solid Color
	5. Smoothing	Off / **Auto**
	6. Toner Saving	**Off** / On
	7. Dithering	**Auto** / Photographic / Text
	8. Paper Type	**Plain Paper** / OHP / Thick Paper
	9. Auto Tray SW	**On** / Off
	A. Auto Duplex	**Off** / On
	B. Duplex Bind	**Short edge** / Long edge
	C. Collate / Stack	**Off** / Sort / Stack
	D. Face UP / Down	**Face Down** / Face Up
	E. Job Timeout	**000 (Off)** to 999 seconds
	F. I/O Timeout	000 (Off) to 999 seconds **300Sec**
	G. Feed Timeout	000 (Off) to 999 seconds **60Sec**
	H. Printer Error	**Off** / On
	I Ktalk Mode	Not effective
	J. Parallel IF1	**System Default** / ACK inside / ACK Outside
System	1. Paper Tray	**Tray 1** / Tray 2 / Tray 3 / Tray 4 / Bypass
	2. I/O Buffer	16KB / 32KB / 64KB / **128KB** / 256KB / 512KB
	3. Transfer	**Hi-speed** / Normal
	4. Image Memory	**Off** / On
	5. Parallel	ACK Inside / **ACK Outside** / STB Down
	6. Bi-direction	**Original Mode** / Standard
	7. OHP Slip	**On** / Off
	8. Printer Lang. [Printer Language]	**IPDL-C** / RPS
	9. Language	**English** / French / German / Italian / Dutch / Japanese
	32. IP Address	**011.022.033.044**

1st step	2nd step	3rd step
System	33. Subnet Mask	**000.000.000.000**
	34. Gateway Add [Gateway Address]	**000.000.000.000**
	35. Access CTL [Access Control]	**000.000.000.000**
	36. Access Mask	**000.000.000.000**
	37. Net Boot [Network Boot]	ARP+PING / ARP&RARP / ARP&BOOTP / ARP&RARP&BOOTP / **None** / RARP+TFTP / BOOTP / RARP&BOOTP / DHCP
	38. Frame NW [Frame Type NW]	**Auto Select** / Ethernet 802.3 / Ethernet 802.2 / Ethernet 2 / Ethernet SNAP
	39. Active PTL	**All Active** / None / TCP/IP Only / NetWare Only / TCP&NetWare / EtherTalk Only / TCP&EtherTalk / NetW&EtherTalk TCP&NW&EtherTK / NetBEUI Only / TCP&NetBEUI / NetW&NetBeui / TCP&NW&NB / ETalk&NetBeui / TCP&ETK&NB / NW&ETK&NB
Maintenance	1. Color Calib. [Color Calibration]	See the following table for details.
	2. Menu Reset	“Press # key”
	3. Menu Protect	**Off** / On
	4. Log Protect	**Off** / On
	5. Log Clear	“Press # key”
	S1. ColorChart [Color Chart]	“Press # key”
	S2. ClearAllMem. [Clear All Memory]	“Press # key”
	S3. Gamma.Calib. [Gamma Calibration]	See the following table for details.
	S4. Printer ID	
	S5. Toner Limiter	See the following table for details.
Print List	1. Config. Page	“Press # key”
	2. Job Log	“Press # key”
	3. Statistics	“Press # key”

2. Media key

1st step	2nd step
1. Paper Tray	**Tray1** / Tray2 / Tray3 / Tray4 / Byps
2. By-pass Size	A3 (L) / B4(L) / **A4(S)** / A4(L) / B5 (S) / B5 (L) / A5(S) / A5 (L) / B6 (L) / A6(L) / 11x17(L) / 8.5x14(L) / 8.5x13(L) / 11x8.5(S) / 8.5x11 (L) / 8.5x5.5(S) / 5.5x8.5(L) / 8x13(L) / 8.25x13 (L)
3. Summary	RC-200 / RWC / RPS / EtherNET

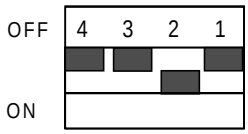
3. Gamma Calibration & Toner Limiter

2nd step	3rd step	4th step	5th step	6th step
S3. Gamma Calib.	1. 2 bit 2. 4 bit 3. 1 bit	1. Test Pattern	"Press # key".	See **NOTE.**
		2. Correction	1 to 32 • Photo / K, C, M, Y / H, M, S, IDm • Letter / K, C, M, Y / H, M, S, IDm	0 to 30 **(15)**
		3. Restore	"Press # key"	
S5. Toner Limiter	Text	Data: 100 to 400 (%) **(180)**		
	Photo	Data: 100 to 400 (%) **(260)**		

