MICRO-FC SECTION

Contents

MICRO-FC

Two types of MICRO-FCs are provided with micro-program exchange and MP installation.

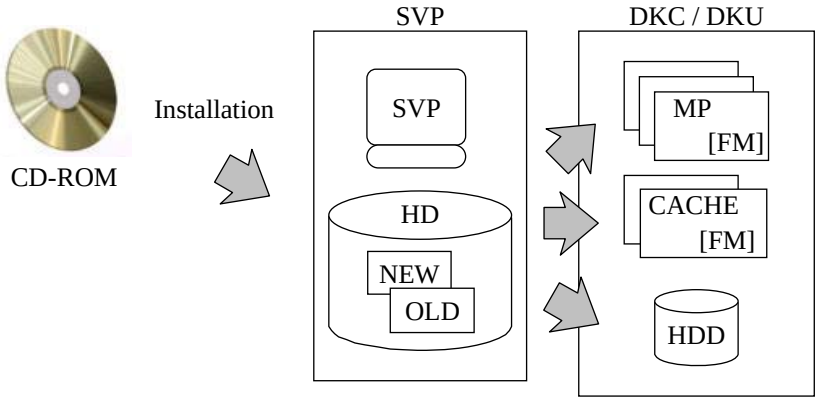
1. Overview

1.1 Micro-program Types

The micro-programs listed below can be exchanged via the SVP. Therefore, the exchange of micro-programs requires operational knowledge of the SVP.

Micro-program	Written to
Setup installer	—
DKCMAIN	MPB (FM/MP)
HTP	16ML8/16MS8
FCHF	MPB (FM) and 8FC16
DKAF	MPB (FM) and DKA Port
SVP	Hard disk in the SVP
SSVPMN	FM (MN)
FCDG	MPB (FM)
CUDG4	Hard disk in the SVP
RAM BOOT	MPB (FM/MP)
CMBK	Cache
BTCL	BKM
Expander	DKU (SSW)
Expander(FMU)	DKU (SSW in the FBX)
CONFIG	Hard disk in the SVP
CFM	BKM
HDD	DKU (HDD)

1.2 Micro-program Exchange Flow



SVP keeps two generations (NEW and OLD version) of the micro-programs.

Micro-programs can be exchanged in the following three ways.
(1) Downloading after storing the micro-programs from CD-ROM to the hard disk
(2) Downloading of the latest versions on the hard disk in the SVP
(3) Version Down (downloading of OLD version on the hard disk)

1.2.1 About OSS media

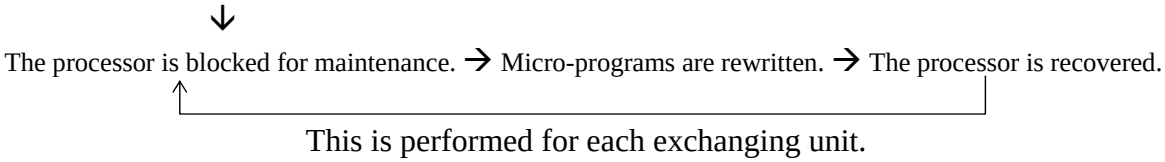
In this storage system, OSS (Open Source Software) that had been contained in the micro-program media is stored in another media. This media is called OSS media. Tomcat, Flash player, Apache, JRE, and Perl are stored in the OSS media.
OSS media is used on SVP maintenance exchange, and on an upgrade installation of Apache, JRE, or Perl.

1.3 Micro-program Exchange

Micro-programs can be exchanged off-line or on-line.

(1) Off-line
The storage system is blocked. → Micro-programs are rewritten. →
The storage system is recovered.

(2) On-line
Transfer micro-programs to the DKC



NOTE:

- The SVP checks the version of the micro-program to be exchanged before rewriting it. When the SVP determines that the micro-program cannot be rewritten, it displays an error message and cancels the exchange of the micro-program.
- The SVP terminates the exchange of micro-programs when the error status is displayed (i.e. when a message " ..... error ..... " or "..... failed ....." is displayed) or when the [Cancel] button is selected.
  If you want to retry the exchange, please start from the first step of the MICRO-FC procedure.
  However, in the case the error status is displayed during a download from SVP to DKC (FM) or DKU by procedures in "3.3 Transferring micro-programs to the DKC" (MICRO03-120) or "4.4 Transferring micro-programs" (MICRO04-160), you can retry it with procedures in "3.4 Hard Disk Download" (MICRO03-130) or "4.5 Hard Disk Download" (MICRO04-320).
- All program files which are automatically exchanged on an SVP during a micro-program exchange, will also be automatically exchanged on the other SVP when the SVP High Availability Feature is installed and the other SVP is functional.
  Those programs which are not automatically exchanged, such as Apache, must be manually exchanged on both SVPs.
  Please confirm that both SVPs contain the same program versions after exchanging program versions. However, SVP switching must be performed before and after the version check. (Refer to "2.17 SVP Switching" (SVP02-17-10).)
- If it is required to version down the current micro-program running on the DKC to a version that is not the last installed, do not attempt this without receiving guidance specific to your case from technical support division or the factory.
  This needs to be analyzed on a case by case basis and a unique procedure may need to be provided for each case.

⚠ CAUTION

When SVP High Reliability Kit is installed, the exchanged micro-program on normal SVP is automatically transferred to and updated on standby SVP. However, when the version of Apache/JRE/Perl stored in OSS media has changed, a manual installation is required on standby SVP.

⚠ CAUTION

In case of ShadowImage for Mainframe/ShadowImage/Volume Migration/Hi-Copy/ FlashCopy (R)/Thin Image, the differential bitmap data on the shared memory of DKC is volatilized by the offline microprogram exchange operation. Furthermore, in case of FlashCopy (R), the relationship is all released. Also, in case of Thin Image, Pool is blocked.

Execute the online microprogram exchange operation not to volatilize the differential bitmap data on the shared memory of DKC, the relationship of FlashCopy (R), and the Pool information on Thin Image.

⚠ CAUTION

When exchanging an FCHF micro-program with a configuration mounting 8FC16, an alternate path may be required depending on updated content of the FCHF micro-program. Micro-program exchange needs the alternate path when the XX part of the FCHF micro-program version (80-XX-YY) is changed. At that time, confirm alternate paths between clusters are configured in all the path definitions connected to 8FC16.

2. Pre-Process Micro FC

2.1 Connect to SVP from Maintenance PC

Connect to SVP from Maintenance PC, with referring “1.4 Connecting the PC to the SVP” (SVP01-60) and then execute following process.

3. Micro-program Exchange Procedure (Off-line)

If an error occurs during a micro-program exchange, retry the exchanging procedure from the beginning.

3.1 Processing before exchange

- Check the storage system status with the maintenance display. (Check the versions of all programs through with the version display.)
- Make sure that correction copy and other processing are not in progress.
- Perform post processing for PIN data.
- Check that all processors are normal.
- Check that all channel paths to the storage system are off-line (to block all micro-programs).
- HTP, FCHF, DKAF, FCDG, DKCMAIN, and RAMBOOT micro-programs can be exchanged off-line.
- For the off-line micro-program exchange operation procedure when FlashCopy (R) relationships exist, refer to THEORY OF OPERATION SECTION “3.9.8 Micro-program Exchange (1) Off-line Micro-program Exchange” (THEORY03-09-350).
- All existing Thin Image pairs must be deleted before executing an off-line micro-program exchange.
- For the off-line micro-program exchange procedure when Thin Image is installed, refer to THEORY OF OPERATION SECTION “3.9.8 Micro-program Exchange (1) Off-line Micro-program Exchange” (THEORY03-09-350).
- In case of performing the off-line micro-program exchange for UR/UR for z/OS pairs, please make sure not to perform on the MCU and RCU simultaneously.
- In some primary storage systems and in some secondary storage systems, when off-line micro-program exchange is executed under the Universal Replicator’s remote copy configuration, please suspend the pairs that were previously registered in EXCTG.
  Furthermore, please do not exchange micro-program on the supervisor-side storage system & subordinate-side storage system at the same time.
- In an OPEN environment, when exchanging the micro-program off-line in the remote copy configuration using multiple primary and secondary storage system of Universal Replicator, first suspend all the pairs in this configuration.
- When any LDEV is being migrated by nondisruptive migration, it is recommended to stop the migration, and to replace the microgram offline after returning to operation on the migration source.

NOTICE: If the status of LDEV which is created by external device mapping function is “Maintenance blockade” status and micro-exchange is operated, the maintenance blockaded LDEV status is resorted and the status is changed to the normal status.

NOTICE: Do not open the ‘Maintenance’ window during micro-program exchange. If the window is opened, micro-program exchange may end abnormally.
In the case that the ‘Maintenance’ window needs to be opened due to an error and so on, contact T.S.D. for help.

NOTICE: When off-line micro-exchange is executed, monitor information on the collection on Dynamic Tiering is annulled. Therefore, the next relocation is not executed for the automatic execution mode. Please execute the termination processing of the monitor if necessary for the manual execution mode.
After off-line micro-exchange, the relocation executed before off-line micro exchange is restarted regardless of the execution mode.

Table 3.1-1 Off-line Micro-program Exchange time (approximate)

(unit : minutes)

	CD-ROM reading	Micro exchange time
DKCMAIN	6	60
HTP		
FCHF		
DKAF		
FCDG		
RAMBOOT		
TOTAL	6	60

NOTE: The above are standard exchange time of micro-program.
Micro-program exchange time depends on the usage status of devices, and it is specifically influenced by the Write Pending amount. It may take more time than the described values when the Write Pending amount is larger.

3.2 Storing the micro-programs to be substituted in the SVP

(1)

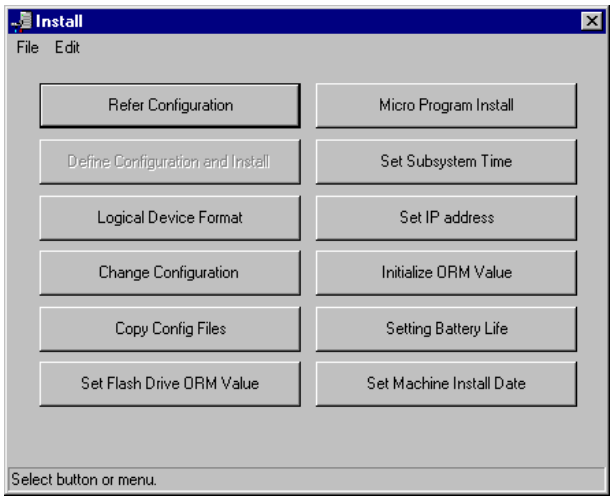
<Initial screen>

(2)

Change the mode to [Modify] (CL).
Select (CL) [Install].

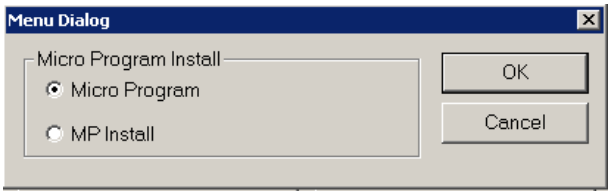
(3)

In the 'Install' window, select (CL) [Micro Program Install].



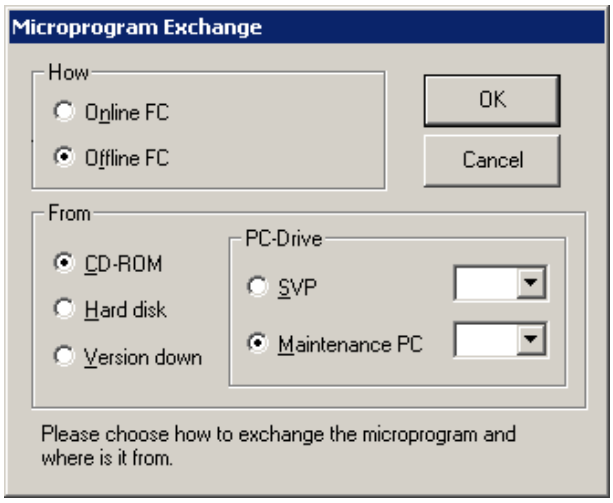
(4)

Select (CL) [Micro Program] and select (CL) [OK].



(5)

In the 'Microprogram Exchange' dialog box,
[How]: select (CL) [Offline FC].
[From]: select (CL) the source from which to store the micro-programs.
[PC-Drive]: select (CL) the Maintenance PC and the drive letter from which to store the micro-programs (In the case of CD-ROM).



[From]'s selection branch

CD-ROM: After being stored on the hard disk from CD-ROM, the micro-programs are downloaded.
--- Select (CL) from the selection of PC-Drive.

Hard disk: The latest versions on the SVP hard disk are downloaded.
--- Go to 3.4 (1). (MICRO03-130)

Version down: Old versions on the hard disk are downloaded.
--- Go to 3.5 (1). (MICRO03-150)

[PC-Drive]'s selection branch

SVP: The SVP's drive --- Select (DR) the drive letter and Select (CL) [OK] and Go to (6).

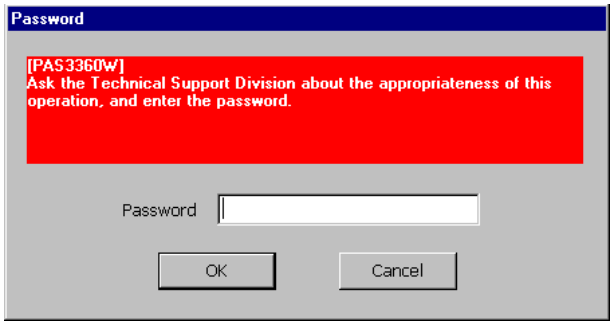
Maintenance PC: The Maintenance PC's drive --- Select (DR) the drive letter and Select (CL) [OK] and Go to (6).

Selecting (CL) [Cancel] returns you to be step (4).

---

(6)

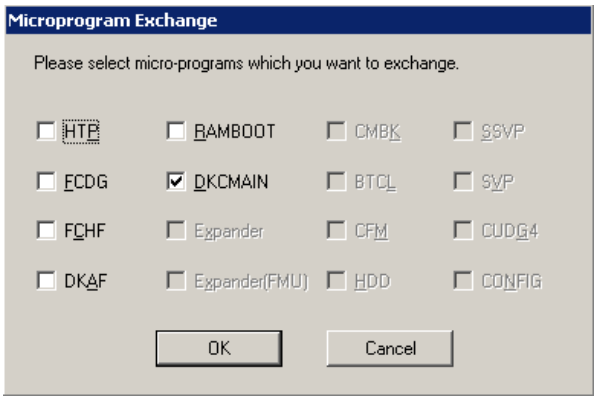
If you want to continue this process, select (CL) [OK] and enter the password, and select (CL) [OK].



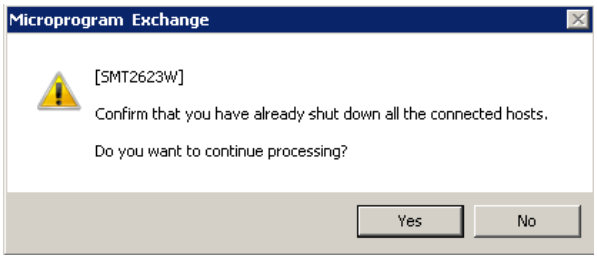
(7)

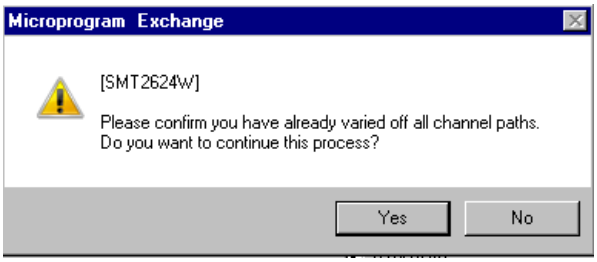
The ‘Microprogram Exchange’ dialog box appears.
Select (CL) one or more items from the list of the type of micro-programs, and select (CL) [OK].

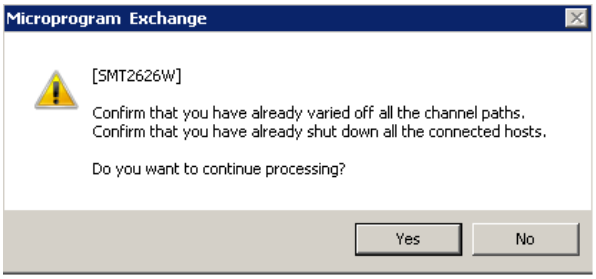
☑ : Micro-programs to be substituted.



One of the messages is displayed by the storage system configuration.



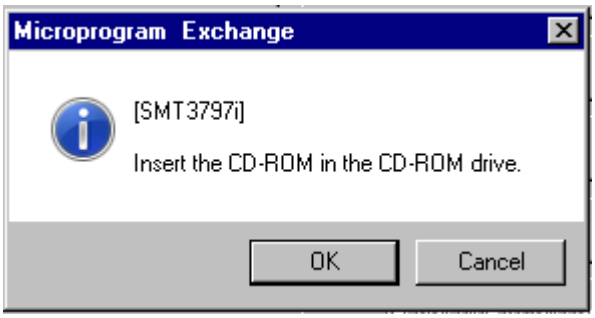




After confirming that all the channel paths are off-line, select (CL) [Yes].

(8)

If you select CD-ROM, a dialog “Insert the CD-ROM in the CD-ROM drive.” appears. Insert the CD-ROM and select (CL) [OK].

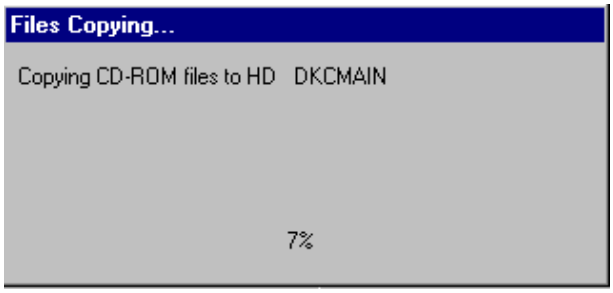


<<Error>>
No CD-ROM or incorrect CD-ROM in the disk drive:
The Message “Insert the correct CD-ROM.” is displayed.
Insert the correct CD-ROM and select (CL) [Retry].
Internal error:
- “Old files erase failed, copy stop.”
- “Memory error has occurred.”
- “File I/O error has occurred.”
- “Logical error has occurred.”
- “The directory create error and copy stop.”
- “The file size is Wrong and copy stop.”

---

(9)

If you select CD-ROM, the message “Copying CD-ROM files to HD DKCMAIN” appears.

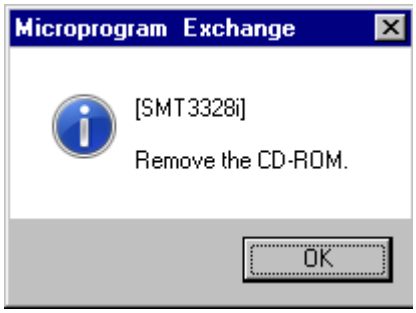


<<Error>>
Internal error:
- “The file size is Wrong and copy stop.”
- “The directory create error and copy stop.”
- “Micro-program version disagreement and copy stop.”
- “Logical error has occurred.”
- “File I/O error has occurred.”
- “Memory error has occurred.”

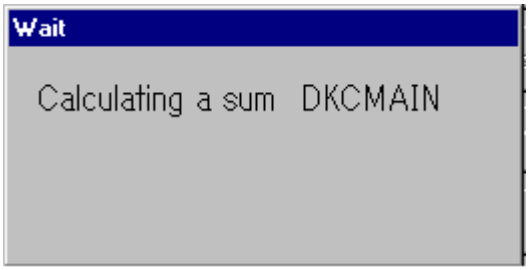
NOTE: When the error message “File I/O error has occurred.” or “Memory error has occurred.” is displayed, power SVP off and on again if the same message appears after reexecuting the micro-program exchange (see SVP01-160 and SVP01-170 in the SVP SECTION).
Then execute the same micro-program exchange again. If the same error occurs (the same error message is displayed), replace SVP hardware (see REP01-320 in the REPLACE SECTION).

(10)

If you select CD-ROM, a dialog “Remove the CD-ROM.” appears.
Remove the CD-ROM and select (CL) [OK].



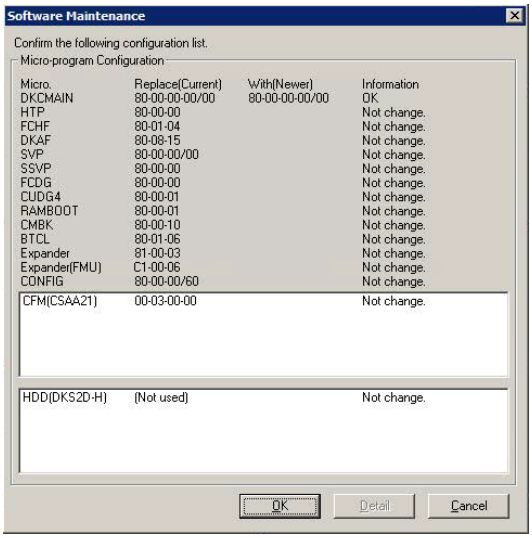
After copy end, sum checker starts.
While checking, the message appears.



(11)

On the ‘Software Maintenance’ dialog box, the micro-program types, current versions, new versions, and message are displayed.

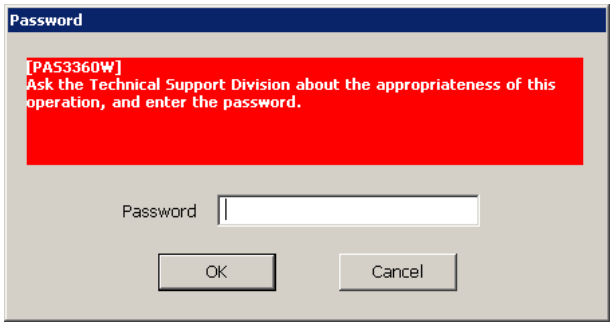
<Display with no error>
The message “Confirm the following configuration list.” is displayed below the title bar. The micro-program can be replaced only when all rows in the information column show “OK”, “Not change” or “Warning”.
To make processing progress, select (CL) [OK].
To terminate micro-program replacement, select (CL) [Cancel].



⚠ CAUTION

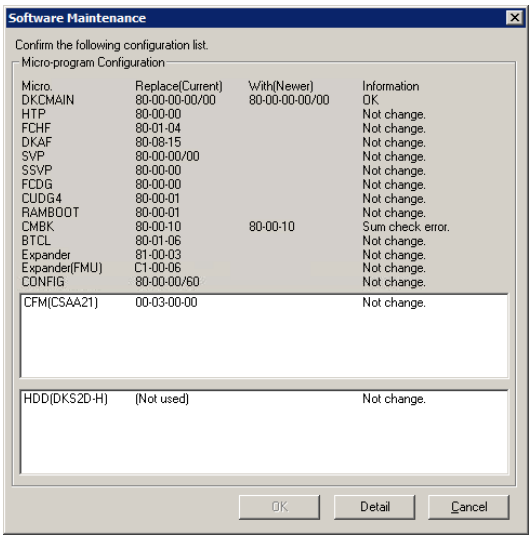
Be sure to select “Detail” when “Warning” is displayed. Confirm the contents and contact the Technical Support Division to ask whether to select [OK] or [Cancel]. To make processing progress, select (CL) [OK], input the password and select (CL) [OK]. Password is needed for this operation. Please call Technical Support Division to obtain password and authorization.

When Technical Support Division judges [OK]:
Select (CL) [OK] to display 'Password' window.
Input password and select (CL) [OK] to continue processing.



When Technical Support Division judges [Cancel]:
Select (CL) [Cancel] to terminate micro-program replacement.

<Display with an error>
A sample display at occurrence of an error is shown on the right. An error message is displayed below the title bar. At the same time, error information is displayed in the information column.
Select (CL) [Cancel] to terminate micro-program replacement.
(NOTE: The [OK] button is disabled.)
Select (CL) [Detail] to display detailed error information.
Before making an attempt to rerun, be sure to correct the cause of the error by referring to the entire status (SVP SECTION), action code (ACC SECTION), and other information.



Below are messages and information that may be displayed in the Information column.

NOTE: Select (CL) [Detail] to display detailed error information, and confirm the cause of these errors.

- "Version error"
- "Revision error"
- "Warning"
- "Can't read the configuration of the micro-program."
- "Warning" (Function bit map error)

Version Check Message Table.

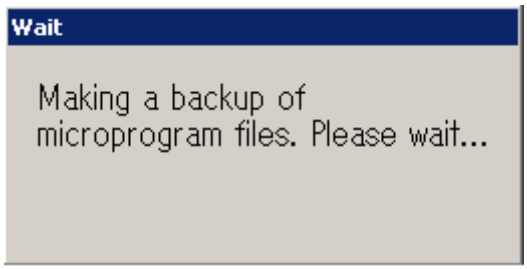
	Message :	Contents and Maintenance
1	Confirm the following configuration list.	Check the version (Normal or Warning). If Warning, it is necessary to be approved by T.S.D. (Technical Support Division).
2	Version error.	Incorrect version. Confirm the micro-program version.
3	Can't read the configuration of the micro-program.	Error caused while the micro-program configuration is being read. Recover the blockade of a concerned processor.
4	Internal error. (On SVP Logic)	Inconsistent logic. (SVP logic) Retry exchange. If the same message is displayed, power SVP off and on.
5	Internal error. (On SVP Memory)	Inconsistent logic. (SVP memory) Retry exchange. If the same message is displayed, power SVP off and on.
6	Internal error. (On Temporary Files)	Inconsistent logic. (temporary file) Retry exchange. If the same message is displayed, power SVP off and on.
7	Version error. (Previous maintenance needed)	Incorrect version. (partial replacement) Confirm the micro-program version.
8	Version error. (Incompatible MP exists)	Incorrect version. (partial replacement) Confirm the micro-program version.
9	Sum Check error.	Sum check code is incorrect. Micro-program data in Micro-Media isn't correct. Exchange the Micro-Media.
10	Revision error	Incorrect revision. Confirm the micro-program revision.
11	The micro-program is incompatible with the system.	Incorrect micro-program. Confirm the micro-program version and system. Contact T.S.D. (Technical Support Division).
12	Combination error	Incorrect micro-program exchange process. Confirm the combination of micro-program version and the exchange process.
13	Internal Version error. DKCMAIN - DKAF combination of Version error.	It is the exchange of incorrect combination of DKCMAIN and DKAF micro-program versions. Confirm the exchange process and the exchange order of DKCMAIN and DKAF.
14	Internal Version error. DKCMAIN - FCHF combination of Version error.	It is the exchange of incorrect combination of DKCMAIN and FCHF micro-program versions. Confirm the exchange process and the exchange order of DKCMAIN and FCHF.

	Information	Contents
1	OK	The micro-program is replaceable.
2	Version error [#xxxx]	MP has an incorrect micro-program version. [processor number]
3	Internal error [#xxxx]	Inconsistent logic error has occurred. [internal error code] 0001: Parameter error 0002: Memory allocation error 0003: Memory allocation error 0005: File I/O error
4	Not change	The micro-program will not be replaced.
5	Read error	An error has occurred while reading the current configuration.
6	Sum Check error	The sum check code is incorrect.
7	Warning	It is necessary to contact T.S.D. (Technical Support Division) for approval.
8	Revision error	MP has an incorrect micro-program revision.

NOTE: For “Function ID Table”, refer to “A.1 Function ID Table” (MICRO-A-10).
When the error message 2179 is displayed on SVP while exchanging micro-programs, check the function detected by the message, take actions, and then perform the exchange again.

(12)

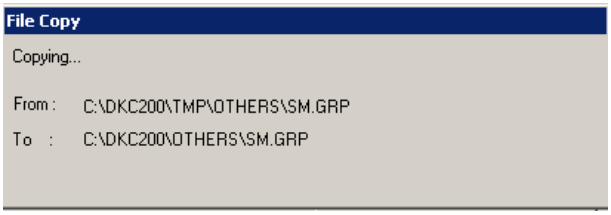
The message “Making a backup of micro program files. Please wait...” appears.



(13)

File copy in SVP.

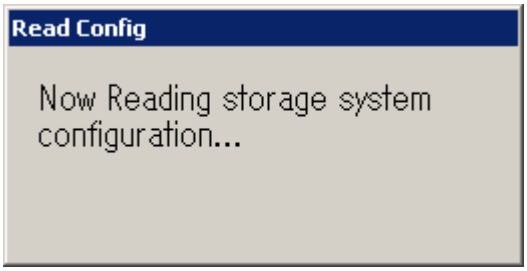
Go to 3.3 (1).



3.3 Transferring micro-programs to the DKC

(1)

The message “Now Reading storage system configuration...” appears.
The current DKC configuration is read.



<<Error>>

- “On exchanging a micro-program, An error has occurred. XX processing is stopped”
- “The processor of an obstacle blockade exits. XX processing is stopped”
- “The processor that failed in an exchange of micro-program exists”
- “An error had occurred in XX blockade processing”
- “File size check error”
- “Invalid file contents”

---

(2)

The message “Downloading *** micro-program...” (***: DKCMAIN, ...) appears.

---

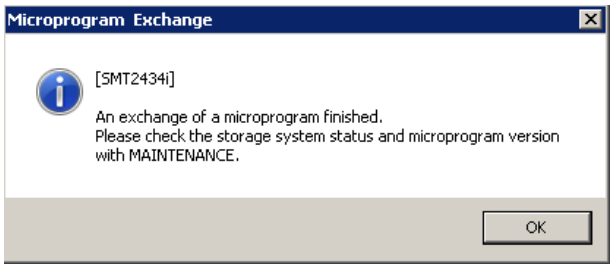
(3)

The message “Now MP Rebooting... Group# n/N” appears.
All processors are recovered.

---

(4)

After downloading the micro-programs, SVP makes the storage system to be enable and displays the following message “An exchange of a microprogram finished. Please check the storage system status and microprogram version with MAINTENANCE.”, select (CL) [OK].



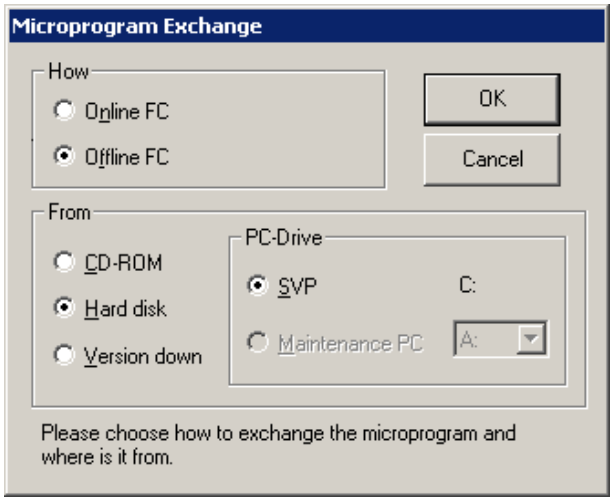
Go to 3.6 (MICRO03-170).

