

DataOverwriteSecurity Unit
Type A/Type B
(Machine Code: B692-01/B694-01)

December 12th, 2003
Subject to change

IMPORTANT SAFETY NOTICES

PREVENTION OF PHYSICAL INJURY

1. Before disassembling or assembling parts of the copier and peripherals, make sure that the copier power cord is unplugged.
2. The wall outlet should be near the copier and easily accessible.
3. Some components of the copier and the paper tray unit are supplied with electrical voltage even if the main power switch is turned off.
4. If any adjustment or operation check has to be made with exterior covers off or open while the main switch is turned on, keep hands away from electrified or mechanically driven components.
5. If the Start key is pressed before the copier completes the warm-up period (the Start key starts blinking red and green alternatively), keep hands away from the mechanical and the electrical components as the copier starts making copies as soon as the warm-up period is completed.
6. The metal parts of the fusing unit and other internal components become extremely hot while the copier is operating. Avoid touching those components with your bare hands.

HEALTH SAFETY CONDITIONS

1. Never operate the copier without the ozone filters installed.
2. Toner and developer are non-toxic, but if you get either of them in your eyes by accident, it may cause temporary eye discomfort. Try to remove with eye drops or flush with water as first aid. If unsuccessful, get medical attention.

OBSERVANCE OF ELECTRICAL SAFETY STANDARDS

1. The copier and its peripherals must be installed and maintained by a customer service representative who has completed the training course on the machines.
2. The NVRAM has a lithium battery which can explode if replaced incorrectly. Replace the NVRAM only with an identical one. The manufacturer recommends replacing the entire NVRAM. Never attempt to recharge or incinerate this battery. Used NVRAMs must be handled in accordance with local regulations regarding the disposal of such items.

SAFETY AND ECOLOGICAL NOTES FOR DISPOSAL

1. Never incinerate toner bottles or used toner. Toner dust may ignite suddenly when exposed to an open flame.
2. Dispose of used toner, developer, and organic photoconductors in accordance with local regulations. (These are non-toxic supplies.)
3. Dispose of replaced parts in accordance with local regulations.
4. When keeping used lithium batteries in order to dispose of them later, do not put more than 100 batteries per sealed box. Storing larger numbers or not sealing them apart may lead to chemical reactions and heat build-up.

LASER SAFETY

The Center for Devices and Radiological Health (CDRH) prohibits the repair of laser-based optical units in the field. The optical housing unit can only be repaired in a factory or at a location with the requisite equipment. The laser subsystem is replaceable in the field by a qualified Customer Engineer. The laser chassis is not repairable in the field. Customer engineers are therefore directed to return all chassis and laser subsystems to the factory or service depot when replacement of the optical subsystem is required.

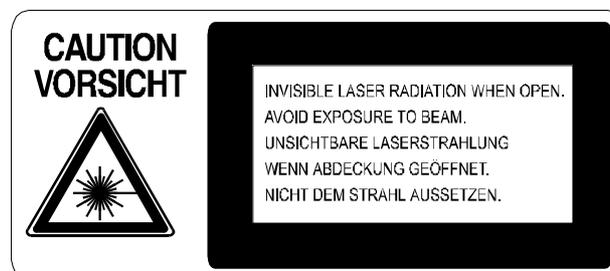
WARNING

Use of controls, or adjustment, or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.

WARNING

WARNING: Turn off the main switch before attempting any of the procedures in the Laser Unit section. Laser beams can seriously damage your eyes.

CAUTION MARKING:



What This Manual Contains

This manual describes the DataOverwriteSecurity (DOS) Unit Type A/B for:

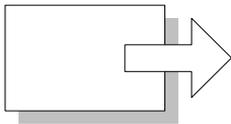
- Model J-C1
- Model A-C3 e/f
- Model R-C3.

The DOS unit is an optional DIMM (or SD card) that contains special firmware. At the end of every job, this special firmware overwrites every cluster in temporary storage on the HDD twice with random data. Then each cluster is once again overwritten with a zero. This erases sensitive data on the disk which could be retrieved surreptitiously.

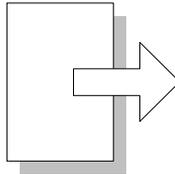
Conventions in this Manual

This manual uses several symbols.

Symbol	What it means
	Refer to section number
	See Core Tech Manual for details
	Screw
	Connector
	E-ring
	Clip ring



Short Edge Feed (SEF)



Long Edge Feed (LEF)

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1. INSTALLATION

1.1 ACCESSORY CHECK

Check the accessories and their quantities against the following list:

DataOverwriteSecurity (DOS) Unit Type A

This module is for Model A-C3 e/f and Model R-C3.

