SD CARD

TECHNICAL SERVICE GUIDE

Contents

1. Introduction

1-1 OBJECTIVE

Although flash memory cards have been used on our products for service activities in the field, some products require several flash memory cards to update all types of firmware. To save time and servicing costs for firmware and data uploading and downloading, newer products will start using SD cards as the new memory media.

1-2 INTRODUCTION OF THE SD CARD

The B070/B071 is the first product released that uses an SD card instead of a ROM DIMM. The SD card will be used on most future products. Each product will describe whether or not the SD card is used.

2. Service Concepts

The following benefits for service activities can be expected with the SD card:

- Maximizing service efficiency, minimizing servicing time and data back-up. SD cards have enough memory to store all types of firmware and/or data, saving servicing costs and time.
- Unlike flash memory cards, the swap box and/or PC application software tools are not required. Firmware can be easily stored, copied, or deleted using Windows Explorer.

3. Service Information

3-1 TRAINING

There is no training course planned for the SD card itself. This new service tool will be introduced during the product-training course.

3-2 FIELD INFORMATION

When reporting a field issue (FPR), the print data and/or debug log data captured by the SD card should be included with the report depending on the type of problem, as it is very useful for analyzing the problem and developing a solution. Please see Section 4-3 below for a detailed description of the functions for the SD card.

The debug log data and/or print file data attached to the report can be sent to the Engineers and used for the following types of problem analyses. Please refer to the Service Manual for the detailed procedures on how to retrieve this information from the machine.

Data	Problem Type
Debug log	• Problems with unknown causes (SC code, paper jam, other abnormal machine operation). • Problems that occur intermittently.
Print data (captured file)	• Font problems • Image data missing • Image problems which cannot be duplicated when printing test patterns from the printer.

4. System Overview

4-1 SD CARD TYPE

There are two types of SD cards: The service SD card, and the application SD card.

	SD Card Type	Description
1	Application	• The cards are provided as an option for expanding features, depending on the model. • The card contains an ID encryption to protect against illegal duplication. • The cards are provided with an application firmware already included, and have varying memory capacities depending on the content.
2	Service	• The cards are registered as service parts and can contain firmware for multiple products. • The cards contain no encryption; therefore, firmware or data in the card can be duplicated. • The memory capacity is 64MB.

4-2 SD CARD ADAPTERS

All models that support the SD card, contain SD card slot(s) for direct uploading and downloading of firmware and other data (see below) between the card and machine. When transferring firmware and data between the card and PC, an adapter is required (PCMCIA adapter or USB reader/writer).

For the specifications of the PCMCIA adapter and USB reader/writer, please refer to section 7 below “System Requirements”.

4-3 FEATURES OF THE SERVICE SD CARD

The following are the features for the Service SD card as of the time this document was issued.
Please refer to the Service Manual for the detailed procedures on how to update the firmware or retrieve the data from the machine.

	Feature	Description	Remarks
1	Firmware update	• Firmware upgrade or downgrade. • Firmware for any supported product can be stored in the card. • The machine automatically scans the content of the card and is able to recognize what model the firmware is for. The machine will only download firmware for the same model (itself).	Please refer to section 4-4 below for guidelines on how to store the firmware and data in the SD card. The firmware cannot be uploaded from the machine to the SD card.
2	Data upload and download	The following data can be transferred between the NVRAM and SD card: • SP data (ex. factory settings) • Logging Data • User settings (e.g. network, Fax and mail addresses).	Transferable data can vary from product to product. Please refer to the Service Manual for each model for details.
3.	Debug log	The machine operation log can be captured when a problem (e.g. SC codes, paper jams) occurs. This data is very useful in determining the cause of a problem. New SP modes have been added to capture the debug log data to the HDD or SD card.	
4.	Card Save	Print data (files) can be stored directly to the SD card without printing out.	
5.	Boot-up from SD card	In cases where the flash ROM boot program has been damaged or corrupted, the SD card can be used to boot up the machine and download its firmware with boot program. This will only be effective when the problem is not hardware-related. Only SD cards that have been specially formatted for machine booting can be used for this purpose.	We will be providing a special tool (utility) to format the SD card for booting, since there is none available in the field. The schedule of releasing this tool is not fixed.

4-4 STORING FIRMWARE AND DATA IN THE SD CARD

(1) Firmware (folder name: romdata):
When the SD card is inserted into the machine slot for firmware update, the machine automatically scans the firmware in the **"romdata**" folder and checks the firmware headers, which indicate the model. If the model is the same as the machine, the transfer is authorized.

NOTE: The firmware should always be in the "romdata" folder. If not, the machine cannot find the firmware.

Therefore folder arrangement is not critical for firmware downloads, since this process is automatic, however creating separate folders under "romdata" for each model will make it easier to delete files later on. An easy to remember method would be to name these folders after the 4-digit product code for each model, e.g. B070, then store the firmware here.

NOTE: Even if different versions of a firmware are stored in the SD card, the machine displays all version of the firmware on the operation panel and you can upgrade or downgrade by selecting a desired one.

(2) Other data (folder names: nvramdata, prt, log):
Different types of data for different products can be stored in the service SD card (ex. SP data, debug log), and so unique folder names are required for each type of data.

- When inserting a blank SD card to upload NVRAM data from the machine to the card, the folder for that model is automatically created.
- When downloading NVRAM data from the SD card to the machine, as with firmware, the machine automatically detects the model to which the data belongs.

