

PRINTER CONTROLLERS
(Machine Code: B516)
SERVICE MANUAL

14 June, 2002
Subject to change

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1. INSTALLATION

1.1 PRINTER CONTROLLER

1.1.1 ACCESSORY CHECK

Check the accessories in the box against the following list:

No.	Description	Q'ty	Note
1	Printer unit	1	
2	PIF unit	1	
3	Bracket – Rear	1	
4	Bracket – PIF	1	
5	Spring plate	2	
6	Earth plate 1	1	
7	Earth plate 2	2	
8	Arrow decal	1	
9	Function decal	1	
10	LAN decal	1	
11	CD ROM – Printer	1	
12	CD ROM – Operation Manual	1	
13	Operating Instructions	1	
14	FCC Label	1	
15	Ferrite Core	1	
16	Screw – M3x6	10	

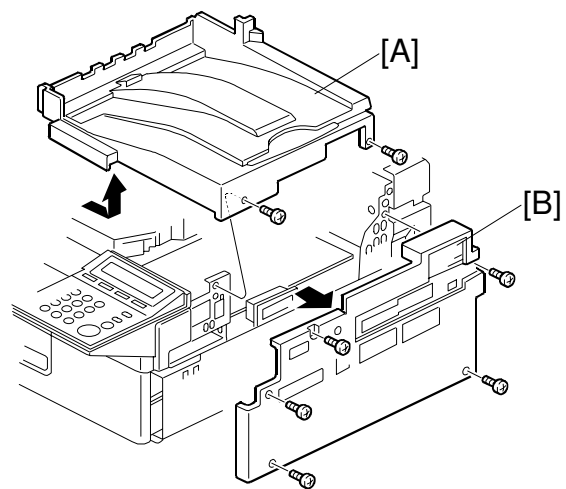
1.1.2 INSTALLATION

⚠ CAUTION

Before installing an optional unit, do the following:

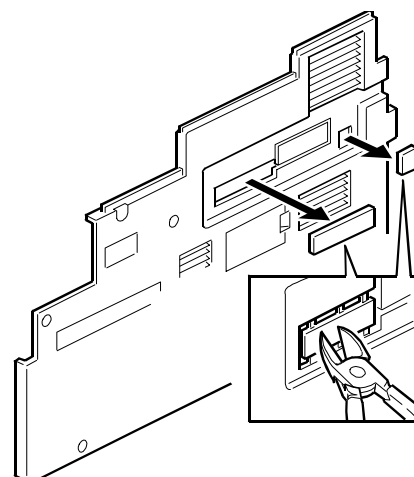
- 1. Print out all messages stored in the memory.**
- 2. Print out the lists of user-programmed items and the system parameter list.**
- 3. Turn off the main switch, and disconnect the power plug.**

1. Remove the upper cover [A] (2 screws) and right cover [B] (5 screws).



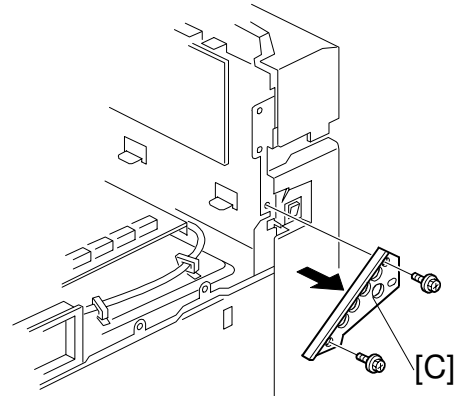
B516I051.WMFF

2. Remove the small cut-out as shown.



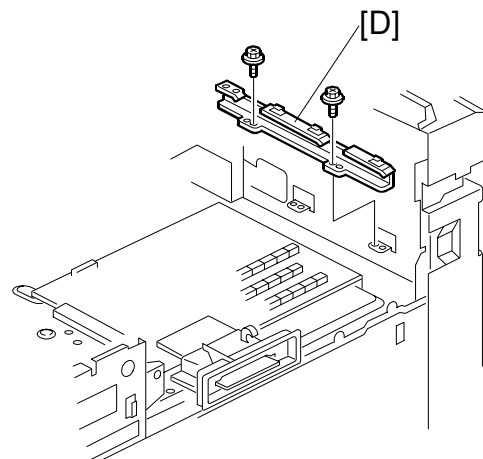
B516I504.WMF

3. Remove the bracket [C] from the right face of the machine.



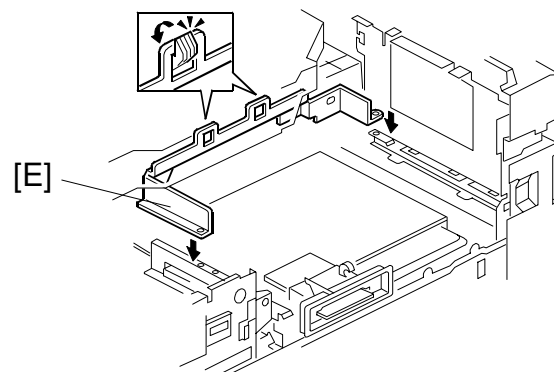
B516I507.WMF

4. Attach bracket [D] as shown (2 screws).



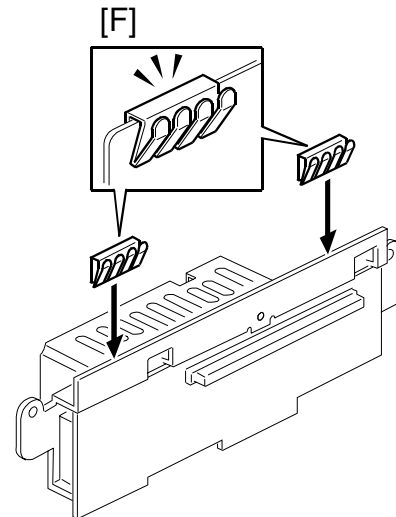
B516I521.WMF

5. Hook the bracket [E] onto the mainframe as shown (without securing the screws).



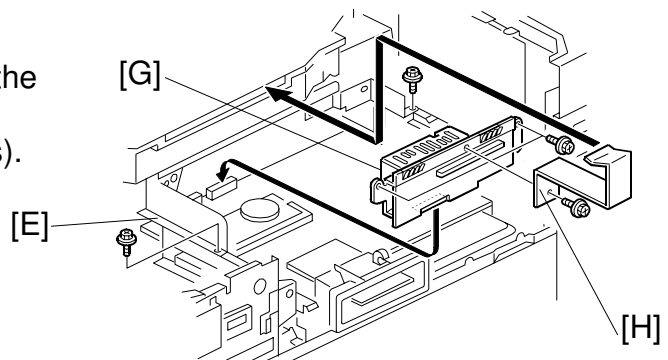
B516I509.WMF

6. Attach the spring plates [F] to the PIF unit.



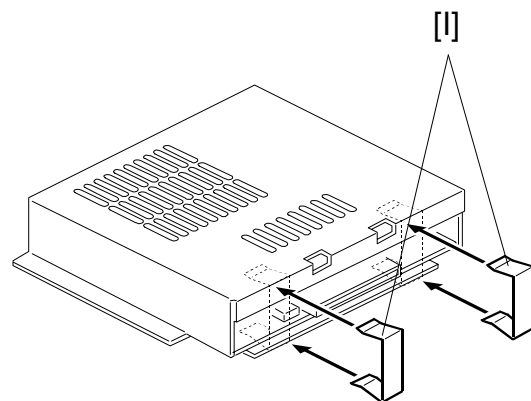
B516I519.WMF

7. Connect the PIF Unit [G] (1 connector, 2 screws) and attach the earth plate [H]. Then secure the bracket [E] from Step 5 (2 screws).



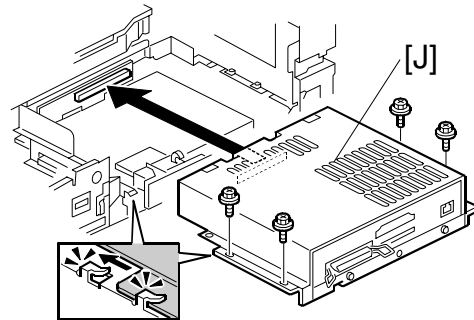
B516I510.WMF

8. Attach the earth plates [I] to the printer unit.



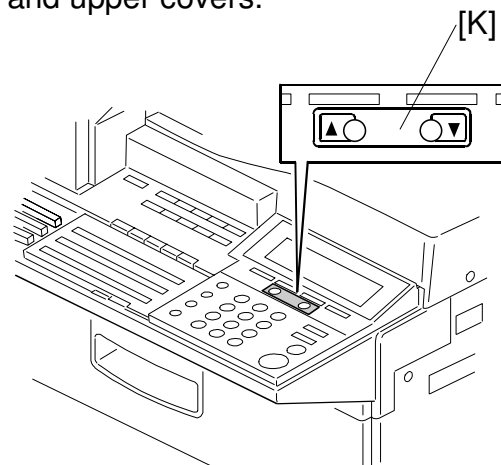
B516I520.WMF

9. Insert the printer unit [J] as shown and connect it to the PIF board (4 screws)



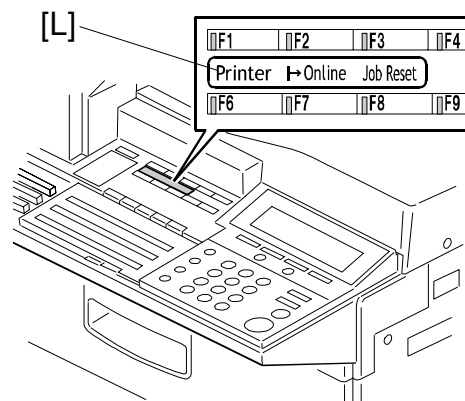
B516I511.WMF

10. Reattach the bracket [C] from step 3, right and upper covers.
11. Affix the decal [K] under the LCD panel as shown.



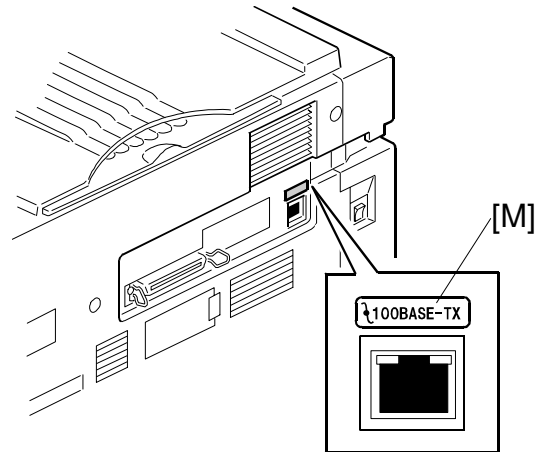
B516I052.WMF

12. Affix the function decal [L] above the user function keys F6-F8 as shown.



B516I053.WMF

13. Affix the LAN connector decal [M] above the LAN connector as shown.



B5161054.WMF

14. Plug in the machine and turn on the main power switch.
15. Program the machine serial number in Service mode, then exit Service mode.
16. Turn the machine off and on 2 times.
17. Print the System Parameter List from inside Service mode, then make sure that "PRINTER INTERFACE" is listed as an option. Then exit Service mode.