Description	Q'ty
1. DIMM	1
2. Keytops for Model R-C3 (Blank Covers)	2
3. Keytops for Model A-C3 e/f (Blank Covers)	2
4. Operation Instructions	1

DataOverwriteSecurity (DOS) Unit Type B

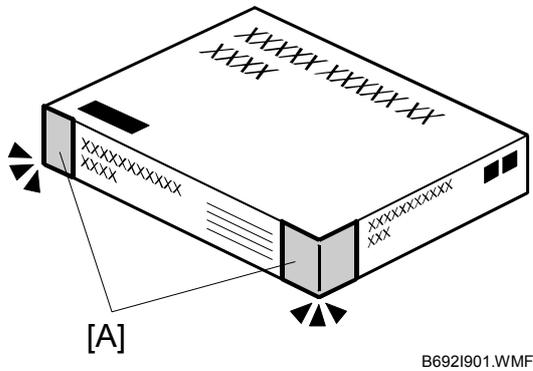
This module is for Model J-C1.

Description	Q'ty
1. SD Card	1
2. Keytop (Blank Covers)	2
3. Operation Instructions	1

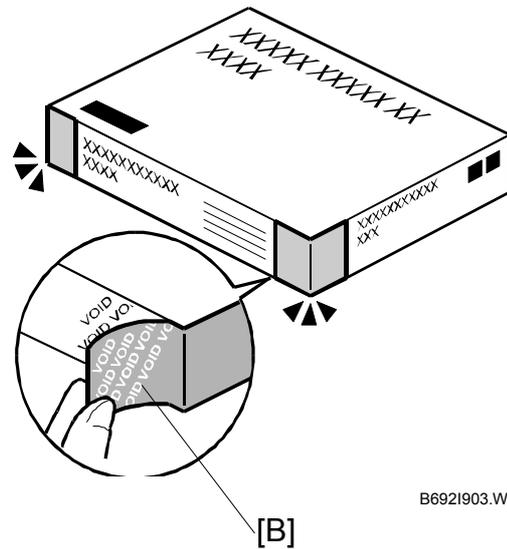
⚠ CAUTION
The machine should always be switched off and its power cord disconnected before doing any of the following procedures.

1.2 BEFORE YOU BEGIN

1.3 SEAL CHECK AND REMOVAL



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⚠ CAUTION

Before you start the installation, you must check the box seals to confirm that they have not been removed since the items were sealed in the box at the factory.

1. Check the box seals [A] on each corner of the box.
 - Confirm that a tape is attached to each corner.
 - The surfaces of the tapes should be blank. If you see “VOID” on the tapes, do not install the components inside the box.
2. If the surfaces of the tapes are unmarked, remove from the corners of the box.
3. As you remove each seal, the “VOID” marks [B] appear. This prevents them from being reattached to the box.
4. Make sure that you have the correct security module for the machine. The machine model requires either the DIMM type or the SD Card type.

Model	Security Module Required
Model A-C3 e/f	DOS Unit Type A (DIMM)
Model R-C3	DOS Unit Type A (DIMM)
Model J-C1	DOS Unit Type B (SD Card)

1.4 INSTALLATION PROCEDURE

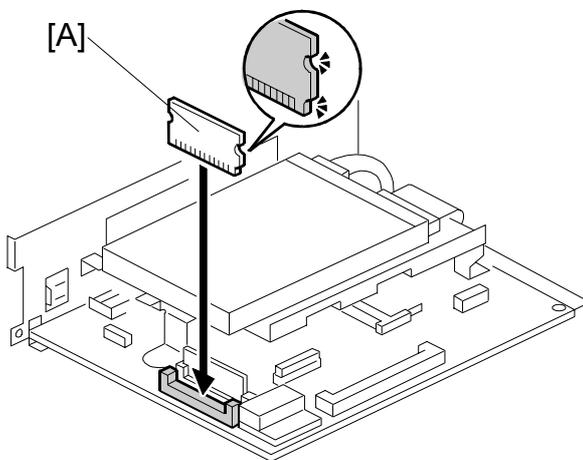
1. If the machine is on, switch off the main power switch.
2. Disconnect the Network cable if the NIB is installed.
3. Disconnect the Fax module cable if the fax option is installed.
4. Switch the main power switch on.
5. Do the "Copy SPs" in the table below.

SP No.	SP Name	Set To:
5871 001	HDD Function Disable	1 (On)
5967 001	Document Server Set Function	1 (Off)
5846 090	USC Settings - Plain Data Forbidden	1 (Check)
5836 001	Capture Settings – Capture Function	0 (On)

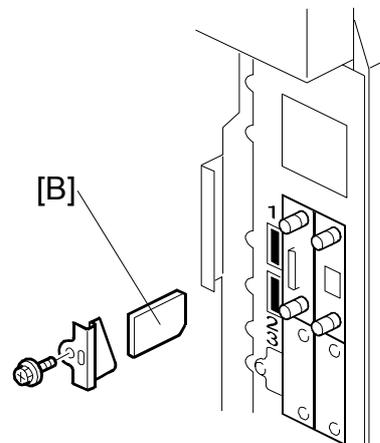
6. Do the "Printer SP" in the table below.