4. Color Calibration

2nd step	3rd step	4th step	5th step	6th step
1. Color Calib.	1. 2bit 2. 4 bit 3. 1 bit	1. Test Pattern	"Press # key"	
		2. Calibrate	"Set Pattern on Glass, Press #"	"Complete"
				"Error Press # to Retry"
		3. Restore	"Press # key"	

4.2 DIP SWITCH



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Switch		Function
1	OFF	Boots up from the flash ROM.
	ON	Boots up from the IC card. This switch needs to be turned on when up-grading firmware.
2	ON	Do not touch these switches in the field.
3 - 4	OFF	.

DIP SW2

The controller recognizes the destination of the product from the setting of this switch. When this switch is ON, the controller boots up the system as an overseas version and automatically selects English at the installation or after memory clear. If this switch is OFF, the controller boots up the system as the Japanese version and automatically selects Japanese.

After the language setting is changed from the default after the installation or memory clear, the controller boots up the system based on the setting selected.

4.3 SWITCH (NETWORK INTERFACE BOARD)

The following procedure resets all the network settings to their defaults.

1. Turn on the main switch while pressing SW1. Continue 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 and on to complete the NBRAM 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 are cleared.

4.4 DETAILED SELF-DIAGNOSTICS

4.4.1 SPECIAL TOOL

The controller executes the detailed self-diagnostics for devices including memory, ASIC, and standard parallel interface, which are not diagnosed in the power-up self-diagnostics mode, by using the parallel interface loop-back connector.

Concerning the DIMM and IC card test, the diagnostics are automatically done when these devices are set in their slot.

Part Number	Description	Remarks
G0219350	Parallel Interface Loop-back Connector	For the standard parallel interface board. The detailed self-diagnostics automatically starts after turning the main switch on.

4.4.2 PROCEDURE

1. Make sure that the main switch is tuned off.
2. Install the parallel interface loop-back connector to the parallel interface connector.
3. Check if the device to be checked is set in the slot.
4. Turn the main switch on.

4.4.3 OPERATION PANEL DISPLAY DURING DETAILED SELF-DIAGNOSTICS

Immediately after turning the power on

Same as power-on self-diagnostics (See 2 Detailed Description.)

During the detailed self-diagnostics

When the controller starts the detailed self-diagnostics, only the ON Line LED starts blinking. At this time, the other LEDS turn off.

“Service diag“ is displayed on the first line of the panel screen and the device code, which is now under testing, is displayed in the lower line.

If the test completes normally

If an error is not detected during self-diagnostics, the controller boots up the system and the Data-in LED continues blinking. The configuration page is automatically printed out in color mode after the copier is Ready.