1.2 INSTALLING OPTIONAL UNITS

⚠ CAUTION

Before installing an optional unit, do the following:

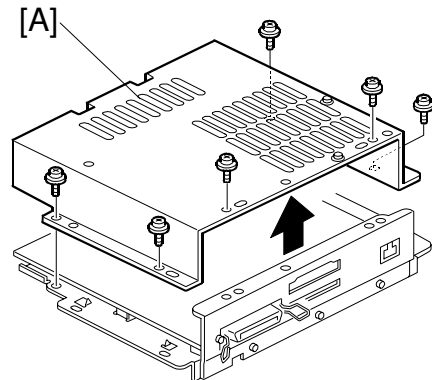
1. Print out all messages stored in the memory.
2. Print out the lists of user-programmed items and the system parameter list.
3. Turn off the main switch, and disconnect the power plug.

Installation

1.2.1 IEEE1394 INTERFACE

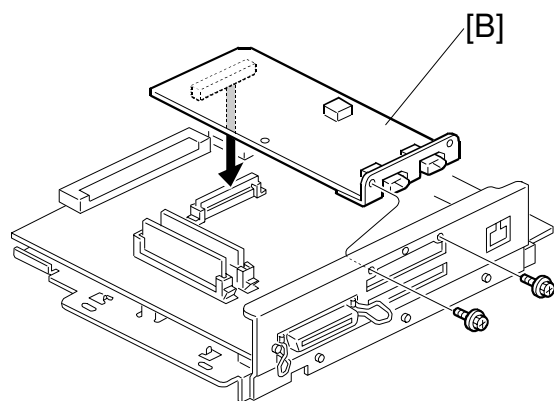
NOTE: The optional IEEE1394 Interface requires total 96MB memory.

1. Remove the printer unit from the machine.
2. Remove the cover bracket [A] as shown (7 screws).



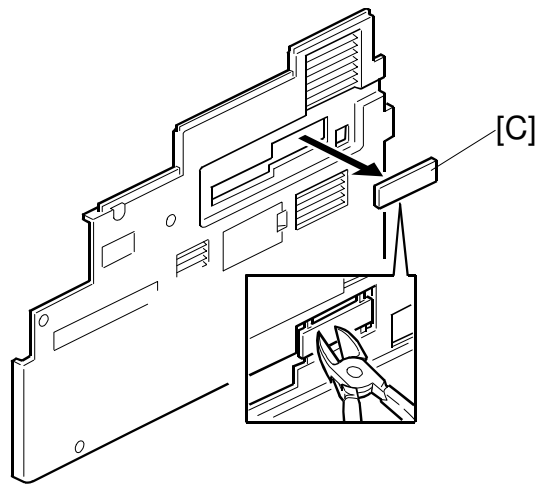
G336I514.WMFF

3. Connect the IEEE1394 board [B] (2 screws) to the controller board.



G336I516.WMFF

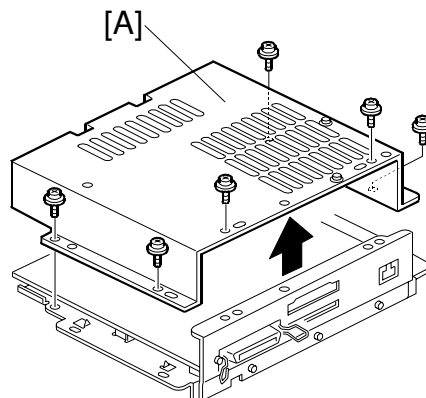
4. Replace the cover bracket.
5. Replace the printer unit in the machine.
6. Remove small cut-out [C] and reattach the right and upper covers.



G336I505.WMF

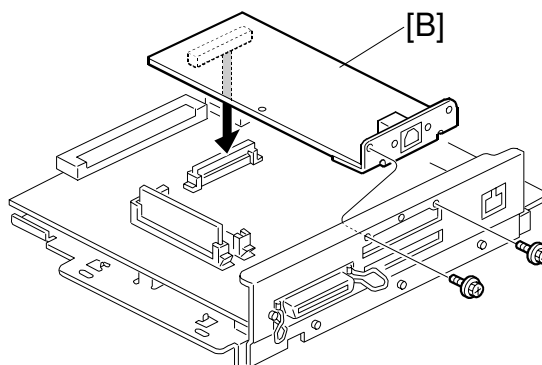
1.2.2 USB 2.0 INTERFACE

1. Remove the printer unit from the machine.
2. Remove the cover bracket [A] as shown (7 screws).



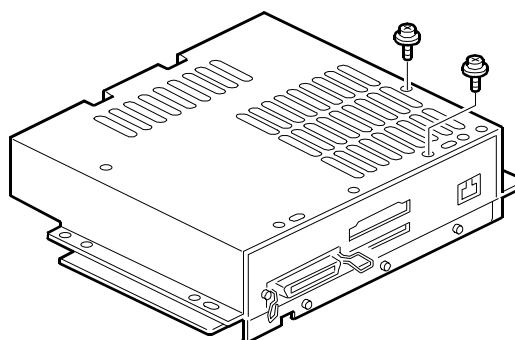
B525I514.WMFF

3. Connect the USB board [B] (2 screws) to the controller board.



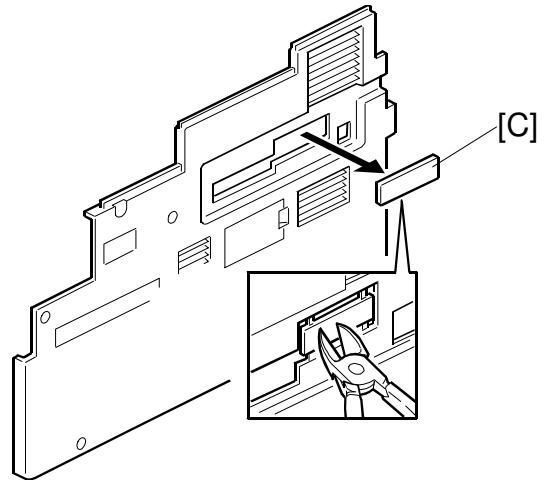
B525I518.WMF

NOTE: Use two screws that are removed from the cover bracket.



B525I050.WMF

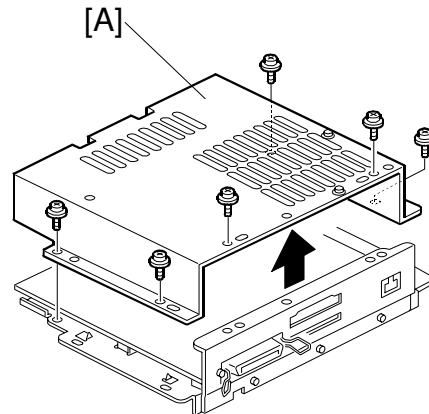
4. Replace the cover bracket.
5. Replace the printer unit in the machine.
6. Remove small cut-out [C] and reattach the right and upper covers.



B525I505.WMF

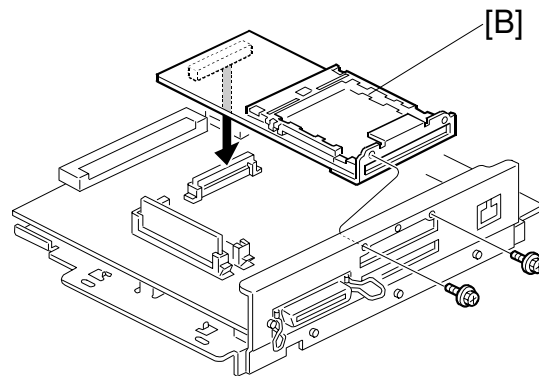
1.2.3 IEEE802.11B INTERFACE

1. Remove the printer unit from the machine.
2. Remove the cover bracket [A] as shown (7 screws).



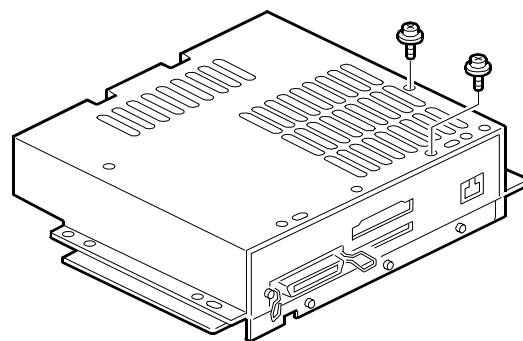
B515I514.WMFF

3. Connect the interface board [B] (2 screws) to the controller board.



B515I517.WMF

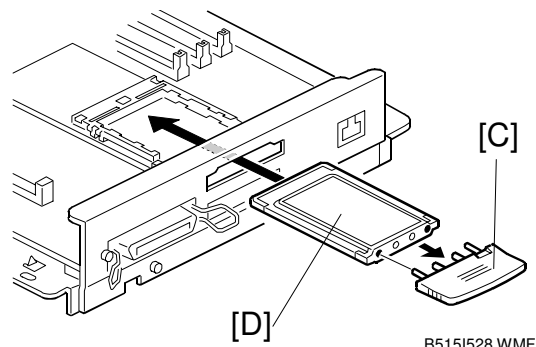
NOTE: Use two screws that are removed from the cover bracket.



