MICRO-FC SECTION

Contents

MICRO-FC

Two types of MICRO-FCs are provided with micro-program exchange and on-line patch. Micro-program exchange is explained in chapter 1 to 5, and on-line patch in chapter 6.

1. Overview

1.1 Micro-program Types

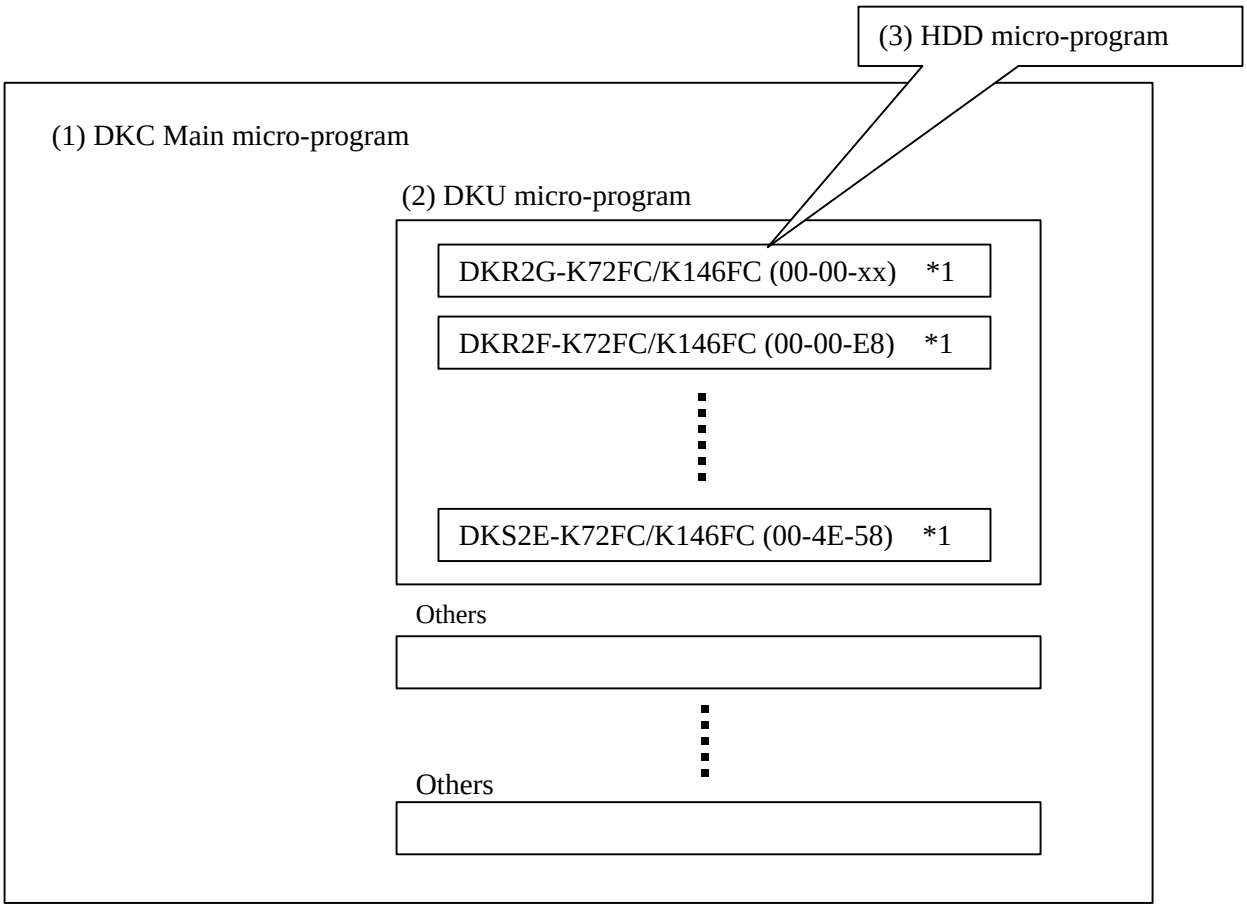
The micro-programs listed below can be exchanged via the SVP. Therefore, the exchange of micro-programs requires operational knowledge of the SVP.

Micro-program	Written to
Setup installer	—
DKCMAIN	FM
SVP	Hard disk in the SVP
LCP/LCDG	FM
HTP/FCDG	FM
CUDG4	Hard disk in the SVP
DKU/HDD	HDU
SCHIP	HDU
SSVP	FM
RAM BOOT	FM
CONFIG	Hard disk in the SVP

1.1.1 Definition of Micro-program Types

The objective of this document is to clarify the definition of micro-program group.

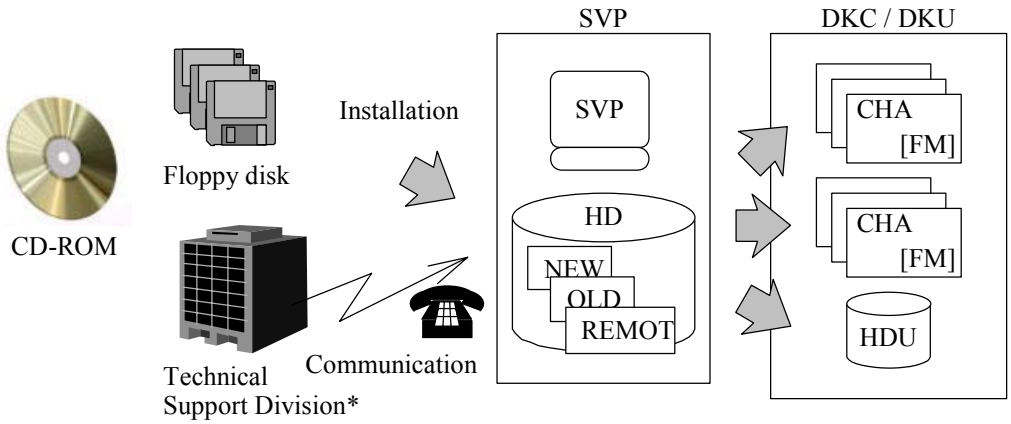
(1) DKC Main micro-program : Micro-program for DKC
(2) DKU micro-program : Group of HDD micro-programs
(3) HDD micro-program : Micro-program for each HDD model



(1) DKC Main micro-program combines DKU micro-program.
(2) DKU micro-program consists of plural HDD micro-programs.
(3) HDD micro-program defined as the micro-program for each HDD model.

*1: HDD Model name and Version is an example

1.2 Micro-program Exchange Flow



The SVP keeps two generations (new and old versions) of micro-programs.

*: Technical Support Division : A base of maintenance service and technical support

Micro-programs can be exchanged in four ways.
(1) Downloading after storing the micro-programs from CD-ROM or floppy disk to the hard disk
(2) Downloading of the latest versions on the hard disk in the SVP
(3) Remote (downloading of the micro-programs transferred from the maintenance center)
(4) Version Down (downloading of old versions on the hard disk)

1.2.1 About OSS media

In this subsystem, OSS (Open Source Software) contained in the media of a micro program until now is stored in another media. This media is called OSS media. Apache, JRE, and Perl are contained in this.
OSS media is used at an initial install or at these install when the version of one of Apache, JRE, or Perl is upgraded.

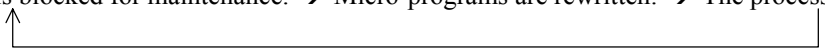
Refer to the WEB CONSOLE section for the relation between the microprogram version of SVP and the Apache/JRE/Perl version.

1.3 Micro-program Exchange

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

(1) Off-line
All processors are blocked for maintenance. → Micro-programs are rewritten. → All processors are recovered. → The DKC is turned off then on again.

(2) On-line
The processor is blocked for maintenance. → Micro-programs are rewritten. → The processor is recovered.



This is performed for each exchanging unit.

Note:

- The SVP checks the version of the micro-program to be substituted 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, when the error status is displayed in downloading from SVP to DKC (FM) or DKU by 3.3 Transferring micro-program to the DKC or by 4.3 Transferring micro-program, you can retry by 3.4 Hard Disk Download or by 4.4 Hard Disk Download.
- 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 SVP02-1280 2.19 "SVP Switching".)
- If it is required to version down the current microcode 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 the SVP High Reliability Kit is installed, the microprogram replacement operation is only in the normal SVP. The selected microprogram is transferred or updated automatically to the standby SVP. However, if the version of Apache/JRE/Perl to be installed in the OSS media changes, you need to install it for the standby SVP manually.

CAUTION

In case of HMRCF/HOMRCF/HIHSM/Hi-Copy/Flash Copy/Flash Copy V2/COW Snapshot, the differential bitmap data on the shared memory of DKC is volatilized by the offline microprogram exchange operation. Furthermore, in case of Flash Copy V2, the relationship is all released. Also, in case of COW Snapshot, 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 Flash Copy V2, and the Pool information on COW Snapshot.