Folder Name		File Name	Remarks
Data Type	Product Code or File Name		
SD card			Folder arrangement:
romdata			Firmware
	B070		Product code
		B0701111.fwu	Type of firmware
		B0701111a.fwu	Type of firmware
		B0702222.fwu	Type of firmware
	BXXX		Product code
		BXXX1111.fwu	Type of firmware
		BXXX2222.fwu	Type of firmware
nvramdata			NVRAM data (factory setting)
	B070		Product code
		serial number.nv	
prt			
	cardsave		
		PRT00000.prn	Name of captured file
		PRT.00001.prn	Name of captured file
log			
	debuglog		File name

4-5 FIRMWARE DISTRIBUTION
Firmware will continue to be provided through the existing route (global server). The .exe file will consist of the firmware and related folders, as shown below.

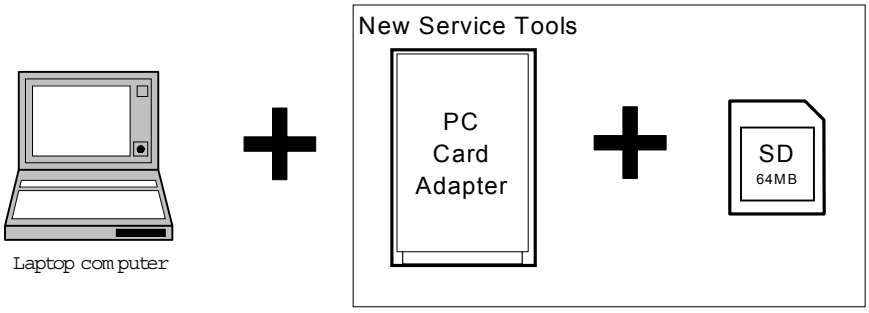
4-6 HOW TO DUPLICATE A SERVICE SD CARD
The following is an example of the contents of an extracted .exe file. Please copy the necessary files/folders onto the SD card, depending on what information already exists in the card.

For example:

Folder	Folder	Firmware File	Note
Romdata (*1)			Case (*1): If the SD card is blank, copy the entire "romdata" folder onto the SD card.
	B070 (*2)		Case (*2): If the card already contains the "romdata" folder, copy the B070 folder onto the card.
		B0701111.fwu (*3)	Case (*3): If the card already contains the folders up to "B070", simply copy the necessary firmware files into this folder.

Adapters: When transferring firmware or data between the SD card and PC, one of the following adaptors is necessary, both of which have been registered as service parts (see below).

PCMCIA Adapter
Required environment: Windows 9x or later



USB Reader/Writer
Required environment: Windows 98 or later

Note: The USB Reader/Writer works on Windows XP, Windows 2000 and Windows Me without an additional driver. A specific driver is required on Windows 98. Please download the USB driver setup application, (http://tsc.ricohcorp.com/protected/utility/Win98_USB_SD_Mem_Driver.exe) when using USB Reader/Writer on Windows 98.

5. Special Tools

The following special tools have been registered as service parts to support products in the field that use SD cards. However when using SD cards, adapters or reader/writers procured as supply goods locally, please be sure to use tools produced by the same manufacturers listed below. This is because products from these vendors were used for the official product evaluations.

Item	Part Number	Description	Q'ty	Manufacturer
1	B6455010	SD Card Kit	1	Toshiba/ Panasonic*
2	B6456700	PCMCIA Card Adapter	1	Panasonic
3	B6456800	USB Reader/Writer	1	Panasonic

"*": Service SD cards supplied from Ricoh are produced by Toshiba, and application SD cards by Panasonic (standard/option).

The SD Card Kit (#B6455010) contains the following parts:

- SD Card
- SD Card Plastic Case
- Label (see Note)

NOTE: The kit contains a blank label for the SD card for writing down the card's contents. Please make sure that the label is affixed in the correct position on the card, as this is essential to ensure that the card fits into the card slot and adaptors properly. Please also be sure to completely remove the old label whenever affixing a new one.

6. System Requirements

6-1 SD CARD

Please read over the important notes described below regarding the handling of the SD card. If these points are not followed carefully, it may cause the card to be damaged or data to be lost.

Important Notes:

- Do not directly touch the card contacts or bring them into contact with a metallic substance.
- Do not bend, drop or apply any force or shock to the card.
- Keep the card dry at all times, avoiding high-humidity environments and making sure condensation does not form on the card. The environmental requirements for operation and storage are as follows:

	During operation:	Storage:
Temperature	0 to 55°C	-20 to 65°C
Humidity	20 to 85%RH	5 to 85%RH

- Do not remove the card or turn the power off while reading or writing data.
- All SD cards come preformatted. However if reformatting the card later on for some purpose, always be sure to confirm the contents of the card before doing so, as all data will be lost when the card is reformatted.
- Do not attempt to duplicate or reformat the application SD card.

Other:

- The power should always be OFF before the card is inserted in or removed from the machine (see Service Manual for details).
- The SD card should always be kept in the plastic case to protect it from any damage.
- No labels should be affixed to the card except for the ones packaged together with the card. This label must be affixed in the correct position, and must always be removed when attaching a new label (should not be stacked).
- If writing on the label, always do so before affixing it to the card.
- Before inserting either the service or application SD card, always make sure that the card switch is unlocked, as using them in the locked condition will cause an error.
- Since the application SD card is formatted in a different way from the service SD card, the application card cannot be used as a service tool.

6-2 PCMCIA CARD ADAPTOR / USB READER WRITER

	PCMCIA Card Adapter	USB Reader Writer
Manufacturer	Panasonic	
Product Code	BN-SDAA BN-SDAA2	BN-SDCA BM-SDCE2
PC	IBM PC-AT compatible computer	
Host Interface	PCMCIA slot	USB port
OS	Win98 SE or later	
Dimensions	85.6x54x5mm	92x56x15mm

NOTE: Swap Box for the flash memory (IC) card cannot be used for uploading the firmware to the SD card.