SP No.	SP Name	Set To:
1006 001	Sample/Proof Print	1 (On)

7. Switch off the operation switch.
8. Switch off the main switch.



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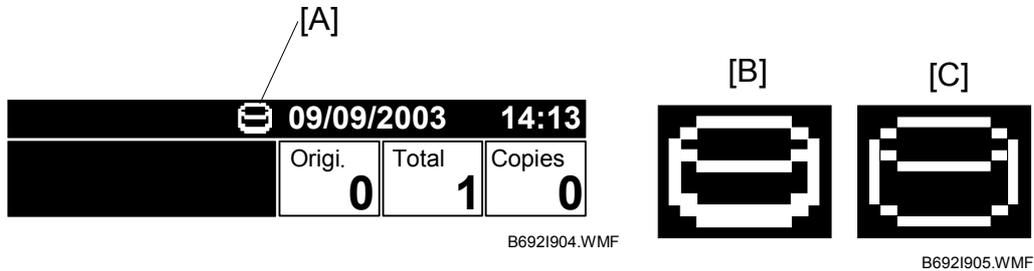
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9. Install either the DIMM [A] or the SD Card [B]:
 - The DIMM is installed for Model A-C3 e/f or Model R-C3.
 - The SD Card is installed for Model J-C1.

Model J-C1

- If the PostScript 3 option is not installed, install the DOS option SD card in Slot 2.
- If the PostScript 3 option is installed, install the DOS option SD card in Slot 1.
(The Printer/Scanner software is on the SD card with the DOS option.)

10. Connect the network cable if the NIB option is installed.
11. Connect the Fax cable if the fax option is installed.
12. Switch the main power switch on.



13. Check the display and make sure that the overwrite erase icon [A] is displayed.
14. Make a Sample Copy.
15. Watch the overwrite erase icon.
 - The bottom of the icon becomes thicker [B].
 - “Next Copy” is displayed briefly below the icon.
 - The icon returns to its normal appearance [C].
16. Remove the Document Server and Scanner keytops and replace them with the blank keytops provided.

2. PREVENTIVE MAINTENANCE

There are no preventive maintenance checks or procedures for the DataOverwriteSecurity Unit.

3. REPLACEMENT AND ADJUSTMENT

3.1 HDD

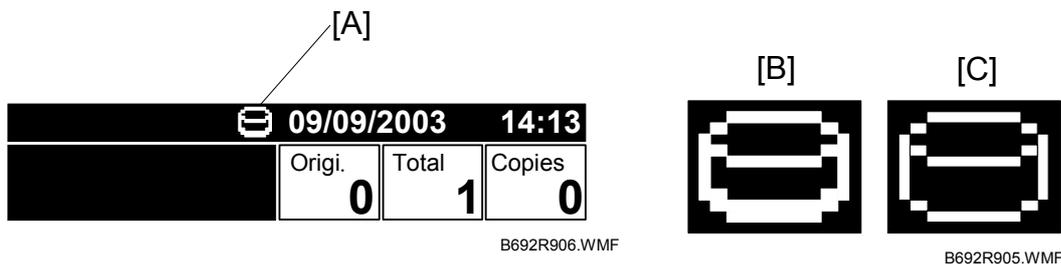
1. Switch the operation power switch off.
2. Switch the main power switch off.
3. Disconnect the power cord from the power supply.
4. Replace the HDD. (Refer to the section "3. Replacement and Adjustment" in the Service Manual of the appropriate machine.)
5. Discard the used HDD

⚠ CAUTION

The customer engineer must consult with the key operator or system administrator to decide how to handle the old HDD.

Replacement
Adjustment

6. Connect the power cord to the power supply.
7. Switch on the main power switch.
8. Make a Sample Copy.



9. Check the overwrite erase icon [A] in front of the date in the upper right corner of the operation panel display.
10. Confirm that the icon has changed from the display for data on disk [B] to no data on disk [C]

NOTE: No SP settings are required for replacement of a defective HDD.

3.2 NVRAM

1. Switch the operation power switch off.
2. Switch the main power switch off.
3. Disconnect the power cord from the power supply.
4. Disconnect the network cable if the NIB option is installed.
5. Disconnect the fax cable if the fax option is installed.
6. Insert a blank IC card or SD card into the controller slot:
 - Model A-C3 e/f, Model R-C3 require the IC card.
 - Model J-1 requires the SD card.
7. Connect the power cord to the power supply.
8. Switch the main switch on.
9. Enter the SP mode.
10. Do the following SPs.

SP No.	Name	Comment
5990 003	SMC Printout – SP	Prints a list of all the current User Tool settings
5990 002	SMC Printout – User Programs	Prints a list of all User Tool settings.
5824	NVRAM Data Upload	Uploads all SP and UT settings to the card.