2. Pre-Process Micro FC

2.1 Connect to SVP from Remote PC

Connect to SVP from Remote PC, with referring “Connecting the PC to the SVP” (SVP01-110) 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 subsystem status through the entire status display. (Check the versions of the all programs through the version display.).
- Make sure that collection copy and other processing are not in progress.)
- Perform post processing for PIN data.
- Check that all processors are normal.
- Check that all CHL pass to the subsystem are off-line (to block all micro-programs).
- LCP, LCDG, HTP, FCDG, DKCMAIN, and RAMBOOT micro-programs can be exchanged on off-line.
- In the case of HRC Asynchronous components, suspending all volume pairs is required prior to the RCU's off-line micro-program exchange. Refer to 3.15.8.1 Managing HRC Asynchronous Subsystems (5) Micro-program Exchange: THEORY03-2010.
- In the case of existing relationship of ShadowImage-FlashCopy(R)option and performing off-line micro-program exchange operation, it is necessary to follow the procedure of THEORY OF OPERATION SECTION "3.12.9 Micro-program Exchange (1) Off-line Micro-program Exchange".
- In case that the off-line micro-program exchange operation is executed when there is a pair of Copy-on-Write Snapshot, it is necessary to delete all Snapshot pairs.
- Refer to "3.12.9 Micro-program Exchange (1) Off-line Micro-program Exchange" on Theory Section if you perform Offline Micro-exchange when the Copy-on-Write Snapshot is installed.
- 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 subsystems and in some secondary subsystems, 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 subsystem & subordinary-side subsystem at the same time.
- In an OPEN environment, when exchanging the micro-program offline in the remote copy configuration using multiple primary and secondary subsystems of Universal Replicator, first suspend all the pairs in this configuration.

Note: 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.

Table3.1-1 Off-line Micro-program Exchange time (approximate)

(unit : minutes)

	CD-ROM → HDD		Downloading
LCP	3	CHA	2
LCDG			
HTP			
FCDG		DKA	2
DKCMAIN			
RAMBOOT			
TOTAL	3	TOTAL	7

Note: After you execute this operation, DKC will clear the condition that DKC reports SIM to the host. Therefore, DKC will report the next SIM to the host when the host accesses 16K I/O, and after you wait for an hour if P/S on is executed.

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

(1)

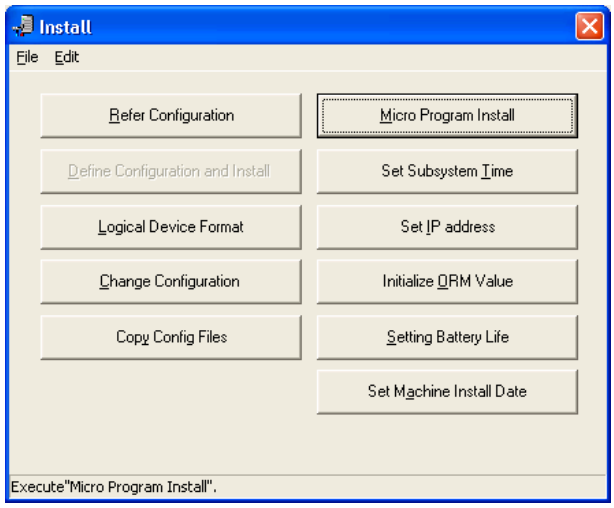
<Initial screen>

(2)

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

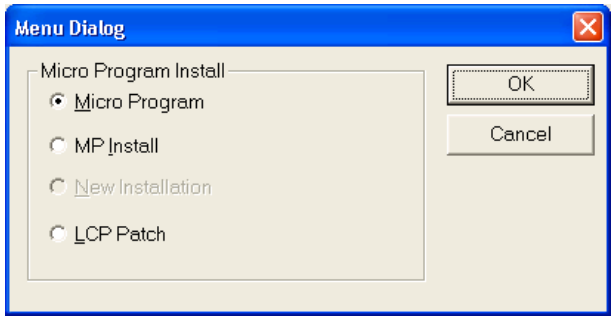
(3)

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

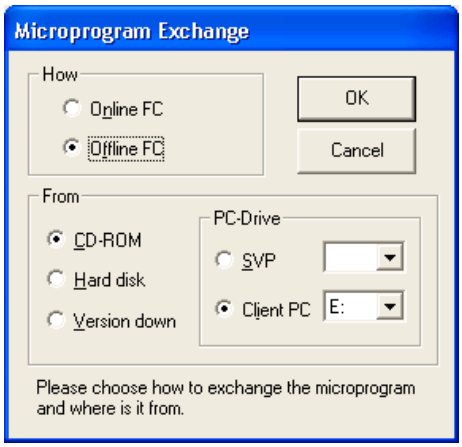


(4)

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



(5)



In the 'Microprogram Exchange' dialog box,
[How]: select (CL) [Offline].
[From]: select (CL) the source from which to store the micro-programs.
[PC-Drive]: select (CL) the 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). (MICRO03-310)

Version Down: Old versions on the hard disk are downloaded.
--- Go to 3.5 (1). (MICRO03-330)

[PC-Drive]'s selection branch

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

Client PC: The Client 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).

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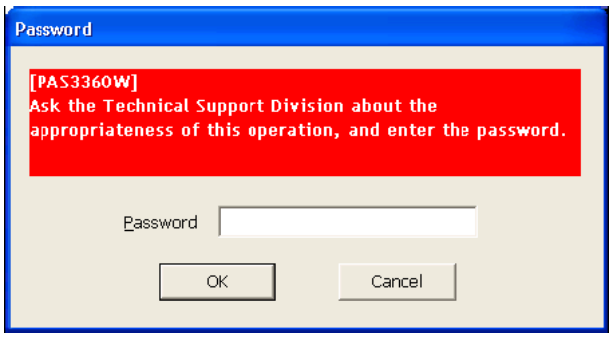
(6)

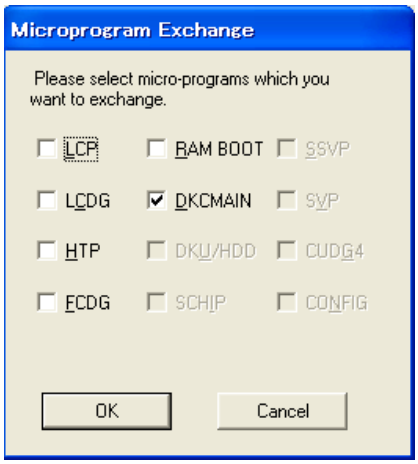
If you want to continue this process, select (CL) [OK] and enter the password, and select (CL) [OK].



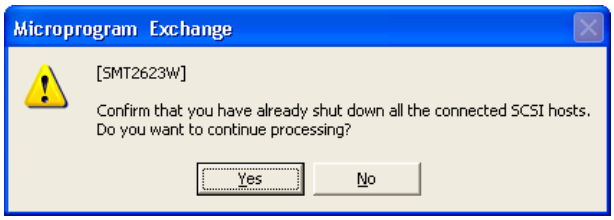
(7)

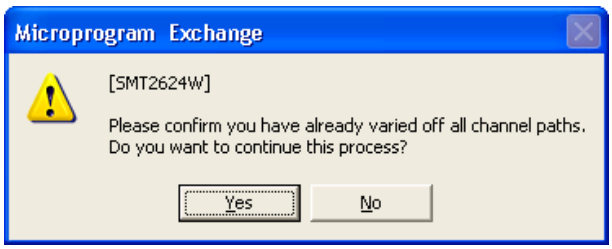
The ‘Microprogram Exchange’ dialog box appears. Select (CL) one or more items from the list of the type of micro-programs, and select (CL) [OK].

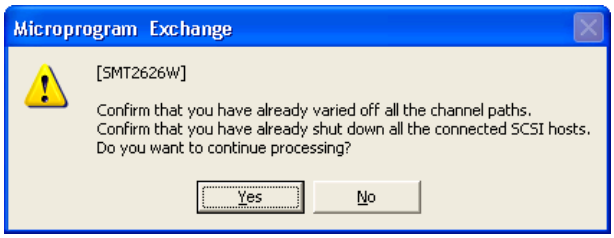
☑ : Micro-programs to be substituted.



One of messages are displayed by the subsystem configuration.



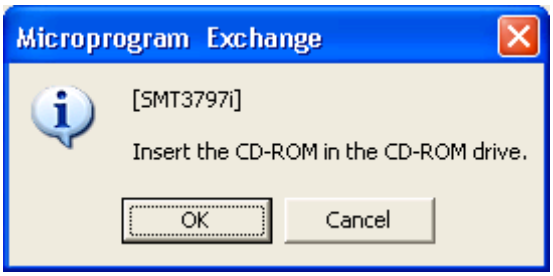




After you confirm that you have already varied all the CHL paths to off-line, select (CL) [Yes].

(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 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].
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.”