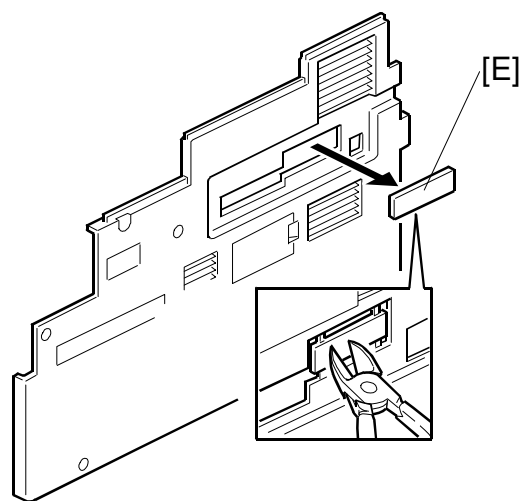
B515I050.WMF

4. Remove the internal antenna [C] and connect the wireless card [D] to the interface board.

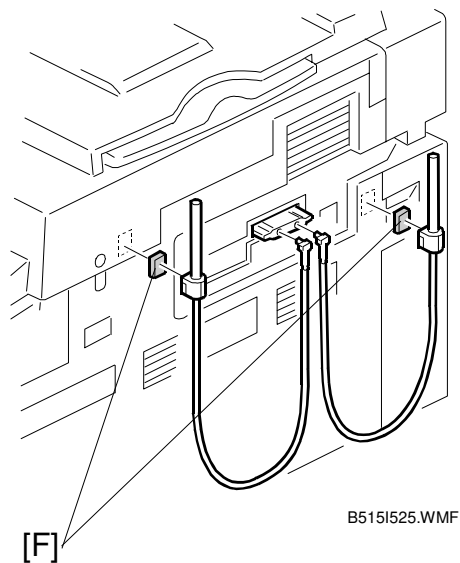
NOTE: Hand the internal antenna to the customer.



5. Replace the cover bracket.
6. Replace the printer unit in the machine.
7. Remove small cut-out [E] and reattach the right and upper covers.

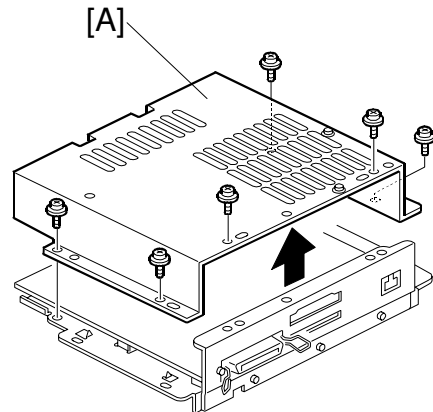


8. Stick the velcro tapes [F] to the right side of the machine and attach the antennas.



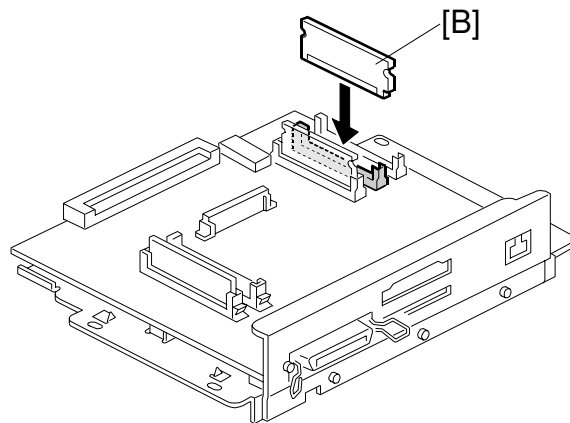
1.2.4 POSTSCRIPT3 DIMM

1. Remove the printer unit from the machine.
2. Remove the cover bracket [A] as shown (7 screws).



G341I514.WMFF

3. Connect the PostScript DIMM [B] to the middle connector as shown.

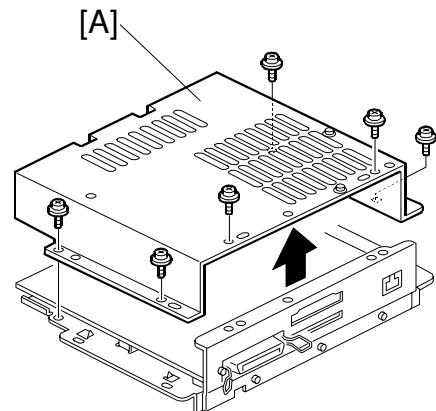


G341I515.WMF

4. Replace the cover bracket.
5. Replace the printer unit in the machine.

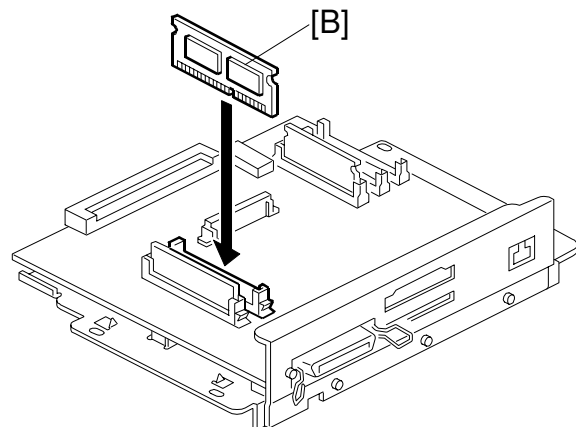
1.2.5 MEMORY UNIT

1. Remove the printer unit from the machine.
2. Remove the cover bracket [A] as shown (7 screws).



G330I514.WMFF

3. Connect the Memory DIMM [B] to the connector as shown.



G330I512.WMF

4. Replace the cover bracket.
5. Replace the printer unit in the machine.

2. TROUBLESHOOTING

2.1 CONTROLLER ERRORS

The following table describes the controller error codes. These codes are displayed at power-on, or after the power-on self diagnostic test, if an error occurs.

CAUTION: Always try turning the main switch off and on and check if the problem persists.

Trouble-
shooting

SC	Symptom	Possible Cause/Required Action
640	Controller to engine communication error.	
	Checksum error detected between the controller and the FCU board.	- Defective controller - Defective PIF board 1. Check the connection between the controller and the PIF board. 2. Replace the PIF board if the error is frequent. 3. Replace the controller board if the error is frequent.
641	Controller to engine communication error.	
	The controller receives no response from the FCU board.	- Defective controller - Defective PIF board 1. Check the connection between the controller and the PIF board. 2. Replace the PIF board if the error is frequent. 3. Replace the controller board if the error is frequent.
670	Engine start-up error	
	The ready signal from the FCU board is not detected.	Defective PIF board. Replace the PIF board.
818	System timeout error	
	System program timeout error detected.	Defective controller Replace the controller if it occurs frequently.
819	Kernel stop error	
	Unexpected CPU error by the ASIC/ RAM full detected.	Defective controller Replace the controller if it occurs frequently.
820	Self-diagnostic error – CPU	
	CPU error detected during self-diagnostic.	Defective controller Replace the controller if the error is frequent.
821	Self-diagnostic error - ASIC/CPU	
	ASIC and CPU timer error detected during self-diagnostic.	Defective controller Replace the controller if the error is frequent.

SC	Symptom	Possible Cause/Required Action
823	Self-diagnostic error – Network Interface	
	Network Interface error detected during self-diagnostic.	Defective controller Replace the controller.
824	Self-diagnostic error – NVRAM	
	NVRAM error detected during self-diagnostic.	- Poor NVRAM connection - Check if the NVRAM is properly installed. - Replace the NVRAM
827	Self-diagnostic error - standard SDRAM	
	Standard SDRAM (memory) error detected during self-diagnostic.	Defective controller Replace the controller if the error is frequent.
828	Self-diagnostic error - Flash ROM	
	Flash ROM error detected during self-diagnostic.	Defective controller Replace the controller if the error is frequent.
829	Self-diagnostic error – Optional RAM	
	Memory RAM error detected during self-diagnostic.	- Poor connection of the optional memory - Defective memory RAM - Check the connection of the optional memory. - Replace the memory DIMM.
835	Self-diagnostic error - Parallel interface	
	Parallel interface error detected during self-diagnostic.	Defective controller Replace the controller.
836	Self-diagnostic error - Font ROM	
	The data in the font ROM on board is damaged.	- Defective font ROM. - Turn the main switch off and on. - Replace the controller board.
837	Self-diagnostic error - Optional PS3 ROM	
	The data in the PS3 ROM (optional ROM-DIMM) is damaged.	- Defective optional PS3 ROM-DIMM. - Turn the main switch off and on. - Replace the optional PS3 ROM-DIMM.
850	Network interface error	
	Network interface error detected.	Defective controller Replace the controller.
851	IEEE1394 interface error	
	IEEE1394 interface error detected.	Defective controller Replace the controller.

SC	Symptom	Possible Cause/Required Action
853	IEEE802.11b error - card not detected (power-on)	
	Wireless LAN card not detected at power-on.	- Poor connection - Defective wireless LAN card - Defective controller - Check the wireless LAN card connection. - Replace the wireless LAN card.
854	IEEE802.11b error - card not detected (during operation)	
	Wireless LAN card not detected during operation.	- Poor connection - Defective wireless LAN card - Defective controller - Check the wireless LAN card connection. - Replace the wireless LAN card.
855	IEEE802.11b error	
	Wireless LAN card error detected.	- Poor connection - Defective wireless LAN card - Defective controller - Check the wireless LAN card connection. - Replace the wireless LAN card.
856	IEEE802.11b interface board error	
	Wireless LAN interface board error detected.	- Poor connection - Defective wireless LAN interface board - Check the wireless LAN interface board connection. - Replace the interface board.
857	USB I/F Error	
	USB interface error detected.	- Defective controller - Check the USB connections, make sure that they are securely connected. - Replace the controller board.
990	Unexpected software error	
	Unexpected software error detected.	Defective controller Replace the controller if the error is frequent.
991	Unexpected software error	
	Unexpected software error detected, which does not affect operation of the machine.	The machine does not stop and the SC code is not displayed. The machine automatically recovers. However, the SC code is logged in the summary sheet (SMC).

SC	Symptom	Possible Cause/Required Action
998	Application start error	
	No applications start within 60 seconds after the power is turned on.	• Loose connection of RAM-DIMM, ROM-DIMM • Defective controller • Software problem 1. Turn the main switch off and on. 2. Check if the RAM-DIMM and ROM-DIMM are properly connected. 3. Reinstall the controller system firmware. 4. Replace the controller.
999	Software update error	
	Software updating failed.	• Controller DIP SW1 setting incorrect. • Defective software on IC card. • Controller software download error. 1. Try downloading the controller firmware again. 2. Replace the controller.

NOTE: If a problem always occurs in a specific situation (for example, same printer driver settings, same image file), the problem may be caused by a software error. In this case, send the following data and information to your product specialist.

- Symptom/Possible causes/Action taken
- Summary sheet (SP mode '1 Service', [Print Summary])
- SMC All (SP5-990-002)
- Logged data (SP5-990-004)
- Printer driver settings used when the problem occurs
- All data displayed on the screen (SC code, error code, and program address where the problem is logged.)
- Image file which causes the problem, if possible

2.2 LEDS AND TEST POINTS

LEDs and test points are not used for this option (except for the Network Interface section 4.3).

3. SERVICE TABLES

3.1 SERVICE PROGRAM MODE

CAUTION

Before accessing the service menu, do the following:

Confirm that there is no print data in the printer buffer (the Data In LED must not be lit or blinking).

If there is some data in the buffer, wait until all data has been printed.