11. When the upload is finished, switch the main power switch off.
12. Disconnect the power cord from the power supply, and remove the card.
13. Replace the NVRAM. (For more details about how to replace the NVRAM, refer to section “3. Replacement and Adjustment” in the Service Manual for the appropriate machine.)
14. Switch on the main power switch.
15. Do the following SPs:

SP No.	Name	Comment
5801 001	Memory Clear – All Clear	Clears entire memory.
5832 002	HDD Formatting – IMH	Initializes documents stored on the document server, stamp print data, scanner delivery images, fax delivery images.

16. Switch the main power switch off, then switch it on again.
17. Insert the IC card or SD card with the uploaded NVRAM data into the controller slot.
18. Enter the SP mode and do SP5825 (NVRAM Data Download).
19. In the "Copy SP" mode, confirm the correct settings of the following SPs:

SP No.	SP Name	Correct Setting
5871 001	HDD Function Disable	1 (On)
5967 001	Copy Server Set Function	1 (Disable)
5846 090	USC Settings - Plain Data Forbidden	1 (Check)
5836 001	Capture Settings – Capture Function	0 (Disable)

20. Exit the "Copy SP" mode and enter the "Print SP" mode.
21. Confirm the correct setting of SP1006.

SP No.	SP Name	Correct Setting
1006 001	Sample/Locked Print	1 (Enable)

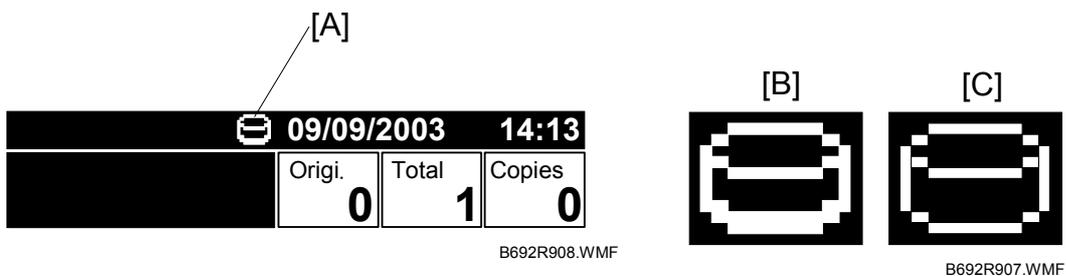
22. Connect the network cable if the NIB option is installed.
23. Connect the fax cable if the fax option is installed.

3.3 DIMM OR SD CARD

1. Switch the operation switch off.
2. Switch the main switch off.
3. Disconnect the power cord from the power supply.
4. Disconnect the network cable if the NIB option is installed.
5. Disconnect the fax cable if the fax option is installed.
6. Make sure that you have the correct DOS unit for the machine.
7. The machine model requires the DIMM or the SD Card.

Model	Security Module Required
Model A-C3 e/f	DOS Unit Type A (DIMM)
Model R-C3	DOS Unit Type A (DIMM)
Model J-C1	DOS Unit Type B (SD card)

8. Install either the DIMM or the SD Card in the controller slot:
 - Model A-C3 e/f, Model R-C3 require the DIMM.
 - Model J-1 requires the SD card.
9. Connect the network cable if the NIB option is installed.
10. Connect the Fax cable if the fax option is installed.
11. Switch the main power switch on.
12. Make a Sample Copy.



13. Check the overwrite erase icon [A] in front of the date in the upper right corner of the operation panel display.
14. Confirm that the icon has changed from the display for data on disk [B] to no data on disk [C].

4. TROUBLESHOOTING

CAUTION

Never turn off the main power switch when the power LED is lit or flashing. To avoid damaging the hard disk or memory, press the operation power switch to switch the power off, wait for the power LED to go off, and then switch the main power switch off.

NOTE: The main power LED lights or flashes while the platen cover or ARDF is open, while the main machine is communicating with a facsimile or the network server, or while the machine is accessing the hard disk or memory for reading or writing data.

4.1 SERVICE CALL CONDITIONS

4.1.1 SUMMARY

There are 4 levels of service call conditions.

Level	Definition	Reset Procedure
A	The LCD shows the SC code. The customer cannot continue to use the machine. The customer must call for service.	The customer engineer must: <ul style="list-style-type: none"> • Enter the SP mode. • Switch the main power switch off and on. • Troubleshoot the problem by following the procedures described in this section.
B	The LCD shows the SC code. The customer cannot continue to use the machine. This is a machine error.	The customer must: <ul style="list-style-type: none"> • Switch the operation switch off and on. • If the error occurs again, switch the main switch off and on. • If the error occurs again, user must call for service.
C	The LCD shows the SC code. However, only the unit that generated the error is disabled.	The customer must: <ul style="list-style-type: none"> • Switch the operation switch off and on. • If the error occurs again, switch the main switch off and on. • After recovery, the user can continue to use any feature other than the disabled function. For example, if an error occurs in Tray 1, the user can use other paper feed trays. • Customer should call for service if the affected function continues to return errors.
D	The LCD shows no SC code. The customer can continue to use the machine.	No action required. The machine updates the SC history.