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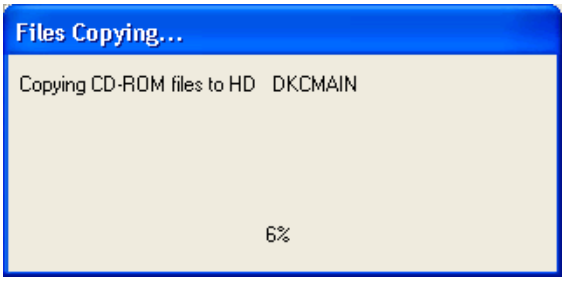
(9)

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

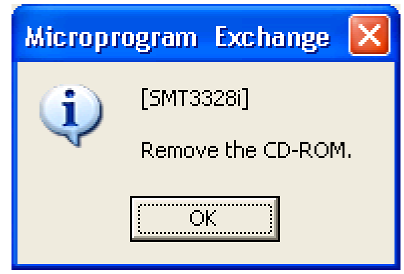


<<Error>>
Internal error:
- “The file size is Wrong and copy stop.”
- “The directory create error and copy stop.”
- “Micro-program version disagreement and copy stop.”
- “Logical error has occurred.”
- “File I/O error has occurred.”
- “Memory error has occurred.”

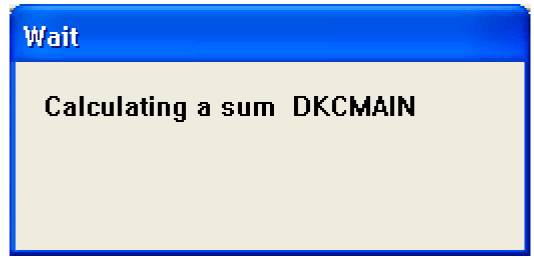
Note : When the error message “File I/O error has occurred.” or “Memory error has occurred.” is displayed, power SVP off and on again if the same message appears after reexecuting the micro-program exchange (see SVP01-180 in the SVP SECTION).
Then execute the same micro-program exchange again. If the same error occurs (the same error message is displayed), replace SVP hardware (see REP01-300 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.



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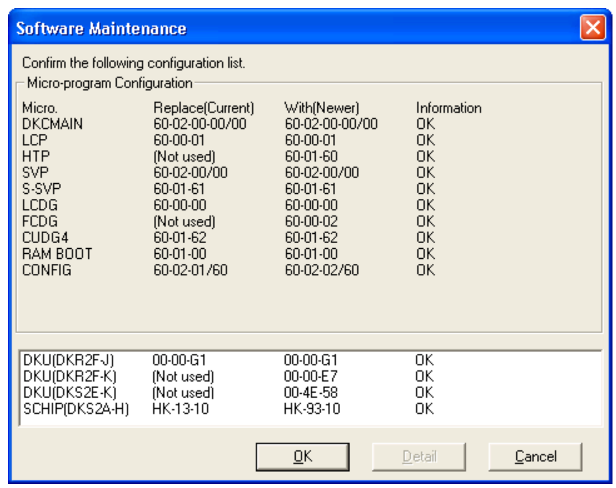
(11)

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

If “Warning” is displayed. Refrain from selecting (CL) “OK” or “Cancel”. Select (CL) “Detail” surely. Confirm the contents and ask the technical support division for decision for selecting “OK” or “Cancel” according to the contents. 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.

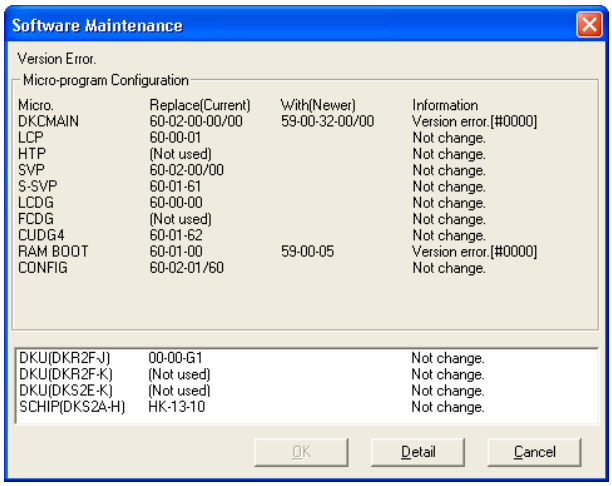
<Display with an error>

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 not displayed.)

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 TSD (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 TSD (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, I/O time-out may occur in the CHT port. 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	FC Condition [#xxxx]	MP has an incorrect micro-program version with partial replacement. [processor number]
4	Internal error [#xxxx]	Inconsistent logic error has occurred. [internal error code]
5	Not change	The micro-program will not be replaced.
6	Read error	An error has occurred while reading the current configuration.
7	Sum Check error	The sum check code is incorrect.
8	Warning	It is necessary to contact TSD (Technical support Division) for approval.
9	Revision error	MP has an incorrect micro-program revision.
10	Package condition	The combination error of micro-program and package has occurred.
11	Facility condition [#xxxx]	MP has an incorrect micro-program version with function of system. [Facility condition error code]
12	Combination error [#xxxx]	The combination error of more than two micro-programs has occurred. [Combination error code]

Internal error code		Contents
1	0001	Parameter error.
2	0002, 0003	Memory allocation error.
3	0005	File I/O error.

Combination error code		Contents
1	8000	High Speed Adapter error
2	8001	Compressed LCDG error

Facility condition error code		Contents
1	C000 ~ C011	Reserve
2	C012	Compressed DKCMAIN error

Function Bit Map Table			
Bit Pattern	Function	Contents	Action (*1)
0010 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Quick Format support	Quick Format support	Please wait 10 minutes after Quick Format is completed and execute micro exchange again.
0001 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	SM maintenance blockage procedure change	When the SMA LSI maintenance blockage processing operates with the micro version incompatibility together, the hard state contradiction of each MP is prevented.	An error message is not displayed for this function.
0000 1000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	RACK MODEL support	The version downgrade from the RACK MODEL support version to the unsupported version is suppressed when RACK MODEL platter.	Please exchange microprogram by the RACK MODEL support version.
0000 0100 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	TCA Migration-Use Support	TCA Migration-Use Support.	Please execute it again after releasing all the registration of CT Group with TCA.

Function Bit Map Table			
Bit Pattern	Function	Contents	Action (*1)
0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	TCA DR-Use Support	TCA DR-Use Support.	Please execute it again after releasing all the registration of CT Group with TCA.
0000 0001 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	FICON Data Migration Support	FICON Data Migration Support	Please try exchange again after executing all of FICON port type change from FNP to HTP.
0000 0000 1000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	FCv2 Support ICKDSF, INCREMENTAL	FCv2 Support ICKDSF, INCREMENTAL	Please release relationship of all INCREMENTAL FlashCopy.
0000 0000 0001 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Copy-on-Write Snapshot Dynamic Provisioning Support	Copy-on-Write Snapshot Dynamic Provisioning Support	Please try exchange again after deleting all of the Copy-on-Write Snapshot pairs which use Dynamic Provisioning's Virtual/Pool VOL for P-VOL.

Function Bit Map Table			
Bit Pattern	Function	Contents	Action (*1)
0000 0000 0000 1000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	VFS Pool VOL of external support made	Version Down from supportmicro for UVM HDP to unsupportmicro is controlled.	Please execute it again after deleting all pool made in external VOL.
0000 0000 0000 0100 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Hyper PAV support	Suppress version downgrade to the Hyper PAV unsupported microprogram version while operating in the Hyper PAV mode.	Perform version downgrade to the Hyper PAV unsupported microprogram version by a forced breakthrough after executing the following procedure. (1) Perform CHP OFF of all paths in the Hyper PAV mode or a change to the basic PAV mode. When you performed CHP OFF, do CHP ON after completing the microprogram replacement. (2) Uninstallation of Hyper PAV P.P.
0000 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Volume Migration and Dynamic Provisioning combination Support	Volume Migration and Dynamic Provisioning combination Support	Please try exchange again after deleting all of the Volume Migration pairs and Volume Migration reserve VOL which use DP-VOL.
0000 0000 0000 0001 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	ReverseCopy/ QuickRestore Support sharing volume of SI P-VOL and TC/UR S-VOL	When ShadowImage P-VOL shares TrueCopy/Universal Replicator S-VOL, ReverseCopy/ QuickRestore operation is allowed to ShadowImage's pairs.	Please try again after ShadowImage pairs (P-VOL is shared TrueCopy/Universal Replicator S-VOL) operations with ReverseCopy/QuickRestore are completed.

Function Bit Map Table			
Bit Pattern	Function	Contents	Action (*1)
0000 0000 0000 0000 1000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	HUR 4x4~MF~ Function support	HUR 4x4~MF~ Function support	Perform the microprogram replacement after doing the following procedures. • Please release all slave JNL Group from EXCTG.
0000 0000 0000 0000 0100 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Data Base Validator function support	Data Base Validator function support	Please execute the micro exchange again after releasing all Data Base Validator information.
0000 0000 0000 0000 0000 1000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Improvement of SI/TC/UR/CC pair operation executing VM.	Improvement of SI/TC/UR/CC pair operation executing VM.	Please execute the micro exchange again after releasing all VM pairs.