3.1.1 ENABLING AND DISABLING SERVICE PROGRAM MODE

Entering the Service Mode

Press the “Up/Down arrow” keys together for about 5 seconds, then press the “Enter” key.

Accessing the Required Program

Use the “Up/Down arrow” keys to scroll through the menu listing.

1. Service: Controller service modes
2. Engine: Engine service modes
3. End: Exit service mode

To select an item, press the “Enter” key. Then the sub-menu will appear.

Scroll through the sub menu items using the “Up/Down arrow” keys.

To go back to a higher level, press the “Escape” key.

Inputting a Value or Setting for a Service Program

Enter the required program mode as explained above. The setting appearing on the display is the current setting.

Select the required setting using the “Up/Down arrow” keys, then press the “Enter” key. The previous value remains if the “Enter” key is not pressed.

Exiting Service Mode

Select “3. End” from the service mode main menu, then press the “Enter” key.

NOTE: To make the settings effective, turn the main switch off and on after exiting service mode.

3.2 PRINTER SERVICE MODE

3.2.1 SERVICE MODE TABLE

Service Table Key

Notation	What it means
[range / default / step]	Example: [-9 ~ +9 / +3.0 / 0.1 mm step]. The setting can be adjusted in the range ± 9 , value reset to +3.0 after an NVRAM reset, and the value can be changed in 0.1 mm steps with each key press.
<i>italics</i>	Comments added for your reference.
*	This value is stored in NVRAM. After a RAM reset, the default value (factory setting) is restored.
DFU	Denotes "Design or Factory Use". Do not change this value

SP No.	Description	Function and Setting
1001	BitSw#1 Set	Adjusts bit switch settings. Note: Currently the bit switches are not being used.
1003	Clear Setting	Not used
1004	Print Summary	Prints the service summary sheet (An error log is printed in addition to the configuration page).
1005	Display Version	Displays the version of the controller firmware.

3.2.2 SP MODES RELATED TO THE PRINTER CONTROLLER

SP5-XXX (Mode)

5	Mode No. (Class 1, 2, and 3)		Function / [Setting]
024*	[mm/inch display]		
	1	mm/inch display selection	Display units (mm or inch) for custom paper sizes. 0: mm (Europe/Asia) 1: inch (USA)
046*	[RomUpdateDisp] ROM Update Display		
	1	ROM Update	Enables or disables the ROM Update utility. DFU [0 or 1 / 1 / -] • 0: Enabled • 1: Disabled
401*	[UlimitAutoSet] User Limited Auto Set		
	44	UlimitAutoSet	Activates the auto user code registration function (prints are counted and logged for each user code and the counts can be viewed with SmartNetMonitor). [0 ~ 1 / 1 / 1/step] 0: Inactivated • 1: Activated
404	[UCodeCtrClr] Use Code Counter Clear		
	UcodeCtrClr		Clear all counters for users. [0 ~ 0 / 0 / 0/step]
801	[Memory Clear]		
	1	All	Clears the settings from the NVRAM and initializes the settings. [0 ~ 0 / 0 / 0/step]
	3	SCS (System Control Service)	Clears the system settings. [0 ~ 0 / 0 / 0/step]
	4	IMH (Image Memory Handler)	Clears IMH data. DFU [0 ~ 0 / 0 / 0/step]
	5	MCS (Memory Control Service)	Clears MCS data. DFU [0 ~ 0 / 0 / 0/step] • MCS is for network settings.
	8	PRT	Clears the user tool settings. [0 ~ 0 / 0 / 0/step]
811	[Machine Serial] Serial Number Display		
	2	Controller S/N	Display the machine serial number
812*	[FAX TEL No.]		
	1	TEL No.	Sets the fax or telephone number for a service representative by using the enter key and the down arrow key. [0 ~ 0 / 0 / 0/step] Both numbers and alphabetic characters can be input.
	2	FAX TEL No.	

5	Mode No. (Class 1, 2, and 3)	Function / [Setting]
828*	[Network] Job spool settings/	Interface selection for Ethernet and wireless LAN
	71 Primary I/F	Interface selection for the Ethernet or wireless LAN when both interfaces are available. 0: Ethernet 1: IEEE802.11b (wireless LAN) Note: This setting is same as the user mode setting "LAN Type" in the Network Setup of the Host Interface menu.
	72 Current I/F	Displays the current interface setting (Ethernet or wireless LAN).
839	[IEEE1394]	
	4 Device Name	Displays the 1394 device name.
	7 Cycle Master	DFU
	8 BCR Mode	DFU
	9 IRM 1394a Check	DFU
	10 Unique ID	DFU
	11 Logout	DFU
	12 Login	DFU
	13 Login MAX	DFU
840	[IEEE802.11b]	
	4 SSID.	Displays the current SSID.
	6 Channel Max setting	Sets the maximum and minimum value for the wireless LAN channel adjustment. DFU [0 to 14] USA: 1 to 11 Note: Do not change the setting, or the machine may be out of compliance with local regulations.
	7 Channel Min setting	
844*	[USB] USB settings	
	1 Transfer Rate	Adjusts the USB transfer rate. HS/FS Auto: High speed/Full speed auto adjust (480Mbps/12Mbps) FS Fixation: Full speed (12Mbps fixed) Do not change the setting unless there is a data transfer error using the USB high speed mode.
	2 Vendor ID	Displays the vendor ID. DFU
	3 Product ID	Displays the product ID. DFU
	4 Dev. Release Num	Displays the development release version number. DFU
907*	[Plug/Play]	
	1 Plug/Play	Specifies the Plug and Play setting. [0 ~ 3 / 0 / 1 /step] • 0: Ricoh • 1: Gestetner • 2: SAVIN • 3: LANIER

5	Mode No. (Class 1, 2, and 3)		Function / [Setting]
970	[DebugSerial]		
	1	DebugSerial	[0 ~ 0xff / 0x00 / 0 /step] DFU
990	[SP print mode]		
	1	SP all print	Prints SP setting data.
	2	SP mode print	[0 ~ 255 / 0 / 0 /step]
	4	Logging Data	• SP all print: All items printed out with SPs 5-990-2, -4, -5, and -7. • SP mode print: All SP mode settings
	5	Diag Report	
	7	NIB Summry	

SP7-XXX (Data Log)

7	Mode No. (Class 1, 2, and 3)		Function / [Setting]
003*	[Print Counter]		
	1	Total Print	Displays the values of the color counters. [−9999 to 9999999 / 0 / 1/step]
	4	Print Mode	
401*	[SC Counter]		
	1	SC Counter	Displays how many times SC codes have been output. [0 ~ 9999 / 0 / 0 time/step]
807	[SC/Jam Clear]		
	1	SC/Jam Clear	Clears the counters related to SC codes and paper jams. [0 ~ 1 / 0 / 0 /step]
832	[Diag. Result]		
	1	Diag. Result	Displays the result of the diagnostics. Refer to section XXX for the error codes. [0 ~ 0 / 0 / 0 /step]
836	[Ttal Capacity]		
	1	Memory Capacity	Displays the capacities of memory on the main controller board.
901	[Assert Info] Assert Information		
	1	File Name	Records the location where the last problem (SC990) was detected in the program. The data stored in this SP is used for problem analysis. [0 ~ 0 / 0 / 0 /step]
	2	# of Lines	
	3	Location	
910	[Firmware PN] Firmware Part Number display		
911	[Firmware Ver] Firmware Version display		

3.3 FIRMWARE UPDATE PROCEDURE

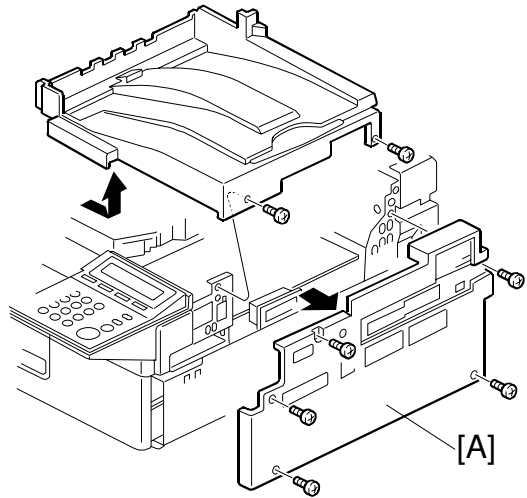
⚠ CAUTION

Be sure to do the following before installation an optional unit.

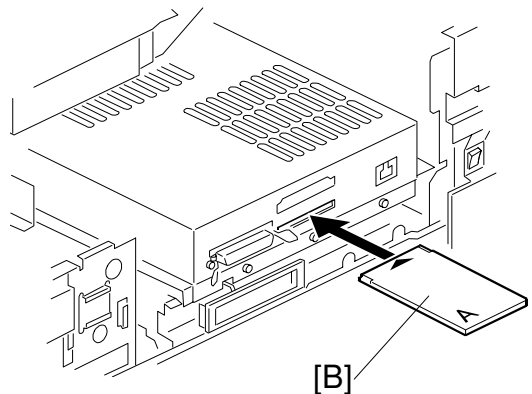
1. Print out all messages stored in the memory.
2. Print out the lists of user-programmed items and the system parameter list.
3. Do not turn off the machine while downloading the firmware.



1. Turn off the main power switch.
2. Remove the cover [A].
3. Insert the IC card [B] containing the software you wish to download into the card slot of the controller.
4. Turn on the main power.
5. Follow the instructions displayed on the operation panel
6. Monitor the downloading status on the operation panel.
 - While downloading is in progress, the panel displays "Writing". When downloading has been completed, the panel displays "Completed".
 - The Start key lights red while downloading is in progress, and then lights green again after downloading is completed.
7. After confirming that downloading is completed, turn off the main power and remove the IC card.
8. If more software needs to be downloaded, repeat steps 1 to 7.
9. Turn the main power on and confirm that the new software loads and that the machine starts normally.



H310I051.WMF



H310I529.WMF

ERROR RECOVERY

If a download attempt failed, you must boot up the machine from the IC card. To do this, DIP SW 1 on the controller board needs to be ON. The machine automatically starts upgrading the firmware.

3.4 SELF DIAGNOSTIC TEST

In addition to the power-on self test, you can set the machine in a more detailed diagnostic mode to test other components and conditions. It requires a loop-back connector (P/N: G0219350).

1. Turn off the machine and attach the loop-back connector to the parallel interface.
2. Turn on the machine while pressing the “On Line” key and “# Enter” key together.
3. The machine prints the diagnostic report automatically.
 - Refer to section 7.1.2 of the main unit service manual for how to check the error codes (SP 7-832).