3.4 Hard Disk Download

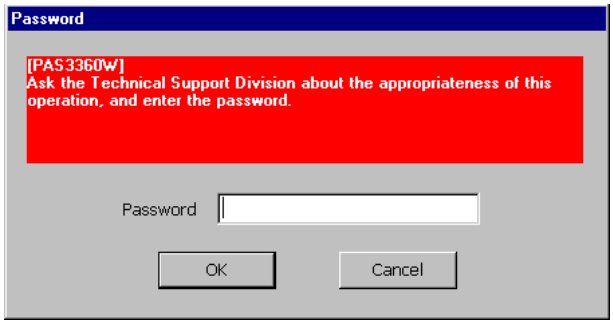
Download the latest version of the micro-program on the SVP hard disk.

(1)

[How]: Select (CL) [Offline FC].
[From]: Select (CL) [Hard disk] in the 'Microprogram Exchange' dialog box.
And select (CL) [OK].

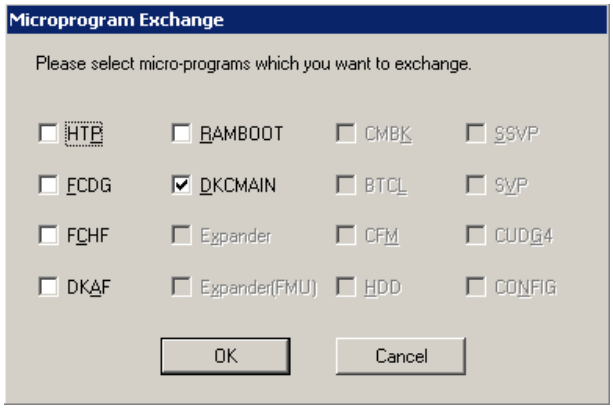


If you want to continue this process, select (CL) [OK], enter the password, and select (CL) [OK].

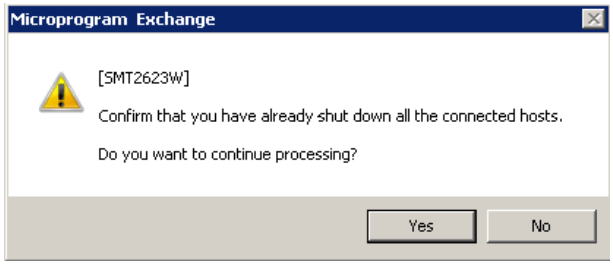


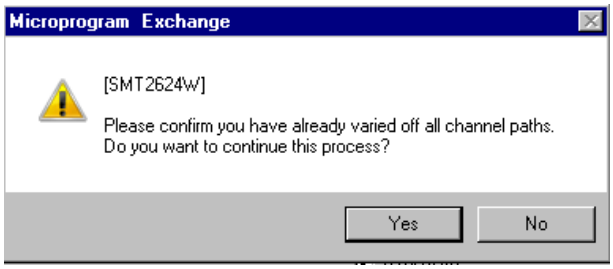
The 'Microprogram Exchange' dialog box appears.
Select (CL) one or more items from the list of the type of micro-programs, and select (CL) [OK].

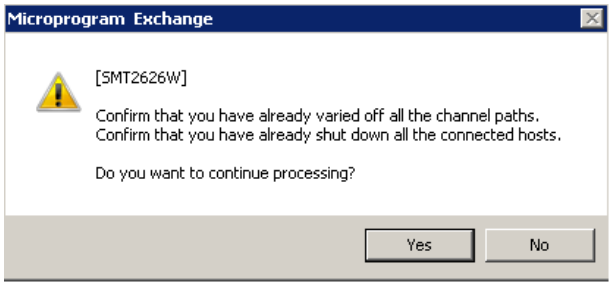
☑ : Micro-programs to be substituted.



One of the messages is displayed by the storage system configuration.







After confirming that all the channel paths are off-line, select (CL) [Yes].

Return to 3.2 (11). (MICRO03-70)

If an error occurs in downloading micro-programs to DKC, remove the cause of an error using Maintenance Display (SVP SECION), Action Code (ACTION CODE SECTION), and other information to execute the exchange again. Then start from the first step of MICRO-FC procedure. At this time, you can select [Hard disk] at 3.2 (5). (MICRO03-40)

3.5 Version Down

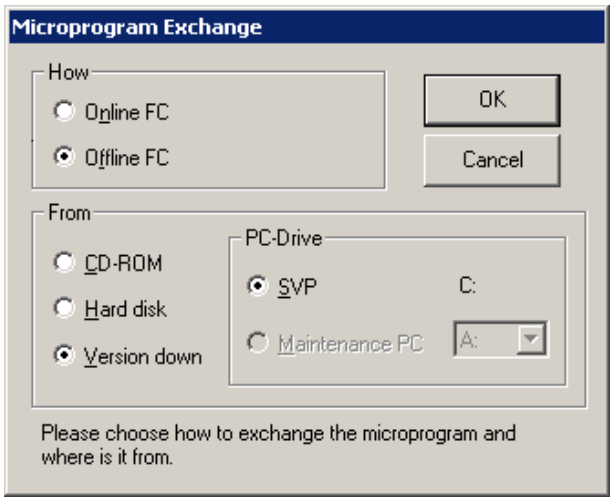
⚠ CAUTION

Ask the technical support division about the appropriateness of the operation.
Do not execute the Version Down function during initial copy or resynchronization of TrueCopy, Universal Replicator, or global-active device. If you execute it, the micro-program exchange may fail.

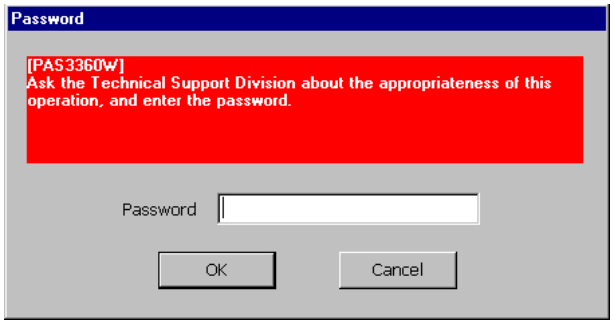
If you want to restore the micro-program to the previous version of the micro-program after the exchange (by CD-ROM, Floppy Disk), execute the Version Down function.

(1)

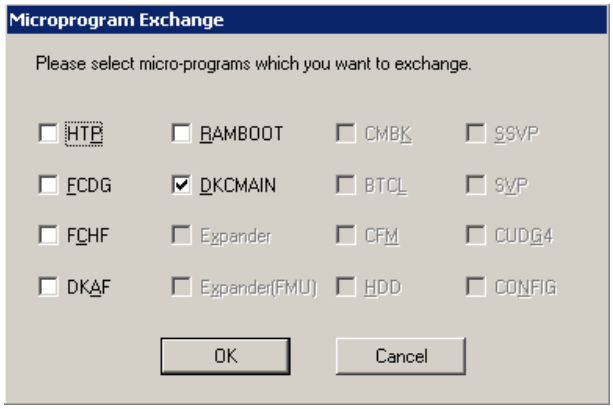
[How]: Select (CL) [Offline FC].
[From]: Select (CL) [Version down] in the 'Microprogram Exchange' dialog box.
And select (CL) [OK].



If you want to continue this process, select (CL) [OK], enter the password, and select (CL) [OK].



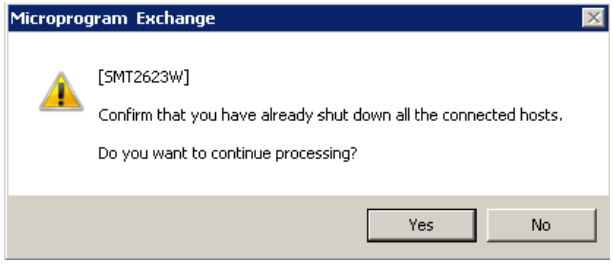
The ‘Microprogram Exchange’ dialog box appears.
Select (CL) one or more items from the list of the type of micro-programs, and select (CL) [OK].

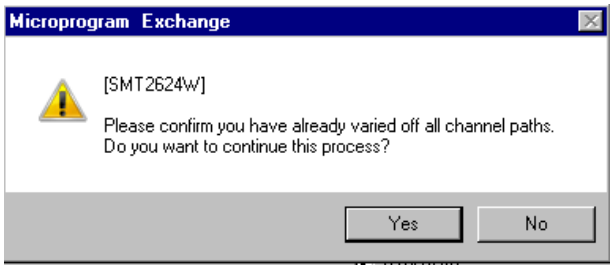


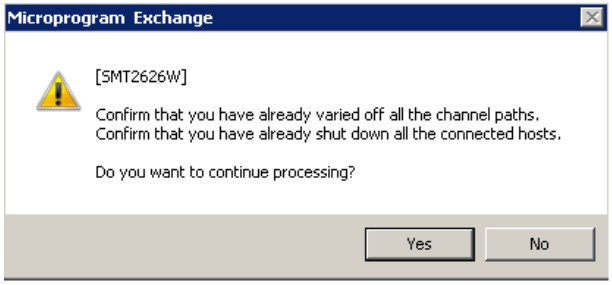
☑ : Micro-programs to be substituted.

NOTE: The Version Down function can restore only the micro-program exchanged by CD-ROM. It is not possible to execute the Version Down function for the micro-program which is not exchanged by CD-ROM.

One of the messages is displayed by the storage system configuration.







After confirming that all the channel paths are off-line, select (CL) [Yes].

Return to 3.2 (11). (MICRO03-70)

3.6 Checking the functions after exchange

Check that the version of the recently installed micro-program is the same as that of the replaced micro-program by using the version display in the MAINTENANCE function.
(See SVP SECTION.)

NOTICE: If you find "??-??…" or incompatibility version, recover the status following the "6.2 Recovery procedure in off-line menu was selected" (MICRO06-120).

When you downgraded the version of the micro-program of SVP, the program (jar file) of Web Console may be cached and not operated. Clear the cache of Java. Refer to the WEB CONSOLE SECTION for clearing the cache of Java.

After changing the mode from [Modify Mode] to [View Mode], select (CL) the [Execute]-[Exit] menu on the maintenance screen and then check that Web Console starts. If it failed to start, recover it referring to trouble shooting in the WEB CONSOLE SECTION.

When the customer uses Storage Navigator, request the customer to restart the Storage Navigator running PC (Web client) surely after replacing the micro-program.

4. Micro-program Exchange Procedure (On-line)

If an error occurs during a micro-program exchange, retry the exchanging procedure from the beginning or execute the procedure explained in Chapter 7 “Trouble Recovery Procedure in Exchanging Micro-programs”.

NOTE : In case an error occurs during an exchange of the DKU micro-programs, make a note on the number of the DKU in which the error occurred when the error is recovered.

4.1 Processing before exchange

- The following Online HDD Micro-program exchange is supported for all models.
- Check the storage system status through the entire status display. (Check the versions of all the micro-programs through the version display.)
- Make sure that no processing is in progress. (*1)
- Perform post processing for PIN data.
- Check that all processors are normal.
- When exchanging a micro-program with a configuration mounting 8FC16 where the XX part of the FCHF micro-program version (80-XX-YY) is to be changed, alternate paths between clusters are defined in all the path definitions connected to 8FC16.
  (For details, refer to “10. Procedure of the FCHF Micro-program Exchange by Alternate Path”.)

*1: In case Dynamic Sparing, Correction Copy, or Copy Back is running, the micro-program exchange can be performed if HDD micro-program is not included. For details, refer to “Notes on maintenance during LDEV Format/drive copy operations” (THEORY03-23-10).

NOTICE: It is recommended to execute this function in the status of all MP’s utilization rates less than 50% because processing time of this function may be influenced by I/O processing.

NOTICE: If the status of LDEV which is created by external device mapping function is “Maintenance blockade” status and micro-exchange is operated, the maintenance blockaded LDEV status is restored and the status is changed to the normal status.

NOTICE: Do not use newly supported functions until all micro-program exchange operations are completed.

NOTICE: Do not open the ‘Maintenance’ window during micro-program exchange. If the window is opened, micro-program exchange may end abnormally. In the case that the ‘Maintenance’ window needs to be opened due to an error and so on, contact T.S.D. for help.

NOTICE: When the SVP High Reliability Kit has been installed and an SVP fail over (SIM=7FF3XX) is detected, take action for the failure (SIM=7FF3XX) first.

4.2 On-line micro-program exchange time (approximate)

Micro-program exchange time is largely varied depending on the device configuration and the combination of micro-program versions.
When the micro-program version and the base version are matched in some micro-program type, exchange time is shortened because the micro-program exchange is completed only by updating the control information. Also, the more the mounted hardware to have exchange is, the longer the exchange time is, and the less, the shorter.
Exchange time for each micro-program type is as follows. The exchange time does not include waiting time to respond to various screen messages.

① DKCMAIN/RAMBOOT/HTP/FCDG exchange time is varied when the micro-program version and the base version are matched or by the selected reboot pattern. The reboot pattern (By ONE) exchange time varies according to the number of mounted MPB.
The approximate exchange time for each micro-program type is as follows.

Table 4.2-1 DKCMAIN/RAMBOOT/HTP/FCDG Exchange time (approximate)

(unit : minutes)

Micro-program type	Exchange time when the version is matched	Exchange time for each reboot pattern			
		1/2	1/4	1/8	By One
DKCMAIN	10	25	30	35	170 (*1)
RAMBOOT					
HTP					
FCDG					

*1: The case of 8 sets of mounted MPB (the longest time)

② FCHF exchange time is varied when the micro-program version and the base version are matched or whether 8FC16 is mounted or not. Also, when the XX part of the version (80-XX-YY) is going to be changed, an interlock with the alternate path function at the host side is necessary and the consideration of the working time is also required.
The approximate FCHF exchange time is as follows.

Table 4.2-2 FCHF Exchange time (approximate)

(unit : minutes)

Micro-program type	Exchange time for the matched version or no mounted device	Exchange time when 8FC16 is mounted and the version is upgraded	Exchange time for version up which interlocks with the alternate path function
FCHF	5	8 + (1 × The number of mounted 8FC16)	20 (*2)

*2: Reboot time is displayed because FCHF reboots when interlocking with the alternate path function.
Discuss with clients for the time interlocking with the alternate path function at the host side.

③ DKAF exchange time is varied when the micro-program version and the base version are matched or by the number of mounted DKU.
The approximate DKAF exchange time according to the number of mounted DKU is as follows.

Table 4.2-3 DKAF Exchange time (approximate)

(unit : minutes)

Micro-program type	Exchange time for the matched version or no mounted device	Exchange time for version up		
		The number of DKU 1	The number of DKU 8	The number of DKU 16
DKAF	5	15	20	30

④ SVP/SSVP/CUDG4/CONFIG exchange time is not varied whether the micro-program version and the base version are matched or not, and/or by the device configuration.
The approximate exchange time for each micro-program type is as follows.

Table 4.2-4 SVP/SSVP/CUDG4/CONFIG Exchange time (approximate)

(unit : minutes)

Micro-program type	Exchange time
SVP	20
SSVP	10
CUDG4	1
CONFIG	10

⑤ CMBK/BTCL/CFM exchange time is varied depending on the combination of versions.
The approximate exchange time for each micro-program type is as follows.

Table 4.2-5 CMBK/BTCL/CFM Exchange time (approximate)

(unit : minutes)

Micro-program type	Exchange time when the version is matched	Exchange time for version up
CMBK	1	5
BTCL	1	5
CFM	1	5

⑥ Expander/Expander(FMU) exchange time varies depending on the number of mounted DKU when the micro-program version and the base version are not matched.
The approximate Expander/Expander(FMU) exchange time according to the number of mounted DKU is as follows.

Table 4.2-6 Expander/Expander(FMU) Exchange time when the version is matched (approximate)

(unit : minutes)

Micro-program type	Exchange time when the version is matched
Expander	5
Expander(FMU)	

Table 4.2-7 Expander/Expander(FMU) Exchange time at the time of configuring DKC0 (approximate)

(unit : minutes)

Micro-program type	Exchange time for version up							
	The number of DKU 1	The number of DKU 2	The number of DKU 3	The number of DKU 4	The number of DKU 5	The number of DKU 6	The number of DKU 7	The number of DKU 8
Expander	15	28	41	55	66	77	88	100
Expander(FMU)								

Table 4.2-8 Expander/Expander(FMU) Exchange time at the time of configuring DKC0/1 (approximate)

(unit : minutes)

Micro-program type	Exchange time for version up							
	The number of DKU for DKC0 1 The number of DKU for DKC1 1	The number of DKU for DKC0 2 The number of DKU for DKC1 2	The number of DKU for DKC0 3 The number of DKU for DKC1 3	The number of DKU for DKC0 4 The number of DKU for DKC1 4	The number of DKU for DKC0 5 The number of DKU for DKC1 5	The number of DKU for DKC0 6 The number of DKU for DKC1 6	The number of DKU for DKC0 7 The number of DKU for DKC1 7	The number of DKU for DKC0 8 The number of DKU for DKC1 8
Expander	40	60	80	105	130	155	180	200
Expander(FMU)								

⑦ HDD exchange time is varied by the number of mounted hard drives of the hard drive type to have exchange when the micro-program version and the base version are matched.
The approximate HDD exchange time according to the number of mounted hard drives is as follows.

Table 4.2-9 HDD Exchange time (approximate)

(unit : minutes)

Micro-program type	Exchange time for the matched version or no mounted device	Exchange time for version up		
		The number of hard drives to be exchanged 500	The number of hard drives to be exchanged 1000	The number of hard drives to be exchanged 2000
HDD	5	20	30	40

Exchange time is the sum of the above mentioned ① ~ ⑦.
For example, if the device configuration has two DKC (with the maximum mounted number of CHA/DKA/MPB/CACHE) and 16 DKU (with the maximum mounted number of mounted hard drives of HDD) with all different micro-program version types, micro-program exchange time is as follows (the longest time).

Table 4.2-10 Exchange time with the maximum configuration (approximate)

(unit : minutes)

Micro-program type	Exchange time
DKCMAIN	30 (①)
RAMBOOT	
HTP	
FCDG	
FCHF	20 (②)
DKAF	30 (③)
SVP	20 (④)
SSVP	10 (④)
CUDG4	1 (④)
CMBK	5 (⑤)
BTCL	5 (⑤)
Expander	200 (⑥)
Expander(FMU)	
CONFIG	10 (④)
CFM	5 (⑤)
HDD	40 (⑦)
Total	376 (6 hours and 16 minutes)

4.3 Storing the micro-programs to be substituted in the SVP

(1)

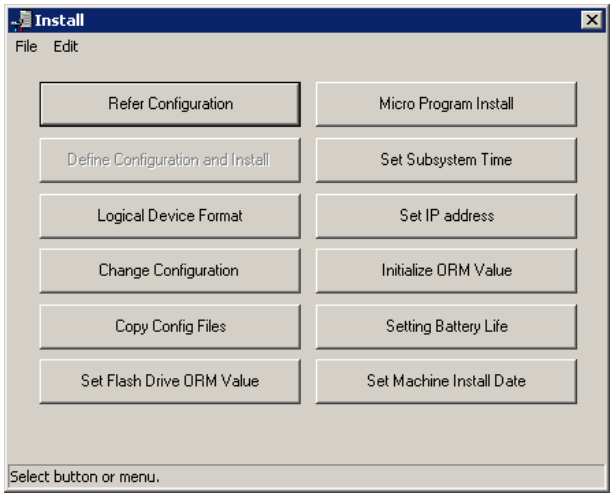
<Initial screen>

(2)

Change the mode to [Modify] (CL).
Select (CL) [Install].

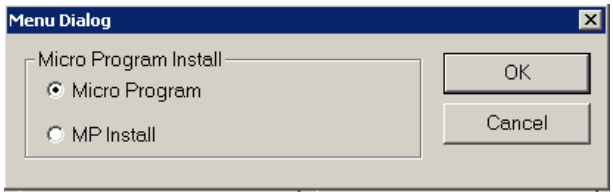
(3)

In the 'Install' window, select (CL) [Micro Program Install].

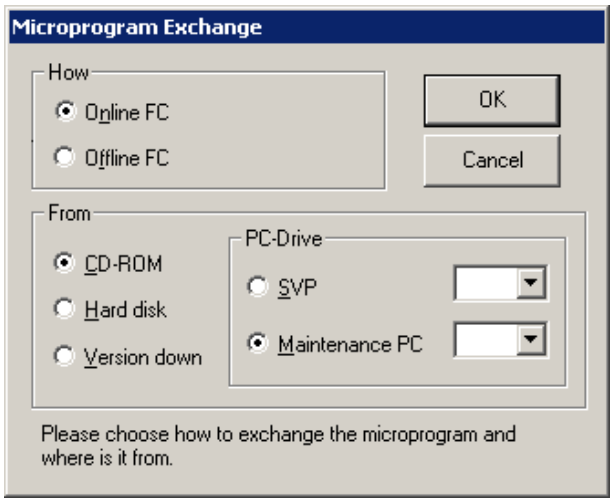


(4)

Select (CL) [Micro Program].
Select (CL) [OK].
Selecting (CL) [Cancel] returns you to Step (3).



(5)



In the 'Microprogram Exchange' dialog box,
[How]: Select (CL) [Online FC].
[From]: Select (CL) the source from which to store the micro-programs.
[PC-Drive]: Select (CL) the Maintenance PC and the drive letter from which to store the micro-programs (In the case of CD-ROM).

[From]'s selection branch

CD-ROM: After being stored on the hard disk from CD-ROM, the micro-programs are downloaded.
--- Select (CL) from the selection of PC-Drive.

Hard disk: The latest versions on the SVP hard disk are downloaded.
--- Go to 4.5 (1). (MICRO04-320)

Version down: Old versions on the hard disk are downloaded.
--- Go to 4.6 (1). (MICRO04-340)

[PC-Drive]'s selection branch

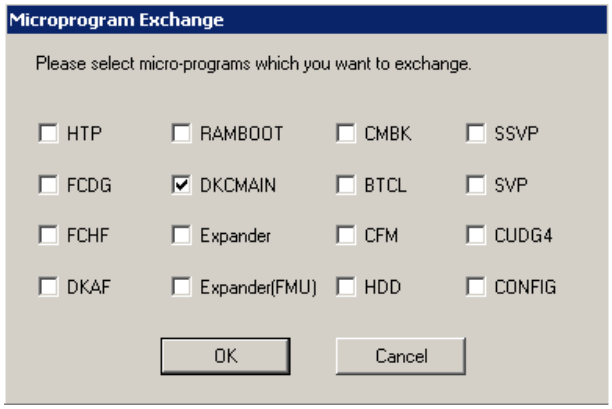
SVP: The SVP's drive --- Select (DR) the drive letter and select (CL) [OK].
Go to (6).

Maintenance PC: The Maintenance PC's drive --- Select (DR) the drive letter and select (CL) [OK].
Go to (6).

Selecting (CL) [Cancel] returns you to be step (3).

---

(6)



The 'Microprogram Exchange' dialog box appears.
Select (CL) one or more items from the list of the type of micro-programs, and select (CL) [OK].

☑ : Micro-programs to be substituted.

(7)

When DKCMAIN, or RAMBOOT were selected, you can select the reboot pattern from the list.

⚠ CAUTION

Please select a reboot pattern by taking the following table into account.

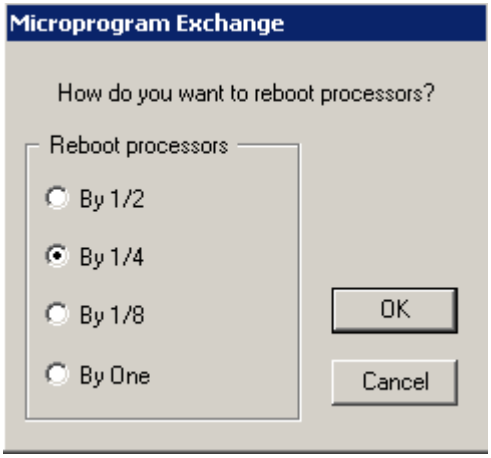
REBOOT PATTERN		By 1/2	By 1/4	By 1/8	By One
EXCHANGE TIME	STANDARD VALUE(*1) [MINUTE](APPROX.)	25	30	35	170
		SHORT ⟷ LONG			
EFFECT ON PERFORMANCE OF DKC		BIG ⟷ SMALL			

*1: MEASURE CONDITION : MP PCBx8 (128MP), NO I/O.

Sometimes an “error” message is displayed temporarily in [Reboot status display]. But, there is no problem if the reboot is finished without error.

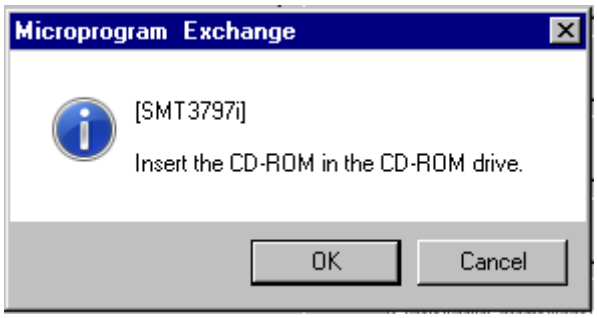
Please select (CL) one of these patterns and select (CL) [OK].

By 1/2 : Reboot by half MPs in the DKC storage system.
By 1/4 : Reboot by quarter MPs in the DKC storage system.
By 1/8 : Reboot by 1/8 MPs in the DKC storage system.
By One : Reboot by minimum reboot unit MPs in the DKC storage system.



(8)

If you select CD-ROM, a dialog “Insert the CD-ROM in the CD-ROM drive.” appears. Insert the CD-ROM and select (CL) [OK].



<<Error>>

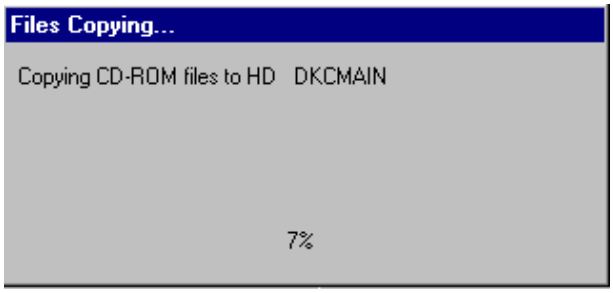
No CD-ROM or uncorrect CD-ROM in the disk drive:

The Message “Insert the correct CD-ROM.” is displayed.
Insert the correct CD-ROM and select (CL) [Retry].

---

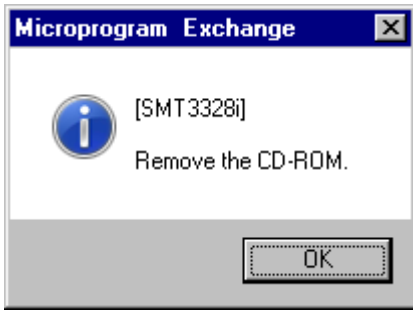
(9)

If you select CD-ROM, the message “Copying CD-ROM files to HD DKCMAIN” appears.

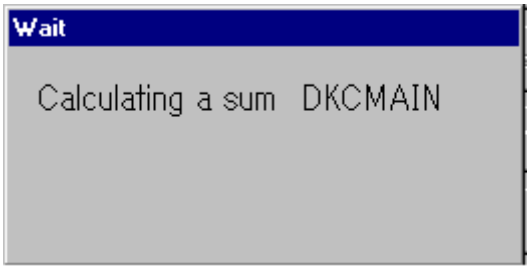


(10)

If you select CD-ROM, a dialog “Remove the CD-ROM.” appears.
Remove the CD-ROM and select (CL) [OK].

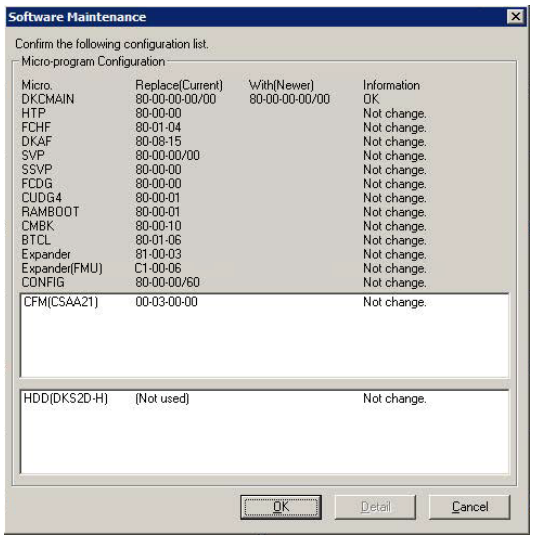


After copy end, sum checker starts.
While checking, the message appears.



(11)

On the ‘Software Maintenance’ dialog box, the micro-program types, current versions, new versions, and message are displayed.

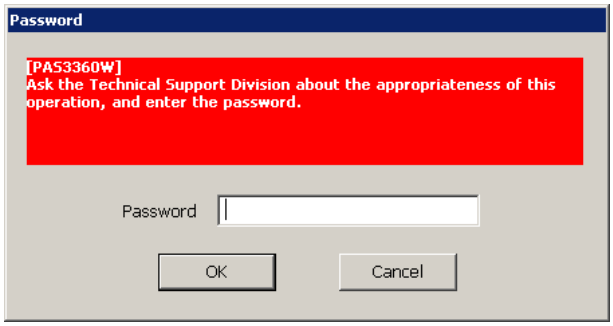


<Display with no error>
The message “Confirm the following configuration list.” is displayed below the title bar. The micro-program can be replaced only when all rows in the information column show “OK”, “Not change” or “Warning”.
To continue processing, select (CL) [OK].
To terminate micro-program replacement, select (CL) [Cancel].

⚠ CAUTION

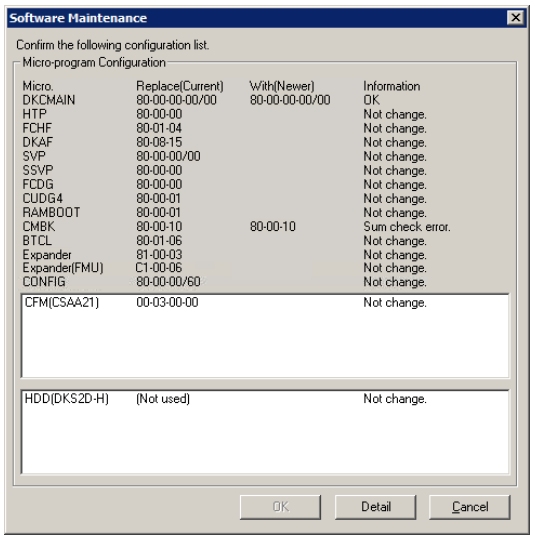
Be sure to select “Detail” when “Warning” is displayed. Confirm the contents and contact the Technical Support Division to ask whether to select [OK] or [Cancel]. To make processing progress, select (CL) [OK], input the password and select (CL) [OK]. Password is needed for this operation. Please call Technical Support Division to obtain password and authorization.

