

Model S-C2
PRINTER/SCANNER UNIT
(Machine Code: B683)

Standard for B130/B169
Optional for B129

SERVICE MANUAL

9 March 2004
Subject to change

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1. INSTALLATION

See Model S-C2 Service Manual.

2. TROUBLESHOOTING

See Model S-C2 Service Manual.

Trouble-
Shooting

3. SERVICE TABLES

3.1 SERVICE PROGRAM MODE

CAUTION

Before activating the service program mode, check that the Data-In LED is off. The LED indicates that the machine is processing some data.

CAUTION

Do not turn off the main power switch while the Power LED is on or blinking; otherwise, the memory may be damaged. Before turning off the main power switch, press the power key on the operation panel and wait until the Power LED turns off.

Service
Tables

NOTE: The main power LED is on or blinks under any of the following conditions:

- The platen cover is open.
- The copier is communicating with a network device.
- The copier is accessing the memory.

3.1.1 ACTIVATING AND QUITTING SP MODE

IMPORTANT

Do not let the user have an access to the service program mode (SP mode). Only service representatives are allowed to use the SP mode. Should the user have an access to the SP mode, the normal operation of the machine is NOT guaranteed any more.

Activating Printer/Scanner SP Mode

1. Press the  key.
2. Press the following keys in the following order: ①②⑦
3. Press the  key and hold it down until the SP mode menus are displayed (for about three seconds).
4. Press the ③ key (Printer SP) or the ④ key (Scanner SP).

Quitting Printer/Scanner SP Mode

Press the  (cancel) key several times until you quit the printer/scanner SP mode.

3.2 PRINTER SERVICE MODE

3.2.1 SERVICE MODE TABLE

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

3.2.2 COPIER SERVICE PROGRAMS

The table lists the copy SPs that are closed related to the printer application program. For details, see Model S-C2 Service Manual.

SP No.	Description	Summary
5801	Memory Clear	Resets the process-control data and counters. All settings return to their default values.
5907	Plug & Play	Specifies the plug-and-play settings.
7832	Display Self Diag	Displays the self-diagnostic result.

3.3 SCANNER SERVICE MODE

3.3.1 SCANNER PROGRAM 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.

SP1	Mode Number		Function and [Setting]
1004*	1	Compression Type	Selects the compression type for binary picture processing. [1: MH , 2: MR, 3: MMR]
1005*	1	Erase Margin	Creates an erase margin for all edges of the scanned image. <i>If the machine has scanned the edge of the original, create a margin.</i> [0 ~ 5 / 0mm / 1mm step]

For the settings of the image quality, see the Model S-C2 Service Manual.

3.4 FIRMWARE UPDATE PROCEDURE

See Model S-C2 Service Manual.

3.5 POWER-ON SELF TEST

When you turn on the main power switch, the GW controller conducts the Self Test. The controller stores the error code if it detects an error. The controller checks the following hardware and software:

- CPU, ASIC, and clock
- Flash ROM
- Resident and optional SDRAM (if installed)
- IEEE1394 interface (if installed)
- NVRAM
- PS fonts (if installed)

3.6 SELF DIAGNOSTIC TEST

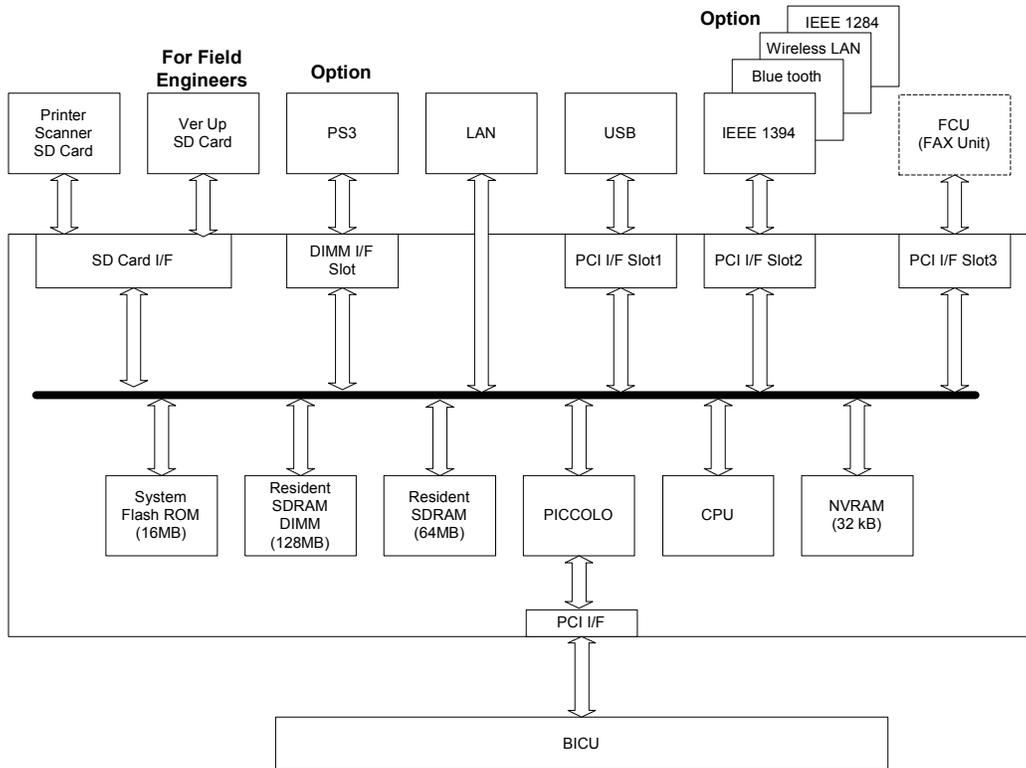
In addition to the power-on self-test, you can make the machine conduct a more detailed test. You need the loop-back connector (P/N: G0219350).