Function Bit Map Table			
Bit Pattern	Function	Contents	Action (*1)
0000 0000 0000 0000 0000 0100 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	RAID600 HUR UR-SI combination At Time SPLIT/ UR-CoW combination At Time Snapshot Support	Version Down to HUR At Time SPLIT/ At Time Snapshot unsupportmicro version is controlled.	Execute the micro exchange again after completing At Time SPLIT of ShadowImage and At Time Snapshot of CoW Snapshot. If it is impossible in the above action, execute the micro exchange by the Initialize operation of SI after forcible deletion.
0000 0000 0000 0000 0000 0001 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	HXRC function support	Version Down from supportmicro for HXRC function to unsupportmicro is controlled.	Please execute the micro exchange again after deleting all HXRC pairs.
0000 0000 0000 0000 0000 0000 0100 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	FC to PPRC Primary support	PPRC Primary function support of FCv2	Put the pair of TrueCopy that the S-VOL of FlashCopy and the P-VOL of TrueCopy are in cooperation into the suspend status. Moreover, cancel the relation of FalshCopy that the S-VOL of FlashCopy and the P-VOL of TrueCopy are in cooperation or have cooperated.

Function Bit Map Table			
Bit Pattern	Function	Contents	Action (*1)
0000 0000 0000 0000 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	TC CTG Support	TC CTG Support	Please delete all devices that use the CTG mode with TC.
0000 0000 0000 0000 0000 0000 0001 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Overload control for SI-CoW	Overload control for SI-CoW	Please execute the micro exchange again after executing either the following. • Releasing all pairs of Copy-on-Write Snapshot. • Releasing all pairs of ShadowImage. • Waiting for ten minutes after stopped copy job (pair state become simplex, split or suspend.) of ShadowImage, Volume Migration and Flash Copy version1.
0000 0000 0000 0000 0000 0000 0000 1000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	SATA drive function support	Suppressing version downgrade to the microprogram version which does not support the SATA drive (DKxxx-HxxxAT) function	De-install all SATA drives before microprogram replacement, wait for five minutes, and then execute microprogram replacement again.
0000 0000 0000 0000 0000 0000 0000 0100 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	UR Delta resync Function support	UR Delta resync Function support	Perform the microprogram replacement after doing the following procedures. • Please delete all UR pairs, which status is HOLD (Hold) or HLDE (Hlde) with each DKC of 3DC Multi-target Configuration. Refer to the Troubleshooting Section “17.6 UR Microprogram Version-Down Replacement Procedure (3DC Multi-target Configuration)” for the procedure for performing the microprogram replacement.

Function Bit Map Table			
Bit Pattern	Function	Contents	Action (*1)
0000 0000 0000 0000 0000 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Support of DP-VM interoperability expansion	A Volume Migration pair that uses DP-VOL of different emulation types (OPEN-0V/ OPEN-V) exists.	After deleting the VM pair that uses DP-VOL of different emulation types (OPEN-V/ OPEN-0V), perform the micro-program exchange again.
0000 0000 0000 0000 0000 0000 0000 0000 0100 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	SI-DP Quick Restore support	SI-DP Quick Restore support	Please try exchange again after waiting for complete Quick Restore job of the ShadowImage pair which use DP-VOL.
0000 0000 0000 0000 0000 0000 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	TC/UR Dynamic Provisioning	TC/UR Dynamic Provisioning support	Please delete all devices that use the HDP VOL with TC/UR. Please unite CLPR by moving CLPR of the pair volume in the journal group or deleting the pair volume in the journal group when the pair volume of CLPR different in the same journal group of UR exists.
0000 0000 0000 0000 0000 0000 0000 0000 0001 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	HDP-Volume Migration Provisioning combination Support	HDP-Volume Migration Provisioning combination Support	Please try exchange again after it waits for a while after deleting all of the Volume Migration pairs and Volume Migration reserve VOL which use DP-VOL. Please execute it again after it recovers normally when there is a blockaded pool.

Function Bit Map Table			
Bit Pattern	Function	Contents	Action (*1)
0000 0000 0000 0000 0000 0000 0000 0000 0000 1000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Inquiry response changing regarding DP volumes	In DP volume, the volume of OPEN-V as the inquiry response exists.	Please operate microcode exchanging again after changing inquiry response from OPEN-V to OPEN-0V regarding DP volumes. Please see WEB CONSOLE section, if you want to know how to change an emulation type.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0100 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Expansion of VDEV Number	Version down restraint to non-support microprogram of the expansion of the number of VDEV with the large-capacity HDD correspondence	Please take off an HDD of more than 400G other than an SATA HDD. And please carry out micro exchange again after waiting more than five minutes.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	HUR 4 × 4 × 4 TC-T/S Support	HUR 4 × 4 × 4 TC-T/S Support	Please delete all devices that use the T/S mode with TC-MF.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0001 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	FlashCopy Fast Reverse Restore function	FlashCopy Fast Reverse Restore function support	Please doing either of the following procedures. • Please wait for completing FlashCopy pair reestablishment with Fast Reverse Restore function when it has not yet. • Please delete FlashCopy pair re-established with Fast Reverse Restore function when the pair status is SUSPEND.

Function Bit Map Table			
Bit Pattern	Function	Contents	Action (*1)
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 1000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	UR 8192 pairs per JNL Group Function Support	UR 8192 pairs per JNL Group Function Support	Perform the microprogram replacement after doing the following procedures. • Please delete UR pairs until becoming below 4096 pairs in each JNL group.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0100 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	LU of 4TB is supported by Copy-on-Write Snapshot	The pair of Snapshot that uses LU of 2TB or more exists.	Please execute the micro exchange again after deleting all pairs of Copy-on-Write Snapshot that uses LU of 2TB or more.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	CACHE 4Gbyte DIMM Support	CACHE 4Gbyte DIMM Support	Please execute the micro exchange again after deleting all 4Gbyte DIMM.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0001 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Encryption	Encrypt DKA is installed.	Please de-install Encrypt DKA and execute micro exchange again.

Function Bit Map Table			
Bit Pattern	Function	Contents	Action (*1)
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 1000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Copy-on-Write Snapshot At Time Snapshot Support	Copy-on-Write Snapshot At Time Snapshot Support	Please execute the micro exchange again after deleting all of the Copy-on-Write Snapshot pairs which registered in Consistency Group.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0100 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	HAM (High Availability Manager) support	Suppress version downgrade to the HAM unsupported microprogram version.	Please execute micro exchange again after deleting all the HAM Pair and Quorum Disk.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Support for HDP-TC/UR and “00” data light when HDP relation is released	Version Down from supportmicro for HDP-TC/UR and “00” data light when HDP relation is released to unsupportmicro is controlled.	Please try exchange again after it waits for a while after releasing the V-VOL in the HDP pool.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0001 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	SATA drive M/F Vol support	Suppressing version downgrade to the microprogram version which does not support the SATA drive M/F Vol compositions.	De-install all SATA drives M/F Vol compositions before microprogram replacement, and then execute microprogram replacement again.

Function Bit Map Table			
Bit Pattern	Function	Contents	Action (*1)
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 1000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Support for HDP-SI (Quick Restore)/VM	Version Down from supportmicro for HDP-SI (Quick Restore) to unsupportmicro is controlled.	Please try exchange again after waiting for Quick Restore job of the ShadowImage pair which use DP-VOL. Please execute it again after it recovers normally when there is a blockaded pool.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0100 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	RAID600 UR 4 × 4 × 4 (with UR delta Resync) Function Support	Suppressing version downgrade to the microprogram version which does not support the RAID600 UR 4 × 4 × 4 (with UR delta Resync) function	Perform the microprogram replacement after release all slave JNL Group from EXCTG.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Support for 4TB HDP-Volume	Version Down from the supported micro for HDP-Volume of which maximum capacity is 4TB to the unsupported micro is controlled.	Please delete HDP-Volume of which capacity is more than 2.9TB. And, please execute the micro exchange again after waiting more than five minutes.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 1000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	UR MF DATA-VOL CLPR Coexistence Support	UR MF DATA-VOL CLPR Coexistence Support	Please execute it again after uniting CLPR by moving CLPR in the journal group or deleting the pair volume in the journal group.

Function Bit Map Table			
Bit Pattern	Function	Contents	Action (*1)
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0100 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	UR OPEN No I site data vol Support	Version Down from supportmicro for UR OPEN No I site data vol to unsupportmicro is controlled.	Please deleting the journal groups registered while System Option Mode 707 was ON, execute it again.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	UVM APLB path mode Support	UVM APLB path mode Support	Please turn off System Option 720 to change the APLB mode to the Single mode and execute the Check Path operation.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0001 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Support for Format page for read of unallocation area of HDP	Version Down from supportmicro for Format page for read of unallocation area of HDP to unsupportmicro is controlled.	Please try exchange again after waiting for a while after it makes the pool or pool VOL is added or pool recovers.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 1000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Support for V-VOL Online Expansion	Version Down from supportmicro for V-VOL Online Expansion to unsupportmicro is controlled.	Please try exchange again after it waits by about 5 minutes after all V-VOL Online Expansion is completed.

Function Bit Map Table			
Bit Pattern	Function	Contents	Action (*1)
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0100 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Relief of the OHUB PCI retryover	Relief of the OHUB PCI retryover	An error message is not displayed for this function.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Support for FlashCopy to HUR Primary Volume function	Version Down from supportmicro for Support for FlashCopy to HUR Primary Volume function to unsupportmicro is controlled.	Please withdraw the relationship of FlashCopy that is sharing / had shared with Primary-Volume of HUR as Target-Volume of FlashCopy.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 1000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Flash Drive function support	Suppressing version downgrade to the microprogram version which does not support the Flash Drive function	De-install all Flash Drives before microprogram replacement, wait for five minutes, and then execute microprogram replacement again.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0100 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Support for TCsync (Duplex)/VM	Version Down from supportmicro for TCsync (Duplex)/VM to unsupportmicro is controlled.	Please execute the micro exchange again after deleting all of the VM pairs.