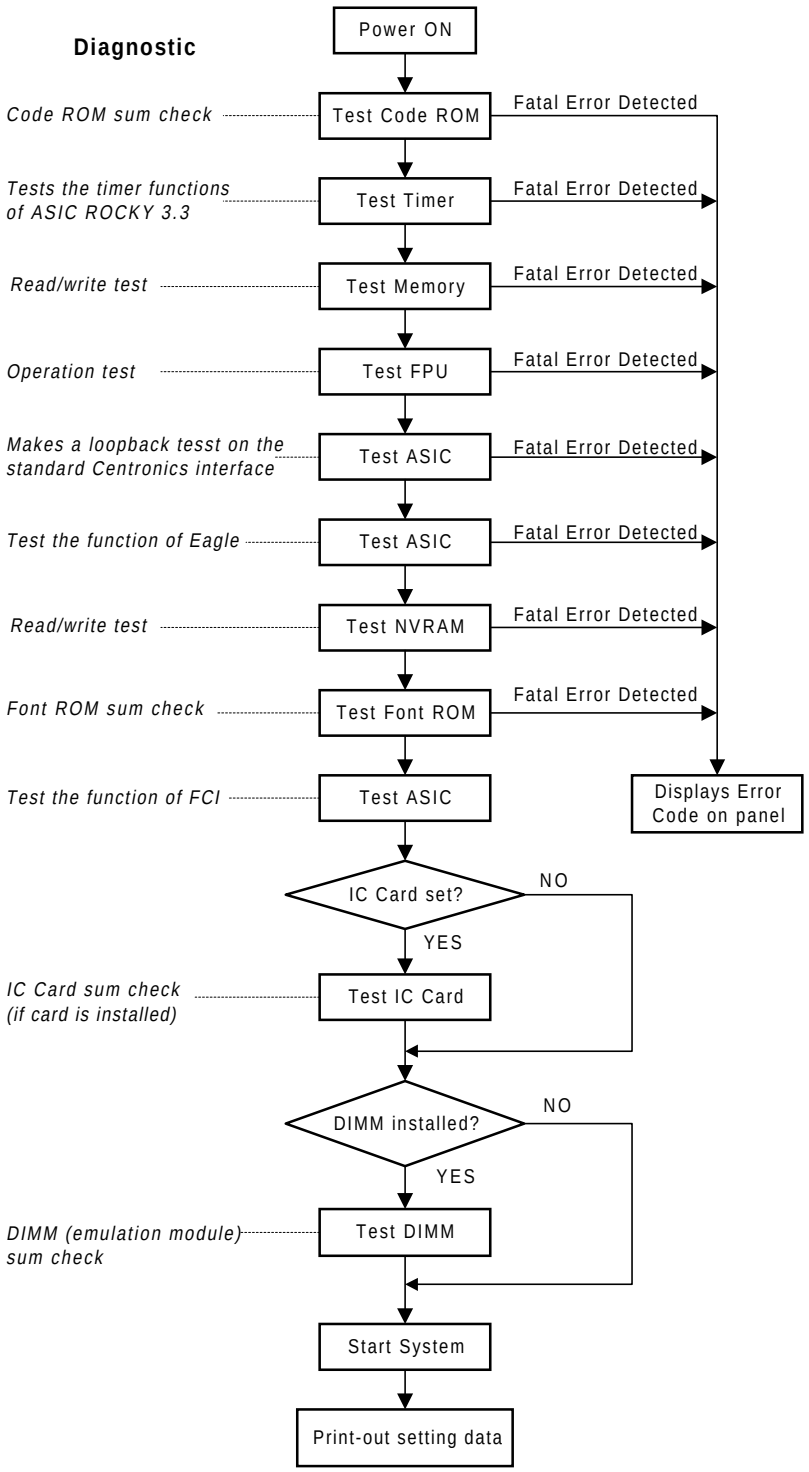
If an error is detected

Non-fatal error (user error) detected

Fatal error detected

Same as power-on self-diagnostics (See “2 Detailed Description”.)

4.4.4 DETAILED SELF-DIAGNOSTICS FLOW CHART



G528M515.WMF

Service Tables

5. REPLACEMENT AND ADJUSTMENT

5.1 GAMMA CORRECTION

NOTE: 1) IDmax in the gamma correction of the controller is accomplished within the IDmax adjusted on the copier. This means that you cannot increase the maximum image density from the controller more than the maximum image density adjusted on the copier.
2) Normally, the ACC on the copier and the Color Calibration on the controller are enough to adjust the color balance to archive the optimum print output. The gamma correction is only required for fine-tuning to meet the user requirements.

The adjustment procedure is almost the same as that on the copier. The gamma data for highlight, middle, shadow areas, and IDmax can be adjusted. The adjustable range is from 0 to 30 (31 steps).

5.1.1 GAMMA ADJUSTMENT PROCEDURE

1. Perform the ACC of the printer mode on the copier.
2. Perform the Color Calibration in all 1-, 2-, and 4-bit modes.
3. Access in the SP mode after the controller is in the Ready condition.
4. Select the “S3. Gamma Calib” and adjust the gamma data.
5. Perform the Color Calibration in all 1-, 2-, and 4-bit modes.
6. Check the result of adjustment did. If not, repeat steps 4 to 6.