1. Turn off the main power switch.
2. Attach the loop-back connector to the parallel interface.
3. Press the  key and the  key and hold them down.
4. Turn on the main power switch.
5. The copier prints the diagnostic report automatically. To view the SC codes, select Copy SP7-832-001.

4. DETAILED SECTION DESCRIPTIONS

4.1 OVERVIEW



Detailed Descriptions

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Main components

- CPU: TOSHIBA TMPR4955BFG-300
- PICCOLO: GW architecture ASIC. It controls all the functions of the controller.
- Flash ROM: 16 MB flash ROM for the system program
- SDRAM: On board 64 MB, DIMM 128 MB (resident)
- NVRAM: Stores the controller settings
- LAN interface
- USB 2.0 interface
- SD Card: Printer/scanner program

Optional components

- PostScript 3 DIMM
- IEEE1394 interface
- Bluetooth interface
- Wireless LAN interface
- IEEE1284 interface

4.2 CONTROLLER FUNCTIONS

4.2.1 PAPER SOURCE SELECTION

Auto Tray Select

When you install the optional paper feed unit (B421), the copier has three trays—tray 1, tray 2, and by-pass tray. When the user select Auto Tray Select in the dialog box of the printer driver, the printer searches tray 1 and tray 2 for the correct paper size and paper type. The by-pass tray is not searched. The following menu specifies which tray is searched first:

 > System Settings > Tray Paper Settings > Ppr Tray Priority: Printer

When the printer does not find the correct paper in the specified tray, the printer searches the other tray. If the printer does not find the correct paper in the other tray either, the printer suspends the processing until the user loads the correct paper.

Manual Tray Select

The user can specify a paper size, paper type, and paper tray in the dialog box of the printer driver. If the printer does not find the correct paper in the specified tray, the printer suspends the processing until the user loads the correct paper.

4.2.2 AUTO CONTINUE

When the printer does not find the correct paper (see 4.2.1), the printer waits for the user to load the correct paper. The following menu specifies the waiting time of the printer:

 > Printer Features > System > Auto Continue

When the waiting time has elapsed, the printer cancels the print job. If Auto Continue is off, the printer keeps waiting; the print job is not canceled.

4.2.3 DUPLEX PRINTING

The user cannot select the by-pass tray for duplex printing.

4.3 SCANNER FUNCTIONS

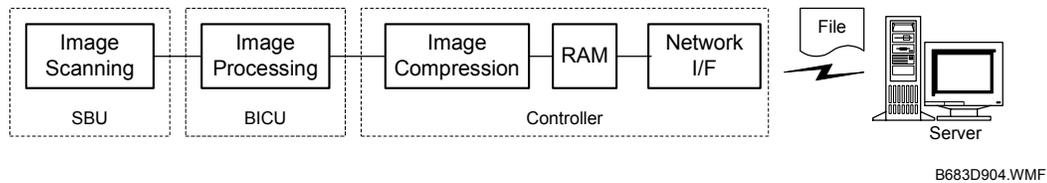
4.3.1 IMAGE PROCESSING FOR SCANNER MODE

The scanner application program executes the image processing on the IPU of the BICU. The application program receives the settings from the scanner driver (TWAIN Mode) or from the operation panel (Delivery Mode), and selects appropriate gamma tables, dither patterns, and other variables.

NOTE: The compression type for binary picture processing is specified by Scanner SP1-004.