Function Bit Map Table			
Bit Pattern	Function	Contents	Action (*1)
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Support for Discard Zero Data of HDP	Version Down from supportmicro for Discard Zero Data of HDP to unsupportmicro is controlled.	Please execute micro exchange again after Discarding all Zero data of Specified DP-VOL.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0100 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	UR OPEN M×N	Downgrading the micro-program of UR M×N OPEN supported version to an unsupported version is prevented.	Check the pair configuration that uses this function, and then perform either of the operations below accordingly. After that, exchange the micro-program again. For details about how to check the JNLG that uses this function, see “Journal Operation Window” in Chapter 4 of Universal Replicator User’s Guide. 1. If multiple JNLGs are defined with the same CTG# in one DKC, re-build the pair configuration so that one JNLG is defined with one CTG#. 2. Suspend all the pairs in the configuration that uses this function.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	TrueCopy RCU All Paths Failure Suspend Function Support	Downgrading from a micro program version that supports the TrueCopy RCU All Paths Failure Suspend Function to an unsupported version is prevented.	Please turn off “Function Switch Bit30” in the ‘System Option’ window of TrueCopy or TrueCopy Mainframe of Web Console, wait for about 5 minutes, and then execute the micro program exchange.

Function Bit Map Table			
Bit Pattern	Function	Contents	Action (*1)
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0001 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Additional Configuration Backup support	Suppressing version downgrade to the microprogram version that does not support the Additional Configuration Backup improved.	Perform the microprogram replacement after doing the following procedures. • Please turn off System Option 727.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 1000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Support for CoW capacity extension (CoW4, CoW5)	Version Down from supportmicro for CoW capacity extension (CoW4, CoW5) to unsupportmicro is controlled.	Please execute micro exchange again after de-install all the installed shared memory of the V-VOL management area for CoW.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0100 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	HPF support	HPF support	• In case FICON PCB is installed Execute again after uninstalling HPF P.P. • In case FICON PCB is not installed and HPF P.P. is installed Execute again after installing FICON PCB and uninstalling HPF P.P. • In case FICON PCB is not installed and HPF P.P. is uninstalled Execute again after installing FICON PCB.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Support for pool sequential allocation	Version Down from supportmicro for pool sequential allocation to unsupportmicro is controlled.	Please execute micro exchange again after deleting all the CoW pool groups.

Function Bit Map Table			
Bit Pattern	Function	Contents	Action (*1)
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0001 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	UUID (User Definable LUN ID) Support	Suppress version downgrade to the UUID unsupported microprogram version	Please perform version downgrade to the UUID unsupported microprogram version after deleting all of UUID setting and Host Mode Option 33 setting per Host Mode 05. In case when UUID setting and Host Mode Option 33 setting was performed once per Host Mode 05, warning function bit dialog message is displayed so that the following procedure is required perform version downgrade to the UUID unsupported microprogram version by continue entering password or try microprogram exchange again.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 1000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	HUR Control Path Support	Downgrading the micro-program of HUR Control Path supported version to an unsupported version is prevented.	Please execute the micro exchange again after releasing the setting of the remote command device registered in all Journal groups.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0100 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Support for page allocation equalization of HDP	Version Down from supportmicro for page allocation equalization of HDP to unsupportmicro is controlled.	Please execute micro exchange again after deleting all the HDP pool groups.

Function Bit Map Table			
Bit Pattern	Function	Contents	Action (*1)
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Support of SATA Enhance method	Suppressing version downgrade to the microprogram version that does not support the SATA Enhance method.	De-install parity groups with SATA Enhance method and then execute the microprogram exchange again.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0100 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Support for conversion of allocation method of pool	Version Down from supportmicro for conversion of allocation method of pool to unsupportmicro is controlled.	Please execute micro exchange again after waiting for a few moments, or set System Option Mode 749 to “ON”. *: If the System Option Mode749 is set to “ON”, make sure to set it to “OFF” after the micro-program is exchanged.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	FCv2 Ext-VOL and DEFRAG improvement	FCv2 S-VOL = external volume is supported, and E-time of DEFRAG job is improved.	Please confirm everything below. • Please set the System Option Mode 753 to “OFF” when it is set to “ON”. • Please withdraw the pairs if S-VOL of FCv2 is external volume. • Please wait for completing the background copy if it is running.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0001 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Support for Write Same	Version Down from supportmicro for Write Same to unsupportmicro is controlled.	Please execute micro exchange again after waiting for a few moments, or all Discarding Zero Data are suspended, or set System Option Mode 755 to “ON”. *: Function Bit turned on by Discard Zero Data function.

Function Bit Map Table			
Bit Pattern	Function	Contents	Action (*1)
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 1000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Support for cooperation of Discard Zero Data and program product (TC/UR)	Version Down from support micro for cooperation of Discard Zero Data and program product (TC/UR) to unsupportmicro is controlled.	Please execute micro exchange again after Discarding Zero Data for the specified DP-VOL is completely finished, or Discarding all Zero Data are suspended, or waiting for a few moments for adding pool, or set System Option Mode755 to "ON". *: Function Bit turned on by Write Same function.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0100 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	TC Sync Open/MF Consistency function support	Version Down from supportmicro for TC Sync Open/MF Consistency function to unsupportmicro is controlled.	Please execute the micro exchange again after releasing all of the MF Volumes which registered in TC Sync Open/MF Consistency Group.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Volume Migration Never Give Up Mode Support	Version Down from supportmicro for Volume Migration Never Give Up Mode to unsupportmicro is controlled.	Please execute the micro exchange again after deleting all of the Volume Migration pairs.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0001 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	8US P/K Support	Suppress version downgrade to the 8US unsupported microprogram version.	Please de-install 8US and then execute microprogram exchange again.

Function Bit Map Table			
Bit Pattern	Function	Contents	Action (*1)
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 1000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	New P/K (8US) Support	If 8US P/K is mounted, version downgrade to the unsupported microprogram version is controlled.	Please de-install 8US and then execute microprogram exchange again.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0100 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Support HAM pair of LUSE	Suppressing version downgrade to the microprogram version that does not support HAM pair of LUSE.	De-install all HAM pair of LUSE and then execute the microprogram exchange again.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Support of UVM EMC CX series RAID-6 devices	Suppressing version downgrade to the microprogram version that does not support UVM EMC CX series RAID-6 devices.	Perform version downgrade to the microprogram version that does not support UVM EMC CX series RAID-6 devices by a forced breakthrough after executing the following procedure. • Please be sure to execute “Delete Volume” operation against all of the mapped UVM EMC CX series RAID-6 devices. If the procedure is not executed, the mapped RAID-6 devices become blockade after the version down procedure. For details, please refer to Hitachi Universal Volume Manager User’s Guide A-1 “Notes on Connecting EMC CLARiiON CX Series”.

Function Bit Map Table			
Bit Pattern	Function	Contents	Action (*1)
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0001 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Suppport of 600GB Drive and 2TB Drive	When FC-HDD of 600GB or more or SATA-HDD of 2TB or more is installed, the version-down is suppressed.	De-install FC-HDD of 600GB or more and SATA-HDD of 2TB or more. After that, wait for 5 minutes and exchange microcode again.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 1000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Release function of the maintenance lock	The DKCMAIN I/F of the force release function for the remained maintenance exclusion lock was changed. SVP and WebConsole use this information for judgement of DKCMAIN I/F version.	An error message is not displayed for this function.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0100 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Restoration processing of account capacity in ShadowImage/ CoW Snapshot	When the account capacity is restored and processed when the version is downed, the down of the version is controlled.	Please execute the micro exchange again after it does for a while.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	UR×UR Support	Version Down from supportmicro for UR×UR to unsupportmicro is controlled.	Please deleting the journal groups registered while System Option Mode 767 was ON, execute it again.

Function Bit Map Table			
Bit Pattern	Function	Contents	Action (*1)
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 1000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	System Option Mode 593 Function	While the System Option Mode 593 Function is operating, Version Down is suppressed.	Please turn off System Option Mode 593 when you execute the down of the micro version.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Version down guard in FlashCopy to PPRC Copy	When the Copying by a FlashCopy to PPRC function VOL of TrueCopy, version down is suppressed.	Please execute the micro exchange again after turns into PAIR.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 1000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Down grade suppression of version when SATA 2TB M/F drive is installed	When SATA 2TB M/F drive is installed, down grade of version is suppressed.	Please execute the micro exchange again after uninstalling the composition of the SATA 2TB M/F drive.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	UR-SI At Time Split SI-Quick function support	Version Down from supportmicro for UR-SI At Time Split SI-Quick function to unsupportmicro is controlled.	Please execute the micro exchange again after releasing all of the setting that split type of SI has been “Quick Split”.