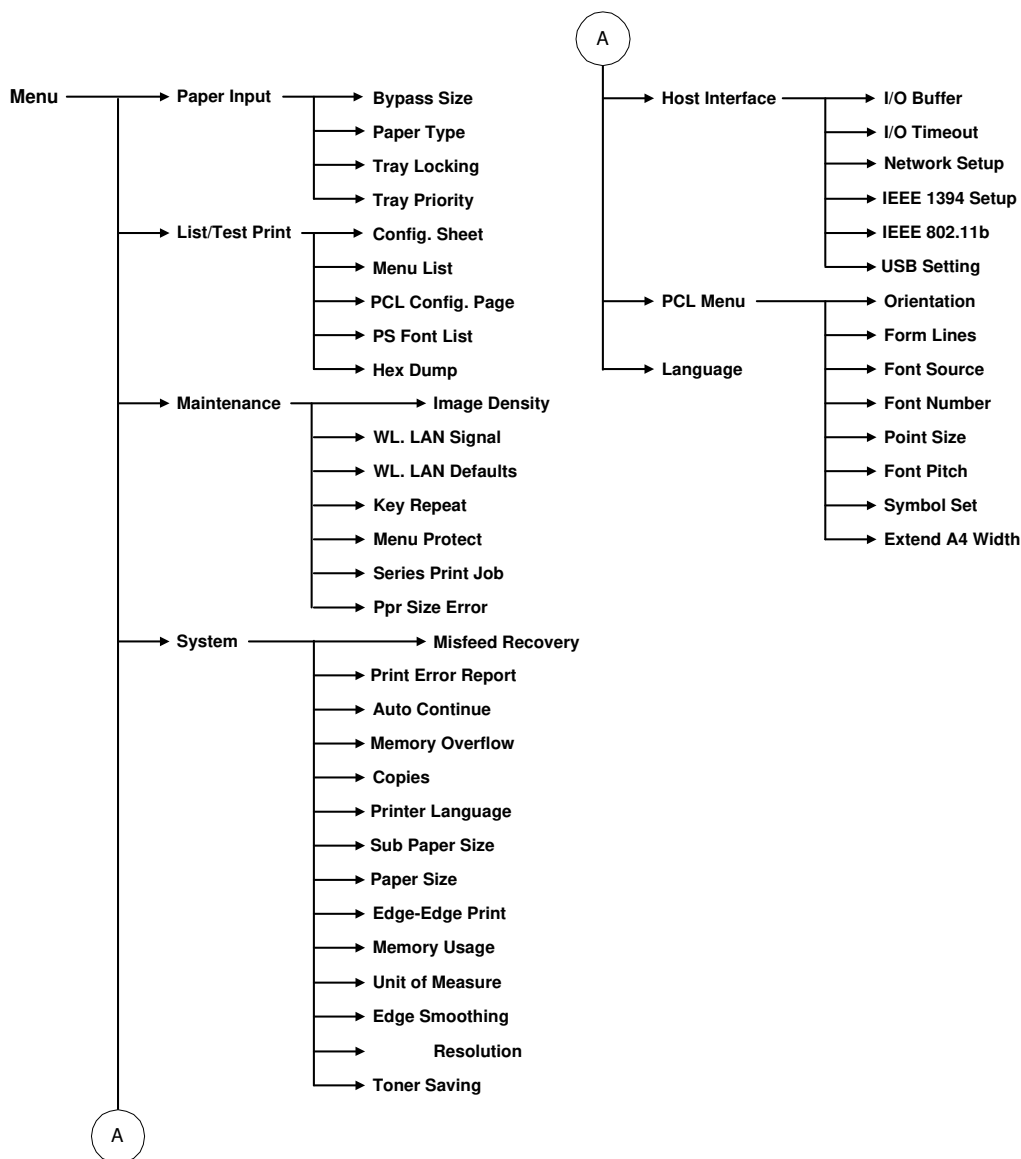
3.5 USER PROGRAM MODE

3.5.1 PRINTER USER PROGRAM MODE

Press the “Printer” key on the operation panel to enter the printer mode. Press the “Menu” button and use the “Up/Down arrow” keys to scroll through the menu listing. To go back to a higher level, press the “Escape” key. After changing the settings, press the “On Line” key.

The user menu list can be printed using “Menu List” in the “List/Test Print” user mode.

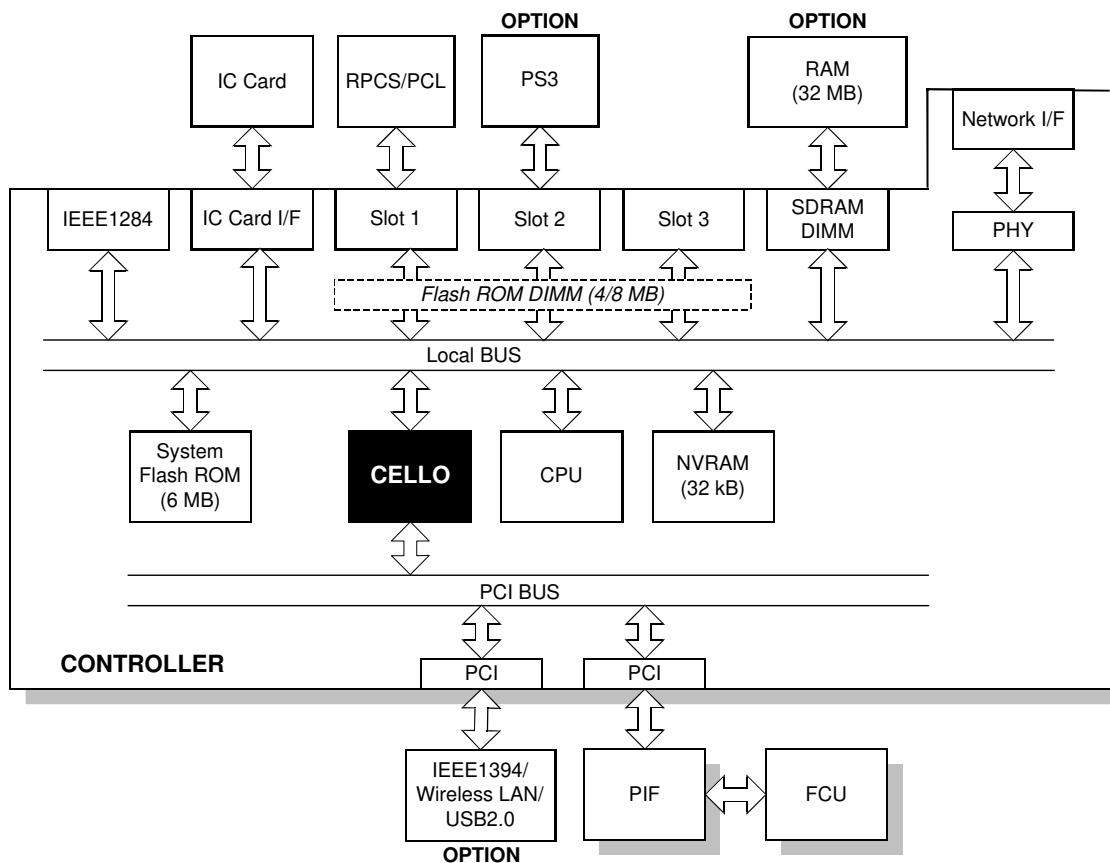
User Mode Tree



B516S900.WMF

4. DETAILED SECTION DESCRIPTIONS

4.1 OVERVIEW



Detailed Descriptions

B516D500.WMF

This machine uses the GW architecture, which allows the controller board to control all applications. To enable the application, just install the appropriate ROM DIMM on the controller.

CPU:	PMC RM5261
CELLO:	GW architecture ASIC. It controls all the functions of the controller board.
Flash ROM:	8MB Flash ROM for the system program
SDRAM DIMM (2 slots):	32 MB SDRAM (resident), expandable with 64 MB optional SDRAM. (Maximum 96MB) Slot1 – 32MB Slot2 – 64MB
NVRAM:	Stores the controller settings
PCI Interface:	Options such as USB2.0, IEEE1394, and Wireless LAN are installed. Only one of these three options can be installed at the same time.
IEEE1284	Supports compatible, nibble, and ECP modes
Network Interface:	100BASE-TX/10BASE-T
PIF	Interface board between the printer controller and the FCU.

4.2 CONTROLLER FUNCTIONS

4.2.1 PAPER SOURCE SELECTION

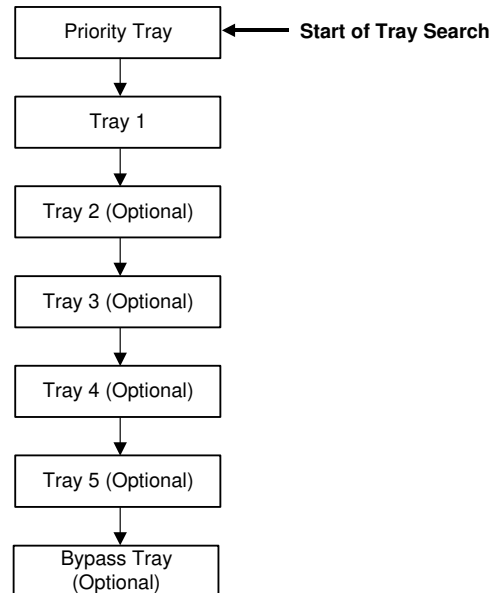
Tray Priority (Auto Tray Select)

The Tray Priority setting determines the start of the tray search when the user selects “Auto Tray Select” with the driver. The machine searches for a paper tray with the specified paper size and type.

When no tray contains paper that matches the paper size and type specified by the driver, the controller stops printing until the user loads the correct paper.

The Tray Priority setting can be specified using the Paper Size Setting in the user tools. (User Tools/ System Settings/ Paper Size Settings)

NOTE: The by-pass tray is not part of the tray search.



B516D501.WMF

Tray Lock

If Tray Lock is enabled for a tray, the controller skips the “locked” tray in the tray search process.

The Tray Lock setting can be specified by selecting “No” for the “Apply Auto Paper Select” setting in the Paper Size Setting screen in the user tools. (User Tools/ System Settings/ Paper Size Settings)

NOTE: The by-pass feeder cannot be locked.

Manual Tray Select

If the selected tray does not have the paper size and type specified by the driver, the controller stops printing until the user loads the correct paper.