Image Data Path

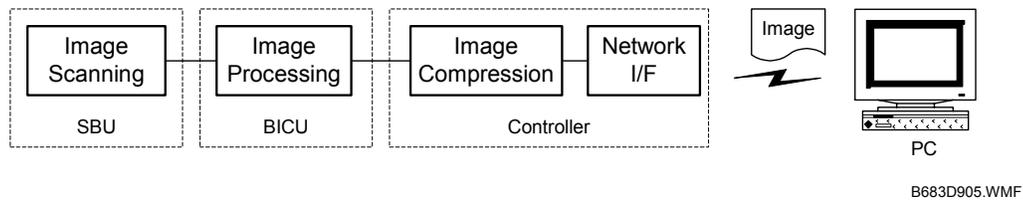
1. Image Store/Image Delivery Mode



The scanner application program processes images and compresses them. The data is stored in the controller RAM. The data format is TIFF or PDF (binary picture processing). The user selects a data format from the following menu: Options > File Type.

Before transferring the data to the server, the controller attaches the destination and page information.

2. Twain Mode



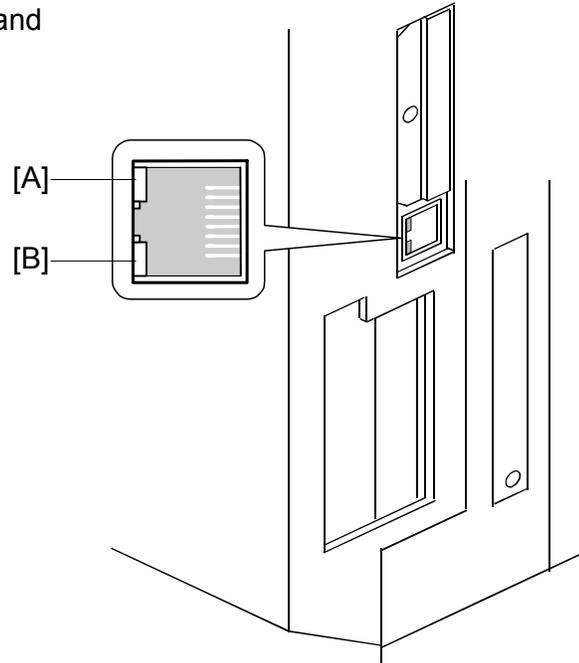
The scanner application program processes images and compresses them. The data is transferred to the scanner driver on the PC. The data format is TIFF or PDF.

Detailed Descriptions

4.4 NETWORK INTERFACE

4.4.1 LED

Two LEDs indicate the network status and data rate.



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LED	On	Off
[A] Green (Network status)	Connected	Not connected
[B] Yellow (Transfer rate)	100 Mbps	10 Mbps

4.5 IEEE1394 INTERFACE

4.5.1 SPECIFICATIONS

Hardware Specifications

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

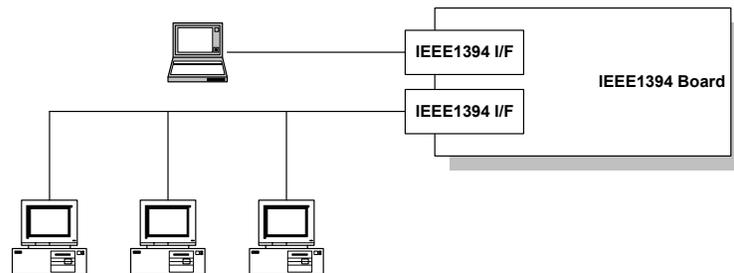
System Requirements

PC: Windows PC with IEEE1394 port
 OS: Microsoft Windows 2000 Service Pack 1
 Cable length: 4.5m (15ft)

4.5.2 IEEE 1394

IEEE 1394 (FireWire [registered by Apple Computer, Inc.]) is a peer-to-peer networking technology. The maximum transfer rate is 400 Mbps. As of present, IEEE 1394 supports the following features:

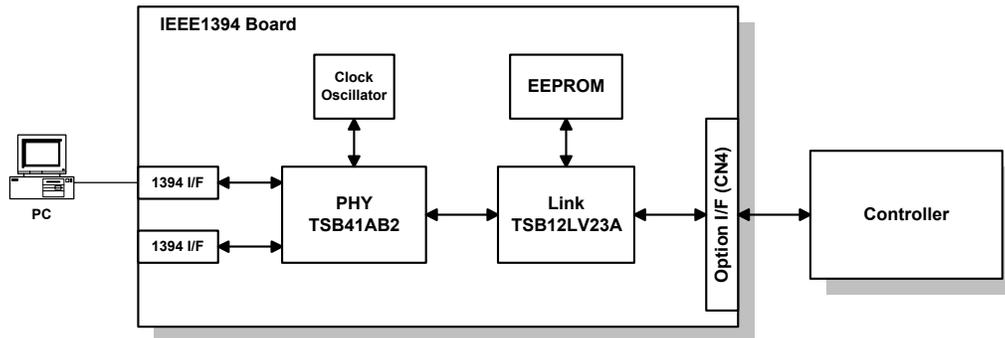
- Hot swapping (You can connect the cable to an active device while the device is powered on.)
- Peer-to-peer networking (You do not need a dedicated server.)
- No terminator or device ID required
- Automatic device configuration (The configuration is automatically made when a device is powered on or a Plug and Play device is installed.)
- 100-, 200-, and 400-Mbps transfer rate
- Common connectors for different devices



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Cables are 4.5 m (15ft) or shorter. You can use up to 16 cables to connect up to 63 devices to an IEEE 1394 network. There are two types of IEEE1394 cables: four pins (data only) and six pins (data and power). Model S-C2 supports 6-pin cables only. Model S-C2 has two 6-pin ports.

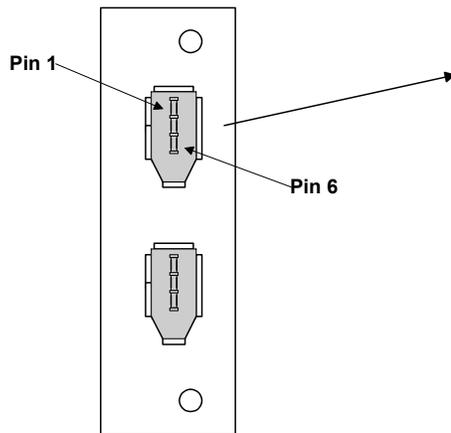
4.5.3 BLOCK DIAGRAM



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

4.5.4 PIN ASSIGNMENT



Pin assignment	
Pin 1	Pin 4
Pin 2	Pin 3
Pin 5	Pin 6

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

4.5.5 REMARKS ABOUT IEEE 1394

- To check the successful installation of the interface board, see Configuration Page.
- Print jobs are not spooled. When trying to print a file, the user may receive a notification from the busy interface.
- When having requested the printer to print a file, do not turn off the power switch of the printer until the printer finishes the job. The printer can be communicating with the computer.
- The user cannot view the status of the printer with a utility program such as Printer Manager for Client.

4.5.6 TROUBLESHOOTING

Identifying Problematic Computer

When the problem is caused by somewhere unknown on the network, identify the problematic computer first. Check the computers on the network. See if you can see the status of the printer from each computer. You should see the status "Printer Ready" when the interface cable is connected; you should see the status "Offline" when it is disconnected.

Detailed
Descriptions

Platform

Check that the computer is running Windows 2000 Service Pack 1 or later.

Interface Board

When having replaced the interface card, setup the printer once again. Each interface card has a unique address just like the MAC address for an Ethernet card. If you have changed the interface card, the printer driver does not recognize the new interface card.

Networking

IEEE 1394 does not support loop configurations (the network whose communication line makes a closed loop).

4.6 IEEE 802.11B (WIRELESS LAN)

4.6.1 SPECIFICATIONS

The wireless LAN is a local area network that sends and receives data via radio without using any physical connection between individual nodes and the hub. Usually, the wireless LAN can be integrated with an existing wired network.

Standard: IEEE 802.11b
Transfer rate: 11 Mbps (140 m [153 yd.])
(Maximum distance): 5.5 Mbps (200 m [219 yd.])
2 Mbps (270 m [295 yd.])
1 Mbps (400 m [437 yd.])
Protocol: TCP/IP, Apple Talk, NetBEUI, IPX/SPX
Bandwidth: 2.4GHz (divided over 14 channels, 2400 to 2497 MHz for each channel)

LED Indicators

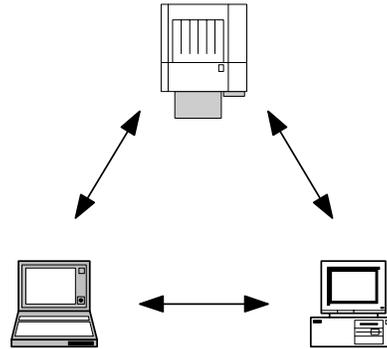
LED	On	Off
Green (Network status)	Connected	Not connected
Orange (Power supply)	On	Off

4.6.2 TRANSMISSION MODES

Wireless communication has two modes: 1) the ad hoc mode and 2) the infrastructure mode.