When Technical Support Division judges [OK]:
Select (CL) [OK] to display ‘Password’ window.
Input password and select (CL) [OK] to continue processing.



When Technical Support Division judges [Cancel]:
Select (CL) [Cancel] to terminate micro-program replacement.

<Display with an error>
A sample error display is shown on the right. An error message is displayed below the title bar.
At the same time, error information is displayed in the information column.
Select (CL) [Cancel] to terminate the micro-program replacement.
(NOTE: The [OK] button is disabled.)
Select (CL) [Detail] to display detailed error information.
Before attempting to rerun, be sure to correct the cause of the error. Refer to the entire status (SVP SECTION), action code (ACC SECTION), and other information.



Below are messages and information that may be displayed in the Information column.

NOTE: Select (CL) [Detail] to display detailed error information, and confirm the cause of these error.
- “Version error”
- “Revision error”
- “Warning”
- “Can’t read the configuration of the micro-program.”
- “Warning” (Function bit map error)

Version Check Message Table.

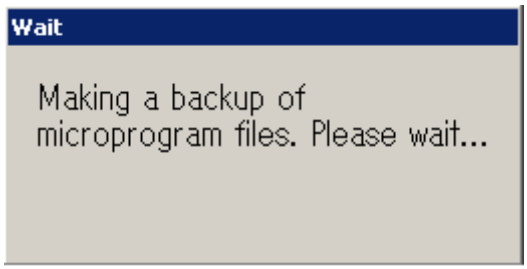
	Message :	Contents and Maintenance
1	Confirm the following configuration list.	Check the version (Normal or Warning). If Warning, it is necessary to be approved by T.S.D. (Technical Support Division).
2	Version error.	Incorrect version. Confirm the micro-program version.
3	Can't read the configuration of the micro-program.	Error caused while the micro-program configuration is being read. Recover the blockade of a concerned processor.
4	Internal error. (On SVP Logic)	Inconsistent logic. (SVP logic) Retry exchange. If the same message is displayed, power SVP off and on.
5	Internal error. (On SVP Memory)	Inconsistent logic. (SVP memory) Retry exchange. If the same message is displayed, power SVP off and on.
6	Internal error. (On Temporary Files)	Inconsistent logic. (temporary file) Retry exchange. If the same message is displayed, power SVP off and on.
7	Version error. (Previous maintenance needed)	Incorrect version. (partial replacement) Confirm the micro-program version.
8	Version error. (Incompatible MP exists)	Incorrect version. (partial replacement) Confirm the micro-program version.
9	Sum Check error.	Sum check code is incorrect. Micro-program data in Micro-Media isn't correct. Exchange the Micro-Media.
10	Revision error	Incorrect revision. Confirm the micro-program revision.
11	The micro-program is incompatible with the system.	Incorrect micro-program. Confirm the micro-program version and system. Contact T.S.D. (Technical Support Division).
12	Combination error	Incorrect micro-program exchange process. Confirm the combination of micro-program version and the exchange process.
13	Internal Version error.	If you perform the replacement of micro-program with the combination of these micro-program versions, there is a possibility that DKC/HDU blockades the part. Confirm the micro-program version and replace process.

	Information	Contents
1	OK	The micro-program is replaceable.
2	Version error [#xxxx]	MP has an incorrect micro-program version. [processor number]
3	Internal error [#xxxx]	Inconsistent logic error has occurred. [internal error code] 0001: Parameter error 0002: Memory allocation error 0003: Memory allocation error 0005: File I/O error
4	Not change	The micro-program will not be replaced.
5	Read error	An error has occurred while reading the current configuration.
6	Sum Check error	The sum check code is incorrect.
7	Warning	It is necessary to contact T.S.D. (Technical Support Division) for approval.
8	Revision error	MP has an incorrect micro-program revision.

NOTE: For “Function ID Table”, refer to “A.1 Function ID Table” (MICRO-A-10).
When the error message 2179 is displayed on SVP while exchanging micro-programs, check the function detected by the message, take actions, and then perform the exchange again.

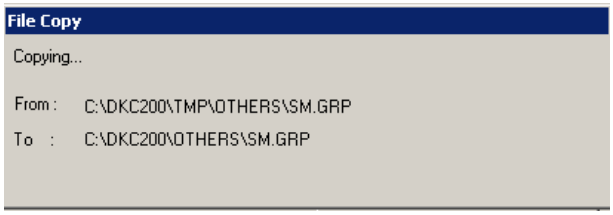
(12)

The message “Making a backup of microprogram files. Please wait...” appears.



(13)

File copy in SVP.



- DKC/DKU: go to 4.4.1 (MICRO04-160).
- SSVP: go to 4.4.2 (1) (MICRO04-280).
- SVP: go to 4.4.2 (2) (MICRO04-280).
- Config: go to 4.4.3 (MICRO04-300).

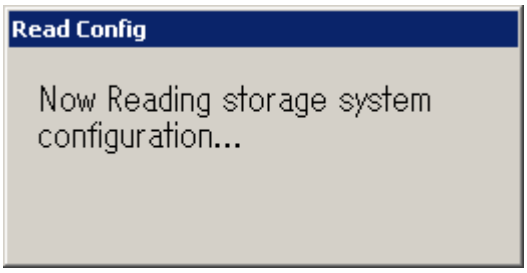
4.4 Transferring micro-programs

4.4.1 Transferring micro-programs to the DKC/DKU

(1)

The message “Now Reading storage system configuration...” appears.

The current DKC configuration is read.



NOTE: When a match is not found in the version and revision between the micro-program in the DKC and that on the SVP hard disk, the micro-program cannot be exchanged on on-line. In this case, the message “Is the device off-line?” appears, and the exchange is canceled.
When a processor is blocked due to a failure, the message “Processing cannot be continued because of a processor blocked due to a failure” appears, and the exchange is canceled.

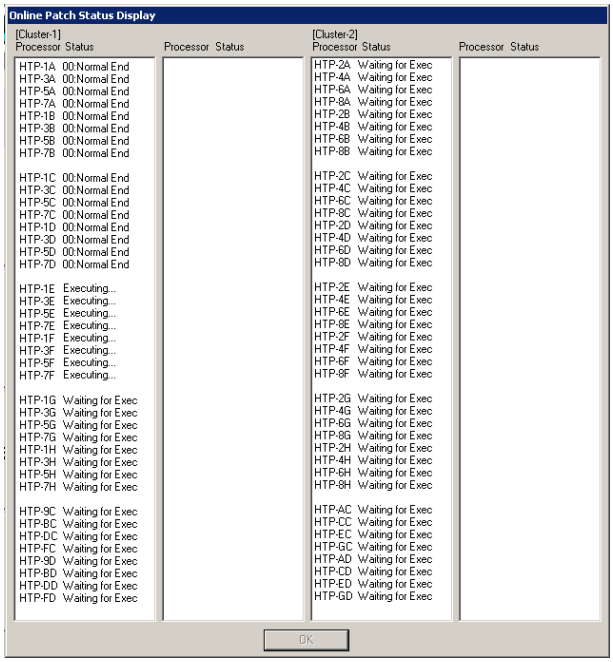
If an error occurs while downloading micro-programs, resolve the cause of the error using Maintenance Display (SVP SECTION), Action Code (ACTION CODE SECTION), and other information, then start from the beginning of the MICRO procedure to execute the exchange again. At this time, you can select [Hard disk] at 4.5 (MICRO04-320) or [CD-ROM] at 4.3 (5) (MICRO04-70).

<HTP micro-program exchange>
If HTP micro-program exchange, the following message appears.

(a)

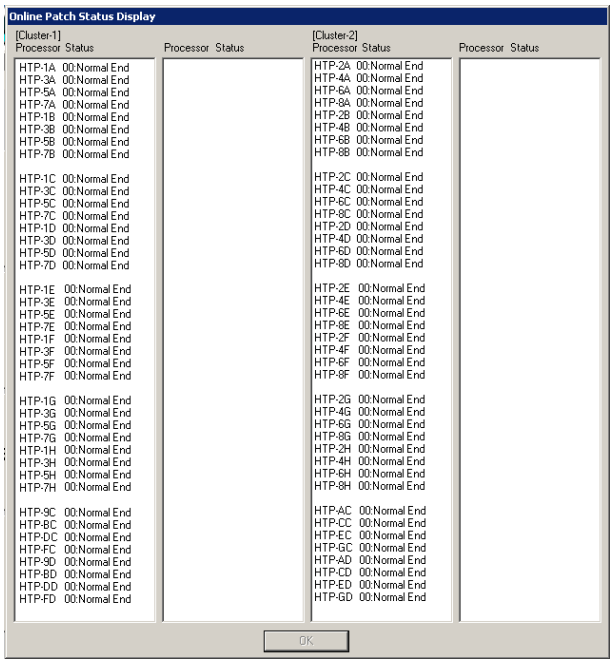
The message displays the execution status of the online patch in the installed HTP.

<Explanation of status>
Not selected---------- Not selected as the target.
Waiting for Execution -- Execution is awaited.
Executing... ---------- Execution is in progress.
XXXX Blockade Error Processor XXXX is blockaded.



(b)

When execution is competed for all targets, you will go to Step (2). If some errors occur, you can now select [OK].
Select (CL) [OK].
You will return to 4.2 (3).



(2)

The message “Downloading *** micro- program...” (***: micro-program type) appears.

(3)

The message “Now MP Rebooting... Group# n/N” appears while recovering the processor.

<FCHF micro-program exchange>

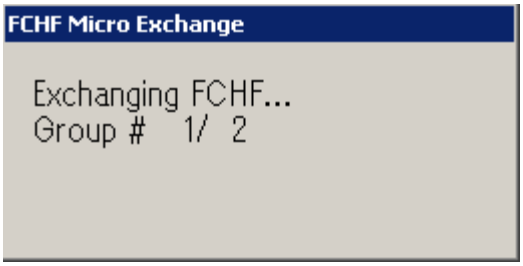
⚠ CAUTION

FCHF micro-program exchange has two methods. One is the method which does not disconnect the 8FC16 path link, and the other method which requires the alternate path. They are decided according to the changes of the FCHF micro-program. The method requiring an alternate path runs when exchanging a micro-program whose XX of the FCHF version (80-XX-YY) is changed. For micro-program exchange, operate by following the displayed messages.

Confirm the preconditions described in “10. Procedure of the FCHF Micro-program Exchange by Alternate Path” before starting the FCHF micro-program exchange procedures.

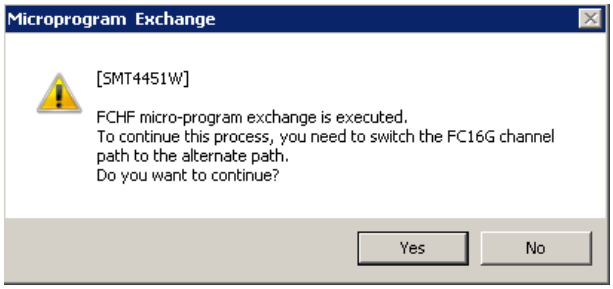
For the FCHF micro-program version (80-XX-YY),
If the XX is same, go to the method not disconnecting the path link of 8FC16: (a).
If the XX is going to be changed, go to the method requiring the alternate path: (b).

(a) In the case the message “Exchanging FCHF...” is displayed
- The micro-program exchange is performed without breaking the 8FC16 path link.



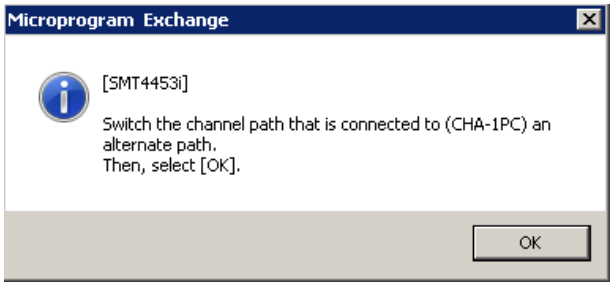
(b) In the case the message “Exchanging FCHF...” is not displayed
- The micro-program exchange needs the alternate path.

- The FCHF micro-program exchange execution confirmation message is displayed. Select (CL) [Yes] when the preconditions for path switching (MICRO10-10) are satisfied. When the preconditions are not satisfied, select (CL) [No] to abort the micro-program exchange.



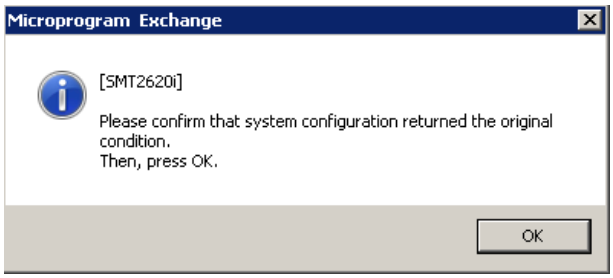
- The alternate path switching message is displayed. Switch the channel path of the indicated FC16 CHA PCB location to an alternate path. Select (CL) [OK.]

  Perform the path switching in the following order.



  1. FC16 CHA PCB installed in DKC-1/Cluster-1
  2. FC16 CHA PCB installed in DKC-1/Cluster-2
  3. FC16 CHA PCB installed in DKC-2/Cluster-1
  4. FC16 CHA PCB installed in DKC-2/Cluster-2

- The message shown on the right is displayed. Confirm that the system configuration is restored to the original condition, then select (CL) [OK.]

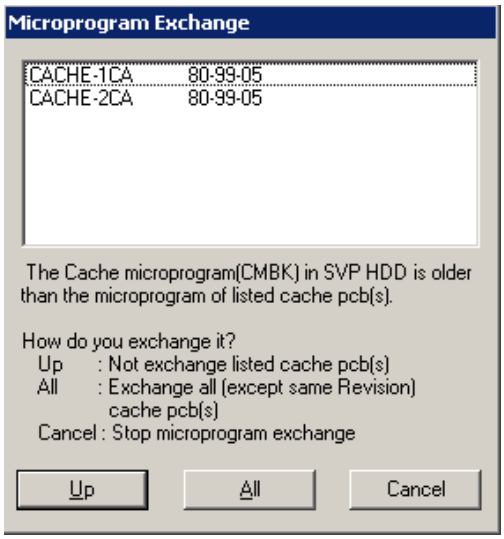


NOTE: The FCHF micro-program exchange keeps waiting until you respond to the confirmation messages.

<CMBK micro-program exchange>

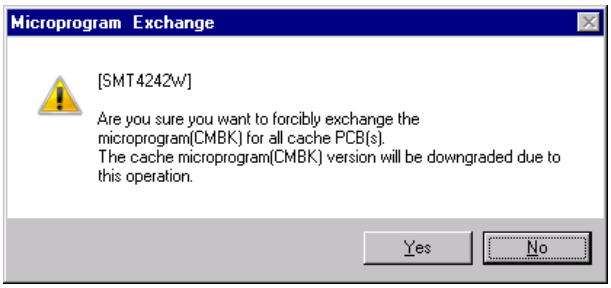
(a)

When the revision of the CMBK micro-program on the SVP hard disk is old, the Cache PCB locations where the micro-program revision will be downgraded by the exchange are displayed.



- When you select (CL) [Up], the exchange is performed only for the CMBK micro-programs of the Cache PCBs where the micro-program revision will be upgraded by the exchange.

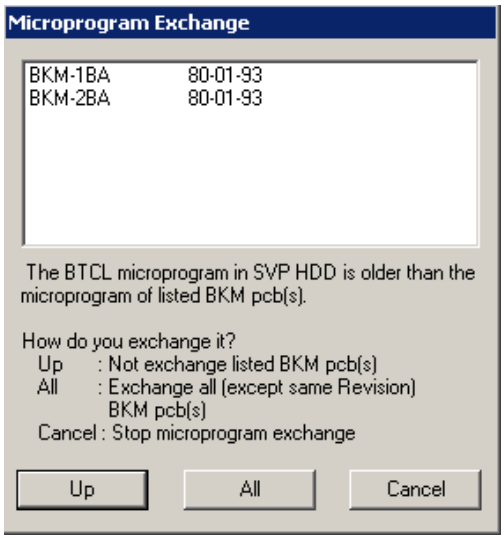
- When you select (CL) [All], the message shown on the right is displayed.
  When you select (CL) [Yes] in response to the message, the exchange is performed for all the CMBK micro-programs of the Cache PCBs where the micro-program revision is different from that on the SVP hard disk.



<BTCL micro-program exchange>

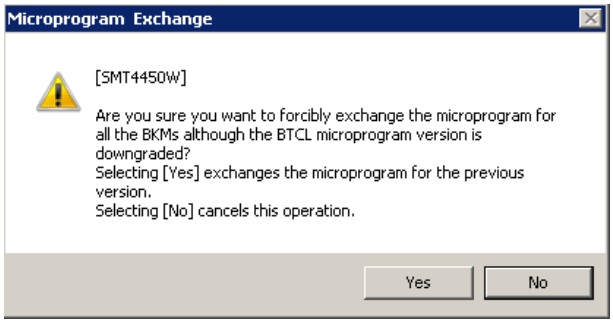
(a)

When the revision of the BTCL micro-program on the SVP hard disk is old, the BKM PCB locations where the micro-program revision will be downgraded by the exchange are displayed.



- When you select (CL) [Up], the exchange is performed only for the BTCL micro-programs of the BKM PCBs where the micro-program revision will be upgraded by the exchange.

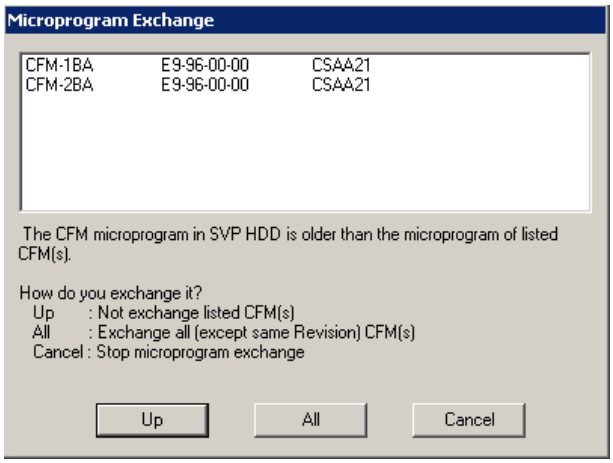
- When you select (CL) [All], the message shown on the right is displayed.
  When you select (CL) [Yes] in response to the message, the exchange is performed for all the BTCL micro-programs of the BKM PCBs where the micro-program revision is different from that on the SVP hard disk.



<CFM micro-program exchange>

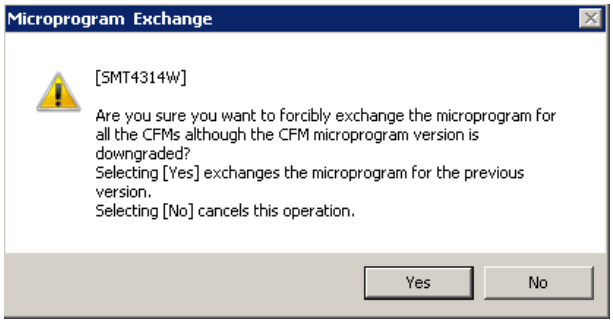
(a)

When the revision of the CFM micro-program on the SVP hard disk is older than that of CFM's, the CFM locations where the micro-program revision will be downgraded by the exchange are displayed.



- When you select (CL) [Up], the exchange is performed only for the CFM micro-programs of the CFMs where the micro-program revision will be upgraded by the exchange.

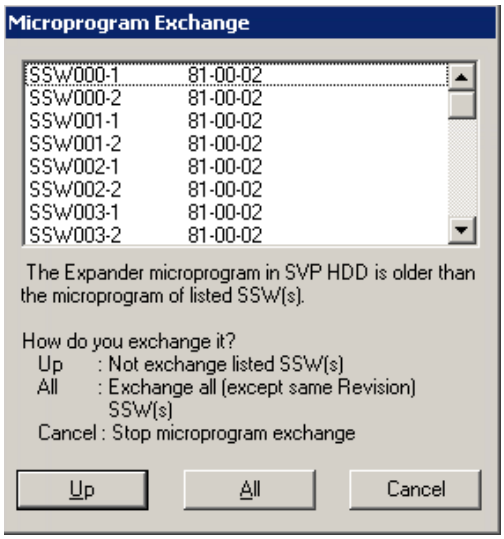
- When you select (CL) [All], the message shown on the right is displayed.
  When you select (CL) [Yes] in response to the message, the exchange is performed for all the CFM micro-programs of the CFMs where the micro-program revision is different from that on the SVP hard disk.



<Expander micro-program exchange>

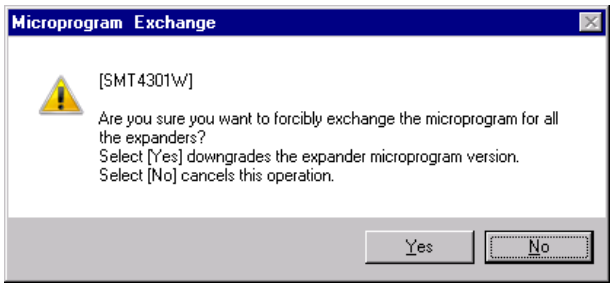
(a)

When the revision of the Expander micro-program on the SVP hard disk is older than that of SSW's, the SSW locations where the micro-program revision will be downgraded by the exchange are displayed.



- When you select (CL) [Up], the exchange is performed only for the Expander micro-programs of the SSWs where the micro-program revision will be upgraded by the exchange.

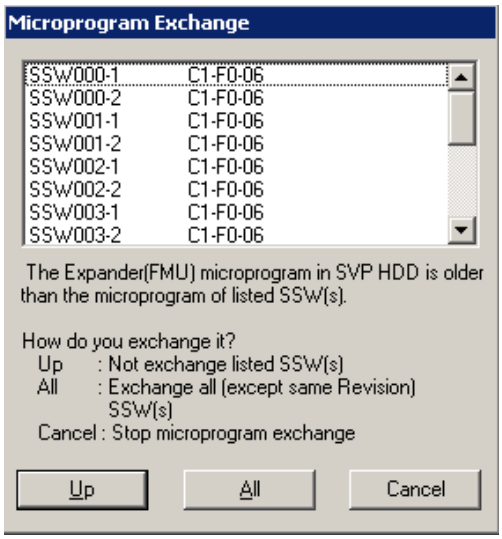
- When you select (CL) [All], the message shown on the right is displayed.
  When you select (CL) [Yes] in response to the message, the exchange is performed for all the Expander micro-programs of the SSWs where the micro-program revision is different from that on the SVP hard disk.



<Expander(FMU) micro-program exchange>

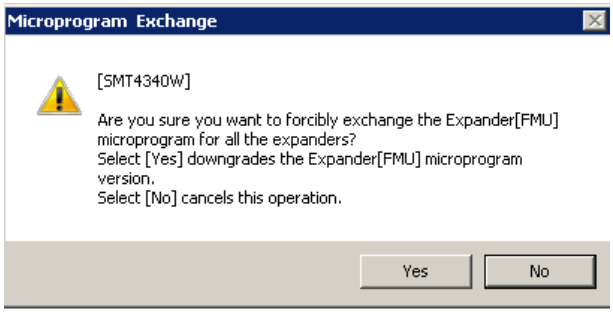
(a)

When the revision of the Expander(FMU) micro-program on the SVP hard disk is older than that of SSW's, the SSW locations where the micro-program revision will be downgraded by the exchange are displayed.



- When you select (CL) [Up], the exchange is performed only for the Expander(FMU) micro-programs of the SSWs where the micro-program revision will be upgraded by the exchange.

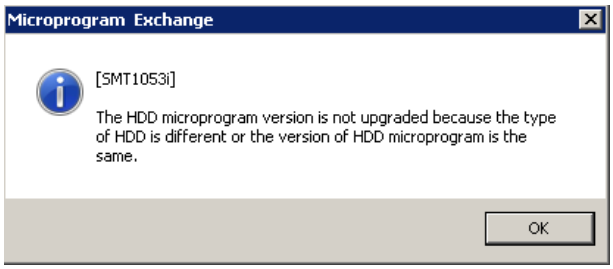
- When you select (CL) [All], the message shown on the right is displayed.
  When you select (CL) [Yes] in response to the message, the exchange is performed for all the Expander(FMU) micro-programs of the SSWs where the micro-program revision is different from that on the SVP hard disk.



<HDD micro-program exchange>

(a)

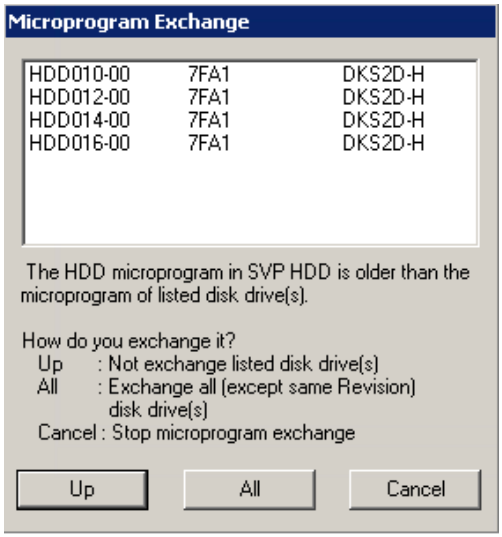
When the revision of the HDD micro-program on the SVP hard disk is the same as that of HDU's, the exchange of the HDD micro-program ends with the following message on the screen:
"The HDD microprogram version is not upgraded because the type of HDD is different or the version of HDD microprogram is the same."



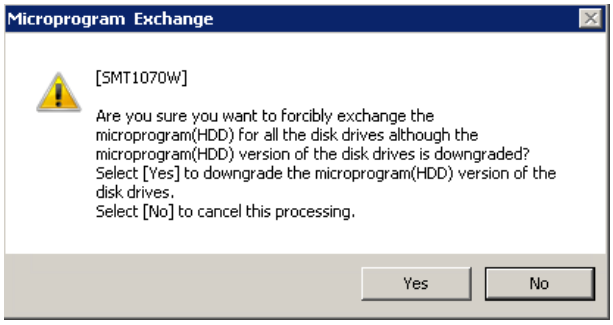
(b)

When the revision of the HDD micro-program on the SVP hard disk is older than that of HDU's, the HDD locations where the micro-program revision will be downgraded by the exchange are displayed.

When you select (CL) [Up], the exchange is performed only for the HDD micro-programs of the HDUs where the micro-program revision will be upgraded by the exchange.

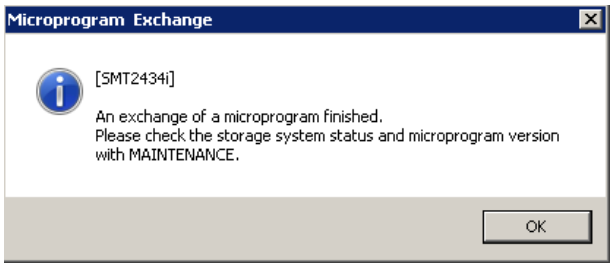


When you select (CL) [All], the message shown on the right is displayed.
When you select (CL) [Yes] in response to the message, the exchange is performed for all the HDD micro-programs of the HDUs where the micro-program revision is different from that on the SVP hard disk.



(4)

In response to the message “An exchange of a microprogram finished. Please check the storage system status and microprogram version with MAINTENANCE.”, select (CL) [OK].



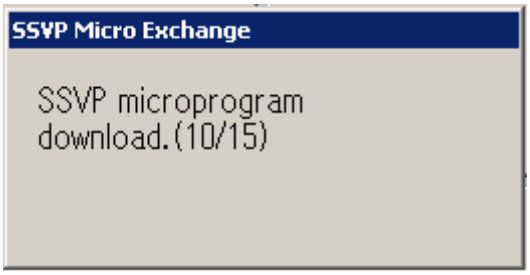
Go to 4.7. (MICRO04-360)

4.4.2 Transferring micro-programs to SVP/SSVP

(1)

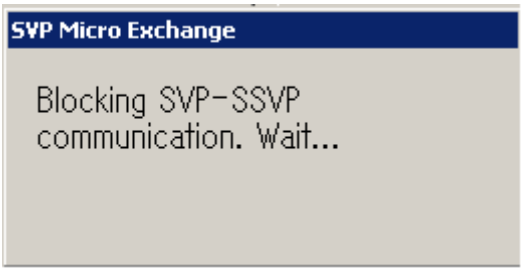
The message “SSVP microprogram download.” is displayed.

If transferring micro-program is only SSVP, go to (4).



(2)

Start of the exchange (SVP).
The message “Blocking SVP-SSVP communication. Wait...” is displayed.

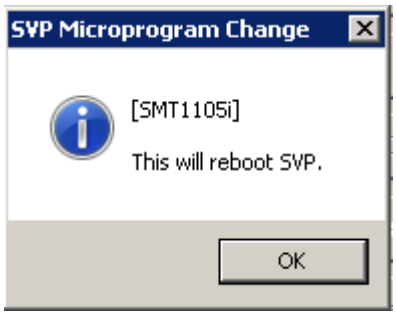


<<Error>>
Internal error :

- “Information file doesn’t exist or open error has occurred!”
- “SVP-SSVP communication blockade error has occurred.”

(3)

End of the exchange (SVP).
Select (CL) [OK].
SVP is rebooted automatically.

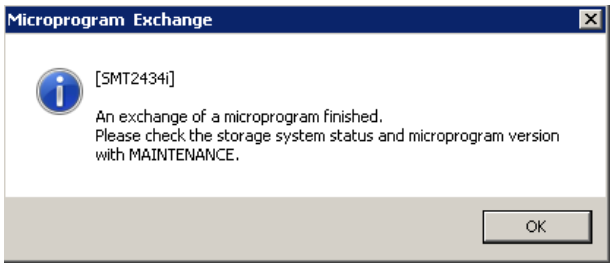


NOTE: After SVP reboot, because the connection with the Maintenance PC and the SVP goes out, make re-connection and check surely the message of the micro-program exchange end.

---

(4)

In response to the message “An exchange of a microprogram finished. Please check the storage system status and microprogram version with MAINTENANCE.”, select (CL) [OK].