4.1.2 SC CODE DESCRIPTIONS

SC828	B	Copy Countermeasure Error	Model A-C3 e/f, Model R-C3 Only
		A special chip on the ROM-DIMM installed in the machine is designed to prevent copying. After the command was sent to this chip, the chip generated an unexpected response.	<ul style="list-style-type: none"> ROM-DIMM

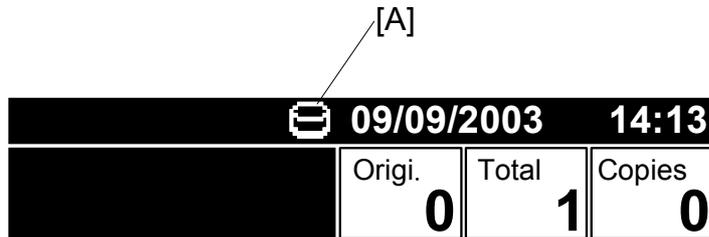
SC865	B	HDD Access Error	Model A-C3 e/f, Model R-C3, Model J-C1
		During operation, the HDD generated an error.	Hard Disk Failure <ul style="list-style-type: none"> Do SP5832 001 (HDD Formatting - All) Do SP5832 002 (HDD Formatting - IMH) If normal operation of the HDD cannot be recovered after doing these two SPs, replace the HDD.

SC866	B	SD Card Recognition Error	Model J-C1 Only
		The machine generated an error when it attempted to detect the electronic recognition license. An illegal program is on the SD card.	<ul style="list-style-type: none"> Use an approved SD card.

SC867	B	SD Card Removal Error	Model J-C1 Only
		The SD card was removed from its slot while an application was executing.	<ul style="list-style-type: none"> Never remove an SD card from the controller slot while a program is executing. Switch the main power switch off and on, then start again.

SC868	B	SD Card Access Error	Model J-C1 Only
		The SC card controller returned an error because the SD card is defective or the SC card controller is defective.	<ul style="list-style-type: none"> Replace the SD card. Replace the SD card controller.

4.2 OVERWRITE ERASE ICON NOT DISPLAYED



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If the overwrite erase icon [A] is not displayed, check the following SPs and make sure that they are set correctly.

Copy SPs

SP No.	SP Name	Set To:
5871 001	HDD Function Disable	1 (On)
5967 001	Copy Server Set Function	1 (Disable)
5846 090	USC Settings - Plain Data Forbidden	1 (Check)
5836 001	Capture Settings – Capture Function	0 (Disable)

Print SP

SP No.	SP Name	Set To:
1006 001	Sample/Locked Print	1 (Enable)

Trouble-
shooting

5. SERVICE TABLES

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.
*	Value stored in NVRAM. After a RAM reset, this default value (factory setting) is restored.
<i>1111</i>	An SP number set in bold-italics denotes a "Special Service Program" mode setting. To display the SSPs: 1. Enter the SP mode. 2. On the touch panel, press "Copy SP" and (#) together.
DFU	Denotes "Design or Factory Use". Do not change this value.
Japan only	The feature or item is for Japan only. Do not change this value.
LEF	Long Edge Feed
SEF	Short Edge Feed
(☛6.2 Image Processing)	Refer to "6.2 Image Processing" in "6. Details". Due to fundamental changes in how image processing adjustment is done with Group 4 SP codes, more details are provided in Section 6.

5.1 COPY SP SERVICE TABLES

5801 1	Memory Clear - All Clear
	Resets all data for process control and all software counters, and restores all modes and adjustments to their default values. To execute, hold down ① for over 3 seconds, and then turn the copier off and on again. Use this SP only after replacing the NVRAM, or after the copier has malfunctioned due to a damaged NVRAM.

5801 014	Clear DCS Settings
	Initializes SP setting related to DCS. DCS (Delivery Control Service) manages the Scan Router connection. To execute, hold down ① for over 3 seconds, and then turn the copier off and on again.

5824	NVRAM Data Upload
	Uploads the UP and SP mode data (except for counters and the serial number) from NVRAM on the control board to a flash memory card. <i>While using this SP mode, always keep the front cover open. This prevents a software module accessing the NVRAM during the upload.</i>

5825	NVRAM Data Download
	Downloads the content of a flash memory card to the NVRAM on the control board.

5832	HDD Formatting	
	Enter the SP number for the partition to initialize, then press #. When execution ends, cycle the machine off and on.	
5832 1	ALL	Initializes entire content of the HDD.
5832 2	IMH	Initializes 1) documents stored on the document server, 2) stamp print data, 3) scanner delivery images, 4) fax delivery images.