Ad Hoc Mode

The ad hoc mode is for the communication on a simple peer-to-peer network. In this mode, the two devices use the same channel for communication. By default, Model S-C2 is in the ad hoc mode and the channel is 11. To use the infrastructure mode, specify necessary settings.

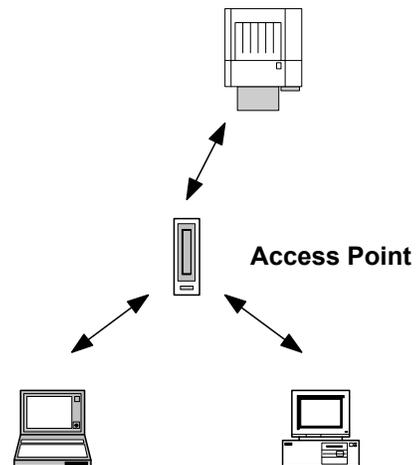


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Detailed
Descriptions

Infrastructure Mode

The infrastructure mode is for the communication between each computer and the printer via an access point. The access point has an antenna; and this access point is wired to the network. This arrangement is suitable for complex topologies. Each wireless LAN client uses the same SSID (Service Set ID) as the access point.



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4.6.3 SECURITY FEATURES

SSID (Service Set ID)

The clients share the same SSID with the access point. The access point connects these clients to the network. The access point rejects any other devices. When a client does not have an SSID, it tries to find the nearest access point.

NOTE: The user can specify an SSID with the Web Status Monitor or telnet.

SSID in Ad Hoc Mode

When no SSID is set, the client can use the ASSID as the SSID in the ad hoc mode (the needs an ASSID for this).

Some devices automatically change from the ad hoc mode to the infrastructure mode when the same SSID is set for the ad hoc mode and for the infrastructure mode. To use such a device also in the ad hoc mode, specify an ASSID.

NOTE: The SSIDs in the ad hoc mode are also known as Network Name.

WEP (Wired Equivalent Privacy)

WEP is a coding system designed to protect wireless data transmission. To decrypt encoded data, the recipient device needs the proper WEP key. There are two types of WEP keys—64 bit and 128 bit. Model S-C2 supports the 64-bit WEP key only.

NOTE: The user can specify a WEP key with the Web Status Monitor or telnet.

MAC Address

Some access points demand an MAC address in the infrastructure mode; other access points do not demand it.

4.6.4 TROUBLESHOOTING

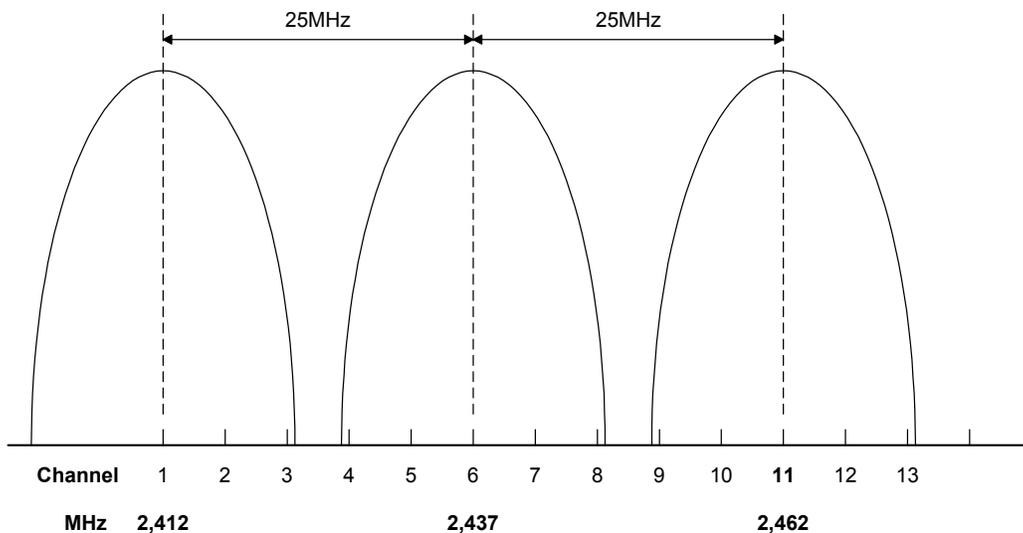
Communication Status

You can view the communication status with the Web Status Monitor or telnet. The status is described on a simple number scale. Note that the device needs to be in the infrastructure mode to check the communication status.

Status Display	Communication Status
Good	76 ~ 100
Fair	41 ~ 75
Poor	21 ~ 40
Unavailable	0 ~ 20

Channel Settings

When some noise interferes with wireless communication, you may need to change the channel settings. To avoid such interference, try using the channel higher or lower by 3. For example, if you see a problem when using channel 11 (default), try using channel 8.