3 step	4 step	5 step			6 step
1. 2 bit 2. 4 bit 3. 1 bit	Correction	Photo	K	H / M / S / IDmax	0 to 30 (*15)
			C	H / M / S / IDmax	0 to 30 (*15)
			M	H / M / S / IDmax	0 to 30 (*15)
			Y	H / M / S / IDmax	0 to 30 (*15)
		Letter	K	H / M / S / IDmax	0 to 30 (*15)
			C	H / M / S / IDmax	0 to 30 (*15)
			M	H / M / S / IDmax	0 to 30 (*15)
			Y	H / M / S / IDmax	0 to 30 (*15)

ADJUSTMENT STANDARD (REFERENCE) FOR GAMMA CORRECTION

The following table shows the adjustment standard (reference) of gamma correction in both letter and photo modes. In the table, the level of color scale on the C4 test chart and test page printed in the SP mode of controller is described.

Adjusting the gamma data so that the image density at each level of the color scale on the test page and C4 test chart becomes close, gives a targeted gamma curve for the controller.

Normally, it is not necessary to adjust the gamma data as shown in the table since ACC on the copier and Color Calibration on the controller adjusts the gamma curve automatically. The fine-tuning of color balance by gamma data adjustment will be required only when the result from ACC and Color Calibration does not meet with the customer's requirement.

If the result of the Color Calibration is out of range, ACC might not be performed before the Color Calibration or any maintenance on the copier is required.

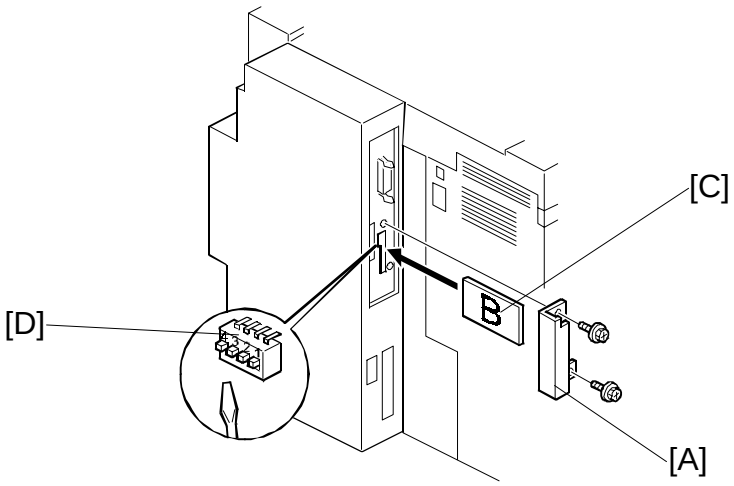
	C4 test chart		1	2	3	4	5	6	7	8	9	10
K	Color Chart	2 bit	-	1	3	5	6	9	11	13	15	16
		4 bit	-	1	3	4	5	9	11	13	16	-
		1 bit	-	1	4	6	7	11	13	15	16	-

	C4 test chart		1	2	3	4	5	6	7	8	9	10
C	Color Chart	2 bit	-	1	2	5	6	9	11	13	14	15
		4 bit	-	1	2	4	6	8	10	11	13	14
		1 bit	-	1	2	4	5	8	10	12	13	14

	C4 test chart		1	2	3	4	5	6	7	8	9	10
M	Color Chart	2 bit	-	1	3	5	6	10	12	14	15	16
		4 bit	-	1	3	5	6	9	11	13	15	16
		1 bit	-	1	2	4	6	10	12	13	16	-

	C4 test chart		1	2	3	4	5	6	7	8	9	10
M	Color Chart	2 bit	1	2	5	7	9	11	13	14	15	16
		4 bit	1	2	5	7	9	11	14	15	-	16
		1 bit	1	2	4	6	8	11	14	15	16	-

5.2 FIRMWARE VERSION UP PROCEDURE



G528R507.WMF

NOTE: 1) The configuration page has to be printed out before upgrading the version.
2) Make sure that the main switch of the copier is always turned off before inserting or removing the IC card.

1. Make sure that the power is off.
2. Remove the IC card cover [A] (2 screws).
3. Insert the IC card [C] in the slot on the controller board so that face **B** of the IC card is as shown.
4. Turn on DIP SW 1 [D] by using a small blade screwdriver.
5. Turn on the main switch of the copier. The controller automatically starts downloading the firmware from the IC card onto the Flash ROM.
   At this time, the panel screen displays the download progress status.

   Status displayed on the screen:

   ERASE – WRITE – VERIFY – OK!!OK!!

   If an error happens, “NG!!NG!!” will be displayed. Turn the main switch off and retry the process by reinserting the IC card.
6. Turn the main switch off after the firmware download is complete. Then, turn off the DIP SW1 and remove the IC card.
7. Reinstall the IC card cover and turn the main switch on.
8. Check if the firmware version is OK by printing the configuration page or in SP mode.