5836*	Capture Settings	
5836 1*	Capture Function (0:Off 1:On)	0: Disable, 1: Enable
	0: With this function disabled, the settings related to the capture feature cannot be initialized, displayed, or selected. 1: With this function enabled, the settings screen for the capture features can be displayed.	

5846	UCS Settings	
	UCS (User Control Service) is the software that manages user codes, the fax address book, the scan-to-email address book, and the scan-to-folder address book.	
5846 50*	Initialize All Directory Info.	Clears all directory information managed by UCS, including all user codes

5871	HDD Function Disable	[0~1 / 0 / 1] (0: OFF, 1: ON)
	Disables the HDD functions by suppressing all functions that write data to the HDD. After this SP is executed, the machine must be switched off and on to enable the setting. This SP is used after the optional Security Module Type A has been installed on the machine. For more details about this installation, see "1. Installation".	

5872	HDD Overwrite Status Check	
	Determines whether the content of the hard disk has been overwritten. Range: 0 to 65535	

5967*	Copy Server Set Function	
	<p>Allows or denies access to the document server screen. After changing this setting, you must switch the main switch off and on to enable the new setting.</p> <p>0: Function enable. Pressing the Document Server button opens the Document Server screen.</p> <p>1: Function disable. Pressing the Document Server button does not display the Document Server screen. Free access to the document server is denied. However, files on the document server can still be accessed with the printer driver.</p>	

Service Tables

5990	SP Print Mode (SMC Printout)	
5990 1	All (Data List)	Execute to print a list of the settings for the selected item.
5990 2	SP (Mode Data List)	
5990 3	User Program	
5990 5	Diagnostic Report	

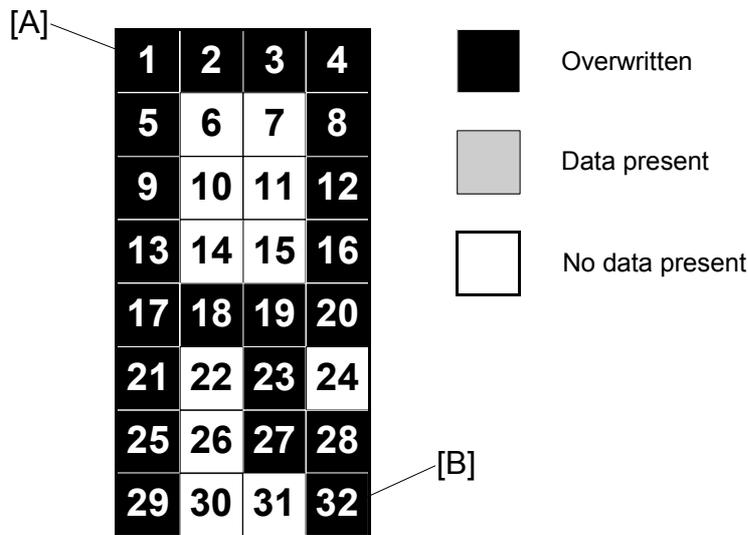
5.2 PRINT SERVICE TABLE

1006 001	Sample/Locked Print	
	<p>[0~1/0/1] 0: Linked, 1: On</p> <p>Enables and disables the document server. When you select "0", the document server is enabled according to the Copy Service Mode SP5967. If you select "1", the document server is enabled regardless of Copy Service Mode SP5967.</p> <p>Note: Set to "1" (On) for use of the Sample Copy and Locked Print features.</p>	

6. DETAILS

When an original is scanned or printed, the data for the job is stored temporarily on the hard disk for jam recovery. After the copy or print job finishes, some of this temporary data remains on the HDD at random locations until it is overwritten by the next job.

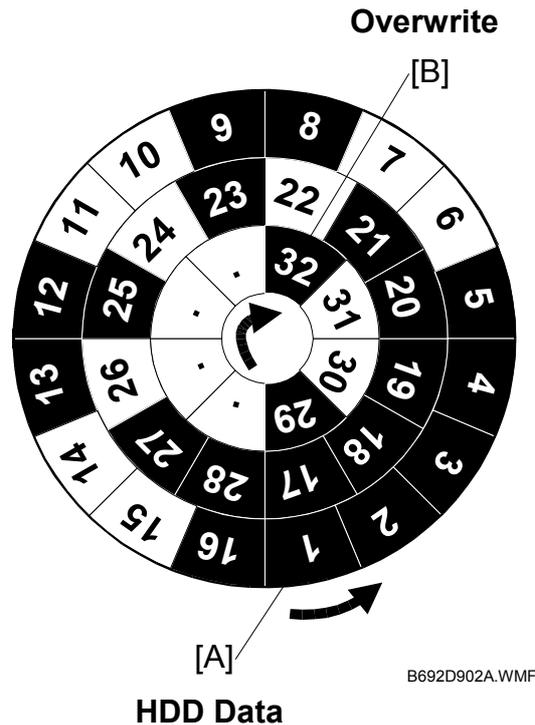
At the end of every copy and print job, the DataOverwriteSecurity Unit automatically writes over unneeded temporary data with random data twice and with a zero (0) once. This is the method recommended by NSA.