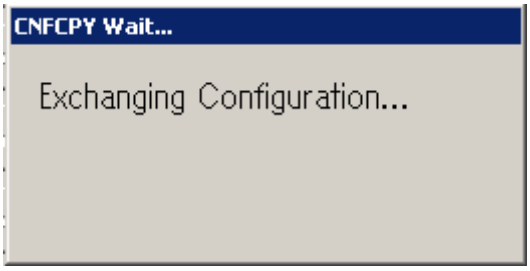


Go to 4.7. (MICRO04-360)

4.4.3 Config Update

(1)

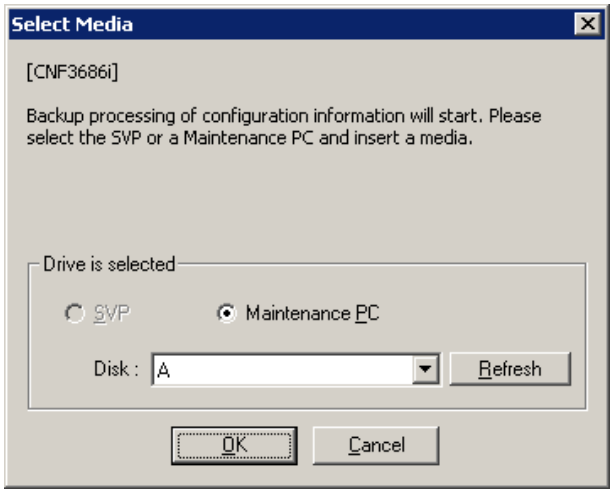
The message “Exchanging Configuration...” is displayed.



(2)

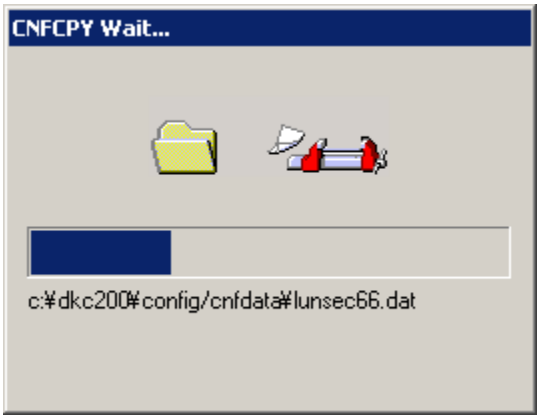
Execute an operation for backing up the configuration information.
Prepare the removable media for backup and insert the media.
Please select (CL) the [Refresh] button, and update drive information.
Select (CL) the drive and the PC in which the media was inserted. Select (CL) the [OK] button.

NOTE: For the procedure of backing up the configuration information to a CD-R, see page MICRO07-190.



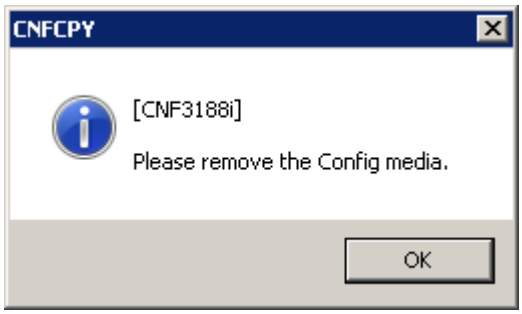
(3)

Backup the configuration information to the Config media for backup. While this operation is being done, the ‘CNFCPY Wait...’ window is displayed.



(4)

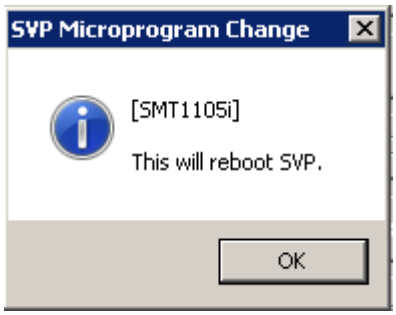
After the Config media is pulled out, select (CL) the [OK] in response to the message “Please remove the Config media.”.



(5)

Select (CL) [OK].
SVP is rebooted automatically.

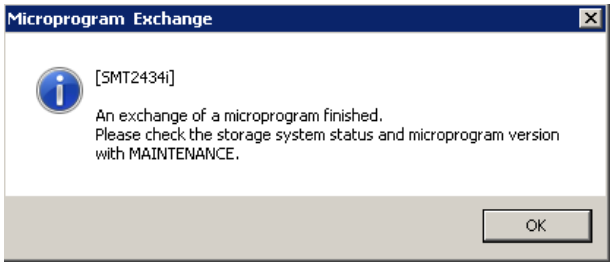
NOTE: After SVP reboot, because the connection with the Maintenance PC and the SVP goes out, make re-connection and check surely the message of the micro-program exchange end.



(6)

In response to the message “An exchange of a microprogram finished. Please check the storage system status and microprogram version with MAINTENANCE.”, select (CL) [OK].

Go to 4.7. (MICRO04-360)

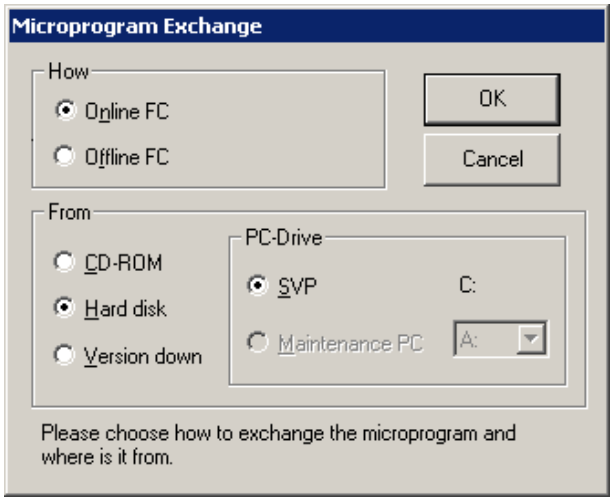


4.5 Hard Disk Download

The latest version of micro-programs on the SVP hard disk is downloaded to DKC.

(1)

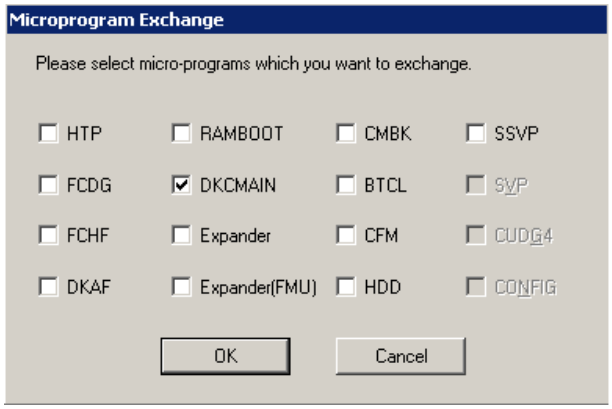
[How]: Select (CL) [Online FC].
[From]: Select (CL) [Hard disk] in the 'Microprogram Exchange' dialog box.
And select (CL) [OK].



(2)

Select (CL) one or more items from the list of the type of micro-programs.
And select (CL) [OK].

☑ : Micro-programs to be substituted.



(3)

When DKCMAIN, or RAMBOOT were selected, you can select the reboot pattern from the list.

⚠ CAUTION

Please select a reboot pattern by taking the following table into account.

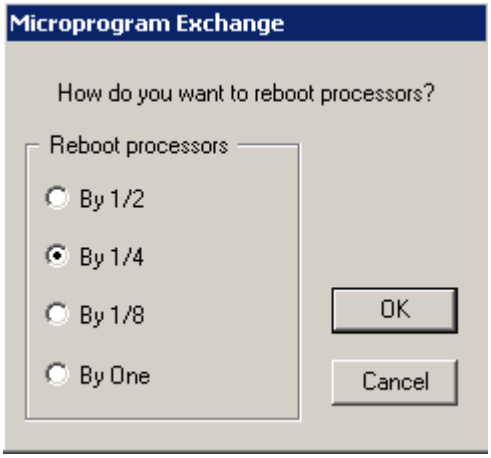
REBOOT PATTERN		By 1/2	By 1/4	By 1/8	By One
EXCHANGE TIME	STANDARD VALUE(*1) [MINUTE](APPROX.)	25	30	35	170
		SHORT ⟷ LONG			
EFFECT ON PERFORMANCE OF DKC		BIG ⟷ SMALL			

*1: MEASURE CONDITION : MP PCBx8 (128MP), NO I/O.

Sometimes an “error” message is displayed temporarily in [Reboot status display]. But, there is no problem if the reboot is finished without error.

Please select (CL) one of these patterns and select (CL) [OK].

By 1/2 : Reboot by half MPs in the DKC storage system.
By 1/4 : Reboot by quarter MPs in the DKC storage system.
By 1/8 : Reboot by 1/8 MPs in the DKC storage system.
By One : Reboot by minimum reboot unit MPs in the DKC storage system.



(4)

Execute from 4.3 (11).
Go back to 4.3 (11) (MICRO04-110).

4.6 Version Down

⚠ CAUTION

Ask the Technical Support Division about the appropriateness of the operation.
Do not execute the Version Down function during initial copy or resynchronization of TrueCopy, Universal Replicator, or global-active device. If you execute it, the micro-program exchange may fail.

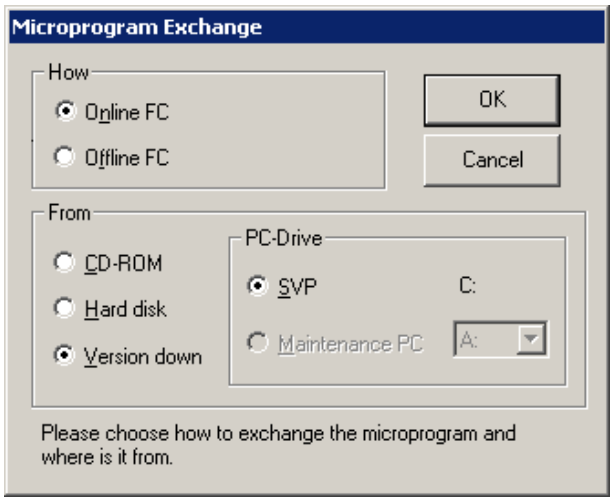
⚠ CAUTION

After HTP Version Down, replace the PCB.

If you want to restore micro-programs to the previous versions of the micro-programs after the exchange (by CD-ROM), execute the Version Down function.

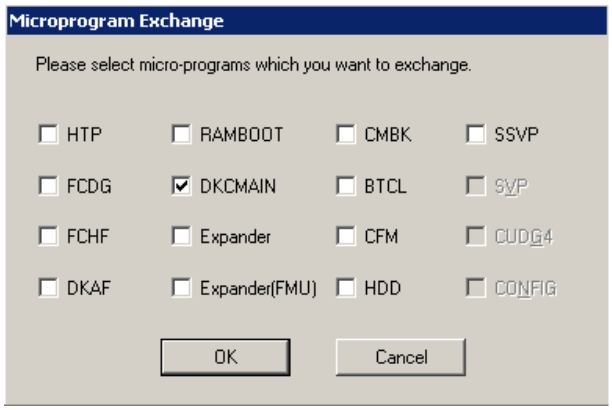
(1)

[How]: Select (CL) [Online FC].
[From]: Select (CL) [Version down] in the 'Microprogram Exchange' dialog box.
And select (CL) [OK].



(2)

Micro-programs to be restored are displayed in the ‘Microprogram Exchange’ dialog box.



NOTE:

- The Version Down function can restore only the micro-program exchanged by CD-ROM. It is not possible to execute the Version Down function for the micro-program which is not exchanged by CD-ROM.

(3)

Return to 4.3 (7) (MICRO04-80).

4.7 Checking the functions after exchange

Check that the version of the recently installed micro-program is the same as that of the replaced micro-program by using the version display in the MAINTENANCE function.
(See SVP SECTION.)

NOTICE: If you find "??-??…" or incompatibility version, recover the status following the "6.1 Recovery procedure in on-line menu was selected" (MICRO06-10).

When you downgraded the version of the microprogram of SVP, the program (jar file) of Web Console may be cached and not operated. Clear the cache of Java. Refer to the WEB CONSOLE SECTION for clearing the cache of Java.

After changing the mode from [Modify Mode] to [View Mode], select (CL) the [Execute]-[Exit] menu on the maintenance screen and then check that Web Console starts. If it failed to start, recover it referring to trouble shooting in the WEB CONSOLE SECTION.

When the customer uses Storage Navigator, request the customer to restart the Storage Navigator running PC (Web client) surely after replacing the micro-program.

5. MP Install

5.1 Over view

This facility is used to restore a processor that failed to complete the rewrite of the micro-programs in FM (Flash Memory) due to an error during the micro-program download.
Since a processor that encountered such a problem started unsuccessfully without loading micro-programs, in a state of waiting for FM write. In such a case, a SIM with reference code = 7900XY (for the MP (Channel adaptor)) is reported. Also, an SSB (F/M = 8C, EC = 3309) is reported. The user must examine this SIM or SSB and perform MP Install on the processor that issued the SIM or the SSB.
If MP Install has failed, please replace the PCB with a service part. (see REPLACE SECTION)

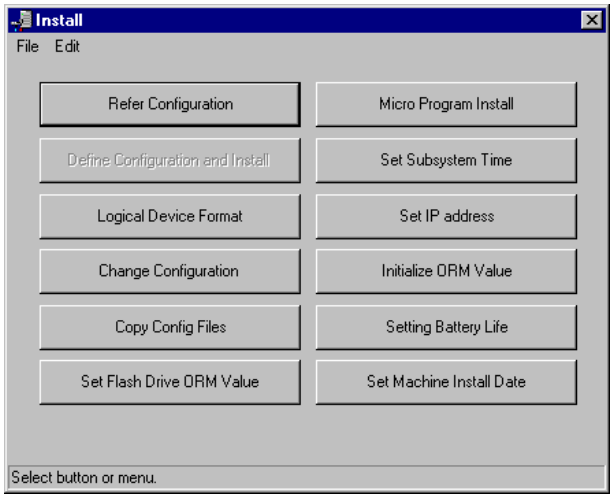
5.2 MP Install

(1)

Select (CL) the [Install] icon in the 'SVP' window.

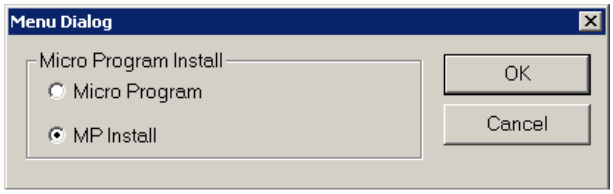
(2)

Select (CL) [Micro Program Install] in the 'Install' window.



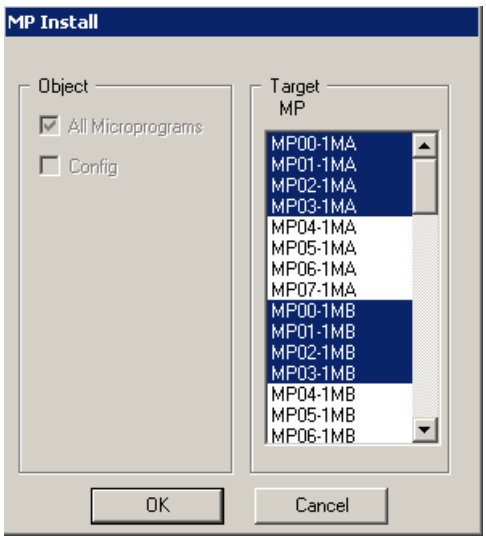
(3)

Select (CL) "MP Install" in the 'Menu Dialog' window and select (CL) [OK].



(4)

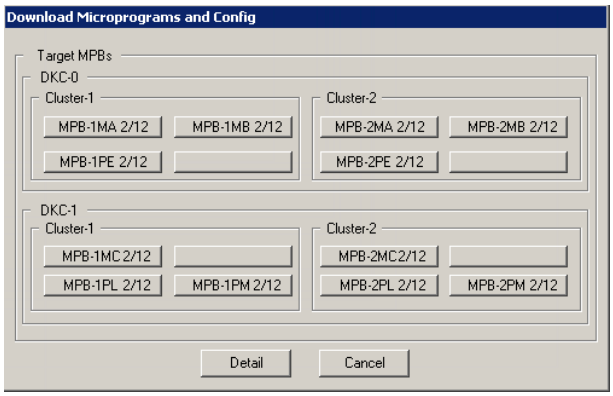
Select (CL) a processor in the 'Target' and select (CL) [OK].



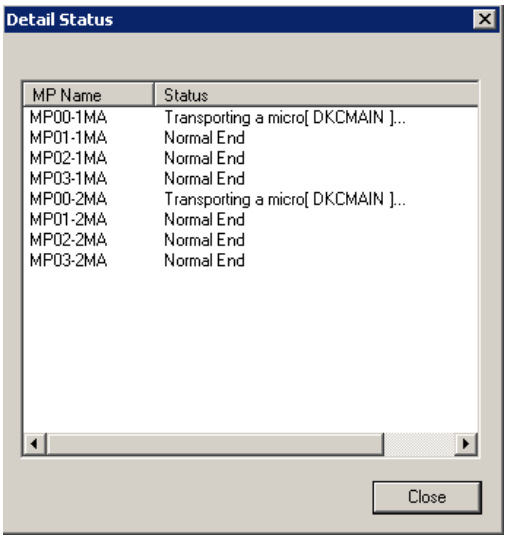
(5)

Progress Dialog appears.
Executing MPB button blink.
When MP Install process finished, the dialog will be closed automatically.

- [Detail]: You can see detail status. See following “Detail status display”.
- [Cancel]: You can interrupt MP Install process.

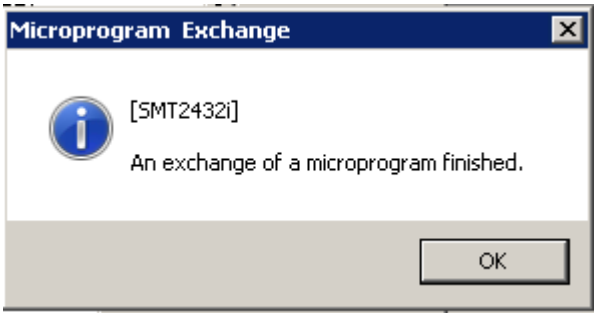


“Detail status display”
Executing MP location and detail status are displayed.
Select (CL) [Close] and return progress dialog.



(6)

In response to the message “An exchange of a microprogram finished.”, select (CL) [OK].



(7)

You will return to the ‘Install’ screen.

6. Trouble Recovery Procedure in Exchanging Micro-programs

6.1 Recovery procedure in on-line menu was selected

If trouble occurs while the micro-programs are being exchanged, symptoms (1) to (10) below can be observed apparently. In these cases, use the recovery procedures shown in flowcharts [A] to [I].

NOTICE: Micro-program exchange may fail when SVP is under heavy load for running virus checker, monitor, etc. In this case, wait for a while, and then perform the micro-program exchange again.
If the micro-program exchange operation failed again, perform the recovery operation by following the procedures in this section.

(1) A power failure occurs.
→ Go to [A]. (MICRO06-30)

(2) An error message displayed. “On exchanging a micro-program, an error has occurred...”
(a) The message “An error occurred while reading from the micro program media...” is displayed.
→ Retry the Micro FC according to the message.
(b) The message “A file I/O error has occurred in a hard disk in the SVP...” is displayed.
→ Go to [D]. (MICRO06-60)
(c) In the case before MP reboot (before displaying IMPL status : SSB = 0x334F does not exist,) except in the case of (a) or (b).
→ Go to [B]. (MICRO06-40)
(d) In the case of a time out during MP reboot (after displaying IMPL status : SSB = 0x334F exists,) except in the case of (a) or (b).
→ Go to [C]. (MICRO06-50)
(e) In the case of except (a) – (d)
→ Go to [C]. (MICRO06-50)

(3) An AP error occurs, resulting in SVP trouble (Key-in operations are disabled and the screen disappears).
→ Go to [B]. (MICRO06-40)

(4) Recovery of a cache failure during the micro-program exchange of DKCMAIN Action.
(a) Restart the micro-program exchange of DKCMAIN Action.

Procedure for the micro-program exchange (version up)	MICRO04-320
Procedure for the micro-program exchange (version down)	MICRO04-340

NOTE:
- The micro-program exchange of the processer whose micro-program has already been exchanged to the latest version is skipped.
- This is an operation that requires entry of a password. Ask the Technical Support Division for propriety of the operation and enter a password after the performance of the operation is approved by the Technical Support Division.

(b) Replace the blocked part in accordance with the SIM message and ACTION CODE SECTION of the maintenance manual.

(5) Procedure for returning the micro-program version to the previous version.
→ Go to [E]. (MICRO06-70)

(6) In the case of incorrect version display ("??-??..." or incompatibility). (The disagreement of a binary version (Internal administrative information) contains it.) (Refer to SVP03-07-40.)
→ Go to [B]. (MICRO06-40)

(7) An error occurs in the HDD micro-program replacing.
→ Go to [F]. (MICRO06-80)

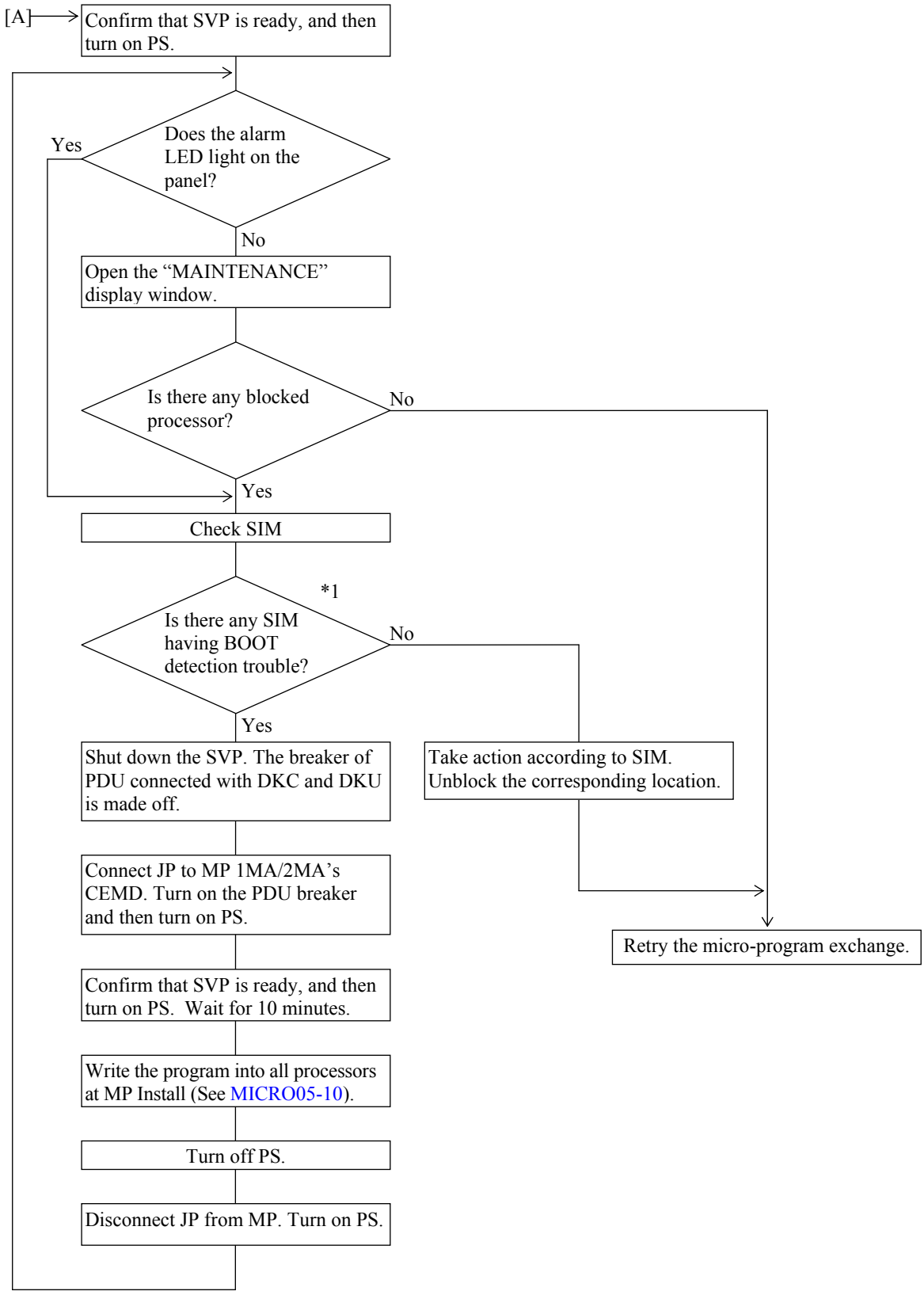
(8) An error occurs in the SSVP micro-program replacing.
→ Go to [G]. (MICRO06-90)

(9) An error occurs in the Expander/Expander(FMU) micro-program replacing.
→ Go to [H]. (MICRO06-100)

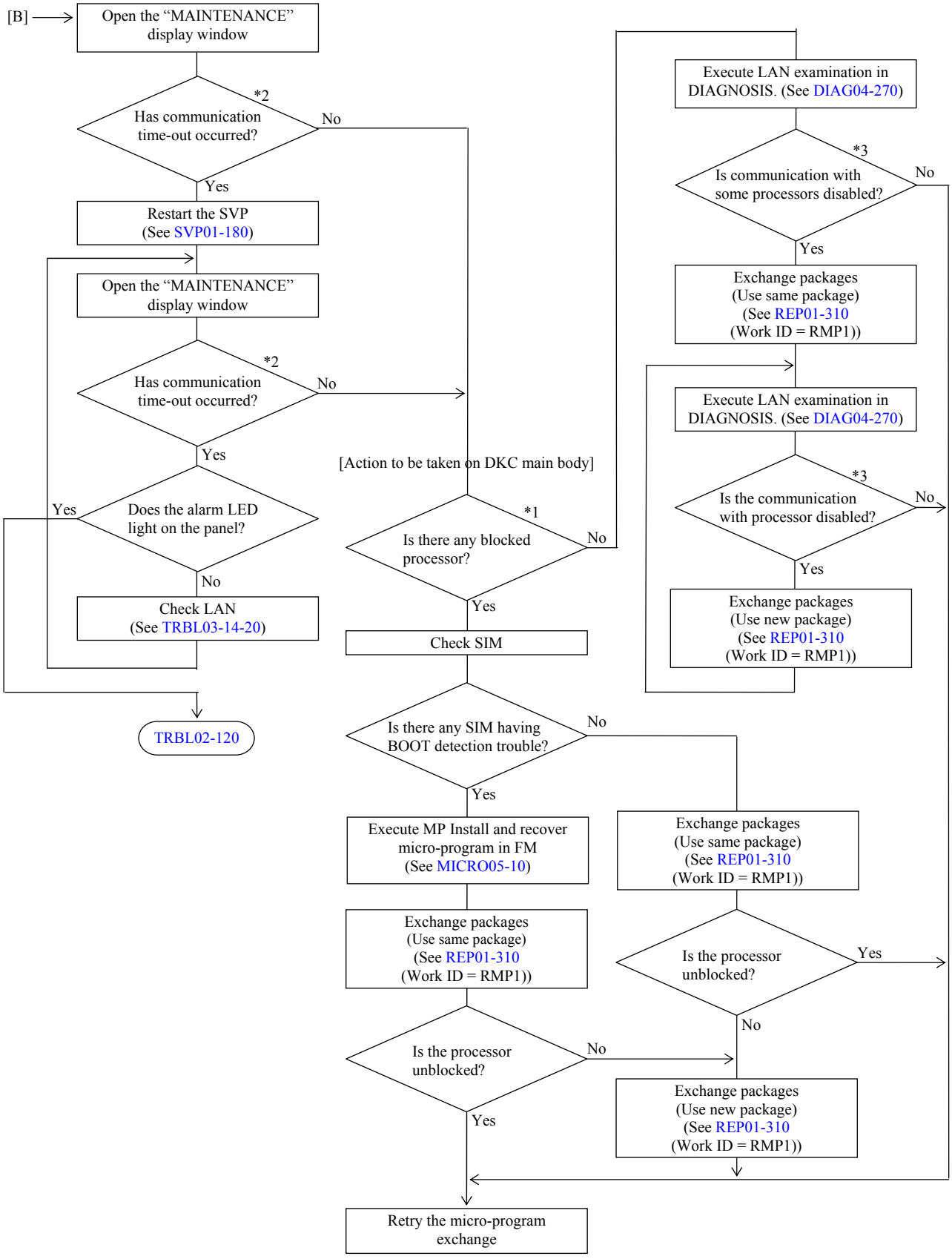
(10) An error occurs in the CFM micro-program replacing.
→ Go to [I]. (MICRO06-110)

[Sections to be referenced for recovery procedure]
(i) Status display : "Activating and Terminating STATUS" on SVP SECTION (SVP03-01-10)
(ii) Version display : "Version of Microprogram" on SVP SECTION (SVP03-07-10)
(iii) MP installation : "MP Install" on MICRO-FC SECTION (MICRO05-10)
(iv) Package exchange : "Hot Replace" on REPLACE SECTION (REP01-10)
(v) SVP exchange : "Hot Replace" on REPLACE SECTION (REP01-10)

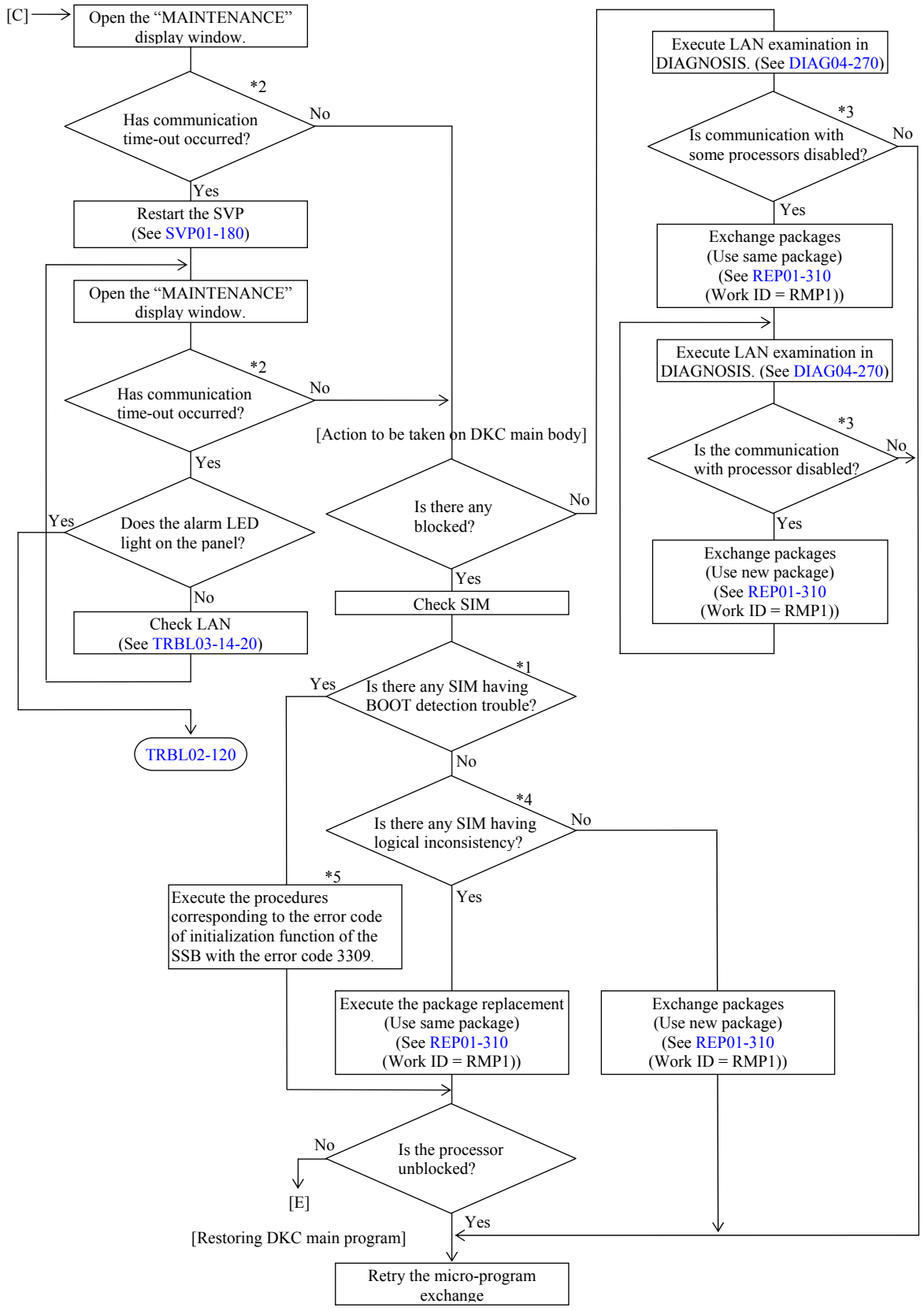
[Recovery Procedure for Power Failure]



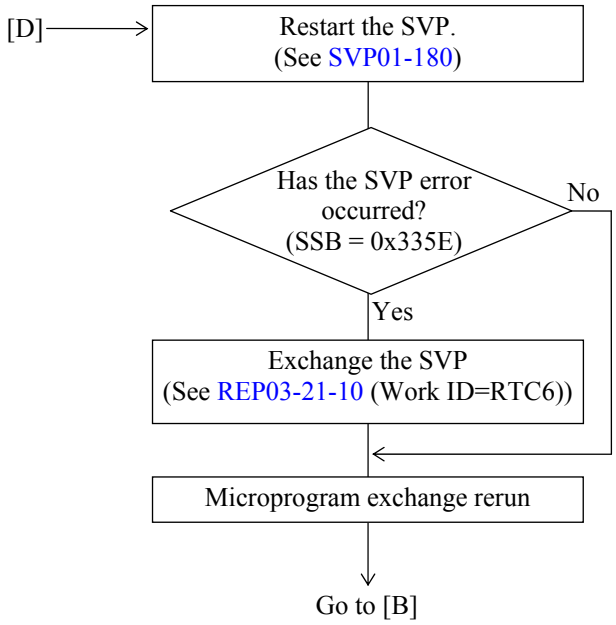
[Recovery Procedure for Communication Time-out/PC Trouble in Downloading Micro-program /Version incompatibility]



[Recovery Procedure for Communication Time-out during System Block Processing/Micro-program Downloading/Version incompatibility]



[Recovery Procedure for I/O Error on SVP Hard Disk]



*1: Reference code "7900XY"
XY: Shows processor id. (See SIMRC02-570)
For details of the trouble, refer to the explanation about the BOOT detected error at SSB (Byte27 =8C).
(See SSBLOG05-2090)

*2: The message "communication error occurred SVP-DKC" is displayed.