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Detailed
Descriptions

Starting Point

If you see some problem, examine the following:

- Wireless-LAN-card LED: The LED indicates that the interface board is operating normally. This does not necessarily mean that all wireless-LAN settings are correct.
- Network settings: Check that IEEE 802.11b is set as the LAN type.
- Channel settings: Check that the correct channel is selected.
- Security settings: Check that the correct SSID and the WEP key are selected.

If you see some problem with the infrastructure mode, examine the following:

- MAC address: Check that the MAC address is correctly set.
- Communication condition: If the condition of communication is poor, try moving the machine. Remove any obstacle that may interfere with radio communication. Try changing the communication channel.

4.7 BLUETOOTH

4.7.1 SPECIFICATIONS

Overview

Bluetooth enables radio communication between some portable nodes such as laptop computers and mobile phones. Some of the advantages are as follows:

- You do not need high-cost equipments.
- Bluetooth supports a lot of protocols for the infrared transmission (IrDA).
- Bluetooth nodes communicate with other Bluetooth nodes with no special settings.

Standard: Bluetooth 1.1 (Bluetooth Special Interest Group)

Transfer rate: 1 Mbps

Bandwidth: 2.4GHz (Frequency Hopping Spread Spectrum [FHSS])

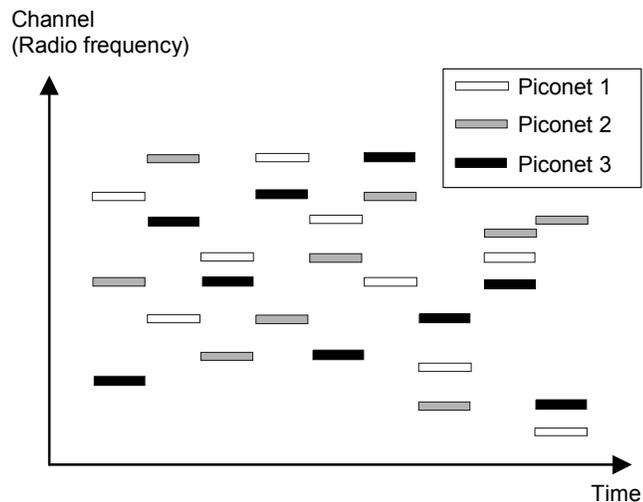
Piconet

The network of Bluetooth nodes is called Piconet. The nodes communicate in the ad hoc mode. Piconet consists of eight nodes or less. One of the nodes is the master; the others are slaves. The master controls the hopping frequencies and timings. The master also has the registered ID codes of the slaves. The master can be changed to a slave, and a slave can be changed to the master. When the master leaves Piconet, one of the slaves becomes the master. Usually, a printer is a slave of the master.

Detailed Descriptions

FHSS (Frequency Hopping Spread Spectrum)

Bluetooth has 79 channels in the bandwidth from 2,402 MHz to 2,480 MHz. The difference in the radio frequency between two adjacent channels is 1 MHz. Piconet changes the communication channel 1,600 times in a second. Doing so, the Piconet networks in the same LAN can prevent the radio frequencies from crossing.



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4.7.2 PROFILE

Profiles are the protocols used by Bluetooth nodes. There are 14 profiles:

- Generic Access Profile
- Cordless Telephony Profile
- Serial Port Profile
- Dial-up Networking Profile
- LAN Access Profile
- Object Push Profile
- Synchronization Profile
- Service Discovery Profile
- Intercom Profile
- Headset Profile
- Fax Profile
- Generic Object Exchange Profile
- File Transfer Profile
- Hardcopy Cable Replacement Profile

The Serial Port Profile (SPP) and the Hardcopy Cable Replacement Profile (HCRP) are used for printers. The SPP can supersede the serial port; the HCRP can supersede the parallel port.

4.7.3 SECURITY

Public Mode/Private Mode

When the Bluetooth nodes are in the public mode, computers can browse through the Bluetooth network. Model S-C2 is in the public mode by default. When the Bluetooth nodes are in the private mode, computers cannot browse through the Bluetooth network.

PIN Code (Personal Identification Number).

Bluetooth nodes can send a PIN code. This code identifies the node. When a computer receives a PIN code, the computer can communicate with the node. PIN codes consist of four digits. Model S-C2 uses the last four digits of the serial number as its PIN code. You cannot change this code.