4.2.2 AUTO CONTINUE

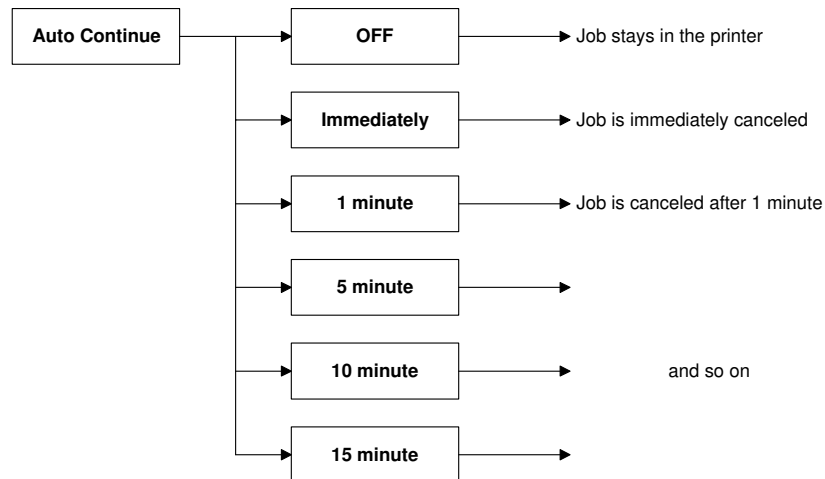
When this function is disabled, the machine stops printing and cancels the print job if there is no paper tray which matches the paper size and paper type specified by the driver.

If Auto Continue is enabled, the machine waits for a specified period (0, 1, 5, 10, 15 minutes) for the correct size paper to be set in the tray, then cancels the print job if the interval expires.

- The interval can set with the Printer Settings in the user tools.
(User Tools/ Printer Settings/ System/ Auto Continue)

If Auto Continue is disabled, the machine will not print the job, but will not cancel it, so the job stays in the print queue.

If no paper tray matches the paper size and paper type specified by the driver:



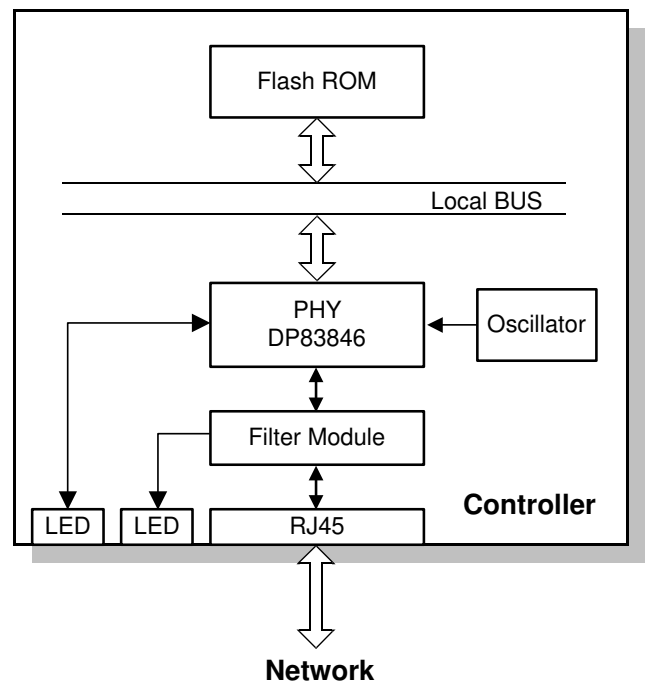
B516D505.WMF

Detailed
Descriptions

NOTE: The default setting for Auto Continue is “Off.”

4.3 NETWORK INTERFACE

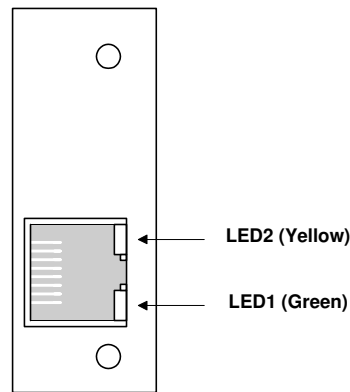
4.3.1 BLOCK DIAGRAM



B516D503.WMF

- The Flash ROM contains the NIB firmware. The firmware can be upgraded using an IC card connected to the controller board.

4.3.2 LED INDICATORS



B516D506.WMF

Description	On	Off
LED1 (Green): Link status	Link success	Link failure
LED2 (Yellow): Data rate	100 Mbps	10 Mbps

4.4 IEEE1394 INTERFACE

4.4.1 SPECIFICATIONS

Hardware Specification

Interface: IEEE1394 (6 pins)
 (no power supply, cable power repeated, IEEE1394a-2000 compliant)
 Ports: 2 ports
 Data rates: 400Mbps/200Mbps/100Mbps

System Requirements

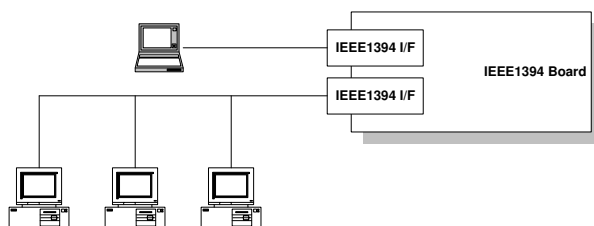
PC: Windows PC with IEEE1394 port
 OS: Microsoft Windows 2000 upgraded with service pack 1
 Cable length: 4.5m (15ft)

4.4.2 IEEE1394

IEEE1394, also known as FireWire (a name patented by Apple), is an easy-to-use peer-to-peer networking technology allowing speeds of up to 400 Mbps.

The current standard contains the following features, which are supported in most devices:

- Hot swapping (cables can be connected and disconnected while the computer and other devices are switched on)
- Peer-to-peer networking (no hub required)
- No terminator or device ID is required, unlike SCSI
- Automatic configuration of devices upon start-up, or “plug and play.”
- Real-time data transfer at 100, 200, and 400 Mbps
- Common connectors for different devices

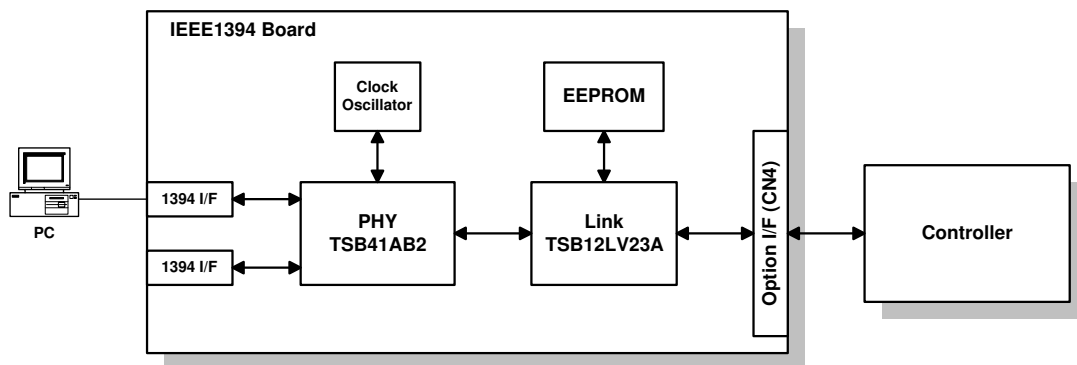


B516D507.WMF

The cable length is limited to 4.5 m (15ft). However, up to 16 cables and 63 devices can be connected to an IEEE1394 network.

IEEE1394 cables can be either 4-pin (data only) or 6-pin (data and power). IEEE1394 allows either 6-pin or 4-pin connectors. However, this machine only uses the 6-pin connectors. The machine has two 6-pin ports.

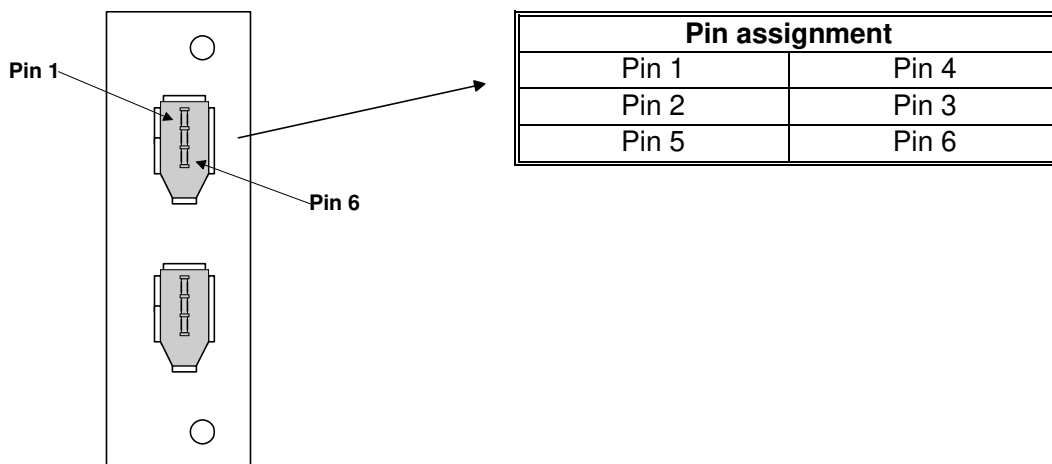
4.4.3 BLOCK DIAGRAM



B516D508.WMF

- PHY: Physical layer control device
- Link: Link layer control device
- EEPROM: 256-byte ROM

4.4.4 PIN ASSIGNMENT



B516D509.WMF

Pin No.	Signal Description
1	Cable Power
2	GND
3	Receive strobe
4	Transmit data
5	Receive data
6	Transmit strobe

4.4.5 REMARKS ABOUT THIS INTERFACE KIT

Note the following points about this unit.

- The machine does not print reports specifically for IEEE1394. Just print the Configuration Page at installation to check that the machine recognizes the card.
- There is no spooler or print queue. If a computer tries to print over the IEEE1394 while the printer is busy, the IEEE1394 interface card inside the printer will return a busy signal.
- After starting a job using IEEE1394, do not switch the printer off until the job has been completed. Even though the printer may appear to be dead, it may be in the middle of an IEEE1394 protocol exchange with the computer.
- When using IEEE1394, it is not possible to check the printer status from the computer with a utility such as Printer Manager for Client.