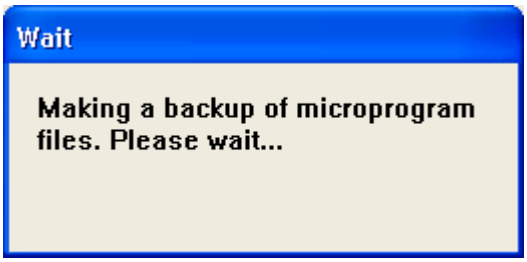
Function Bit Map Table			
Bit Pattern	Function	Contents	Action (*1)
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0100 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	TC Performance improvement Support	Suppress version downgrade to the TC performance improvement unsupported microprogram version.	After making the setting of Host Mode Option 49/50/51 all turning off microprogram exchange again. When de-install 8US, execute the setting of Host Mode Option 49/50/51 all turning off also in advance.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0001 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Shortening of RIO MIH Time for MF	Shortening of RIO MIH Time for MF function support	Please execute the micro exchange again after Suspend all TureCopy for Mainframe Pairs.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 1000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	PreserveMirror FlashCopy Support	PreserveMirror FlashCopy Support	Please release relationship of PreserveMirrorFlashCopy. If there are TrueCopyMainframe pairs that PreserveMirror FlashCopy relationship were released with FORCE parameter of ICKdSF/TSO during background copy of PreserveMirrorFlashCopy were processing, please delete TC pair.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0100 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Resync multi job copy support	Resync multi job copy functiom support	Please execute the micro exchange again after finished or Suspend all ShadowImage or ShadowImage for Mainframe pairs copying resync copy.

Function Bit Map Table			
Bit Pattern	Function	Contents	Action (*1)
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0010 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	Improvement of FCv2 Establish performance	Improvement of FCv2 Establish performance	Please release relationship of all INCREMENTAL FlashCopy.
0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0001 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000	TC/TCA/UR use quantity check function support	TC/TCA/UR use quantity check function support	Please execute the micro exchange again after you turn off a remote copy function switch 37.

*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.

(12)

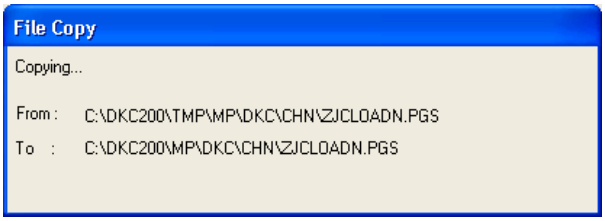
The message “Making a backup of micro-program files. Please Wait...” appears.



(13)

File copy in SVP

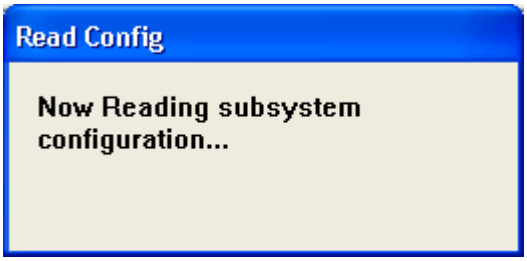
Go to 3.3 (1).



3.3 Transferring micro-programs to the DKC

(1)

The message “Now Reading subsystem configuration...” appears.



<<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...” (***: MAIN, ...) appears.

---

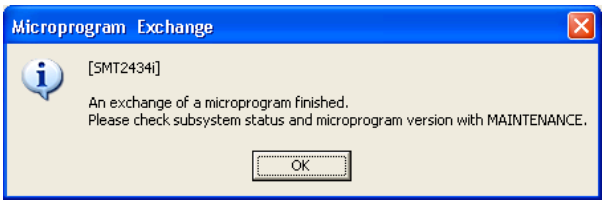
(3)

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

---

(4)

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



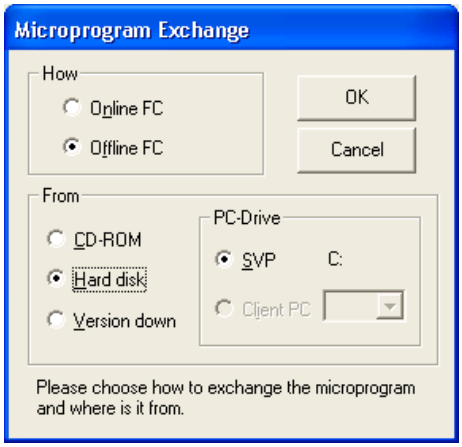
Go to 3.6 (MICRO03-350).

3.4 Hard Disk Download

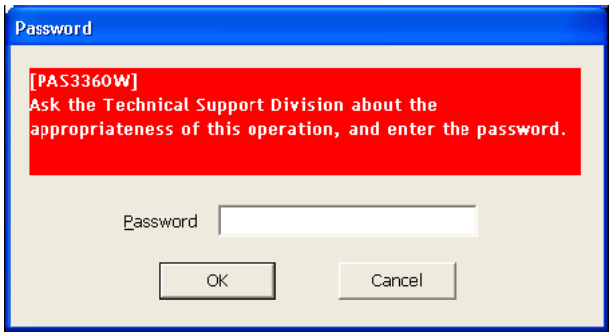
The latest version of the DKCMAIN micro-program on the SVP hard disk is downloaded to the DKC.

(1)

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

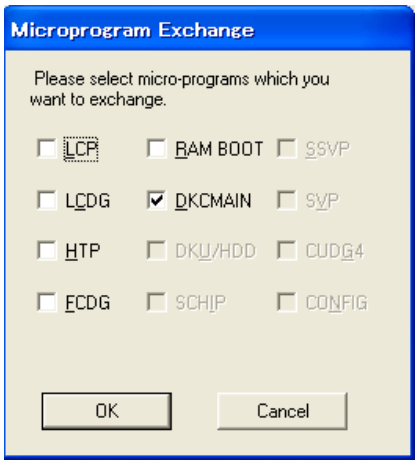


If you want to continue this process, select (CL) [OK], enter the password, and select (CL) [OK].

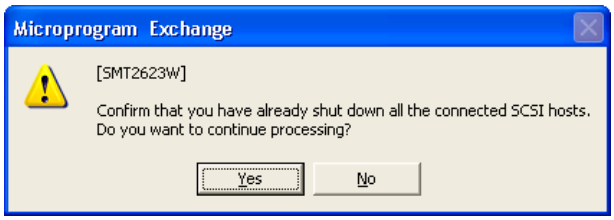


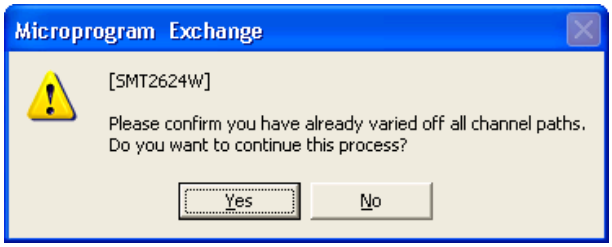
The 'Microprogram Exchange' dialog box appears.
Select (CL) one or more items from the list of the type of micro-programs, and select (CL) [OK].

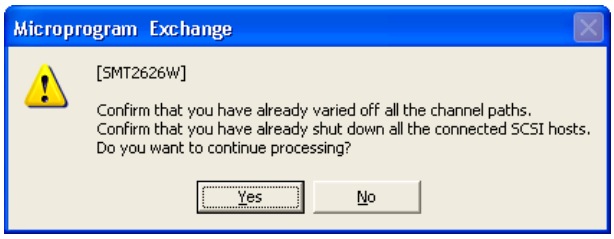
☑ : Micro-programs to be substituted.



One of messages are displayed by the subsystem configuration.







After you confirm that you have already varied all the CHL paths to off-line, select (CL) [Yes].

Go 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 section), 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 3.4 (MICRO03-310).

---

(2)

Go to 3.3 (1) (MICRO03-300).

3.5 Version Down

CAUTION

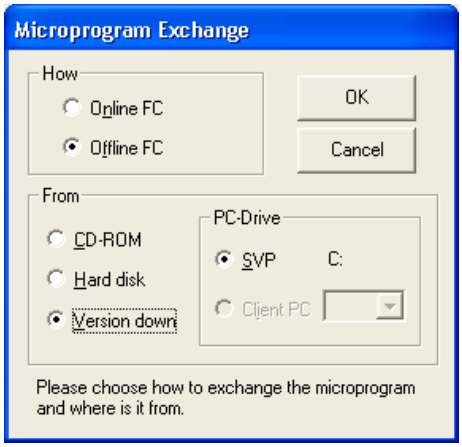
Ask the technical support division about the appropriateness of the operation.
Please do not execute the Version Down function during initial copy or resynchronization of TrueCopy or UniversalReplicator. If you execute it, the micro-program exchange may fail.