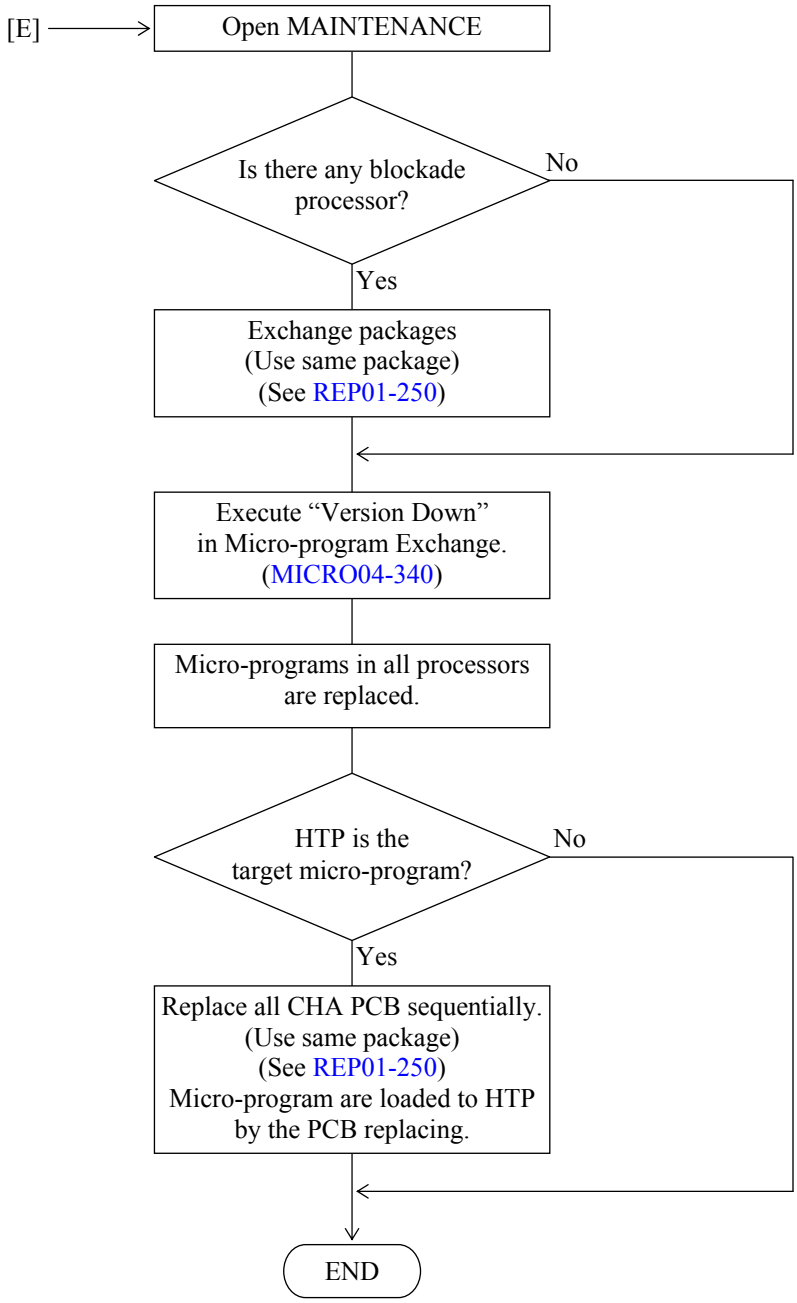
*3: Each LAN error processor button blinks.

*4: Reference code
3080x0:Indicates that a WCHK1 dump has occurred.
x: Shows processor id.

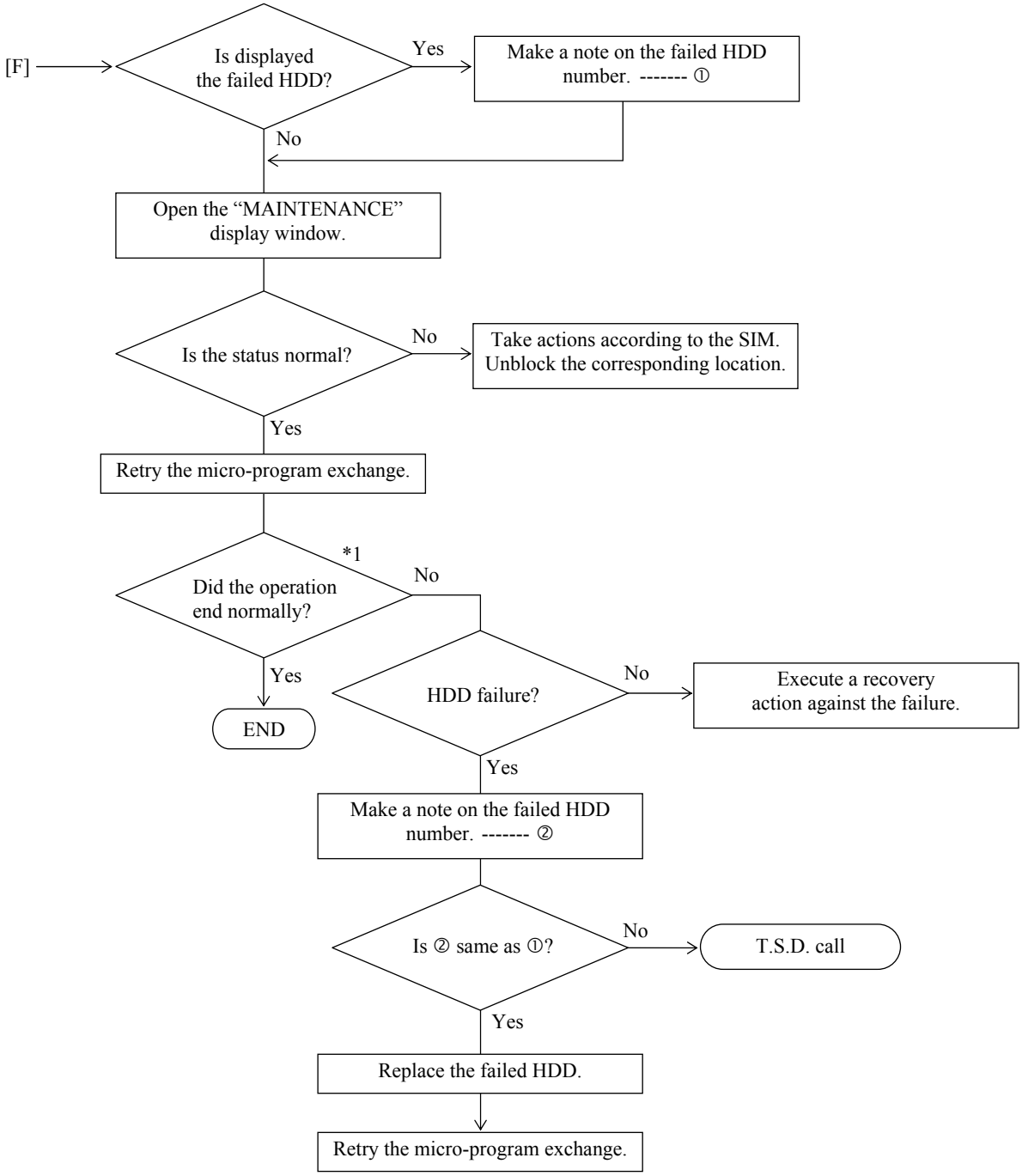
*5: Refer to "SSBLOG05-2090" for the SSB with the error code 3309.
Also, the error code of initialization function is shown in 5C-5Fth byte of the SSB. The procedures corresponding to the error code of initialization function are as follows.

Error code of initialization function	Procedures	NOTE
56000041	1. SVP Replace 2. MP Install 3. Package Replace	Refer to "REP03-21-10 (Work ID : RTC6)" for SVP Replace. Use the same package in 3.
others	1. MP Install 2. Package Replace	Use the same package in 2.

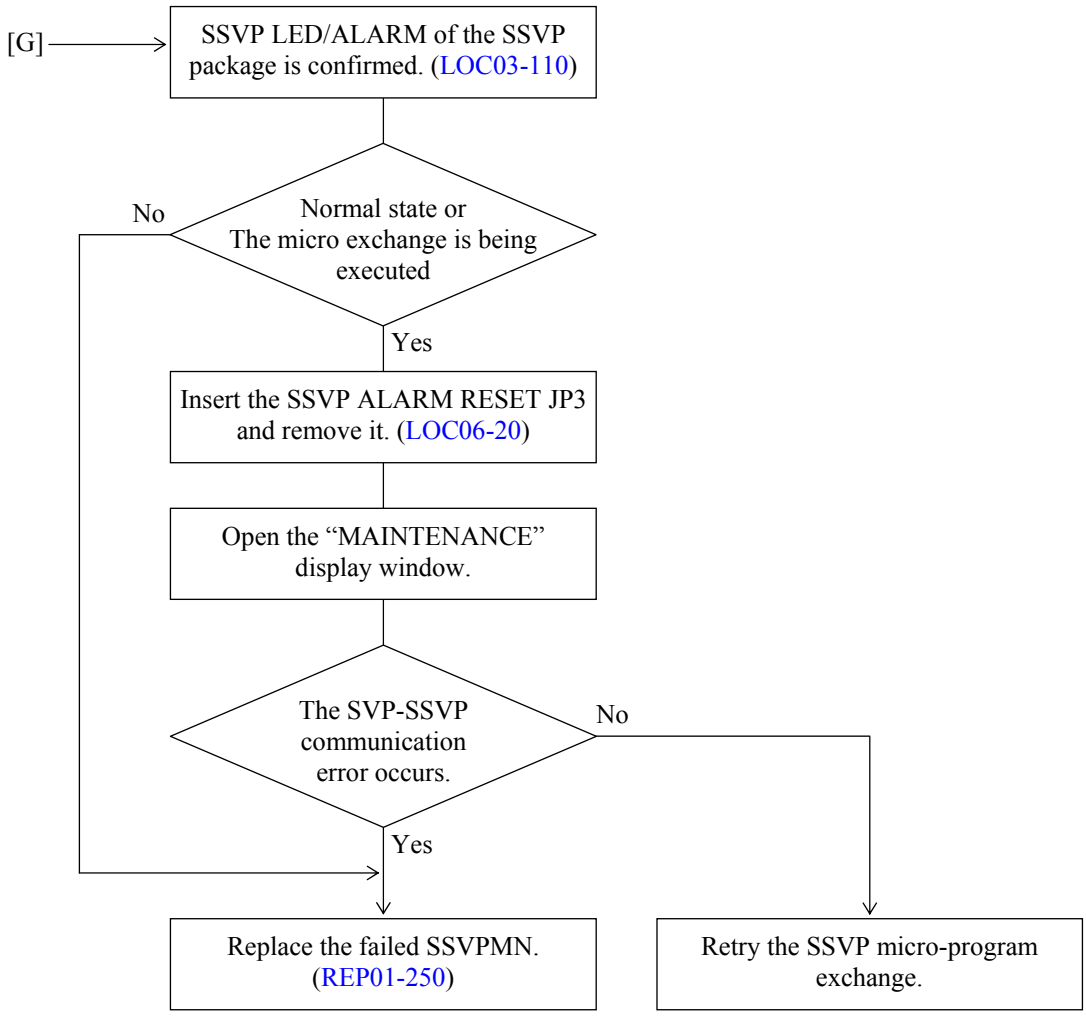
[Procedure for returning the micro-program version to the previous version]



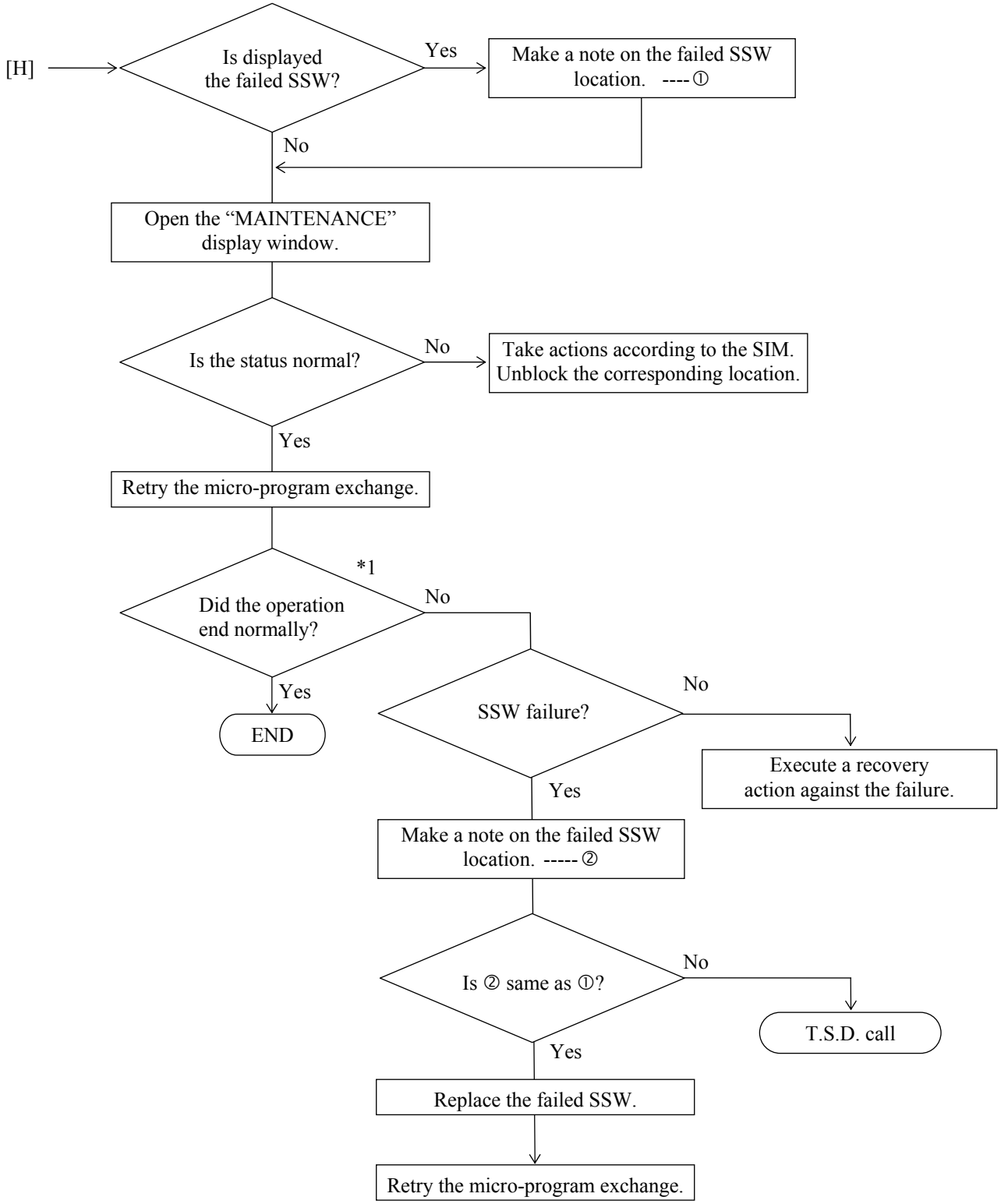
[Recovery procedure when a DKU error occurs during a downloading of the micro-program (HDD micro-program)]



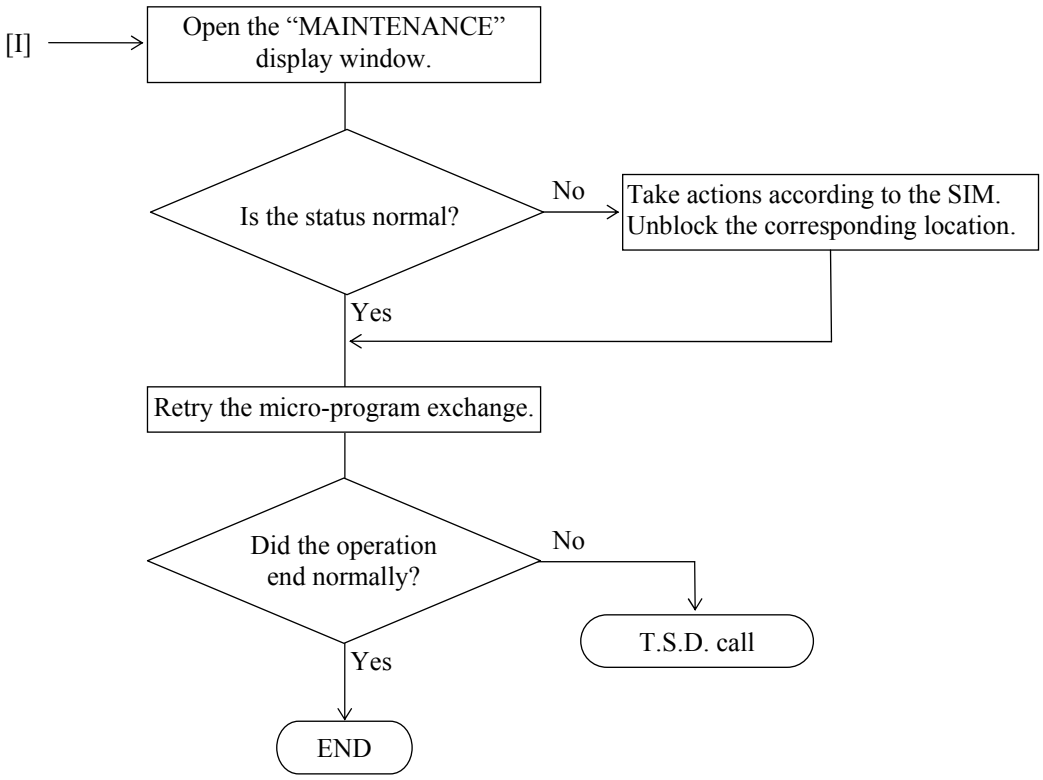
[Recovery procedure SSVP micro-program]



[Recovery procedure when a DKU error occurs during a downloading of the micro-program (Expander/Expander(FMU) micro-program)]



[Recovery procedure when the micro-program exchange of CFM is failed.]



6.2 Recovery procedure in off-line menu was selected

If trouble occurs while the micro-programs are being exchanged, symptoms (1) to (5) below can be observed apparently. In these cases, use the recovery procedures shown in flowcharts [a] to [f].

NOTICE: Micro-program exchange may fail when SVP is under heavy load for running virus checker, monitor, etc. In this case, wait for a while, and then perform the micro-program exchange again.
If the micro-program exchange operation failed again, perform the recovery operation by following the procedures in this section.

(1) A power failure occurs.
→ Go to [a]. (MICRO06-140)

(2) An error message displayed. “On exchanging a micro-program, an error has occurred.…”
(a) The message “An error occurred while reading from the micro program media.…” is displayed.
→ Retry the Micro FC according to the message.
(b) The message “A file I/O error has occurred in a hard disk in the SVP...” is displayed.
→ Go to [f]. (MICRO06-180)
(c) In the case before MP reboot (before displaying IMPL status : SSB = 0x334F does not exist,) except in the case of (a) or (b).
→ Go to [b]. (MICRO06-150)
(d) In the case of a time out during MP reboot (after displaying IMPL status : SSB = 0x334F exists,) except in the case of (a) or (b).
→ Go to [d]. (MICRO06-160)
(e) In the case of except (a) – (d)
→ Go to [c]. (MICRO06-150)

(3) An AP error occurs, resulting in SVP trouble (Key-in operations are disabled and the screen disappears).
→ Go to [e]. (MICRO06-170)

(4) Recovery of a cache failure during the micro-program exchange of DKCMAIN Action.
(a) Restart the micro-program exchange of DKCMAIN Action.

Procedure for the micro-program exchange (version up)	MICRO03-130
Procedure for the micro-program exchange (version down)	MICRO03-150

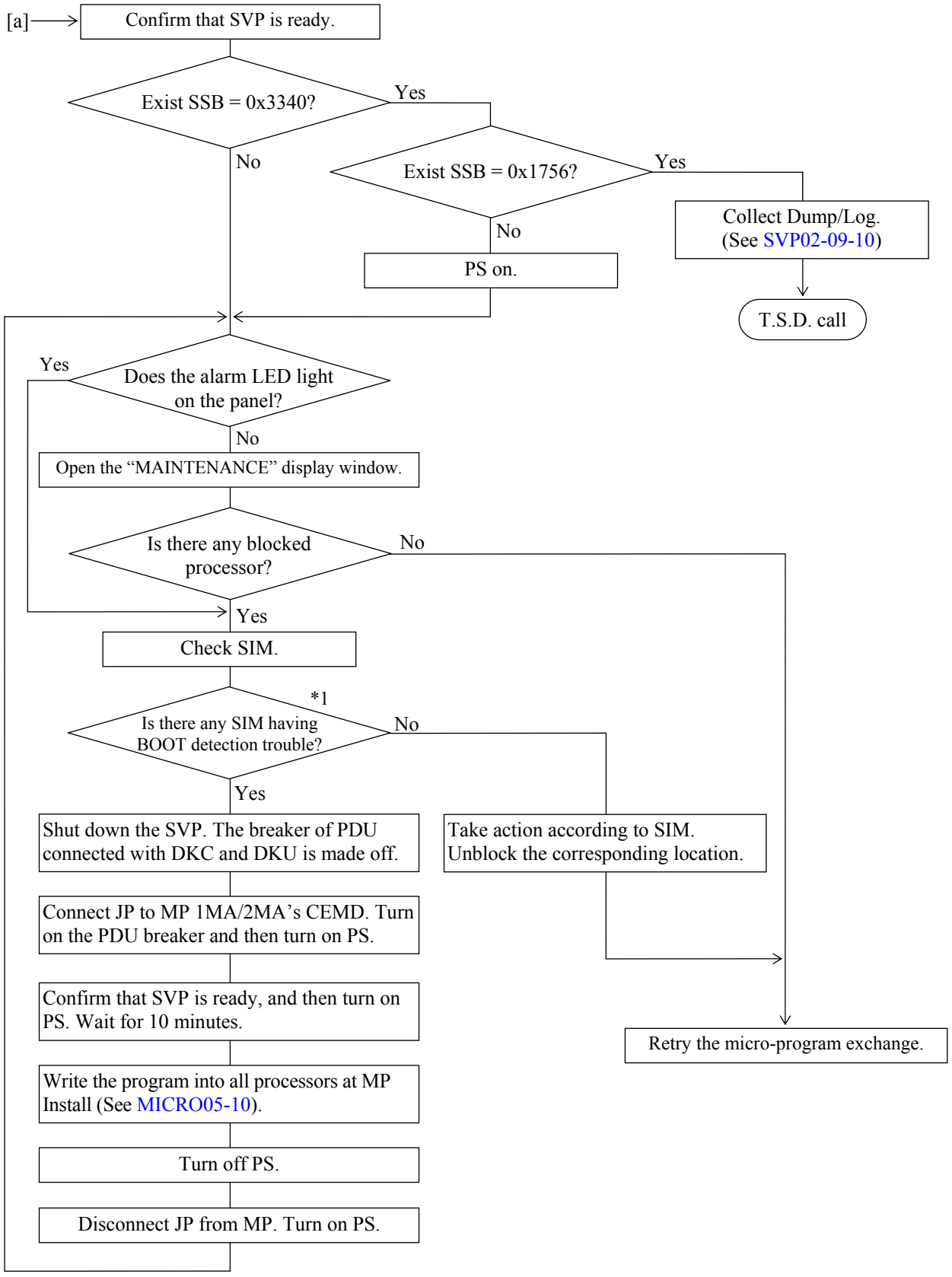
NOTE:
- The micro-program exchange of the processer whose micro-program has already been exchanged to the latest version is skipped.
- This is an operation that requires entry of a password. Ask the Technical Support Division for propriety of the operation and enter a password after the performance of the operation is approved by the Technical Support Division.

(b) Replace the blocked part in accordance with the SIM message and ACTION CODE SECTION of the maintenance manual.