4.4.6 TROUBLESHOOTING NOTES

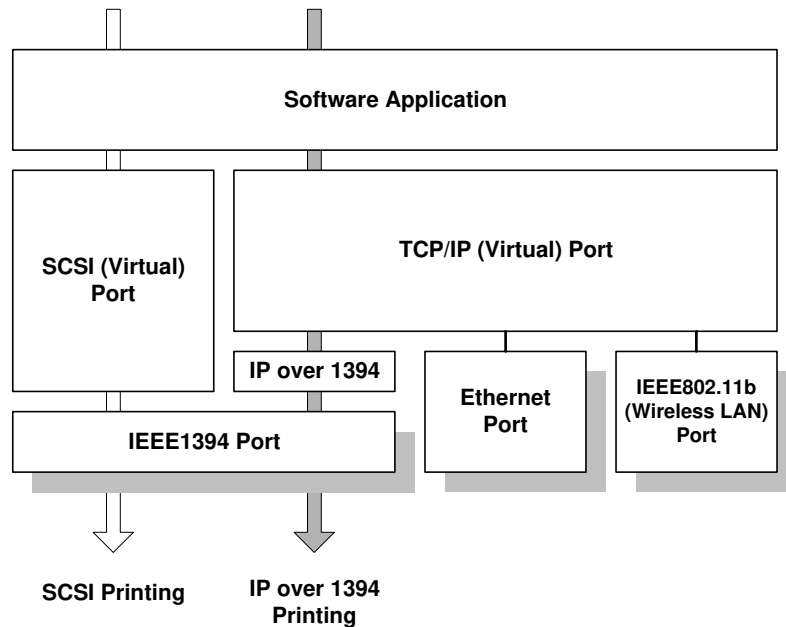
If there are problems printing using the IEEE1394 interface, check the following.

- Is the computer using Windows 2000 with service pack 1?
- Has the interface card been replaced recently? Each card has an individual address, similar to the MAC address in an Ethernet card. If the card was changed, the driver cannot find the old card. The new card is another device and a new printer appears in Windows Control panel, and this must be configured in the same way as the printer that was replaced (the old printer icon in Windows Control Panel should be deleted) has to be reconfigured.
- Is there a loop somewhere in the network? An IEEE1394 network must be a chain or a branched chain. There can be no loops.
- Try to find out where in the chain the problem is occurring. Test the machine one-to-one with the computer to determine if the printer is defective (when the printer's interface cable is plugged in, the computer should see 'Printer Ready'; when the cable is disconnected, the computer should see 'Offline').

4.4.7 IP OVER IEEE1394

This machine supports IEEE1394 printing by setting an IP address. This feature is called 'IP over 1394'.

The former IEEE1394 printing without IP address is known as 'SCSI printing'.



B516D510.WMF

NOTE: 1) Windows XP is the only OS which supports IP over 1394.
2) Windows XP and 2000 supports IEEE1394 SCSI printing.

4.5 USB

4.5.1 SPECIFICATIONS

This model is equipped with standard USB.

Interface: USB 1.1, USB 2.0

Data rates: 480 Mbps (high speed), 12 Mbps (full speed), 1.5 Mbps (low speed)
High-speed mode is only supported by USB 2.0.

4.5.2 USB 1.1/2.0

USB (Universal Serial Bus) offers simple connectivity for computers, printers, keyboards, and other peripherals. In a USB environment, terminators, device IDs (like SCSI), and DIP switch settings are not necessary.

USB 1.1 contains the following features:

- Plug & Play
- Hot swapping (cables can be connected and disconnected while the computer and other devices are switched on)
- No terminator or device ID required
- Data rates of 12 Mbps (full speed), and 1.5 Mbps (low speed)
- Common connectors for different devices

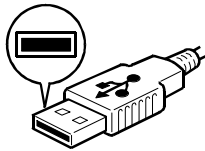
USB 2.0 is a successor to the USB 1.1 specification. It uses the same cables, connectors, and software interfaces. It provides an easy-to-use connection to a wide range of products with a maximum data rate of 480 Mbps (high speed).

Up to 127 devices can be connected and six cascade connections are allowed. Power is supplied from the computer and the maximum cable length is 5 m.

4.5.3 USB CONNECTORS

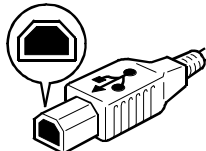
USB is a serial protocol and a physical link transmitting all data on a single pair of wires. Another pair provides power to downstream peripherals.

The USB standard specifies two types of connectors, type “A” connectors for upstream connection to the host system, and type “B” connectors for downstream connection to the USB device.



G081D945.WMF

Type “A” connector

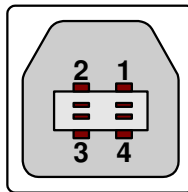


B516D512.WMF

Type “B” connector

4.5.4 PIN ASSIGNMENT

The controller has a type “B” receptacle (CN10).



B516D502.WMF

Pin No.	Signal Description	Wiring Assignment
1	Power	Red
2	Data –	White
3	Data +	Green
4	Power GND	White

4.5.5 REMARKS

- The machine does not print reports specifically for USB.
- Only one host computer is allowed for the USB connection.
- After starting a job using USB, do not switch the printer off until the job has been completed.

When a user cancels a print job and data transmitted to the printer has not been printed at the time of cancellation, the job will continue to print up to the page where the print job was cancelled

- When the controller board is replaced, the host computer will recognize the machine as different device.

Related SP Mode

“USB Settings” in the printer engine service mode. Data rates can be adjusted to full speed fixed (12 Mbps). This switch may be used for troubleshooting if there is a data transfer error using the high-speed mode (480 Mbps).

Data rates can also be adjusted using the UP mode “USB Setting” in the Host Interface in the System menu.

This mode can be accessed only when the “Enter”, “Escape”, then “Menu” keys are pressed to enter the UP mode.

4.6 IEEE802.11B (WIRELESS LAN)

4.6.1 SPECIFICATIONS

A wireless LAN is a flexible data communication system used to extend or replace a wired LAN. Wireless LAN employs radio frequency technology to transmit and receive data over the air and minimize the need for wired connections.

- With wireless LANs, users can access information on a network without looking for a place to plug into the network.
- Network managers can set up or expand networks without installing or moving wires.
- Most wireless LANs can be integrated into existing wired networks. Once installed, the network treats wireless nodes like any other physically wired network component.
- Flexibility and mobility make wireless LANs both effective extensions of and attractive alternatives to wired networks.

Standard applied: IEEE802.11b

Data transfer rates: 11 Mbps/5.5 Mbps/2 Mbps/1 Mbps (auto sense)

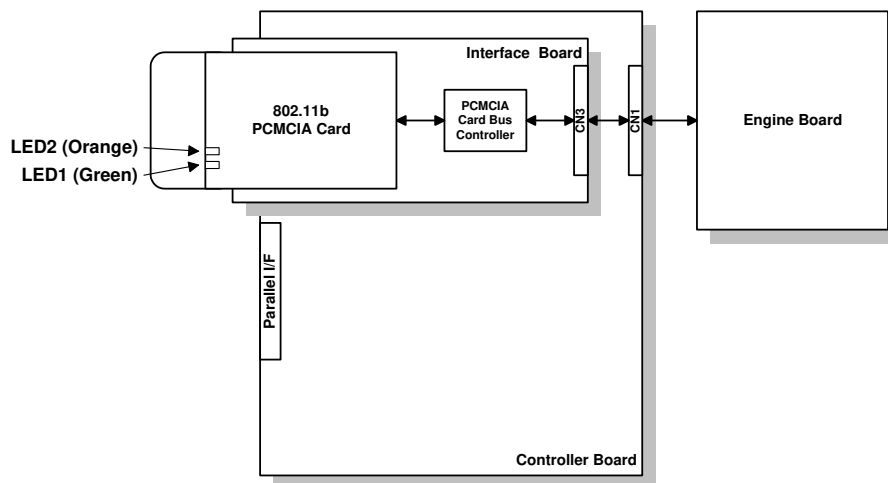
Network protocols: TCP/IP, Apple Talk, NetBEUI, IPX/SPX

Bandwidth: 2.4GHz

(divided over 14 channels, 2400 to 2497 MHz for each channel)

NOTE: The wireless LAN cannot be active at the same time as the Ethernet LAN. The "LAN Type" setting in the Host Interface menu determines the LAN interface that will be used.

4.6.2 BLOCK DIAGRAM



B516D513.WMF

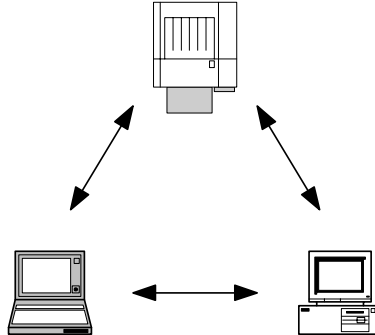
LED Indicators

LED	Description	On	Off
LED1 (Green)	Link status	Link success	Link failure
LED2 (Orange)	Power distribution	Power on	Power off

4.6.3 TRANSMISSION MODE

The following transmission modes are provided for wireless communication.

Ad hoc Mode



B516D514.WMF

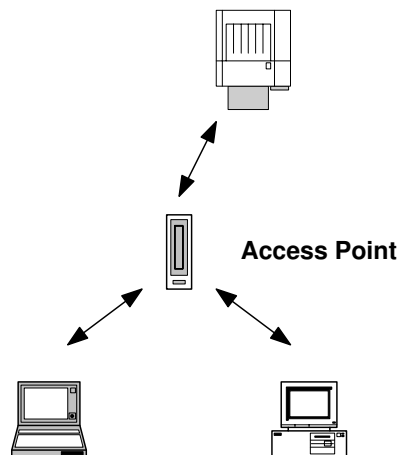
The ad hoc mode allows communication between each device (station) in a simple peer-to-peer network. In this mode, all devices must use the same channel to communicate.

In this machine, the default transmission mode is ad hoc mode and the default channel is 11. First, set up the machine in ad hoc mode and program the necessary settings, even if the machine will be used in the infrastructure mode.

To switch between ad hoc and infrastructure modes, use the following user tool:
Host Interface Menu - IEEE802.11b - Comm Mode

Detailed
Descriptions

Infrastructure Mode



B516D515.WMF

The infrastructure mode allows communication between each computer and the machine via an access point equipped with an antenna and wired into the network. This arrangement is used in more complex topologies.

- The wireless LAN client must use the same SSID (Service Set ID) as the access point in order to communicate.

4.6.4 SECURITY FEATURES

SSID (Service Set ID)

The SSID is used by the access point to recognize the client and allow access to the network. Only clients that share the same SSID with the access point can access the network.

NOTE: 1) If the SSID is not set, clients connect to the nearest access point.
2) The SSID can be set using the web status monitor or telnet.

Using the SSID in Ad hoc mode

When the SSID is used in ad hoc mode and nothing is set, the machine automatically uses "ASSID" as the SSID. In such a case, "ASSID" must also be set at the client.

NOTE: SSID in ad hoc mode is sometimes called "Network Name."

WEP (Wired Equivalent Privacy)

WEP is a coding system designed to protect wireless data transmission. In order to unlock encoded data, the same WEP key is required on the receiving side. There is 128 bit WEP keys.

NOTE: The WEP key can be set using the web status monitor or telnet.