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Original Data

Detailed
Descriptions



A copy or print job always starts writing data to disk, starting with the clusters at the outer edge [A] and progressing toward the center.

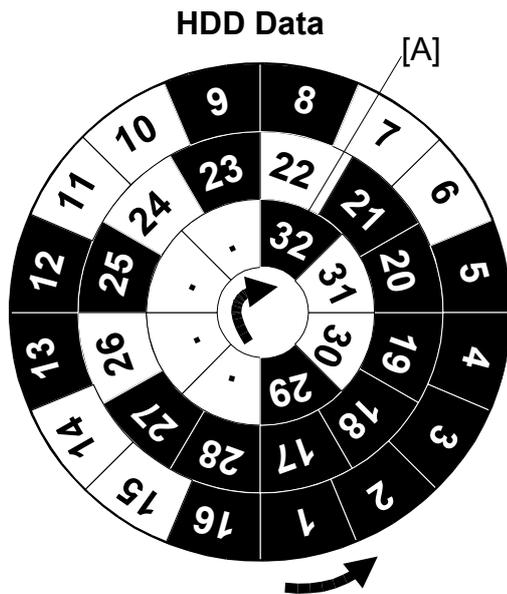
The overwrite, on the other hand, always begins at the center cluster [B] and progresses toward the edge.

Taking the first square as cluster 1 on the outermost track:

- A job starts writing from 1, 2, 3, and continues toward 32.
- At the end of the job, the Security module overwrite erase proceeds from the opposite direction, starting from 32, 31, 30 on the innermost track and continues to 1.

NOTE: Each number in the illustration represents 1 cluster, the smallest unit the operating system uses to handle data on the HDD.

If a copy or print job starts during data overwrite, the job has priority and the overwriting stops, and the copy or print job begins.

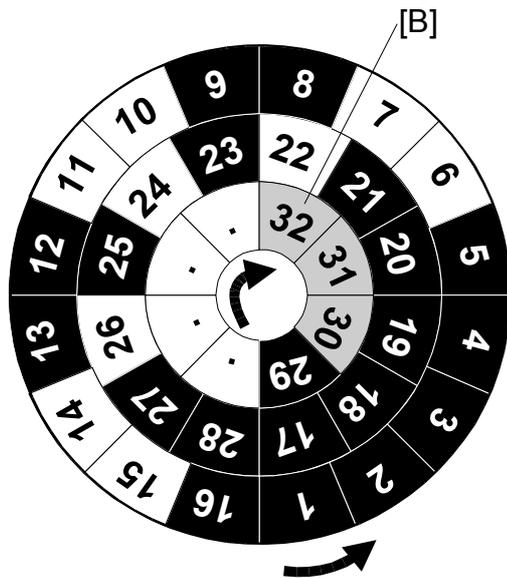


Original Data

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24
25	26	27	28
29	30	31	32

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1. A copy job writes data to the HDD as far as cluster 32 [A].

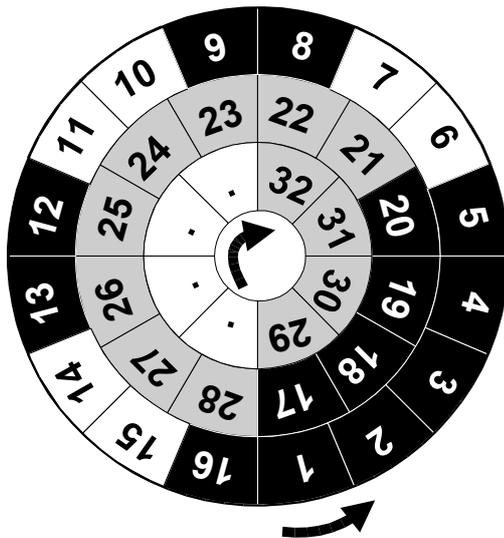


1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24
25	26	27	28
29	30	31	32

Detailed Descriptions

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2. When the copy job is finished, the data overwrite starts at cluster 32 [B] can continues to overwrite each cluster twice with random data and once with a "0".