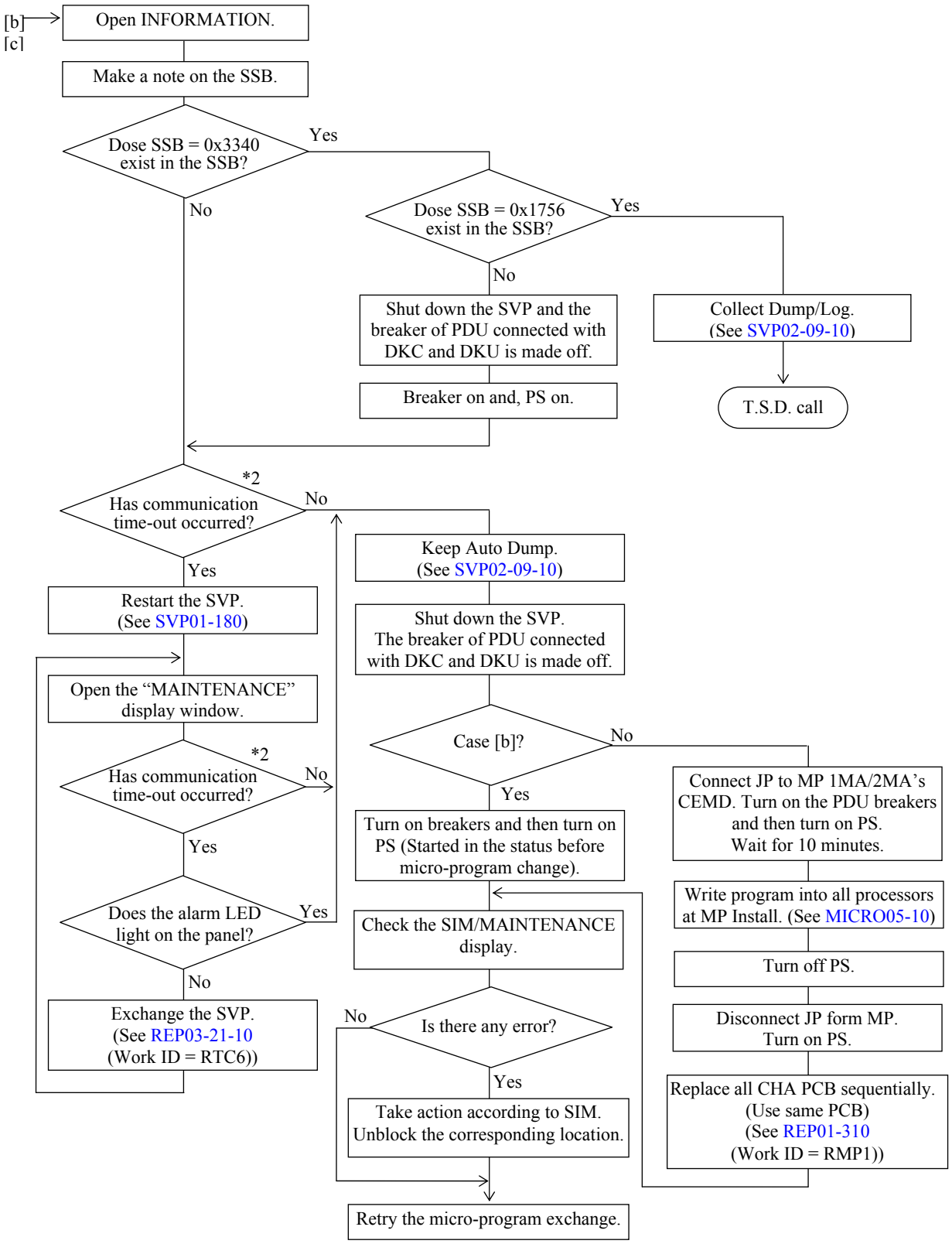
(5) In the case of incorrect version display ("??-??..." or incompatibility). (The disagreement of a binary version (Internal administrative information) contains it.) (Refer to SVP03-07-40.)
→ Go to [b]. (MICRO06-150)

[Sections to be referenced for recovery procedure]
(i) Status display : "Activating and Terminating STATUS" on SVP SECTION (SVP03-01-10)
(ii) Version display : "Version of Microprogram" on SVP SECTION (SVP03-07-10)
(iii) MP installation : "MP Install" on MICRO-FC SECTION (MICRO05-10)
(iv) Package exchange : "Hot Replace" on REPLACE SECTION (REP01-10)
(v) SVP exchange : "Hot Replace" on REPLACE SECTION (REP01-10)

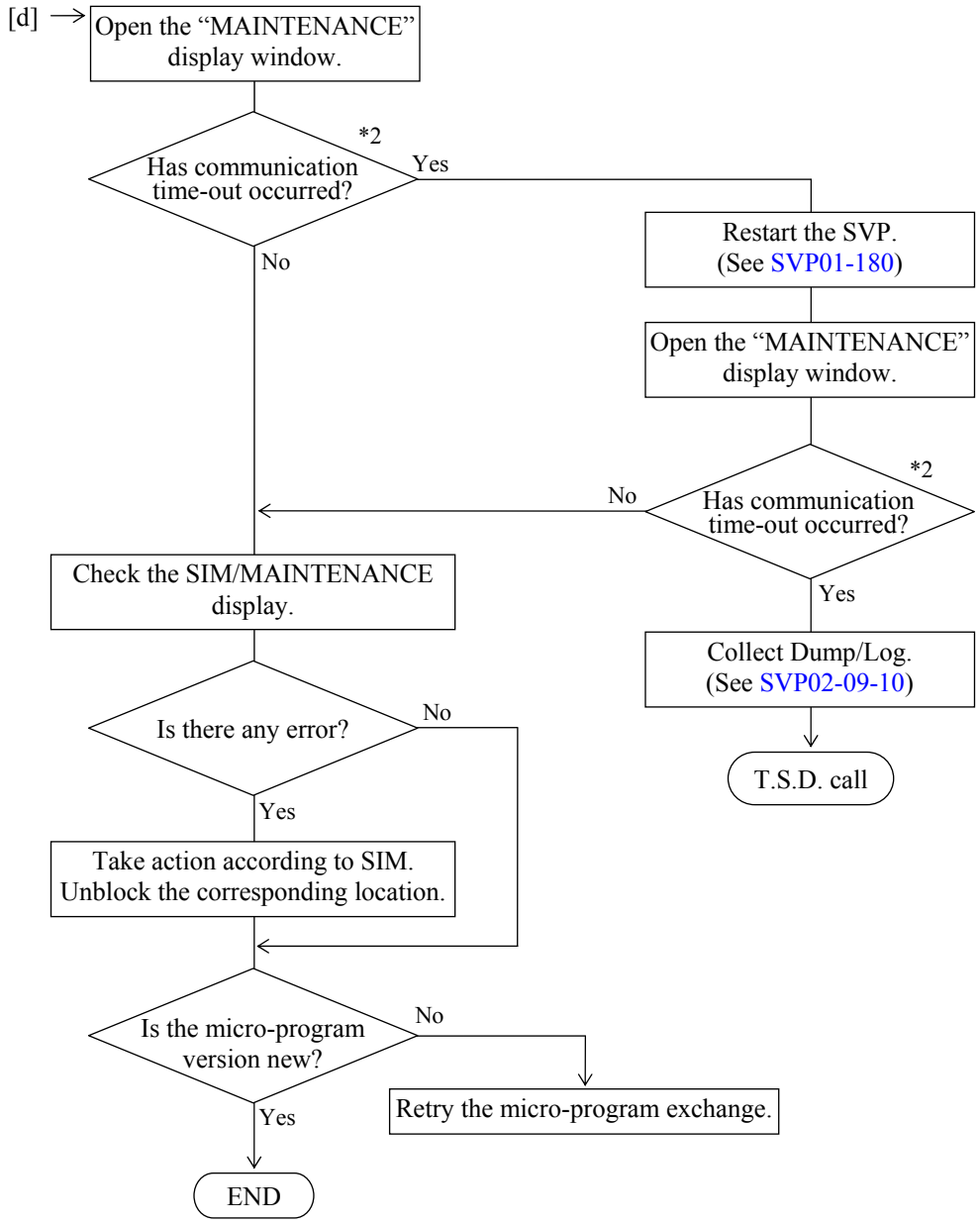
[Recovery Procedure for Power Failure]



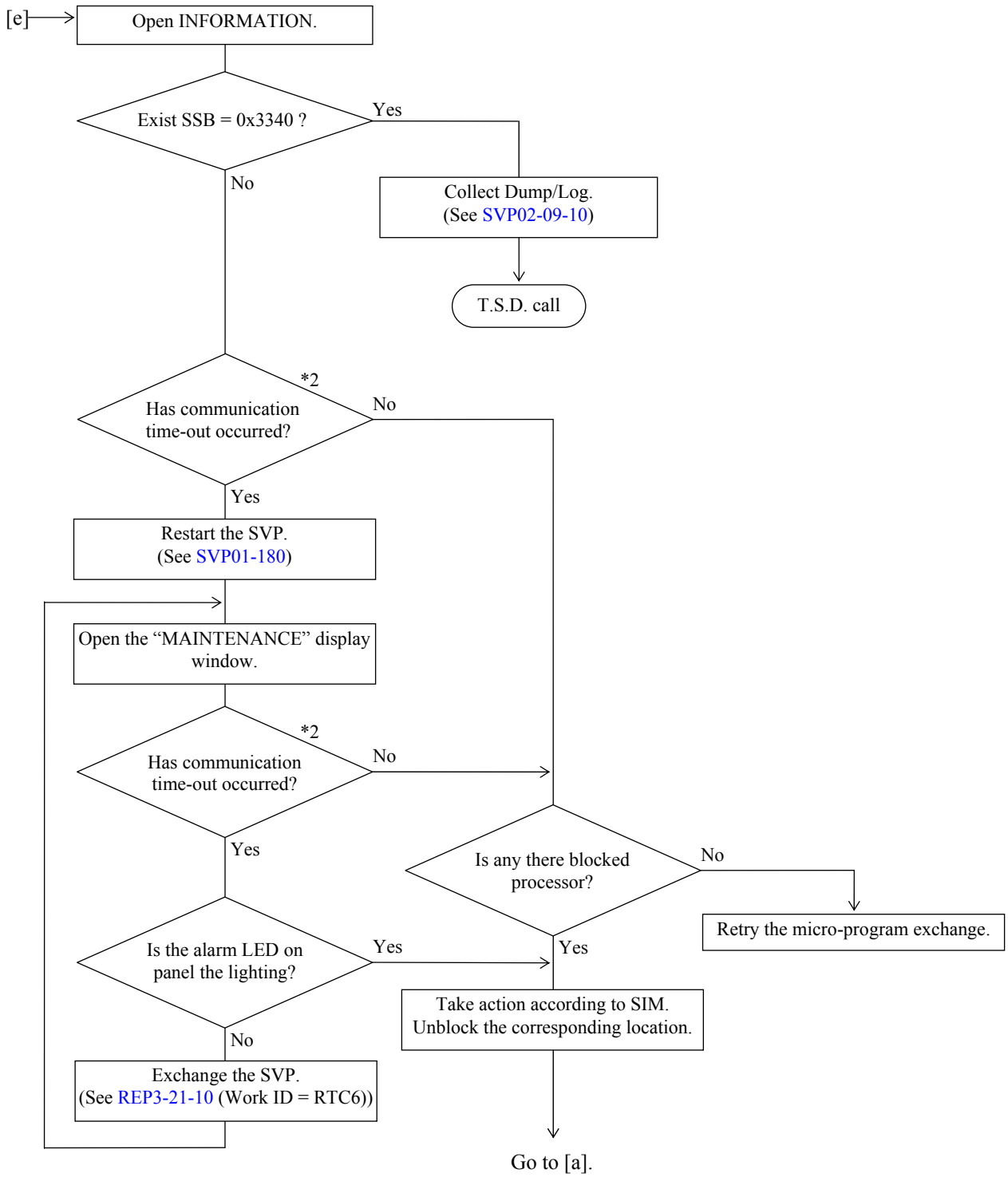
[Recovery Procedure for Communication Time-out during System Block Processing/Micro-program Downloading/Version incompatibility]



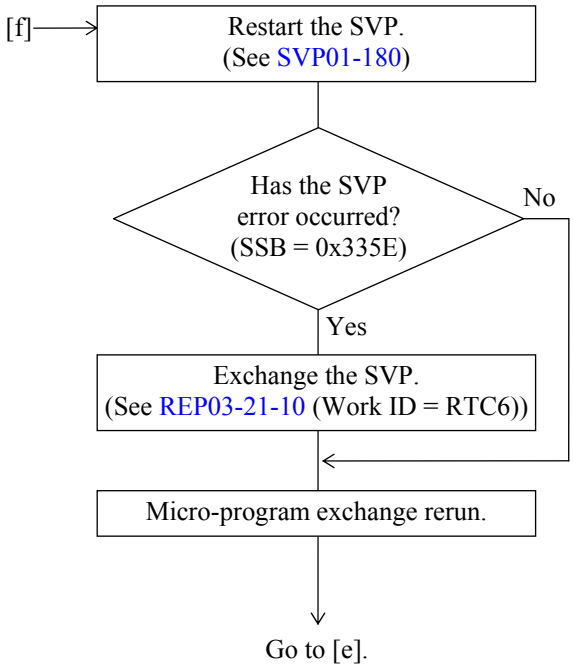
[Recovery procedure for communication time-out during system recovery processing]



[Recovery Procedure for an error in data transferred to the DKC/AP error/SVP error]



[Recovery Procedure for I/O Error on SVP Hard Disk]



*1: Reference code "7900XY"
XY: Shows processor id. (See SIMRC02-570)
For details of the trouble, refer to the explanation about the BOOT detected error at SSB (Byte27 = 8C).
(See SSBLOG05-2090)

*2: The message "communication error occurred SVP-DKC" is displayed.

7. Config Exchange Procedure

7.1 Config Version Up

(1)

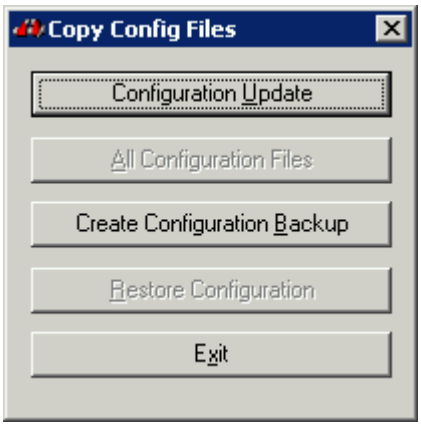
It changes into [Modify] mode on the 'SVP' window.

(2)

Select (CL) [Install] in the 'SVP' window and select (CL) [Copy Config Files] in the 'Install'.

(3)

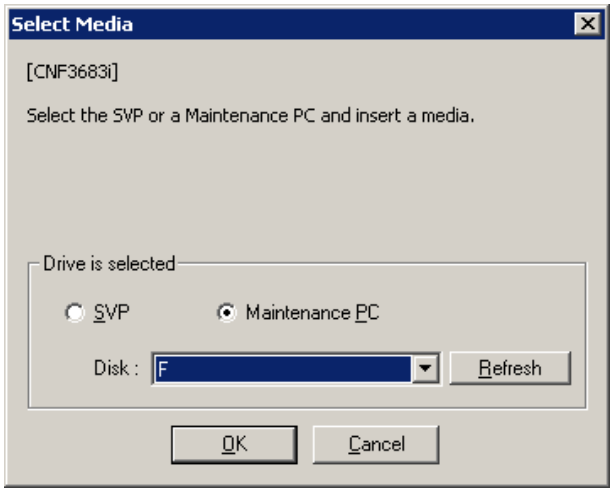
Select (CL) [Configuration Update] in the 'Copy Config Files'.



(4)

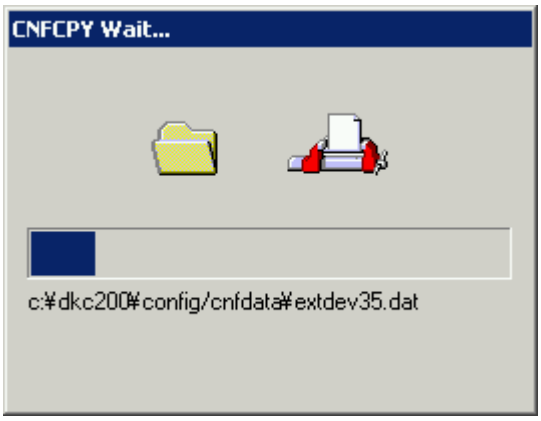
Insert the media for version up.
Please select (CL) the [Refresh] button, and update drive information.
Select (CL) the drive and the PC in which the media was inserted. Select (CL) the [OK] button.

NOTE: For the procedure of backing up the configuration information to a CD-R, see page MICRO07-190.



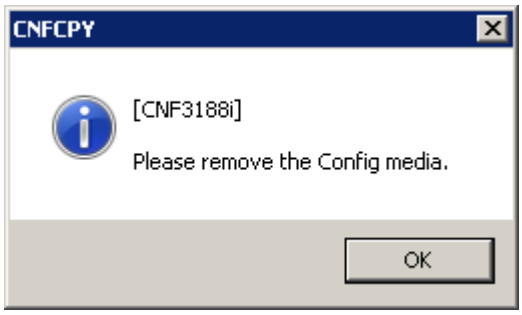
(5)

Copy the configuration information from the Config media to the SVP.
While this operation is being done, the 'CNFCPY Wait...' window is displayed.



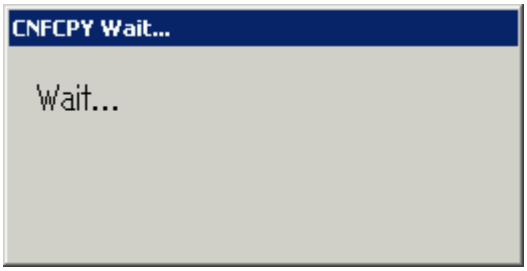
(6)

After the Config media is pulled out, select (CL) the [OK] in response to the message "Please remove the Config media.".



(7)

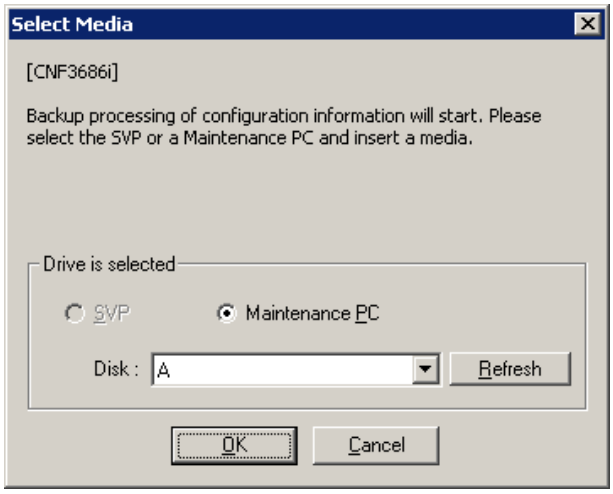
Processing for reflecting composition information is performed.
In the meantime, the wait window is displayed.



(8)

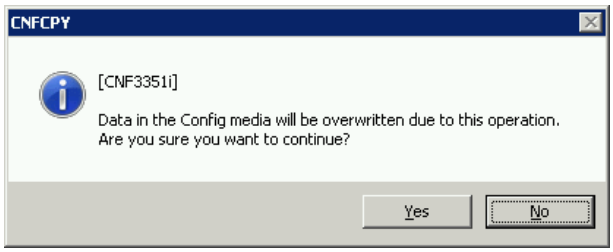
Execute an operation for backing up the configuration information.
Prepare the removable media for backup and insert the media.
Please select (CL) the [Refresh] button, and update drive information.
Select (CL) the drive and the PC in which the media was inserted. Select (CL) the [OK] button.

NOTE: For the procedure of backing up the configuration information to a CD-R, see page MICRO07-190.



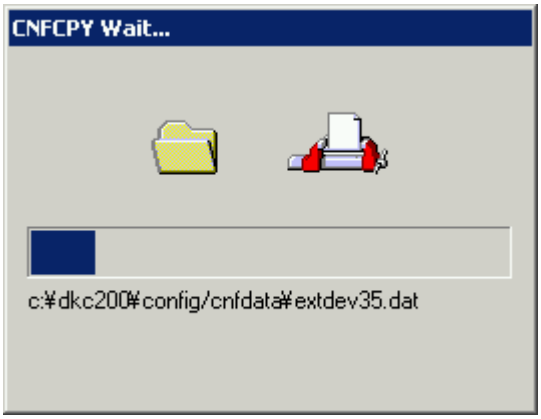
(9)

If you want to continue, select (CL) [Yes].



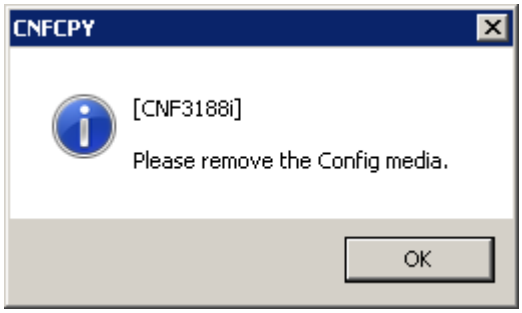
(10)

Backup the configuration information to the Config media for backup. While this operation is being done, the 'CNFCPY Wait...' window is displayed.



(11)

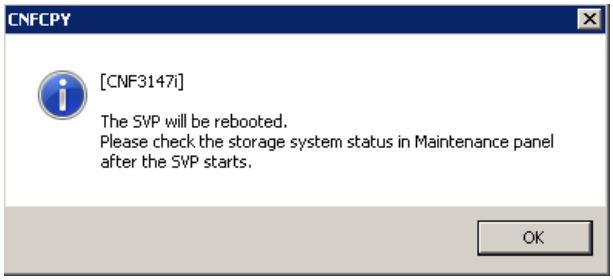
After the Config media is pulled out, select (CL) the [OK] button.



(12)

When Selecting [OK] to the message "The SVP will be rebooted. Please check the storage system status in Maintenance panel after the SVP starts." SVP PC reboots.

NOTE: After the SVP reboot, re-connect to the SVP with the Maintenance PC.



(13)

After SVP PC starts, select (CL) [MAINTENANCE] in the 'SVP' windows. (See SVP03-01-10)

7.2 Config Backup

(1)

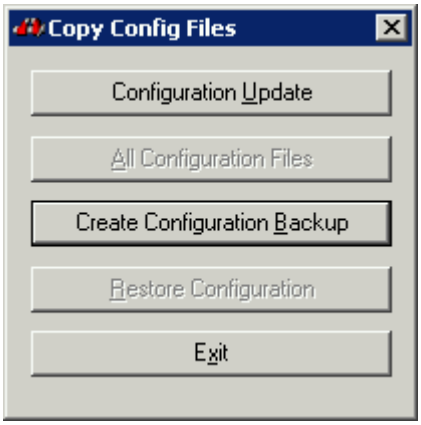
It changes into [Modify] mode on the 'SVP' window.

(2)

Select (CL) [Install] in the 'SVP' window and select (CL) [Copy Config Files] in the 'Install'.

(3)

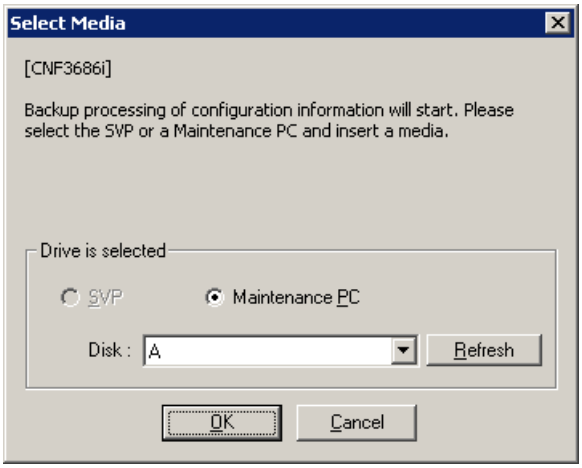
Select (CL) [Create Configuration Backup] in the 'Copy Config Files'.



(4)

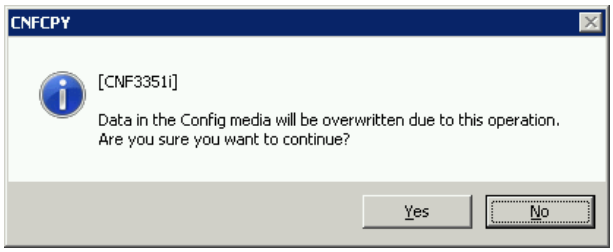
Execute an operation for backing up the configuration information.
Prepare the removable media for backup and insert the media.
Please select (CL) the [Refresh] button, and update drive information.
Select (CL) the drive and the PC in which the media was inserted. Select (CL) the [OK] button.

NOTE: For the procedure of backing up the configuration information to a CD-R, see page MICRO07-190.



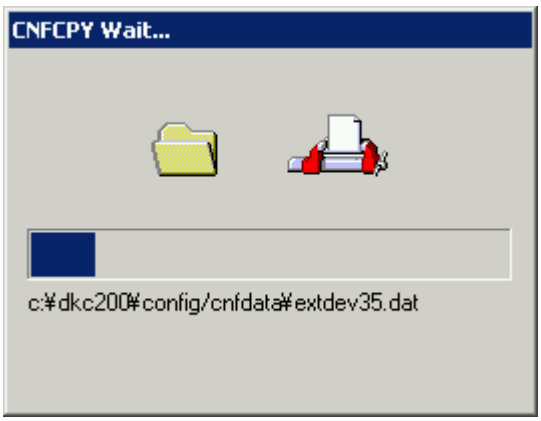
(5)

When no configuration information is saved on the selected media, go to (6).
When other configuration information has been saved on it, the message shown on the right is displayed.
Select (CL) the [Yes] button to continue the process.
Select (CL) the [No] button when the backup to the Config media is not necessary. You return to (3).



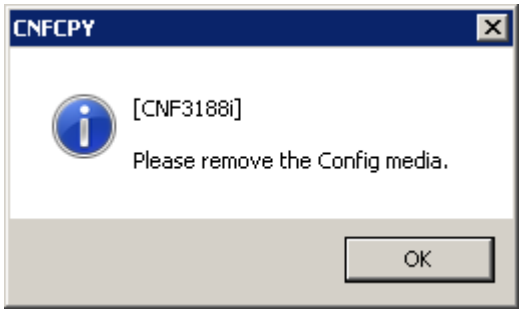
(6)

Backup the configuration information to the Config media for backup. While this operation is being done, the 'CNFCPY Wait...' window is displayed.



(7)

After the Config media is pulled out, select (CL) the [OK] in response to the message "Please remove the Config media.".



(8)

Select (CL) [Exit] of the 'Copy Config Files' to finish this operation.

(9)

It changes into [View] mode on the 'SVP' window.

7.3 Define Configuration & Install

(1)

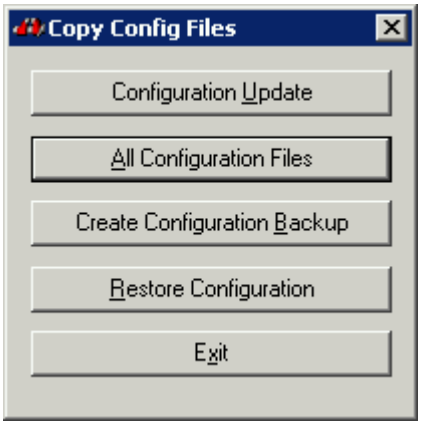
It changes into [Initial Setting] mode on the 'SVP' window.
(Press the [Shift] + [Ctrl] + [I] keys, and enter the password and select (CL) [OK].)
Select (CL) [Install] in the 'SVP' window and select (CL) [Copy Config Files] in the 'Install'.

NOTE: The mode changes to [Initial Setting (Unlocked)] when the storage system is in CE MODE.

---

(2)

Select (CL) [All Configuration Files] in the 'Copy Config Files'.

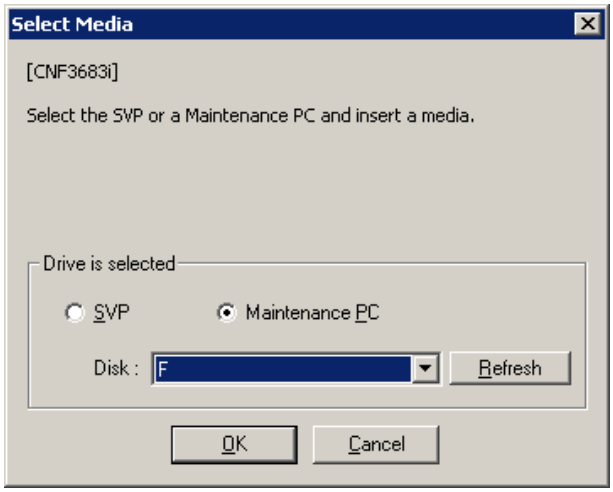


---

(3)

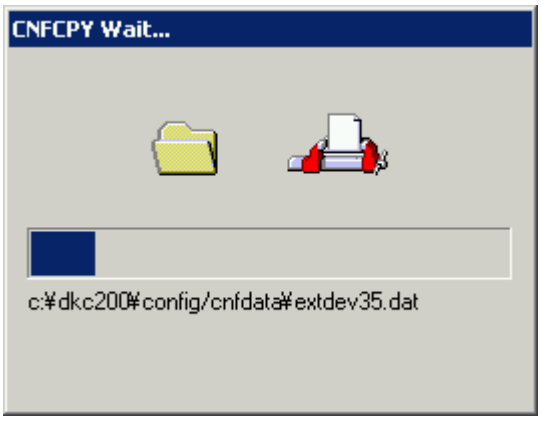
Insert the media.
Please select (CL) the [Refresh] button, and update drive information.
Select (CL) the drive and the PC in which the media was inserted. Select (CL) the [OK] button.

NOTE: For the procedure of backing up the configuration information to a CD-R, see page MICRO07-190.



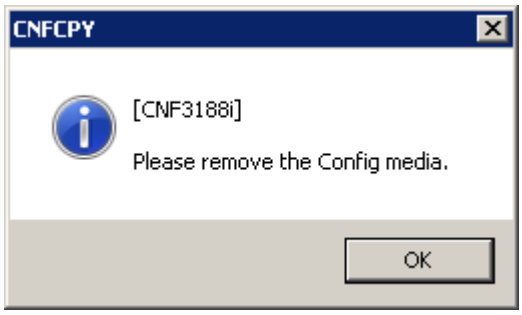
(4)

Copy the configuration information from the Config media to the SVP.
While this operation is being done, the ‘CNFCPY Wait...’ window is displayed.



(5)

After the Config media is pulled out, select (CL) the [OK] in response to the message “Please remove the Config media.”.



(6)

Select (CL) [Exit] of the ‘Copy Config Files’, and execute ‘Define Configuration & Install’ (go to INST05-02-80).

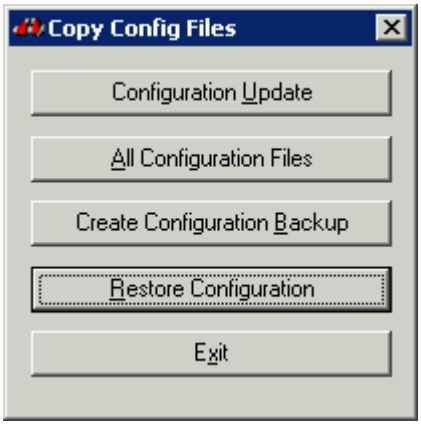
7.4 Restoring Configuration Information

(1)

It changes into [Initial Setting] mode on the 'SVP' window.
(Press the [Shift] + [Ctrl] + [I] keys and select (CL) the [OK] button after entering a password.)
Then select (CL) [Install]. Select (CL) [Copy Config Files] in the 'Install' window.

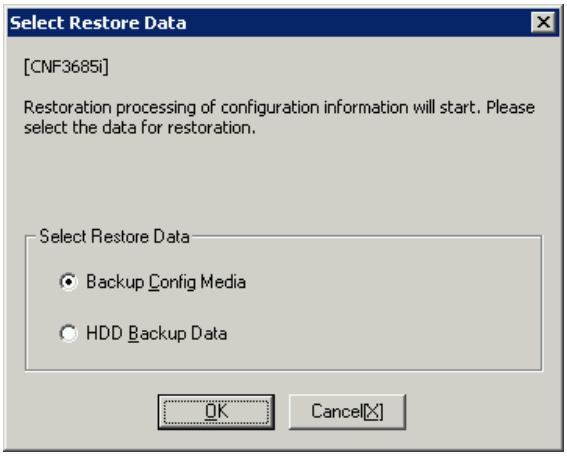
(2)

Select (CL) [Restore Configuration] in the 'Copy Config Files' window.



(3)

Select (CL) the configuration information to be restored. When restoring the configuration information using the Configuration Information media, select "Backup Config Media" and select (CL) the [OK] button. When restoring the configuration information using the configuration information backup data stored in a hard disk of the SVP, select "HDD Backup Data", and then select (CL) the [OK] button.