4.8 USB

4.8.1 SPECIFICATIONS

Interface: USB 2.0
 Data rates: 480 Mbps (high speed)/12 Mbps (full speed)

4.8.2 GENERAL FEATURES

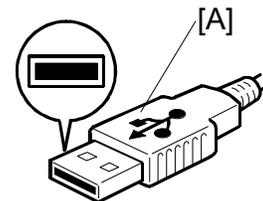
The USB (Universal Serial Bus) offers simple connectivity for computers and their peripherals. You do not need terminators or device IDs. The USB provides the following features:

- Plug & Play: When you connect a device to a computer, the computer recognizes the device and activates the correct driver. If the computer does not find a correct driver, it outputs a message.
- Hot swapping: You can connect the cable to an active device while the device is powered on.
- No terminator required
- No device ID required
- 480-Mbps (high speed)/12-Mbps (full speed) transfer rate
- Bi-directional data transfer between computers and peripherals with 4-byte headers and device IDs
- Connectivity of up to 127 peripherals (up to 6 cascade connections possible)
- Power supply from the computer
- 5-m cable (at the maximum)

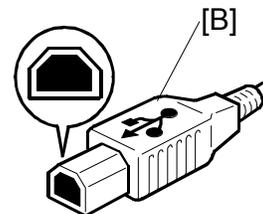
Detailed
 Descriptions

4.8.3 USB CONNECTOR

The USB has a serial protocol and a physical link. The USB cable contains two pairs of wiring: one pair transmits data and the other pair transmits electricity for downstream peripherals. There are two types of connectors: Type A [A] is for the connection on the upstream and Type B [B] is for the connection on the downstream.



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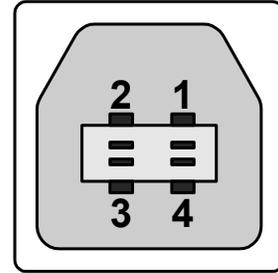


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4.8.4 PIN ASSIGNMENT

Model S-C2 supports Type B connectors.

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



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4.8.5 REMARKS

- Model S-C2 does not make special logs or histories dedicated to the USB.
- Only one host computer is allowed.
- When having requested the printer to print a file, do not turn off the power switch of the printer until the printer finishes the job.
- When having canceled a requested print job, make sure that the printer has already processed the cancellation before turning off the power switch. The printer can be processing some data that has been already sent before the cancellation.
- If you replace the controller board of a printer, the host computer takes the printer a newly installed peripheral.

4.8.6 SP MODE

Copy SP5-844-001 specifies the transfer rate. You can select the Full Speed (12 Mbps) or the Auto Change (480/12 Mbps). The 480-Mbps transfer rate can cause a trouble that is not caused by the 12-Mbps transfer rate. When you see a trouble, try specifying the Full Speed.

SPECIFICATIONS

1. GENERAL SPECIFICATIONS

1.1 PRINTER

Printing Speed:	Maximum 15 ppm (A4/LT SEF)
Printer Languages:	PCL6/PCL5e PostScript 3 (option) RPCS (Refined Printing Command Stream) - an original Ricoh PDL
Resolution:	600 dpi (PCL 6/PCL5e/PS3/RPCS) 300 dpi (PCL6 PCL5e/PS3) 200 dpi (RPCS)
Resident Fonts:	PCL: 35 Intellifonts 10 True Type fonts PS3: 136 fonts (24 Type 2 fonts, 112 Type 14 fonts)
Host Interfaces:	Ethernet (100 Base-TX/10 Base-T) (standard) USB 2.0 (Standard) Bi-directional IEEE 1284 parallel x 1 (option) IEEE1394 (option) Wireless LAN (option)
Network Protocols:	TCP/IP
Memory:	128 MB
Supported Paper Size	See the copier service manual.

1.2 SCANNER

Standard Scanner Resolution:	Main scan/Sub scan 600 dpi
Available scanning Resolution Range:	Twain Mode: 100 ~ 600 dpi E-mail/Network Delivery Scanner: 100 dpi, 200 dpi, 300 dpi, 400 dpi, 600 dpi
Scanning Throughput:	18 spm for TWAIN 22 spm for Delivery mode (A4S, ADF mode)
Interface:	Ethernet (100 Base-TX/10 Base-T for TCP/IP), IEEE 1394, IEEE 802.11b (Wireless LAN)
Compression Method:	PDF, TIFF (MH, MR, MMR)

2. SOFTWARE ACCESSORIES

2.1 PRINTER

Printer Drivers

Printer Language	Windows 95/98/ME	Windows NT 4.0	Windows 2000	Windows XP	Windows Server 2003	Macintosh
PCL 6	Yes	Yes	Yes	Yes	Yes	No
PCL 5e	Yes	Yes	Yes	Yes	Yes	No
PS3	Yes	Yes	Yes	Yes	Yes	Yes
RPCS	Yes	Yes	Yes	Yes	Yes	No

- NOTE:** 1) The printer drivers for Windows NT 4.0 are only for the Intel x86 platform. There is no Windows NT 4.0 printer driver for the PowerPC, Alpha, or MIPS platforms.
- 2) The PS3 drivers are all genuine AdobePS drivers, except for Windows 2000, which uses Microsoft PS. A PPD file for each operating system is provided with the driver.