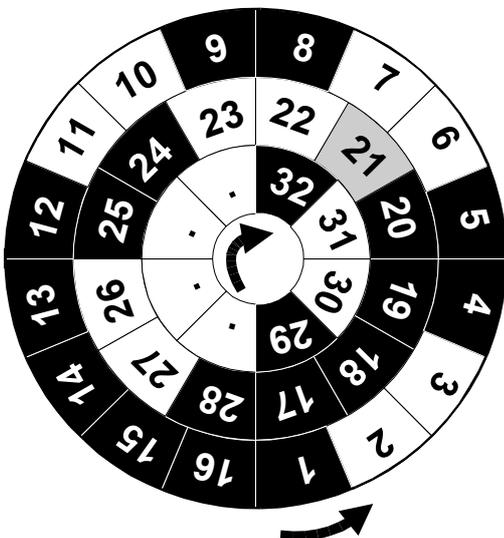


1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24
25	26	27	28
29	30	31	32

[C]

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- In this example, a copy job starts when the overwrite reaches cluster 21 [C] and overwriting stops.

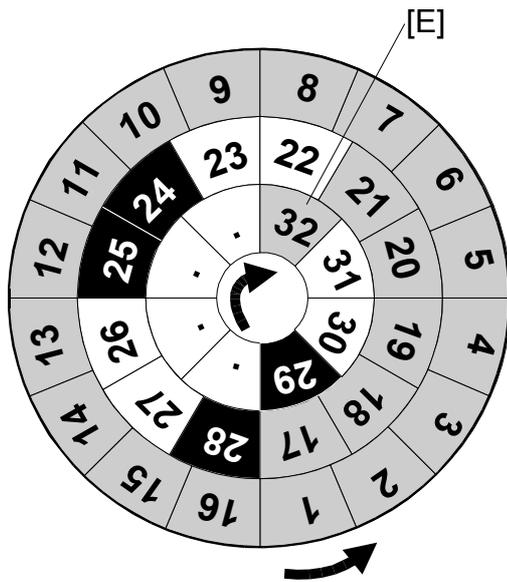


1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24
25	26	27	28
29	30	31	32

[D]

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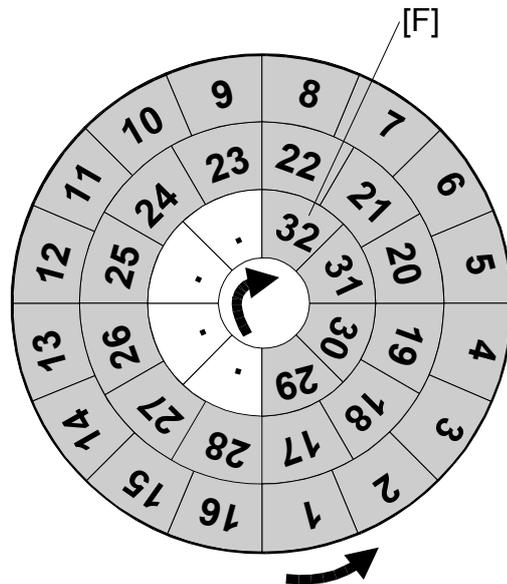
- Next, the job writes data to the disk as far as cluster 32. When the job finishes, the overwrite restarts, starting with cluster 21 [D].



1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24
25	26	27	28
29	30	31	32

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- As soon as the overwrite progresses as far as cluster 1, it starts again from cluster [E] and continues through 32, 31, and so on.



1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24
25	26	27	28
29	30	31	32

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- When overwriting reaches cluster 22 (in this example), the overwrite is finished.

Detailed Descriptions

SPECIFICATIONS

1. HARDWARE

SD Card	Model J-C1	Either the DIMM or SD card is required.
DIMM	Model A-C3 e/f, Model R-C3	

2. SOFTWARE

The table below describes:

- The types of data overwritten automatically.
- Compatibility of the data overwrite function with other functions of the machine.

Types of temporary data that are overwritten	Copy jobs
	Print jobs
	Sample print/locked print jobs * ¹
	LAN fax printing
Types of temporary data that are not overwritten	Document server functions
	Scanner functions (except TWAIN)
	Internet fax
	Paperless/serverless fax
	PS3 (only for Type A) * ²
	Spool printing
	SDK applications (Global Scan, Doc Mail, etc.)
Types of temporary data that are not originally stored on the HDD	File format converter functions
	Normal fax functions (except I-Fax, paperless/serverless fax)
	TWAIN scanner

*¹ A sample print or locked print job can be overwritten after execution.

*² The PS3 function cannot be used with the Type A DIMM because the Type A DIMM is inserted in the PS3 slot. However, Model J C-1 is provided with an SD card merge function, so the PS 3 function can be used with the Type B.

*³ User stamps are not overwritten and erased.

*⁴ Printer fonts, overlay forms, and RTIFF data are not overwritten.

- If the fax option is installed, the address book data is stored in the FCU (500 addresses maximum). If the Function Upgrade Kit is installed, up to 1200 addresses can be stored. The number of addresses that can be stored is determined by the capacity of the FCU and Function Upgrade Kit. The HDD does not store address book data.