MAC Address

When the infrastructure mode is used, access to the network can also be limited at the access points using the MAC address. This setting may not be available with some types of access points.

4.6.5 TROUBLESHOOTING NOTES

Communication Status

Wireless LAN communication status can be checked with the UP mode “W.LAN Signal” in the Maintenance menu. This can also be checked using the Web Status Monitor or Telnet.

The status is described on a simple number scale.

STATUS DISPLAY	COMMUNICATION STATUS
Good	76~100
Fair	41~75
Poor	21~40
Unavailable	0~20

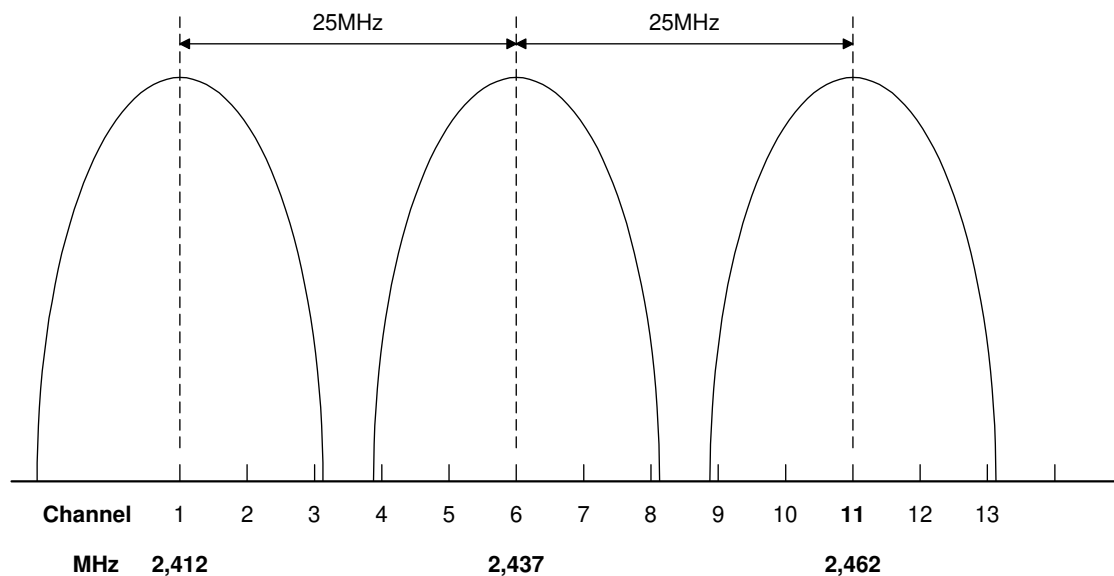
NOTE: Communication status can be measured only when the infrastructure mode is being used.

Channel Settings

If a communication error occurs because of electrical noise, interference with other electrical devices, etc., you may have to change the channel settings.

To avoid interference with neighboring channels, it is recommended to change by 3 channels. For example, if there are problems using channel 11 (default), try using channel 8.

Detailed
Descriptions



B516D516.WMF

Troubleshooting steps

If there are problems using the wireless LAN, check the following.

- 1) Check the LED indicator on the wireless LAN card.
- 2) Check if "IEEE802.11b" is selected in the UP mode LAN Type in Network Setup in the Host Interface menu.
- 3) Check if the channel settings are correct.
- 4) Check if the SSID and WEP are correctly set.

If infrastructure mode is being used,

- 1) Check if the MAC address is properly set
- 2) Check the communication status
If the communication status is poor, bring the machine closer to the access point, or check for any obstructions between the machine and the access point.
If the problem cannot be solved, try changing the channel setting.

SPECIFICATIONS

1. GENERAL SPECIFICATIONS

1.1 PRINTER

Printing Speed

23 ppm

Printer Languages

PCL6

PCL5e

RPCS (Refined Printing Command System)

PostScript 3 (Option)

Resolution

1200 dpi (PCL6/RPCS/PS3)

600 dpi (PCL5e/PCL6/RPCS/PS3)

300 dpi (PCL5e/RPCS/PS3)

Resident Fonts

PCL:

35 Intellifonts

10 True Type fonts

1 bitmap fonts

PS3:

136 fonts (24 Type 2 fonts, 112 Type 14 fonts)

Host Interfaces

Bi-directional IEEE1284 parallel x 1 (standard)

Ethernet (100 Base-TX/10 Base-T) (standard)

IEEE1394 (option)

IEEE 802.11b (Wireless LAN) (option)

USB 2.0 (option)

Network Protocols

TCP/IP, IPX/SPX, NetBEUI, Apple Talk

Memory

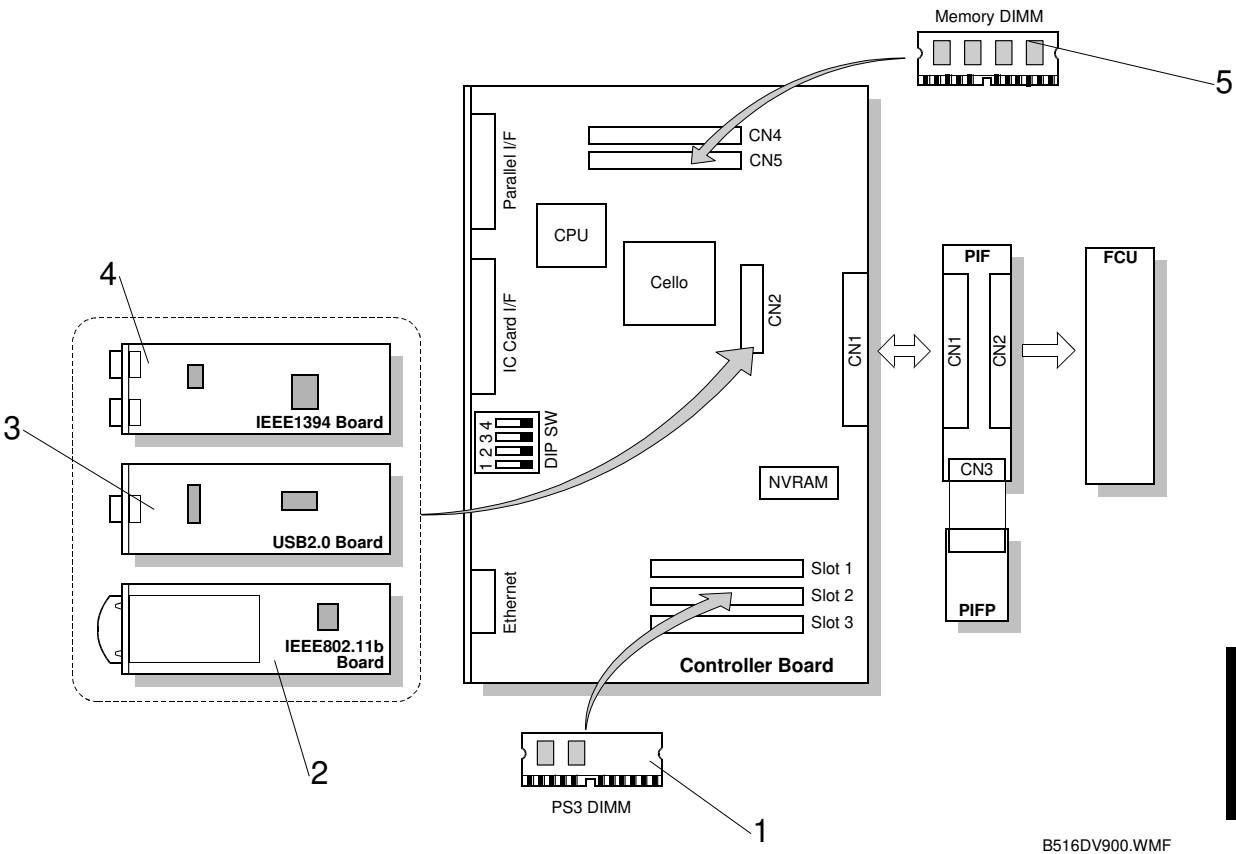
96 MB (Resident 32 MB + 64 MB Memory option)

Supported Paper Sizes***Paper Feed***

Paper Size			Main Unit	Option Paper Unit.	Bypass Tray Unit
A3	SEF	297 x 420 mm	Y	Y	Y
B4	SEF	257 x 364 mm	N	N	Y
A4	SEF	210 x 297 mm	Y	Y	Y
A4	LEF	297 x 210 mm	N	Y	N
B5	SEF	182 x 257 mm	N	N	N
B5	LEF	257 x 182 mm	N	N	N
A5	SEF	148 x 210 mm	N	N	N
A5	LEF	210 x 148 mm	N	Y	N
B6	SEF	128 x 182 mm	N	N	N
B6	LEF	182 x 128 mm	N	N	N
A6	SEF	105 x 148 mm	N	N	N
A6	LEF	148 x 105 mm	N	N	N
DLT	SEF	11" x 17"	Y	N	Y
LG	SEF	8 1/2" x 14"	Y	Y	Y
LT	SEF	8 1/2" x 11"	Y	Y	Y
LT	LEF	11" x 8 1/2"	Y	Y	Y
HLT	SEF	5 1/2" x 8 1/2"	N	N	N
HLT	LEF	8 1/2" x 5 1/2"	N	N	N
A3 wide	SEF	12" x 18"	N	N	N
Executive	SEF	7 1/4" x 10 1/2"	N	N	N
Executive	LEF	10 1/2" x 7 1/4"	N	N	N
F	SEF	8" x 13"	Y	N	N
Foolscap	SEF	8 1/2" x 13"	N	N	N
Folio	SEF	8 1/4" x 13"	Y	N	N
8 K	SEF	267 x 390 mm	N	N	N
16 K	SEF	195 x 267 mm	N	N	N
16 K	LEF	267 x 195 mm	N	N	N
Custom (W:100-297, L:148-432mm)			N	N	Y
Com10	SEF	4 1/8" x 9 1/2"	N	N	N
Monarch	SEF	3 7/8" x 7 1/2"	N	N	N
C6	SEF	114 x 162 mm	N	N	N
C5	SEF	162 x 229 mm	N	N	N
DL Env	SEF	110 x 220 mm	N	N	N

2. MACHINE CONFIGURATION

2.1 SYSTEM COMPONENTS



B516DV900.WMF

Spec.

Item	Machine Code	No.	Remarks
Internal Options			
PostScript3	G341	1	Only one of these three options can be installed in the same machine.
IEEE 802.11b	B515	2	
USB 2.0	B525	3	
IEEE1394	G336	4	
Memory 32 MB	G578	5	Used in common with the model J and K-P1.
Memory 64 MB	G579		