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

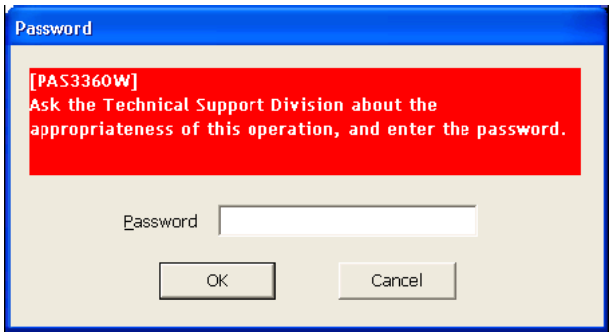
(1) Reinstalling Apache
It is required to reinstall Apache when changing the version from 60-02-00/00 or later to less than 60-02-00/00. Reinstall Apache referring to the following.
Procedure 1: Uninstalling Apache 2.2.4 (Refer to REP04-511.)
Procedure 2: Installing Apache 2.0.54

---

(2)
[How]: Select (CL) [Offline].
[From]: Select (CL) [Version Down] in the 'Microprogram Exchange' dialog box.
And select (CL) [OK].

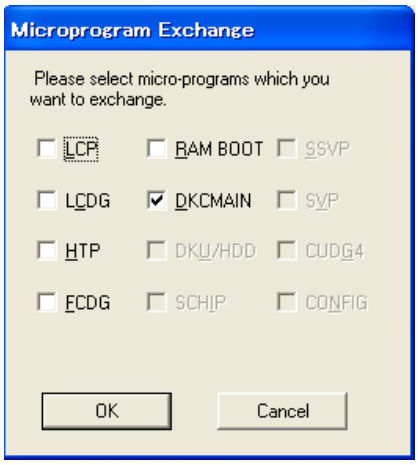


If you want to continue this process, select (CL) [OK], enter the password, and select (CL) [OK].

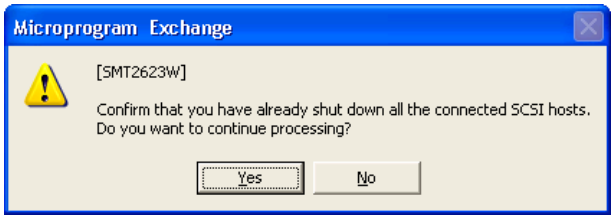


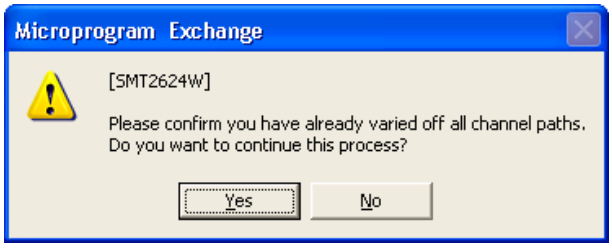
The 'Microprogram Exchange' dialog box appears. Select (CL) one or more items from the list of the type of micro-programs, and select (CL) [OK].

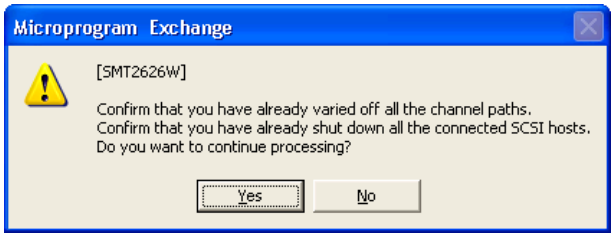
☑ : Micro-programs to be substituted.



One of messages are displayed by the subsystem configuration.







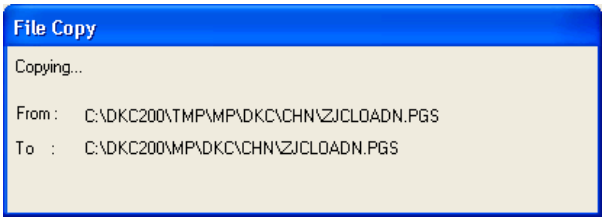
After you confirm that you have already varied all the CHL paths to off-line, select (CL) [Yes].

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

---

(3)

Copy source and copy destination are displayed.



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.)

Note: If you find "??-??…" or incompatibility version, recover the status following the section 7.2.

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.

Check that Web Console starts. If it failed to start, recover it referring to troubleshooting 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 microprogram.

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

- Procedures will be provided by Technical Support Division in case that Online DKU/HDD Micro-program Exchange for SATA HDD is required.
- The following Online DKU/HDD Micro-program exchange is supported for all models listed below.
  - ○ SSD HDDs: All
  - ○ FC HDDs: All
  - □ DKR prefix (HGST)
  - □ DKS prefix (Seagate)
- Check the subsystem status through the entire status display. (Check the versions of all the programs through the version display.)
- Make sure that collection copy and other processing are not in progress.
- Perform postprocessing for PIN data.
- Check that all processors are normal.
- The status of TrueCopy, UniversalReplicator, and the path of the external connection must be normal (refer to Chapter 4.7).

Note: It is recommended to execute this function in the status of all MP’s utilization rates 50% or less because there is a possibility of receiving the influence of I/O processing at the processing time of this function.

Note: 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.

Note: While the microprogram is being downgraded or upgraded, users must not perform any operations that the resulting microprogram would not support.

Table 4.1-1 On-line Micro-Program Exchange time (approximate)

(unit : minutes)

	CD-ROM → HDD	Download HDD → SM/(HDD → FM)	MP Reboot
LCP	3	1/(3)	6
LCDG		1/(3)	
HTP		1/(3)	
FCDG		1/(3)	
DKCMAIN		4	
RAM BOOT		1	
DKU/HDD		60	—
SCHIP		60	—
SSVP	2	15	—
SVP		3	—
CUDG4		0	—
CONFIG	2	1	—
Total	7	87/(93)	6

(Processors : 16, Drive capacity : 180GB)

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

(1)

<Initial screen>

---

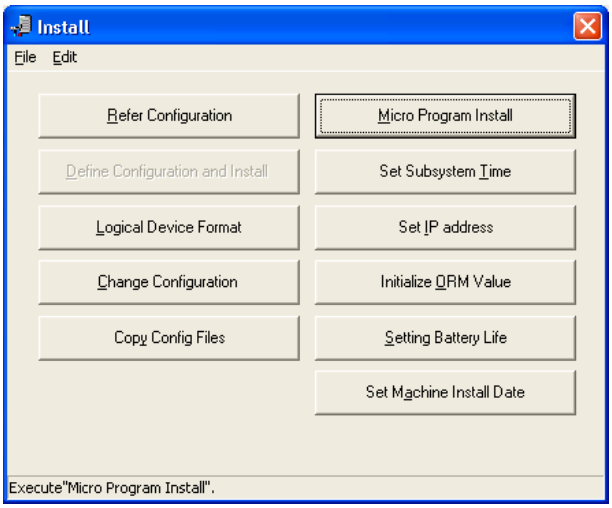
(2)

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

---

(3)

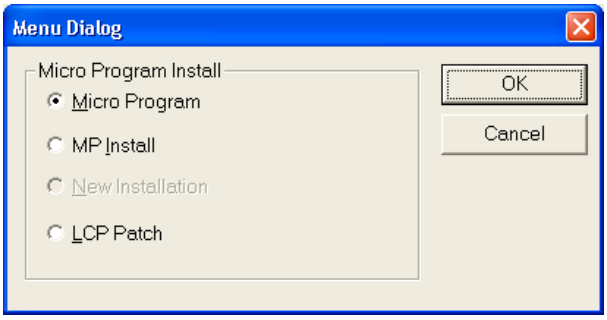
In the 'Install' window, select (CL) [Micro Program Install].



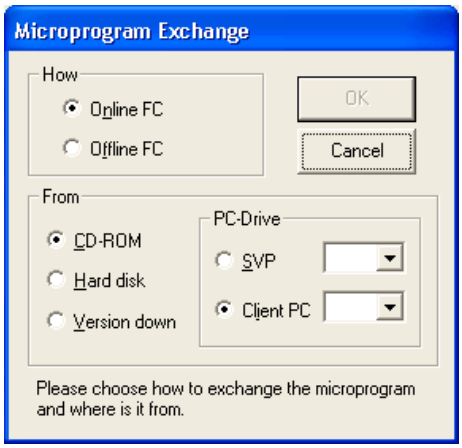
---

(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].
[From]: select (CL) the source from which to store the micro-programs.
[PC-Drive]: select (CL) the 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 4.4 (1). (MICRO04-200)

Version Down: Old versions on the hard disk are downloaded.
--- Go to 4.5 (1). (MICRO04-210)

[PC-Drive]'s selection branch

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

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

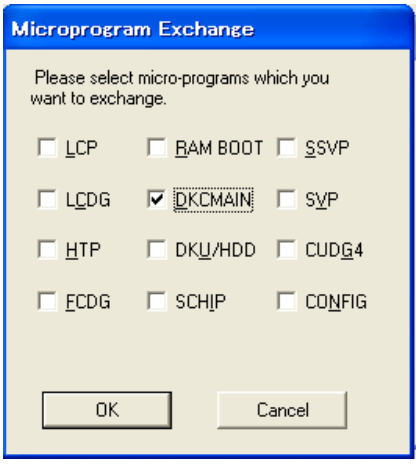
Selecting (CL) [Cancel] returns you to be step (4).

---

(6)

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].