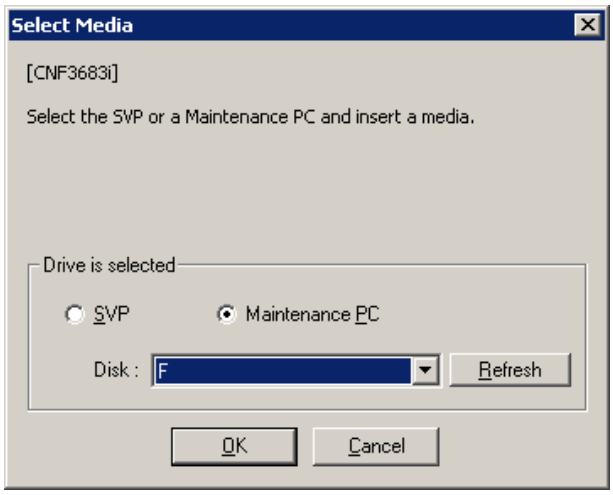


When you have selected the "Backup Config Media", go to Step (4).
When you have selected the "HDD Backup Data", go to Step (5).

(4)

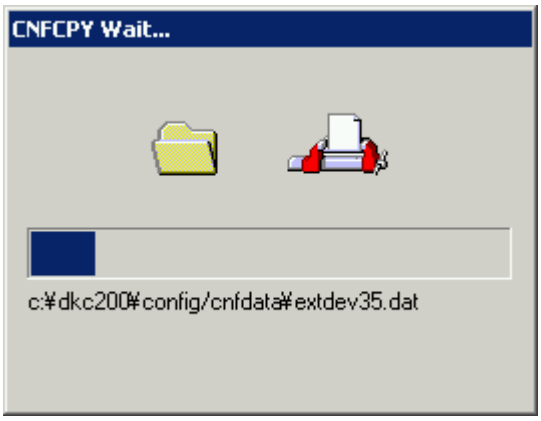
Insert the media
Please select (CL) the [Refresh] button, and update drive information.
Select (CL) the drive and the PC in which the media was inserted. Select (CL) the [OK] button.

NOTE: For the procedure of backing up the configuration information to a CD-R, see page MICRO07-190.



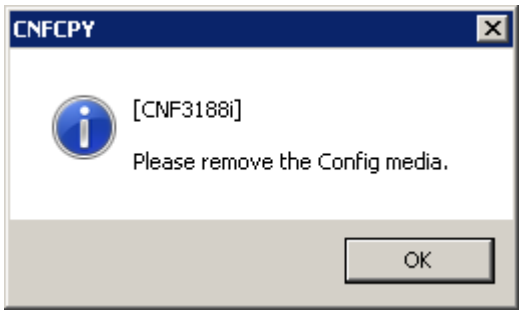
(5)

Make a copy of the configuration information.
During the copying, the 'CNFCPY Wait...' window is displayed.



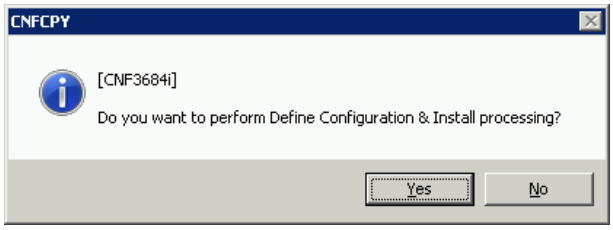
(6)

Since a message shown in the figure on the left is displayed when the "Backup Config Media" is selected in Step (3), pull off the Config media, and then select (CL) the [OK] button.



(7)

When you restore the configuration information successively, select (CL) the [Yes].
When you want to abort the restoration, select (CL) the [No].
When you have selected [Yes], go to Step (8).

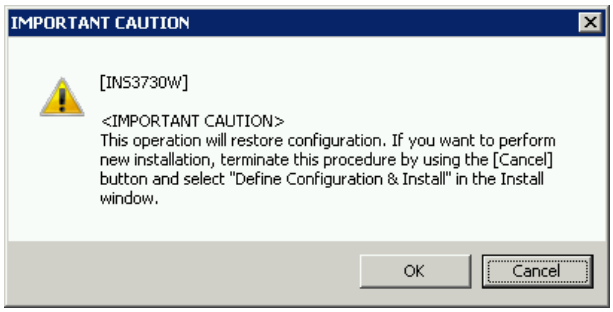


(8)

⚠ CAUTION

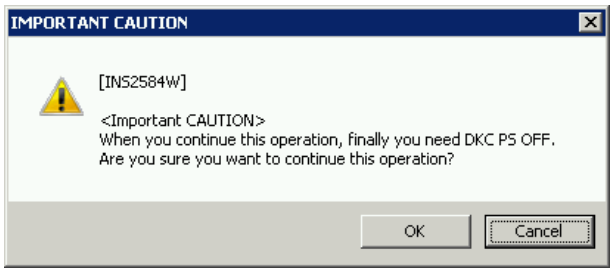
This is a special (exceptional) operation that requires entry of a password and may cause a serious failure such as a system down and a data loss if executed in a case other than the restoration of the configuration information. Ask the Technical Support Division for propriety of the operation and enter a password after the performance of the operation is approved by the Technical Support Division.

Select (CL) the [OK] button in response to the cautionary message, "<IMPORTANT CAUTION> This operation will restore configuration. If you want to perform new installation, terminate this procedure by using the [Cancel] button and select "Define Configuration & Install" in the Install window.".



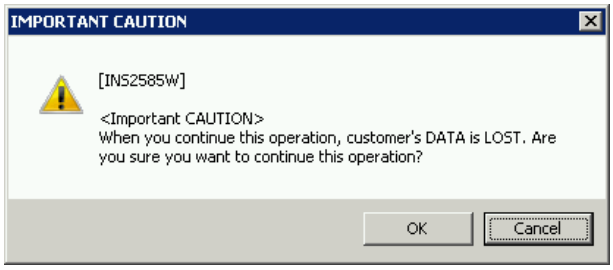
(9)

Select (CL) the [OK] button in response to the confirmatory message, "<Important CAUTION> When you continue this operation, finally you need DKC PS OFF. Are you sure you want to continue this operation?".



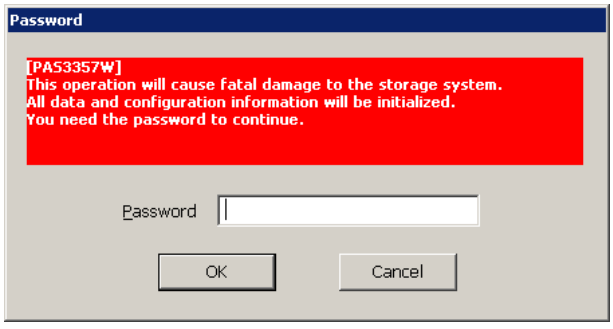
(10)

Select (CL) the [OK] button in response to the confirmatory message, "<Important CAUTION> When you continue this operation, customer's DATA is LOST. Are you sure you want to continue this operation?".

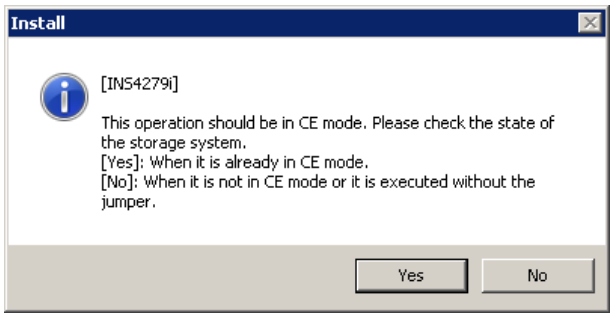


(11)

Enter a password and select (CL) the [OK] button.
To perform this operation, an entry of a password is required. For the password, ask the Technical Support Division.



(12)

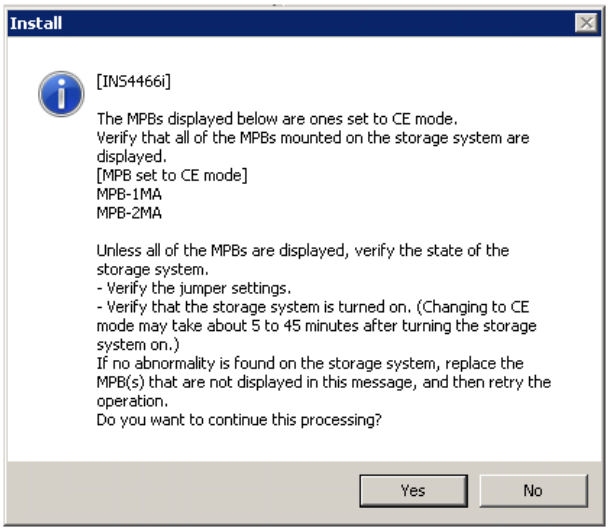


Response to the message "This operation should be in CE mode. Please check the state of the storage system.
[Yes]: When it is already in CE mode.
[No]: When it is not in CE mode or it is executed without the jumper."
Select (CL) [Yes] when storage system is already in CE mode (CEMD jumper from MPB) or select (CL) [No] to execute without the jumper.

When [Yes] is selected (CL), go to Step (12)-1.
When [No] is selected (CL), go to Step (13).

NOTE: When information of HDP/HDT-VOL implementation or progressing state of quick format is not included, go to Step (14).

(12)-1



Response to the message "The MPBs displayed below are ones set to CE mode. Verify that all of the MPBs mounted on the storage system are displayed.
[MPB set to CE mode]
MPB-nnn
MPB-nnn

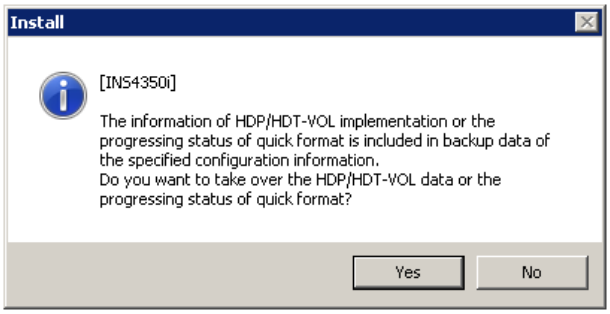
Unless all of the MPBs are displayed, verify the state of the storage system.
- Verify the jumper settings.
- Verify that the storage system is turned on. (Changing to CE mode may take about 5 to 45 minutes after turning the storage system on.)
If no abnormality is found on the storage system, replace the MPB(s) that are not displayed in this message, and then retry the operation.
Do you want to continue this processing?".
When [Yes] is selected (CL), go to Step (13). When [No] is selected (CL), go back to Step (2).

NOTE: MPB displaying in a message is MPB in the CE mode when this message was displayed. Unless all of the MPBs are displayed, select (CL) [No] and start with Step (2) again.

NOTE: When information of HDP/HDT-VOL implementation or progressing state of quick format is not included, go to Step (14).

(13)

Response to the message “The information of HDP/HDT-VOL implementation or the progressing status of quick format is included in backup data of the specified configuration information.
Do you want to take over the HDP/HDT-VOL data or the progressing status of quick format?”.

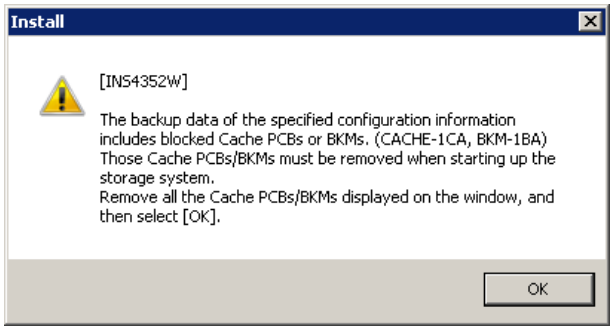


When you take over the data, select (CL) [Yes].
When you do not take over the data, select (CL) [No].

---

(14)

“The backup data of the specified configuration information includes blocked Cache PCBs or BKMs. (CACHE-nnn, BKM-nnn)
Those Cache PCBs/BKMs must be removed when starting up the storage system.
Remove all the Cache PCBs/BKMs displayed on the window, and then select [OK].”



NOTE: When there is not a blocked part in Cache PCB or BKM, this message is not displayed.

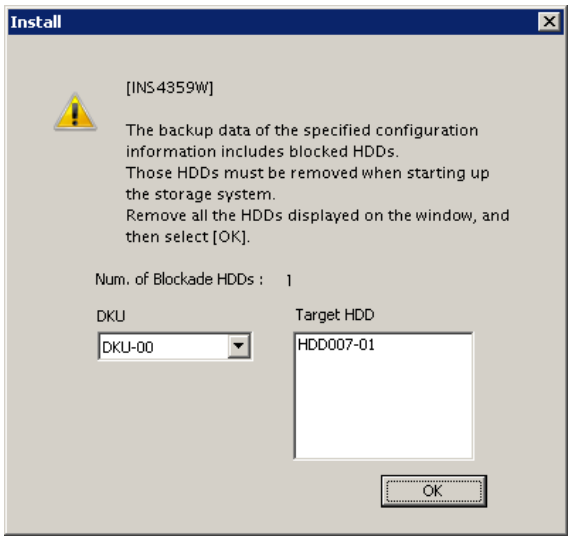
---

(15)

“The backup data of the specified configuration information includes blocked HDDs.
Those HDDs must be removed when starting up the storage system.
Remove all the HDDs displayed on the window, and then select [OK].”

Select the DKU list and remove the target HDD(s) because two or more DKU might be listed.

NOTE: When there is not a blocked HDD, this message is not displayed.



(16)

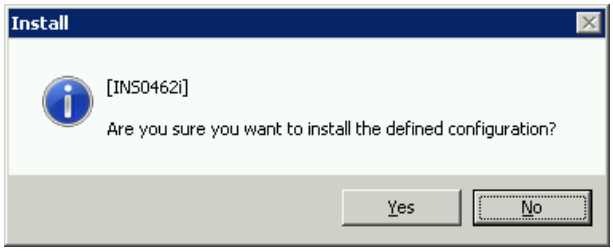
The window for storage system configuration information reference, in which the configuration information is to be restored, is displayed.
For details of the storage system configuration information reference window, refer to “3. <DKC Configuration window>” and following steps in Subsection “5.2.4, Refer Configuration” (INST05-02-540).

---

(17)

Select (CL) the [Yes] button in response to the confirmatory message, “Are you sure you want to install the defined configuration?”.

(When the [No] button is selected, the restoration of the configuration information is suppressed and the procedure for the restoration is terminated.)



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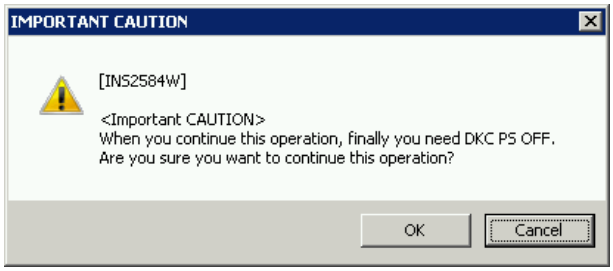
(18)

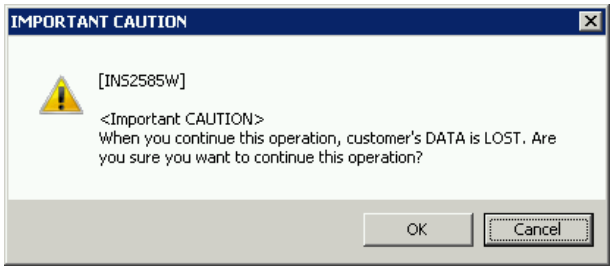
Select (CL) the [OK] button in response to the confirmatory message, “<Important CAUTION> When you continue this operation, finally you need DKC PS OFF. Are you sure you want to continue this operation?”.



---

(19)

Select (CL) the [OK] button in response to the confirmatory message, “<Important CAUTION> When you continue this operation, customer’s DATA is LOST. Are you sure you want to continue this operation?”.



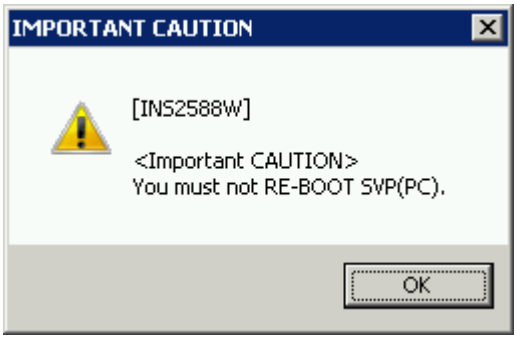
(20)

Select (CL) the [OK] button in response to the confirmatory message, "<Important CAUTION> When you select [OK] button, you can't cancel this operation. Are you sure you want to continue this operation? If you terminate this operation by some forcible method, the storage system be in UNRECOVERABLE SERIOUSLY DAMAGE.".

---

(21)

Select (CL) the [OK] button in response to the cautionary message, "<Important CAUTION> You must not RE-BOOT SVP(PC).".



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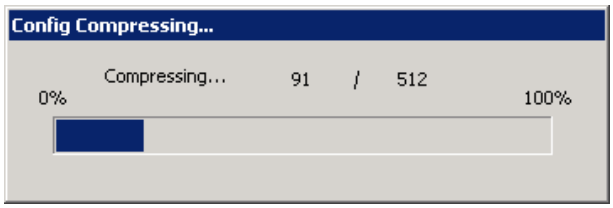
(22) <Compressing of the configuration information>

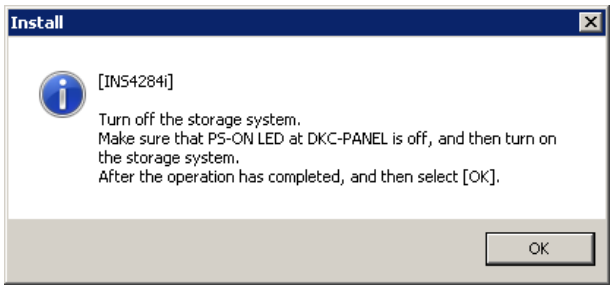
The configuration information is compressed. The dialog of 'Config Compressing...' is displayed. After the compressing is completed, go to Step (24)



NOTE: However, on page MICRO07-110 (12), it advances to Step (23) when [No] is selected (CL).

(23)

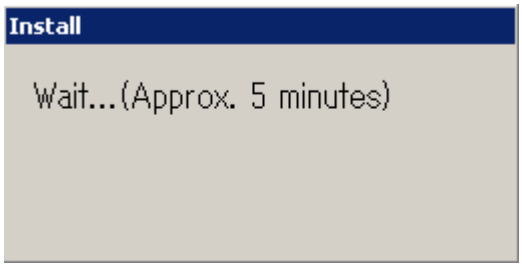
Select (CL) [OK] in response to the message "Turn off the storage system. Make sure that PS-ON LED at DKC-PANEL is off, and then turn on the storage system. After the operation has completed, and then select [OK]."



(23)-1

"Wait... (Approx. 5 minutes)" is displayed.

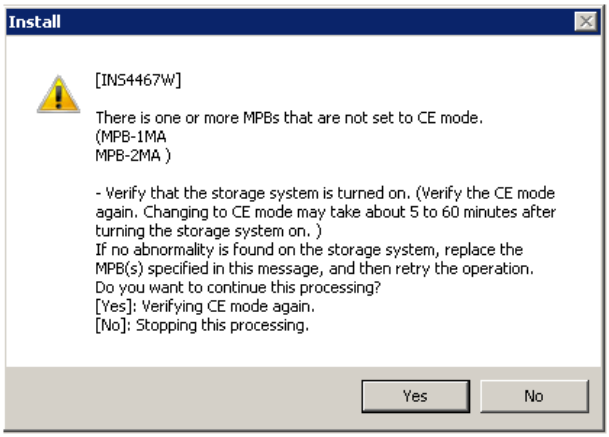
When there is MPB which is not CE mode, go to Step (23)-2.
When there is not MPB which is not CE mode, go to Step (24).



(23)-2

Response to the message "There is one or more MPBs that are not set to CE mode.
(MPB-nnn
MPB-nnn)

- Verify that the storage system is turned on. (Verify the CE mode again. Changing to CE mode may take about 5 to 60 minutes after turning the storage system on.)
If no abnormality is found on the storage system, replace the MPB(s) specified in this message, and then retry the operation.
Do you want to continue this processing?
[Yes]: Verifying CE mode again.
[No]: Stopping this processing."

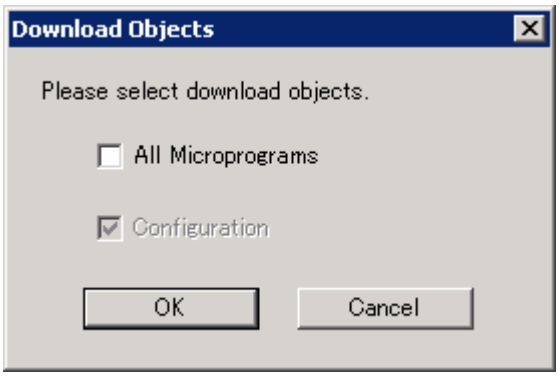


NOTE: The time required to change to CE mode after turning the storage system ON varies depending on cache size. When a cache PCB with the maximum size (524,288 MB) is mounted, changing to CE mode may take up to 60 minutes.

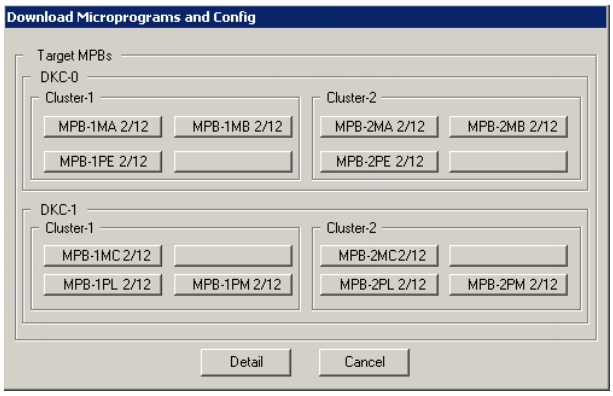
When [Yes] is selected (CL), Verifying of CE mode again. When there is not MPB which is not CE mode, go to Step (24). When there is MPB which is not CE mode, this message is displayed again.
When [No] is selected (CL), go back to Step (1).

(24) <Download Objects window>
Select (CL) the [OK] button.

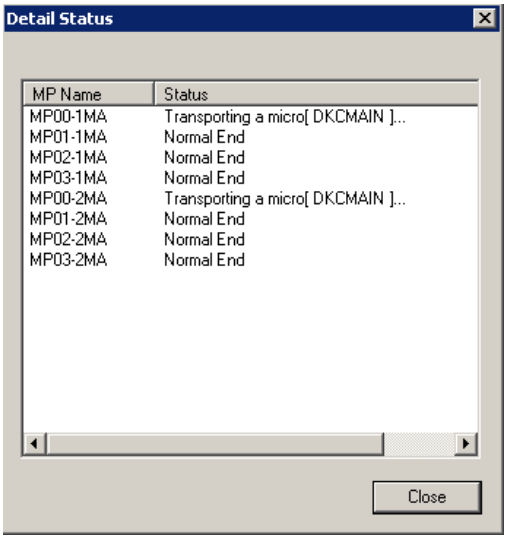
NOTE: Please do not select (CL) [All Microprograms].



(25) <Configuration information transfer>
The configuration information is forwarded. After the forward is completed, go to Step (26).
Select (CL) the [Detail] button. Go to Step (25)-1.

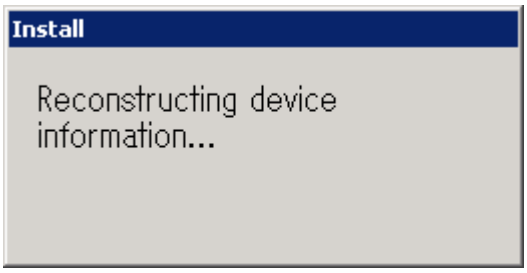


(25)-1
Details of transfer situation are confirmed on ‘Detail Status’ window.
When you close the ‘Detail Status’ window, select (CL) the [Close] button.



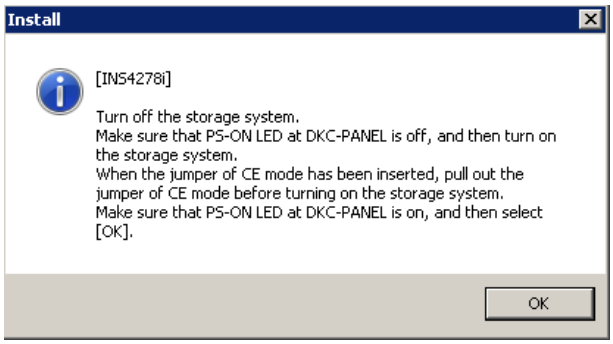
(26)

"Reconstructing device information..." is displayed.



(27)

Select (CL) [OK] in response to the message "Turn off the storage system. Make sure that PS-ON LED at DKC-PANEL is off, and then turn on the storage system. When the jumper of CE mode has been inserted, pull out the jumper of CE mode before turning on the storage system. Make sure that PS-ON LED at DKC-PANEL is on, and then select [OK]."



NOTE: Pull out the CEMD jumper from MPB when powering on the storage system in CE mode by the CE mode switch.

(28)

Select (CL) the [OK] button in response to the message, “This will reboot SVP.”.

NOTE: Although the DKC is powered off, the SVP is neither powered off nor rebooted.

(29)

Execute the Config Version UP (MICRO07-10) with a media that is used in this operation.

7.5 Storing a backup of configuration information (config) to a CD-R

(1)

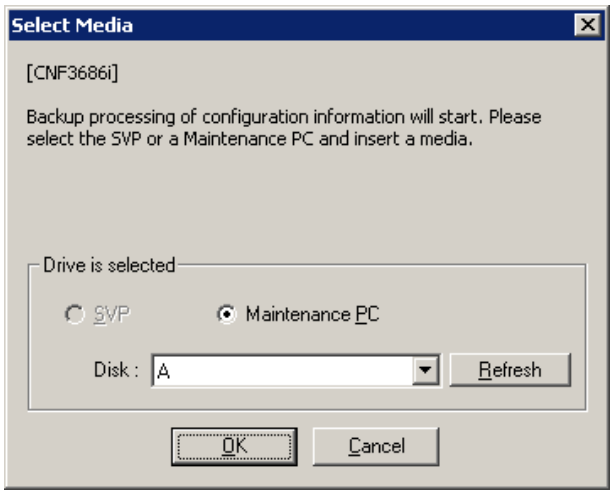
To store a backup of the config, prepare a blank CD-R.

(2)

If the DKC200 directory exists in the root of the hard disk (C drive) of the Maintenance PC to which the backup of the config is stored temporarily, delete the DKC200 directory.

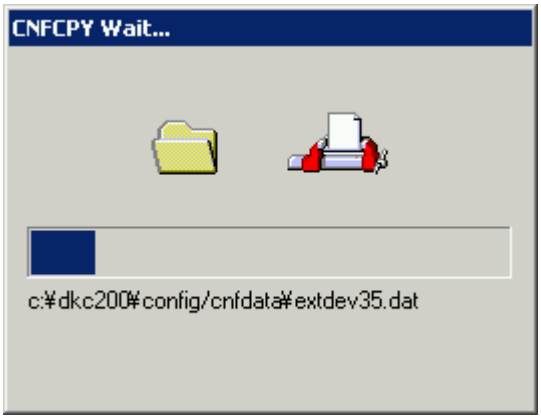
(3)

Perform the backup processing of the config. Select the drive (C drive) prepared in (2).



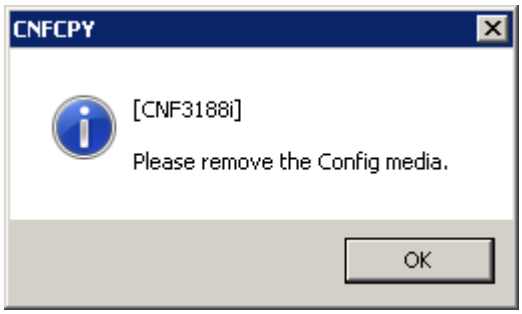
(4)

The backup processing is performed. The 'CNFCPY Wait...' window appears.



(5)

Select (CL) the [OK] button.



(6)

The DKC200 directory exists in the root of the drive (C drive) specified in (3). Use the CD writing tool to copy the DKC200 directory to the root directory of the CD-R, which was prepared in (1).

8. Microprogram Exchange Wizard

Only inserting the CD-ROM and execute the Microprogram-Exchange-Wizard, micro-program are exchanged automatically according to the contents of the definition.

CAUTION

Perform the micro-program exchange when MP processing rate is less than 50%. If the MP processing rate is 50% or higher, micro-program exchange may end abnormally.

CAUTION

When 8FC16 is mounted, for the micro-program exchange where the XX part of the version (80-XX-YY) of an FCHF micro-program running on 8FC16 PCB is going to be changed, a message window is displayed to confirm an alternate path switching to 8FC16.

At that time, the confirmation message needs to be manually responded after switching the alternate path in coordination with the alternate path function of the host.

For details, refer to 4.4.1 <FCHF micro-program exchange>.

- The starting method

(1)

Connect the Maintenance PC to the SVP.

(2)

Insert CD-ROM that the micro-program was stored in the CD-ROM drive of the Maintenance PC.

(3)

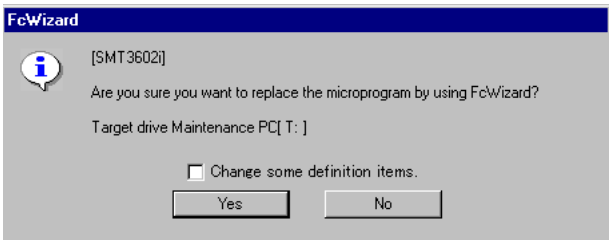
Change the SVP mode to [Modify].

(4)

Select (CL) [FcWizard].

(5)

The message “Are you sure you want to replace the microprogram by using FcWizard?” appears.
Select (CL) [Yes].



If you check (CL) the “Change some definition items” these following dialog appears and you can change some definition of the micro-program exchange.

[Reboot processor] dialog
If the target micro-programs contains DKCMAIN or RAMBOOT, you can select (CL) processors’ reboot pattern.
Refer to 4.3 (7).

---

(6)

According to the contents of the definition file stored in the CD-ROM, micro-program is exchanged automatically (If you change some definitions FcWizard follows those.).

⚠ CAUTION

When FC16 PCB has been mounted and the following conditions for the FCHF micro-program operating on PCB are fulfilled, a confirmation message window of switching FC16 alternant path is displayed while exchanging the FCHF micro-program.

- The version of the operating FCHF micro-program is different from the new version.
- DKC determines that a reboot of FC16 PCB is required due to the updated contents of the new version of FCHF micro-program.