6. TROUBLESHOOTING

6.1 TYPE OF PROBLEMS

The problem can be classified as follows.

1st classification	2nd classification	3rd classification
Operation	• Controller-side Printer Settings • Controller-side Initial Settings • Host-side Application Settings	
Hardware	• Faulty Copier	• Copier • Options • Consumables
	• Faulty Controller	• Controller
	• Hardware Limitations	
Software	• Bug in Controller ROM • Bug in Emulation Module Software • Controller Limitations • Bug in Host-side Application • Host-side Application Limitations	
Operating conditions	• Environment (power, temperature humidity dust, noise, vibration, etc.) • Consumables	

6.2 TROUBLESHOOTING PROCEDURE

6.2.1 HARDWARE TESTS

1. Power-up Self-diagnostics / Detailed Self-diagnostics

Turn on the main switch and check whether non-fatal error or fatal error is detected.

- **No error**
  Print out the configuration page and check which non-fatal error occurred and check the relevant component(s) and/or replace it.
- **Non-fatal error**
  The configuration page is automatically printed out. Check the error code and the relevant component(s) and/or replace it.
- **Fatal error**
  Check the error code and the relevant component(s) and/or replace it.

2. 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?)

6.2.2 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 customers keep.

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

6.2.3 SOFTWARE-RELATED TESTS

Obtain information about the followings:

- PC model
- OS type and version
- Configuration page
- Application software used, and the version
- Data file being printed when the problem occurred (if obtainable)
- RPS2 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
- Copier firmware version (main and scanner)

6.3 STATUS & ERROR MESSAGE

6.3.1 OVERVIEW

The following types of status and error message are shown in the table below. Each type of message displays a different priority on the panel screen. When the controller detects different types of status or errors at the same time, it displays the message that has higher priority. Then the Error indicator will light as shown in the table.

Type of message	Description	Error Indicator	Priority
Internal Error	Controller is out of control.	Light	HIGH
Self-diagnostics Error	Controller detects error during self-diagnostics.	Light	
Controller System Error	Controller cannot work due to a malfunction.	Light	
SC Code (Copier)	Copier cannot be used due to an SC code.	Light	
Warning Error (Copier)	Copier cannot be used due to status error. Controller stops ripping and cancel it depending on the time-out setting.	Light	
System Status	Displays the status message while the copier is warming up.	Not light	
Caution Status (Copier)	Copier can be still used	Light	
Controller Data Read Error	Controller detects that received data is wrong.	Not light	
Emulation Status	Displays the controller status, i.e. “Initializing”, “Waiting”, “Printing” so on.	Not light	LOW

6.3.2 DETAILED MESSAGES

1. Status Messages

Type	Message	Description	Location / Action
System Status	Warming Up	The copier is under the warm-up or process control self-check.	• Wait until the copier is in the ready condition.
	Please Wait	The controller under self-diagnostic mode.	• Wait until the controller is in the ready condition.
Emulation Status	Offline	Controller is offline status. The controller cannot accept or print data.	• Press the Online key to switch the status.
	Initializing	RPS-2 is initializing.	• Initialization of RPS-2 mode
	Ready	The controller is ready for printing job.	• The printer is in ready condition to print.
	Printing	Doing print job.	• Wait for a while. This message appears only in the RPS-2 mode.
	Processing	Print data is being processed.	• Wait for a while.
	Waiting	Controller is waiting for the next data to print.	• Wait for a while.
	Resetting	System is rebooted or print job is now being canceled.	• Wait for a while.
Caution Status	Load Paper	There is no paper in the by-pass table.	• Load the indicated paper in the by-pass table.
	Low on: xxx	Toner indicated (xxx) is almost empty (toner near end condition)	• Replenish indicated toner. • xxx is a color of toner or CMYK combination.
	Add Staples	The staples are almost empty.	• Replenish the staples.
Warning Status	Load YYY	There is no paper indicated (YYY) in the paper tray.	• Load the indicated paper in the paper tray.
	Add Toner xxx	Toner indicated (xxx) is empty (toner end condition).	• Replenish the indicated toner.
	Remove Paper From Duplex Tray	Paper is left in the duplex tray.	• Remove paper from the duplex unit.
	Remove Paper From Sorter	Paper is left in the sorter bins.	• Remove paper from the sorter bins.
	Reset Duplex Tray Correctly	The duplex tray is not installed correctly.	• Reinstall the duplex unit properly.
	Clear Misfeed(s)	Paper jam occurs in the copier.	• Remove the jammed paper according to the display on the copier.