Utilities

- SmartDeviceMonitor for Admin: This utility is for the system administrator to manage network printers (☛ SmartDeviceMonitor for Admin online Help).
- SmartDeviceMonitor for Client: This utility is for users to manage their own print status on the network (☛ SmartDeviceMonitor for Client online Help).
- Font Manager 2000: This utility helps you install new screen fonts, or organize and manage fonts already installed on the system.
- 1394 Utility: This utility is for the IEEE 1394 interface board (☛ Readme or the manual that comes with the optional IEEE 1394 interface board).
- USB Printing Support: This utility is for the USB 2.0 interface. Install this to use USB on computers running Windows 98 SE/Me.
- Acrobat Reader: This utility allows you to read PDF files (Portable Document Format).
- Printer Utility for Mac: This utility allows users to download and manage a variety of fonts as well as manage printers (☛ PostScript 3 Operating Instructions Supplement).

2.2 SCANNER

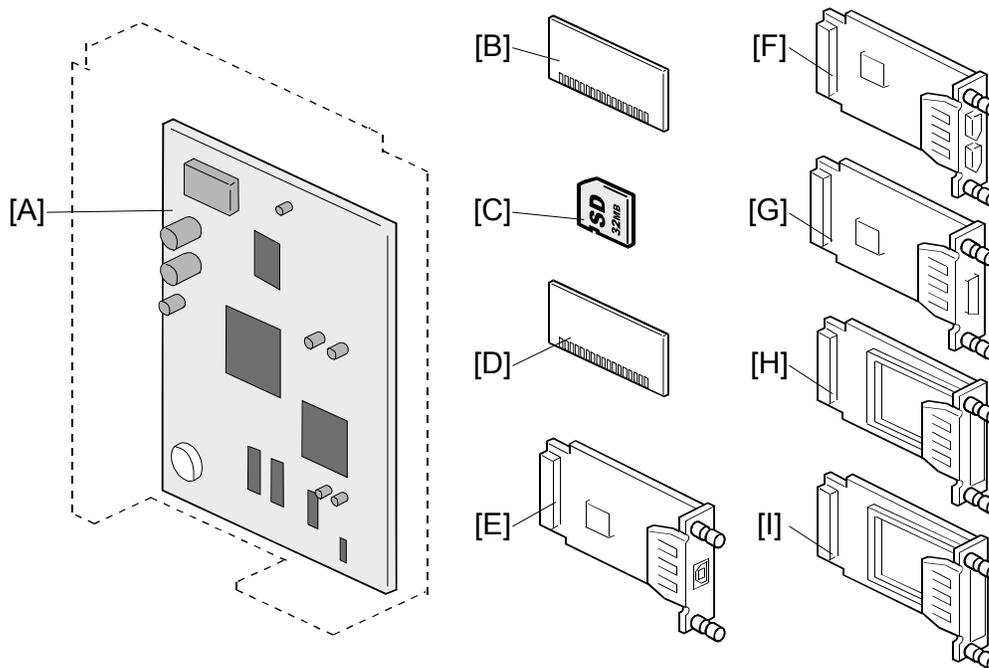
Driver

- TWAIN driver for Windows 95/98/Me/2000/XP/NT 4.0

Utilities

- RouterV2: ScanRouter V2 Lite, ScanRouter V2 Administration Utility
- DeskV2: DeskTopBinder V2 Lite
- Acroread: Acrobat Reader

3. CONFIGURATION



B683V901.WMF

	Standard Component	Machine Code	Remarks
1	GW Controller Board [A]	B683*	
2	SD Card [C]	—	Application programs
3	128-MB Memory [D]	—	
4	USB Interface Board [E]	—	

	Optional Component	Machine Code	Remarks
5	PostScript 3 [B]	B681	
6	IEEE 1394 Interface Board [F]	B581	
7	IEEE 1284 Interface Board [G]	B679	
8	Wireless LAN Interface Board [H]	B682	
9	Bluetooth Interface Board [I]	G377	

* Machine code B683 refers to the optional printer/scanner unit for the basic model (B129). No machine code is given to the standard printer/scanner unit of the MFP model (B130) and the printer/scanner/copier model (B169).