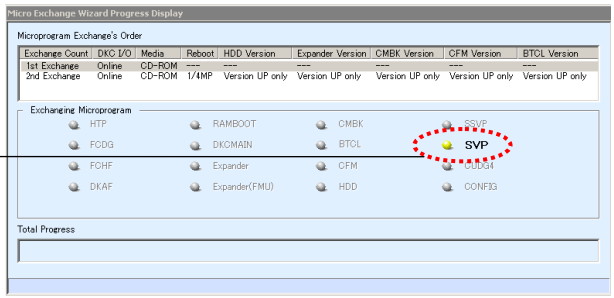
It is necessary to respond to the message by manual operation. See detailed procedure of “4.4.1 <FCHF micro-program exchange>” (MICRO04-190).

---

(7)

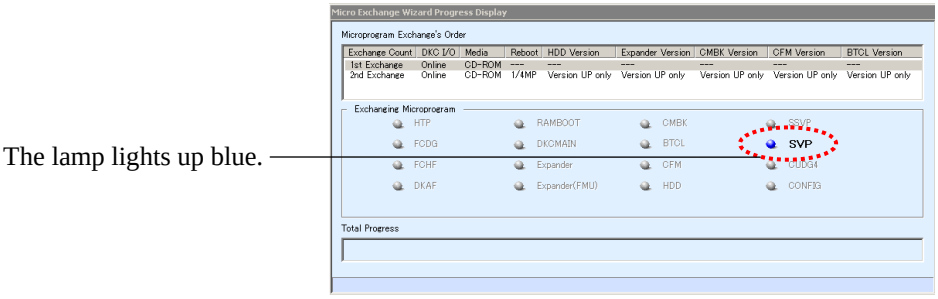
The progress dialog is displayed upper left, and the lamp of the micro-program under execution blinks in yellow.

The lamp blinks in yellow.



(8)

The lamp of the micro-program exchanged normally lights up blue.

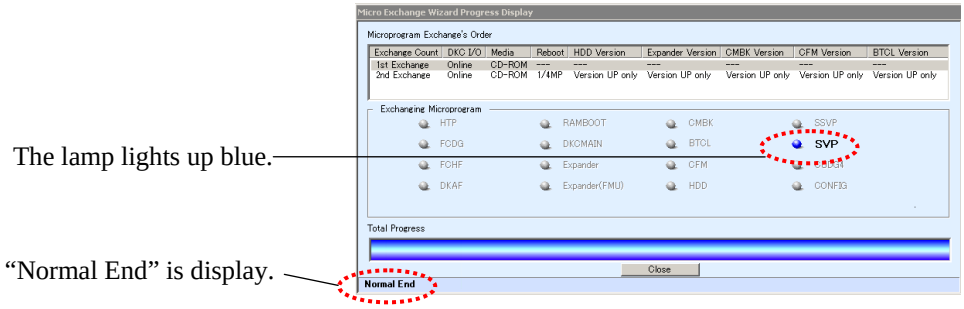


(9)

After the micro-program exchange, [Close] button is displayed.

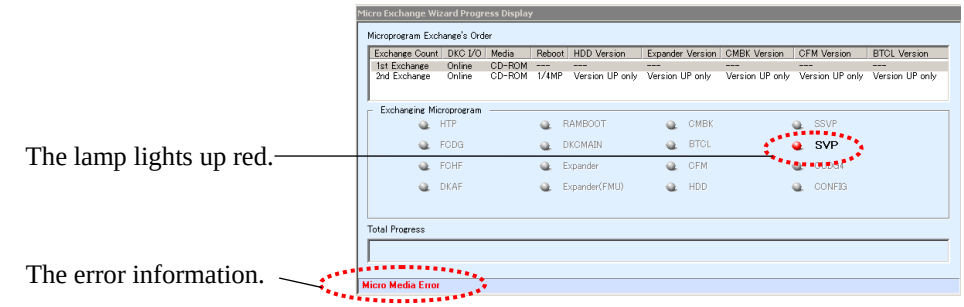
Normal End:

After all micro-program exchange finish, “Normal End” is displayed on the dialog lower left.



Abnormal End:

The lamp of micro-program lights up red, and the error information is displayed on the dialog lower left.



Error information	Action
MP Reboot stop, Due to heavy I/O load	The micro-program exchange is stopped because MP processing rate is 50% or higher. Reduce the MP processing rate less than 50% and then retry the micro-program exchange.
Micro Version Error	The micro-program version is incorrect. Confirm the version.
Micro Sum Check Error	Sum check code is incorrect. Micro-program data in micro-media isn't correct. Exchange the micro-media.
Micro Revision Error	The micro-program revision is incorrect. Confirm the revision.
Micro Combination Error	If you perform the micro-program exchange with the combination of these micro-program versions, DKC/HDU may be partially blocked. Confirm the micro-program versions and exchange procedure.
Micro Media Error	The micro-media has an error. Replace the micro-media.
Errors other than above	Confirm 'SIM/Maintenance' window, remove the error and then retry the micro-program exchange.

(10)

After confirming the message, push the [Close] button and end.

---

(11)

Change the SVP mode to [View].

9. Version upgrade of RAID Manager (SVP)

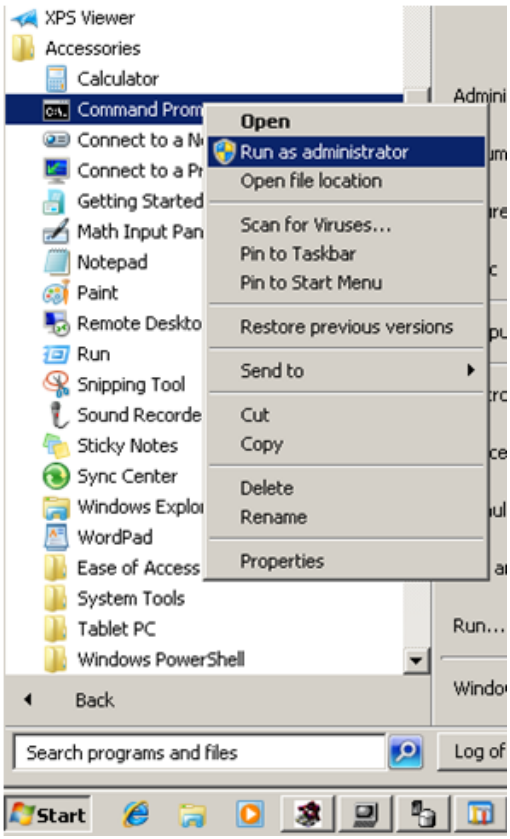
The procedure of the upgrade of RAID Manager installed in SVP is shown. Especially, work concerned is unnecessary execution when there is no instruction from the factory.

(1)

Insert the micro-program media.
Insert the micro-program media into the CD-ROM drive in the Maintenance PC.

(2)

Start the command prompt with the Administrator authority.
Select (CL) [Start]-[Programs]-[Accessories], right-click [Command Prompt], and select (CL) [Run as administrator].



(3)

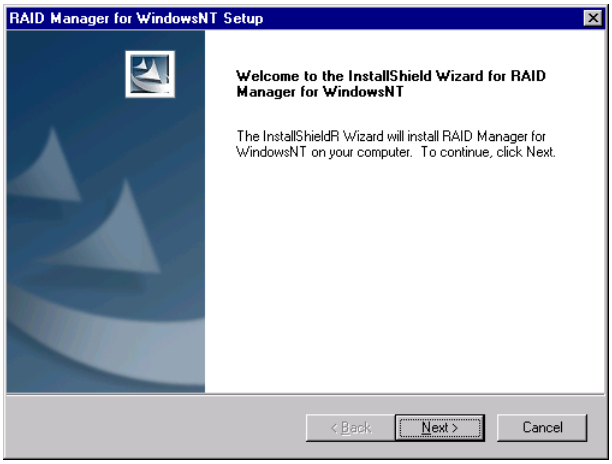
Start the installer.
Enter “\\tsclient\D\RM\Setup.exe /SVP” in the command prompt and press the Enter key. (Enter a space before /SVP).

NOTE: The format of the input value is “\\tsclient\<Drive name>\ RM\Setup.exe /SVP”. Use the name of the drive in which the media is inserted. In the example above, the media is inserted in the D drive.

---

(4)

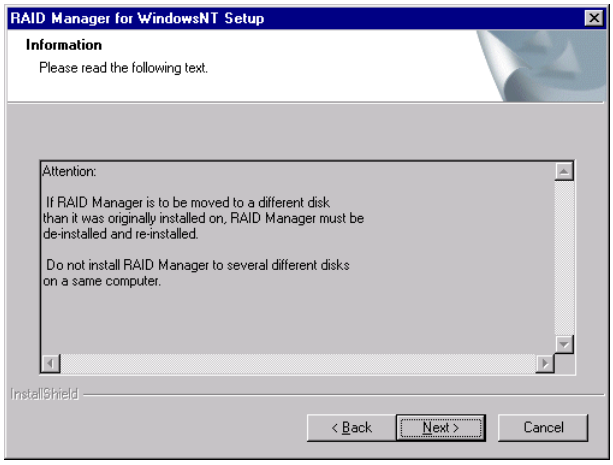
Move to the next dialog box.
The ‘RAID Manager for WindowsNT Setup’ dialog box appears. Select (CL) [Next>].



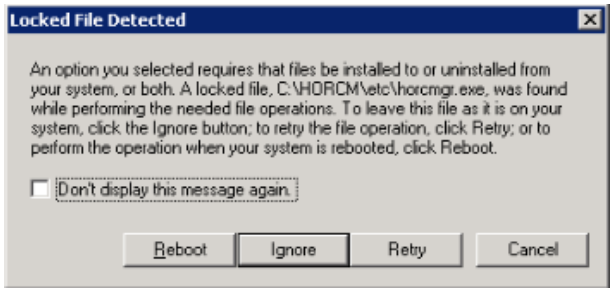
---

(5)

Move to the next dialog box.
Select (CL) [Next >].



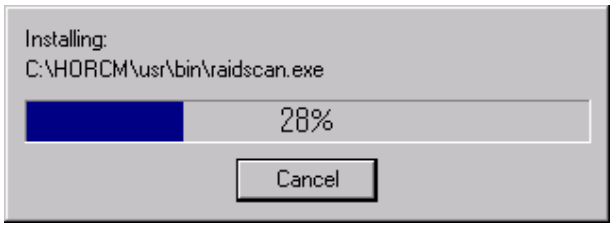
When “Locked File Detected” is displayed, select (CL) [Retry] after waiting for about five minutes.



NOTE: “Locked File Detected” is displayed when RAID Manager process is not terminated.
At this time, you should wait until RAID Manager process is terminated.

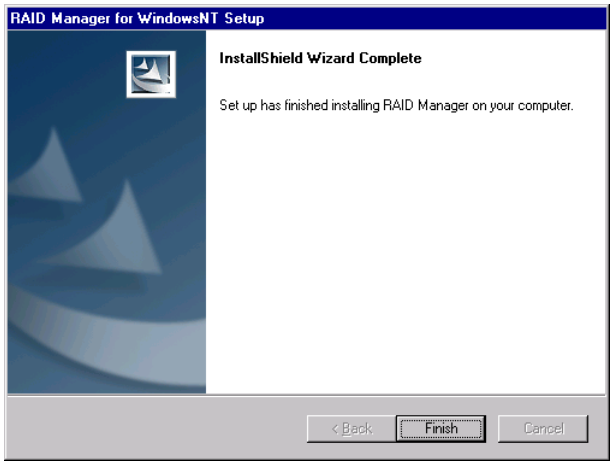
(6)

Wait for the installation to complete.



(7)

Complete the installation operation.
Select (CL) [Finish].



(8)

Reboot SVP.
Select (CL) [Start]-[Run...].
Enter “shutdown /r /t 0” and select (CL) [OK].
SVP reboots.

NOTE: If the SVP High Reliability kit is installed, you need to install it in the standby SVP by using the same procedure. For the procedure of switching to the standby SVP, see “2.17 SVP Switching” (SVP02-17-10) in the SVP SECTION.

10. Procedure of the FCHF Micro-program Exchange by Alternate Path

10.1 Overview

Revision update of an FCHF micro-program supports a method which does not disconnect the path link by reloading the protocol LSI in 8FC16 PCB only and a method which requires coordination with the alternate path function of the host as the change requiring 8FC16 PCB reboot disconnects the path link.
These methods are automatically decided by the changed content of the FCHF micro-program. When the XX part of the FCHF micro-program version (80-XX-YY) is changed, the micro-program exchange method requiring the alternate path works.

Basically only the DKCMAIN micro-program and the FCHF micro-program that are stored in the same medium (CD-ROM medium) can run in combination.

10.2 Confirming the alternate path in advance

It is necessary that the alternate path is configured properly and path switching works at the time of the exchange. Confirm with the customer and the customer SE.
For how to confirm the alternate path, see Table 10.5-1.

10.3 Micro-program exchange type

HP-UX, Solaris, AIX, Windows, Red Hat Linux: Alternate SCSI Path mode.

10.4 Restrictions

(1) Confirm that the alternate path is set properly.
(2) Online exchange can be performed only when both the primary path and the alternate path are normal.
If the paths have any problem, recover them and then perform the online exchange.
(3) Stop I/O to LDEV, in which no alternate path is set, in advance.
(4) In the case of Dual Active, one path may have too much load during the micro-program exchange or the FCHF micro-program exchange. Perform the exchange carefully by choosing the time period when the host load is low, for example.
(5) If RAID Manager is used in the Path Manager environment of Windows OS, the alternate path function is not supported, so shut down RAID Manager.

10.5 Procedure of online micro-program exchange

(1) Procedure of the FCHF micro-program exchange for HP-UX, Solaris, AIX, Windows, and Red Hat Linux.

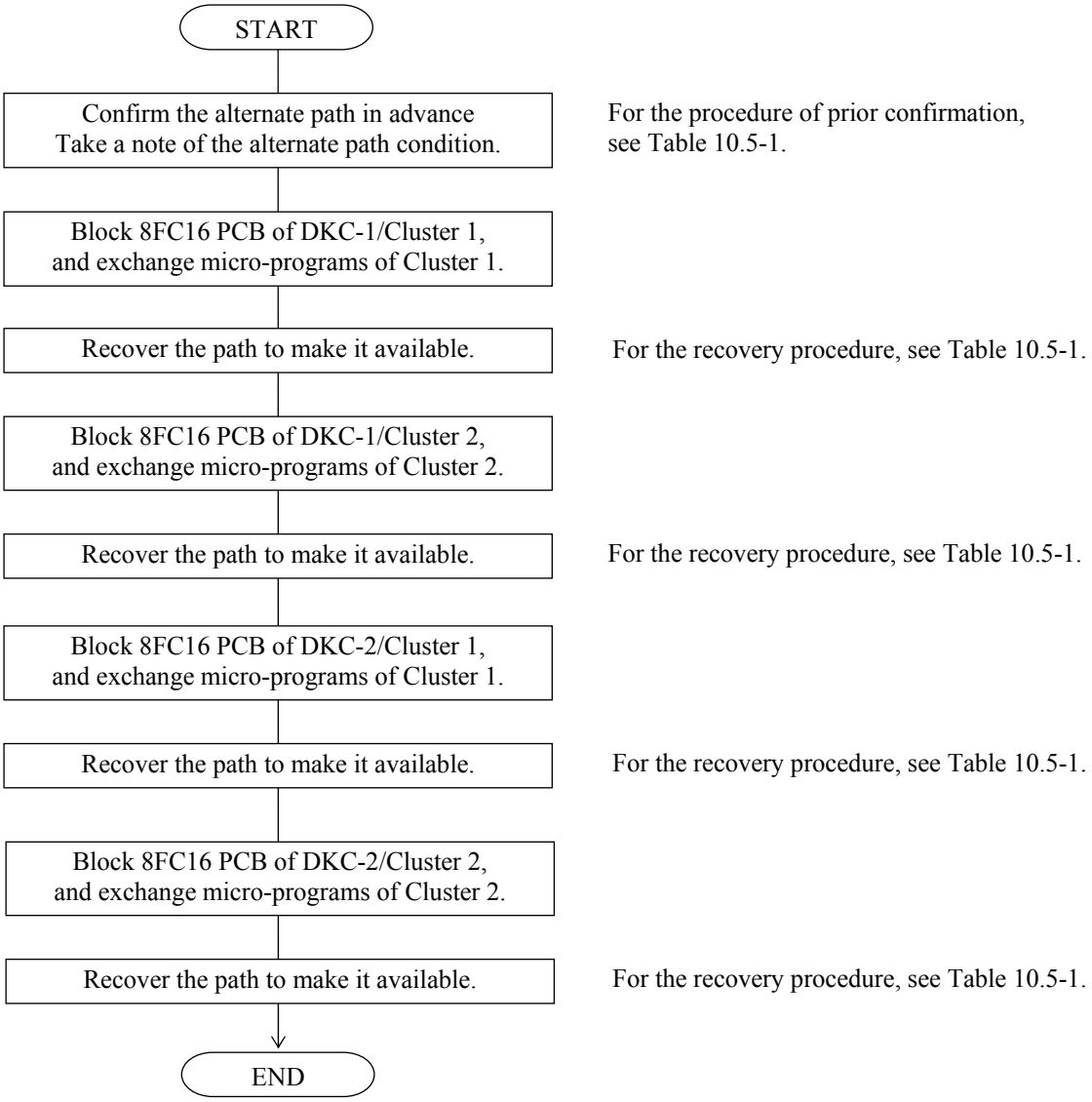


Table 10.5-1 Examples of Alternate path confirmation procedure and recovery confirmation procedure (1/8)

No.	Platform	Alternate path confirmation procedure	Recovery procedure
1	HP	[PVLink] Use the command “vgdisplay -v” to display and check the path status (Pstate) of all devices (LUs). Confirm that “PV Name” is displayed as Alternate Link and the Status is available. ○When switching a path, the following message is output. (1) When a path is switched vmunix: SCSI: Async write error - vmunix: SCSI: Read error -- vmunix: LVM: Performed aswitch for LUN ID ... vmunix: LVM: Recovered Path ... vmunix: LVM: vg[18]: pvnum = 1 is POWERFAILED (2) When a path is recovered vmunix: LVM: Restored PV 0 to VG 19	[PVLink] Auto recovery Use the command “vgdisplay -v” to display and check the path status (Pstate) of all devices (LUs).

Table 10.5-1 Examples of Alternate path confirmation procedure and recovery confirmation procedure (2/8)

No.	Platform	Alternate path confirmation procedure	Recovery procedure
1	HP	[HDLM] Use the command “dlnkmgr view -path” to check the status of all adapters. Perform the following operation according to the adapter status. • All ONLINE ------- All paths are available. After recording this status, perform the micro-program exchange or the 8FC16 PCB exchange. • All OFFLINE ------ A path has a failure. After removing the path failure, place the path online by following the recovery procedure described in this table. ○When switching a path, the following message is output. (1) When a path is switched dlmmgr: KAPL08019-E The path detected an error. dlmmgr: KAPL08022-E A path error occurred. (2) When a path is recovered dlmmgr: KAPL01022-1 8path (s) were processed. Operation name = online dlmmgr: KAPL01001-1 The HDLM command completed normally. Operation name = online	[HDLM] Step (1): Perform the FCHF micro-program exchange in one cluster. Step (2): Check the number of the offline adapter by using the command “dlnkmgr view -path”. Step (3): If the path is not recovered automatically, execute the command “dlnkmgr online -pathid x -s”. (‘x’ here indicates the number of the adapter in which the micro-program exchange was performed) Step (4): Confirm that the status of all adapters is restored to ONLINE by using the command “dlnkmgr view -path”. Perform Steps (1) to (4) also in another cluster. • All ONLINE --- All paths are available. • All OFFLINE-- A path has a failure. After performing the micro-program exchange or the 8FC16 PCB exchange, and the path is recovered, start from Step (1) again. Or after removing the path failure, start from Step (1) again.

Table 10.5-1 Examples of Alternate path confirmation procedure and recovery confirmation procedure (3/8)

No.	Platform	Alternate path confirmation procedure	Recovery procedure
2	Solaris	[VxVM DMP] Use the VxVM command "vxdisk list *diskxx*" or "vxdisk list *cxtxdxsx*" to display and check the path status of all devices (LUs). Perform the following operation according to the path status. • Disabled ----- A path has a failure (or after the micro-program exchange or the 8FC16 PCB exchange, the path is not recovered yet). After removing the failure, check the path status again by performing the procedure. • Enabled ------ After recording this status, perform the micro-program exchange or the 8FC16 PCB exchange. NOTE: If there is at least one disabled path, do not perform online micro-program exchange or 8FC16 PCB exchange. Make sure to remove the failure first and then perform the micro-program exchange. ○When switching a path, the following message is output. (1) When a path is switched vxdmp: Path failure on 32/0x17dd4 vxvm: vxdmp: disabled path 32/0x17dd0 belonging to the dmpnode 106/0x20. (2) When a path is recovered vxvm: vxdmp: disabled path 32/0x17db8 belonging to the dmpnode 106/0x8.	[VxVM DMP] Step (1): Use the VxVM command "vxdmpadm enable ctlr = cx (cx: Controller number)" to make the disabled path available. Step (2): Use the command "vxdisk list *diskxx*" or "vxdisk list *cxtxdxsx*" to confirm that all devices are enabled (= Initial state). If there is any disabled path remaining, start from Step (1) again.

Table 10.5-1 Examples of Alternate path confirmation procedure and recovery confirmation procedure (4/8)

No.	Platform	Alternate path confirmation procedure	Recovery procedure
2	Solaris	[SUN StorEdge Traffic Manager (MpxIO)] Confirm the current alternate path. luxadm display/dev/rdsk/cxtxdxsx ---- (For cxtxdxsx, enter devicename that is displayed by the format command and check the status of all devices.) • ONLINE----- All paths are available. After recording this status, perform the micro-program exchange or the 8FC16 PCB exchange. • OFFLINE --- A path has a failure. ○When switching a path, the following message is output. (1) When a path is switched e4500-2 SCSI transport failed: reason 'aborted': retrying command mpxio: ...Device name multipath status: degraded, path ...to target address: WWN, 6 is offline. (2) When a path is recovered multipath status: optimal, path ... to target address: WWN, 7 is online.	[SUN StorEdge Traffic Manager (MpxIO)] Auto recovery luxadm display/dev/rdsk/cxtxdxsx ---- (For cxtxdxsx, enter devicename that is displayed by the format command and check the status of all devices.)

Table 10.5-1 Examples of Alternate path confirmation procedure and recovery confirmation procedure (5/8)

No.	Platform	Alternate path confirmation procedure	Recovery procedure
2	Solaris	[HDLM] Use the command “dlnkmgr view -path” to check the status of all adapters. Perform the following operation according to the adapter status. • All ONLINE ------- All paths are available. After recording this status, perform the micro-program exchange or the 8FC16 PCB exchange. • All OFFLINE ------ A path has a failure. After removing the path failure, place the path online by following the recovery procedure described in this table. ○When switching a path, the following message is output. (1) When a path is switched dlmmgr: KAPL08019-E The path detected an error. dlmmgr: KAPL08022-E A path error occurred. (2) When a path is recovered dlmmgr: KAPL01022-1 8path (s) were processed. Operation name = online dlmmgr: KAPL01001-1 The HDLM command completed normally. Operation name = online	[HDLM] Step (1): Perform the FCHF micro-program exchange in one cluster. Step (2): Check the number of the offline adapter by using the command “dlnkmgr view -path”. Step (3): If the path is not recovered automatically, execute the command “dlnkmgr online -pathid x -s”. (‘x’ here indicates the number of the adapter in which the micro-program exchange was performed) Step (4): Confirm that the status of all adapters is restored to ONLINE by using the command “dlnkmgr view -path”. Perform Steps (1) to (4) also in another cluster. • All ONLINE --- All paths are available. • All OFFLINE-- A path has a failure. After performing the micro-program exchange or the 8FC16 PCB exchange, and the path is recovered, start from Step (1) again. Or after removing the path failure, start from Step (1) again.

Table 10.5-1 Examples of Alternate path confirmation procedure and recovery confirmation procedure (6/8)

No.	Platform	Alternate path confirmation procedure	Recovery procedure
3	Windows	[Multi-path I/O] In the property window of Multi-Path Disk Device in Windows, select the [MPIO] tab and confirm the status of all paths. After that, perform the following operation according to the status. • All ONLINE ------- All paths are available. After recording this status, perform the micro-program exchange. • All OFFLINE ------ A path has a failure. After removing the path failure, perform the micro-program exchange.	[Multi-path I/O] Step (1): Perform the FCHF micro-program exchange in one cluster. Step (2): In the property window of Multi-Path Disk Device in Windows, select the [MPIO] tab and check if there is any OFFLINE path. Step (3): Confirm that the OFFLINE path found in Step (2) is automatically recovered. If it is not recovered, remove the path failure. Step (4): Confirm that all paths are restored to ONLINE and perform Steps (1) to (4) also in another cluster. • All ONLINE --- All paths are available. After recording this status, perform the micro-program exchange. • All OFFLINE-- A path has a failure. After removing the path failure, perform the micro-program exchange.

Table 10.5-1 Examples of Alternate path confirmation procedure and recovery confirmation procedure (7/8)

No.	Platform	Alternate path confirmation procedure	Recovery procedure
4	AIX	[HDLM] Use the command “dlnkmgr view -path” to check the status of all adapters. Perform the following operation according to the adapter status. • All ONLINE ------- All paths are available. After recording this status, perform the micro-program exchange or the 8FC16 PCB exchange. • All OFFLINE ------ A path has a failure. After removing the path failure, place the path online by following the recovery procedure described in this table. ○When switching a path, the following message is output in errpt -a. • Link error • Software program error • Disk operation error	[HDLM] <u>Step (1):</u> Perform the FCHF micro-program exchange in one cluster. <u>Step (2):</u> Check the number of the offline adapter by using the command “dlnkmgr view -path”. <u>Step (3):</u> If the path is not recovered automatically, execute the command “dlnkmgr online -pathid x -s”. (‘x’ here indicates the number of the adapter in which the micro-program exchange was performed) <u>Step (4):</u> Confirm that the status of all adapters is restored to ONLINE by using the command “dlnkmgr view -path”. Perform Steps (1) to (4) also in another cluster. • All ONLINE --- All paths are available. • All OFFLINE-- A path has a failure. After performing the micro-program exchange or the 8FC16 PCB exchange, and the path is recovered, start from Step (1) again. Or after removing the path failure, start from Step (1) again.

Table 10.5-1 Examples of Alternate path confirmation procedure and recovery confirmation procedure (8/8)

No.	Platform	Alternate path confirmation procedure	Recovery procedure
5	Red Hat Linux	[HDLM] Use dlnkmgr view -afb to confirm that the Auto Fail Back mode is set to ON. Use the command “dlnkmgr view -path” to check the status of all adapters. Perform the following operation according to the adapter status. • All ONLINE ------- All paths are available. After recording this status, perform the micro-program exchange or the 8FC16 PCB exchange. • All OFFLINE ------ A path has a failure. After removing the path failure, place the path online by following the recovery procedure described in this table. ○When switching a path, the following message is output. (1) When a path is switched Mar 29 13:26:57 kernel: SCSI disk error : host 3 channel 0 id 0 lun 1 return code = 10000 Mar 29 13:26:57 kernel: I/O error: dev 08:a0, sector 1867456. (2) When a path is recovered Mar 29 13:28:49 dlmmgr: KAPL08023-I A path was recovered. PathID = 8, PathName = 0003.0000.0000000000000000.0000, DNum = 0, HDevName = sddlmad	[HDLM] Step (1): Check the number of the offline adapter by using the command, “dlnkmgr view -path”. Step (2): Execute the command “dlnkmgr online -path”. Step (3): Confirm that the status of all adapters is restored to ONLINE by using the command “dlnkmgr view -path”. • All ONLINE --- All paths are available. • All OFFLINE-- A path has a failure. After performing the micro-program exchange or the 8FC16 PCB exchange, and the path is recovered, start from Step (1) again. Or after removing the path failure, start from Step (1) again.

11. Version upgrade of OSS

OSS media upgrade is done by reinstalling the software. Please refer to the instructions below.

WEB CONSOLE SECTION:
“5. Procedure of server software uninstallation/installation” (WEB05-10)

Especially, work concerned is unnecessary execution when there is no instruction from the factory.

Appendixes A

A.1 Function ID Table

• Function ID Table

Function ID Table			
Function ID	Function	Contents	Action (*1)
00 : 00	global virtualization Support	Version Down from support micro for global virtualization to unsupported micro is controlled.	Perform the micro-program replacement after doing the following procedures. • Please set virtual-LDEV ID same as actual-LDEV ID in all LDEV. • Please delete all Virtual Storage Machine except Default Virtual Storage Machine. • Please release TC-pair and UR-Pair where is different from actual-LDEV ID in virtual-LDEV ID of Secondary-Volume. • Please delete external volumes for nondisruptive migration.
00 : 01	Mainframe Fibre Data Migration Support	Mainframe Fibre Data Migration Support	Please try exchange again after executing all of FICON port type change from FNP to HTP.
00 : 02	8FC16 Support	8FC16 is installed.	Please execute the micro exchange again after De-Install 8FC16.
00 : 03	Support for global-active device	Suppress version downgrade to the global-active device unsupported micro-program version.	Please execute the micro exchange again after deleting all the global-active device Pair and Quorum Disk.
00 : 07	CM32G, BKML, BMM256 Support	CM32G or BKML or BMM256 is installed.	Please execute the micro exchange again after De-Install all CM32G and BKML and BMM256.

Function ID Table			
Function ID	Function	Contents	Action (*1)
00 : 15	Support DKx5x-xxxxSS/ SLx5x-MxxxSS in UBX	Suppress version downgrade to the micro-program that supports for DKx5x-xxxxSS and SLx5x-MxxxSS in UBX. • DKa5b-ccdd SS a: maker (R or S) b: generation (A to Z) c: rpm (J or K) d: capacity (GB or TB) • SLx5y-MzzzSS x: maker (R or B) y: generation (A to Z) z: capacity (GB)	De-install all DKx5x-xxxxSS and SLx5x-MxxxSS drives before micro-program replacement, wait for two minutes, and then execute micro-program replacement again.

Function ID Table			
Function ID	Function	Contents	Action (*1)
06 : 23	Support for I/O Controlled during pool shrink	Version Down from support micro for I/O Controlled during pool shrink to unsupported micro is controlled.	Please execute the micro exchange again after waiting for the completion of Shrink Pool or Stop Shrinking Pool.
06 : 25	Support for Periodic drive evacuation of the mapping	Version Down from support micro for Periodic drive evacuation of the mapping to unsupported micro is controlled.	Please execute the micro exchange again after it does for a while.
15 : 07	Support for Encrypt DKB	Version Down from support micro for “Encrypt DKB” to unsupported micro is controlled.	Please de-install Encrypt DKB and execute micro exchange again.

*1: If SVP displayed an error message as 2179 during microcode exchange, please check which function is detected by this message, and do the corresponding action. After, please retry exchanging.