Type	Message	Description	Location / Action
Warning Status	Close Door(s) / Cover(s)	Doors or covers are open.	• Close doors or covers.
	Power Off / On No: XXX	Internal error occurs.	• Turn the main switch off and on. Fix the problem if it still occurs.
	Add Fuser Oil	The oil tank is empty.	• Fix the problem.
	Waste Toner is Full	The used toner tank is full.	
	Call Service SC:99	SC code detected on the copier. Code number is fixed to “99” when the copier detects SC condition.	

2. Controller Error (System or Data Read Error)

Type	Error Code	Description	Location / Action
System Error	A3: Error	Too much data for the I/O buffer to handle	• Check if the interface cable is inserted into the controller and your computer securely. • Check if the interface cable is damaged. • Increase the size of I/O buffer.
	A6: Error	Not enough memory to print one or more pages in the job	• Change the Color Level using the printer driver to set the image resolution to [Fast], or change the Color Level to [1 bit]. Turn on “Image Memory” using the printer’s “System Menu”.
	AB: Error	The controller is unable to process the data of job sent	• Reduce the amount of data being sent to the controller.
	B1: Error	Error in the standard parallel interface	• Check the interface cable is inserted properly or damaged. • Check controller.
	B3: Error	Wrong printer setting	• Reset the controller using “Menu Reset”
	B4: Error	Error in the IC card slot	• Check the IC card or controller.
	B5: Error	Error in RPS2 module	• Reinsert or replace the RPS2 module.
	B7: Error	Error in the network interface board	• Reinsert or replace the network interface board.
Data Read Error	85: Error	Error in standard memory	• Check or replace the controller board.
	86: Error	Wrong printer driver selected / Wrong interface cable used	• Check if the correct printer drive is used. • Check the setting on the driver.
	91: Error	Error in the standard memory	• Check or replace the controller board.
	94: Error	Error in the standard memory	• Check the total memory size setting on the driver.

3. Self-diagnostics error

When a controller self-diagnostic error occurs, the error code is displayed on the first line of the panel screen

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 panel screen indicates the address in which the error occurred.
- For errors other than memory errors, the second line always reads “FFFFFFFF”.

Error Code	Description	Location
00XX	Exception processing error	• Controller Board
0101	Flash ROM sum check error	• Controller Board
0201	Standard memory read/write error	• Controller Board
06XX	CPU exception self-diagnostics error	• Controller Board
0D0X	ASIC timer error	• Controller Board
110X	ASIC Centronics interface error Non-fatal error (printed as B1 in the error log.)	• Controller Board
1401	NVRAM error	• Controller Board
160X	Font ROM error	• Controller Board
1703	IC card error Non-fatal error (printed as B4 in the error log)	• IC card • Controller Board
1B0X	Optional Interface Error	• Controller
250X	Optional emulation module error Non-fatal error (printed as B5 in the error log): 2501 & 2507	• RPS2 module (DIMM) (See **NOTE**.) • Controller Board
400X	FPU error	• Controller Board
460X	FCI error Non-fatal error (printed as B9 in the error log)	• Controller Board
470X	ASIC compression / decompression error	• Controller Board

NOTE: If the DIMM is not properly set in the slot or is defective and if the controller detects it, the controller boots up in IPDL-C mode. In this case, the controller seems to be OK, however, print-jobs fail if customers use RPS2 for printing. It is necessary to check whether the DIMM is properly installed in the slot or defective.

4. INTERNAL ERRORS

When an internal error occurs, the message “Power Off / On” is displayed on the first line of the panel screen. The internal error code, “No. XXYY-ZZZZZZZZ) is displayed on the second line of the panel screen. (“XX” denotes a classification code, “YY” denotes a process number, and “ZZZZZZZZ” denotes the program address where the error occurred.)

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

Code (Part of “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 (C)
19	ROCKY level 2 interrupt (XINT1 or XINT0)
20	ROCKY level 1 interrupt (CBE, DBE, Dtc0, EAGLE, EAGLEErr)
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 communication error