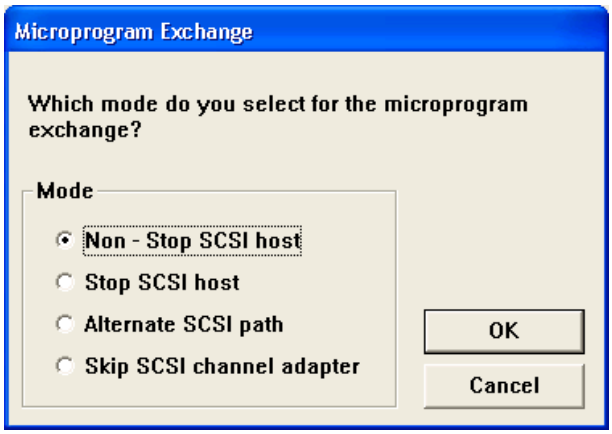
☑ : Micro-programs to be substituted.



Note : SVP changed the message in FM download process. If an operator selected "LCP" or "LCDG", SVP displayed a message as "LCP/LCDG" during the download.

(7)

<If SCSI channel adapter is equipped>
Select (CL) one of the exchange modes of DKCMAIN micro-program as follows, and select (CL) [OK].



- "Non Stop SCSI host " :
  Exchange micro-programs without varying offline SCSI host paths. Go to (7-1).

CAUTION

When execute microprogram FC with Non Stop SCSI host mode, please verify the prerequisite on (MICRO10-20).

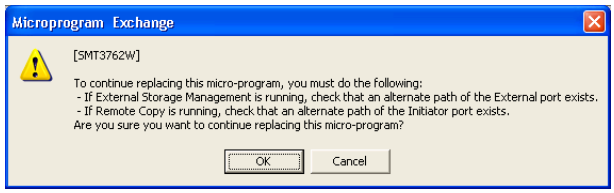
- "Stop SCSI host" :
  Exchange micro-programs by varying off-line the SCSI host paths. Go to (7-2).

- "Alternate SCSI path" :
  Exchange micro-programs by changing the SCSI host path to the alternative path. Go to (7-3).

- "Skip SCSI channel adapter" :
  Exchange micro-programs without a SCSI channel adapter. Go to (7-4).

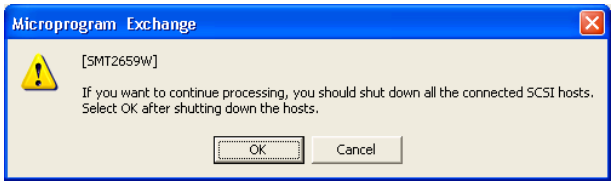
(7-1)

<If “Non Stop SCSI host” is selected >
Select [OK] (CL) after checking the right preconditions. Go to step (8).
Refer MICRO10-10 “Microprogram Replacement with Non Stop SCSI Host”.



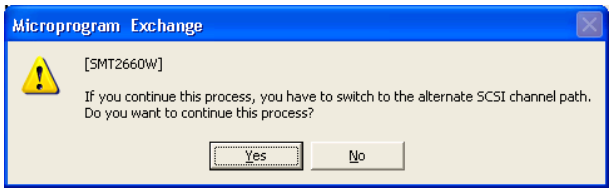
(7-2)

<If “Stop SCSI host” is selected>
Shut down all the SCSI hosts and select (CL) [OK]. Go to step (8).
When [Cancel] is selected (CL), the processing step is returned to (7).

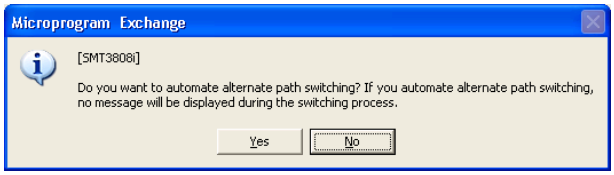


(7-3)

<If “Alternate SCSI path” is selected>
It is necessary to switch the SCSI path to the alternate path before executing the microprogram FC for the CHA (SCSI) PCB.
To continue the processing, select (CL) [Yes].
When [No] is selected (CL), the processing step is returned to (7).

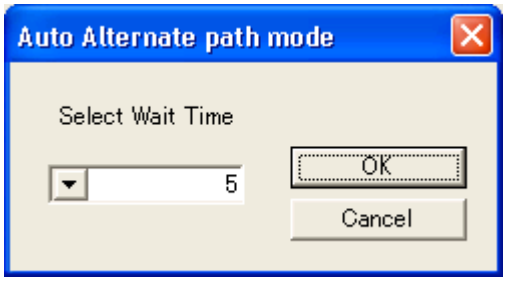


Then, the right message is displayed.
When you want to automate alternate path switching without messages, select (CL) [Yes], and when you want to switch alternate path with messages, select (CL) [No].



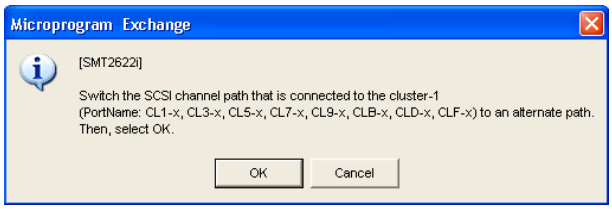
If [Yes] is selected, the dialog which selects wait time is displayed. Select wait time and [OK] button.

- Wait time: unit [minute]

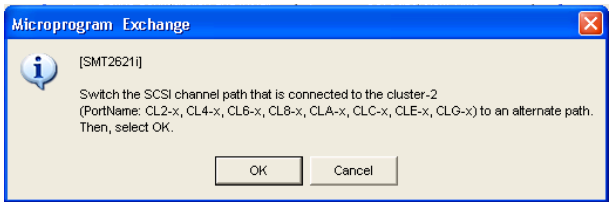


If [No] is selected, there will be no Wait Time associated with switching alternate paths.
When MP reboots by turns in the following procedure “4.3.1 Transferring micro-programs to the DKC/DKU”, the following confirmation message appears on the screen.

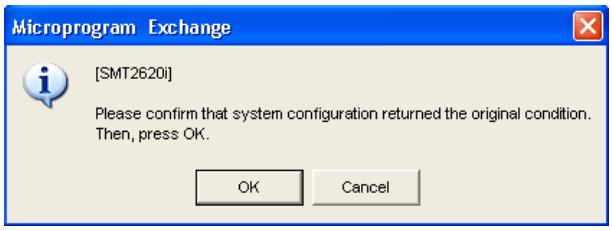
[2622i]
Switch the SCSI channel path that is connected to the cluster-1 (PortName: CL1-x, CL3-x, CL5-x, CL7-x, CL9-x, CLB-x, CLD-x, CLF-x) to an alternate path.
Then, select OK.



[2621i]
Switch the SCSI channel path that is connected to the cluster-2 (PortName: CL2-x, CL4-x, CL6-x, CL8-x, CLA-x, CLC-x, CLE-x, CLG-x) to an alternate path.
Then, select OK.



[2620i]
Please confirm that system configuration returned the original condition.
Then, press OK.



After you manually switch to the alternate paths, select (CL) [OK].

Note: Otherwise the micro-program exchange process waits until you answer the messages to continue the process.

Go to step (8).

For HDLM:
This function cannot be used when the automatic failback function (AFB) is turned off.
Refer to the command explanation chapter “set (Sets the operating environment)” of the Hitachi Dynamic Link Manger User’s Guide for the details of the automatic failback function.
If the microprogram is replaced in this setting, an error message is reported from the HDLM to the OS.
Refer to 10.5, and check the message in the procedure for the HDLM of each OS.

Calculate the recommended value of the Wait time by the following formula, and set it as satisfying ① and ②.

① Wait time > AFB setting time + 30 seconds (Difference until all MPs complete rebooting) + "One minute"

② Wait time > I/O time-out detection time(*1) + "Two minutes"(*2)

*1: This depends on the time-out of the HBA or the driver.

*2: Consider the time until completing I/O in the failover destination, and add an enough value.

Note: If the customer does not wish to receive this error message which will be posted to his logs, then the "dlnkmgr offline" is necessary.
Hitachi's preference is for the customer to use "dlnkmgr offline" to avoid the error message.

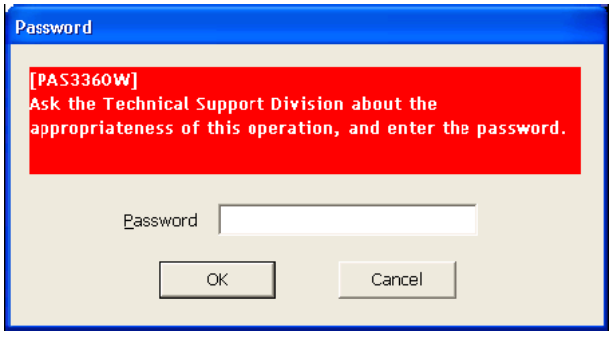
(7-4)

<If "Skip SCSI channel adapter" is selected>
The microprogram FC for the CHA (SCSI) PCB will not be executed. Execute it in the future in the Stop SCSI host mode or the Alternate SCSI path mode.

⚠ CAUTION

Ask the technical support division about the appropriateness of the operation, and input a password after getting an approval of executing the operation.

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



(8)

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.

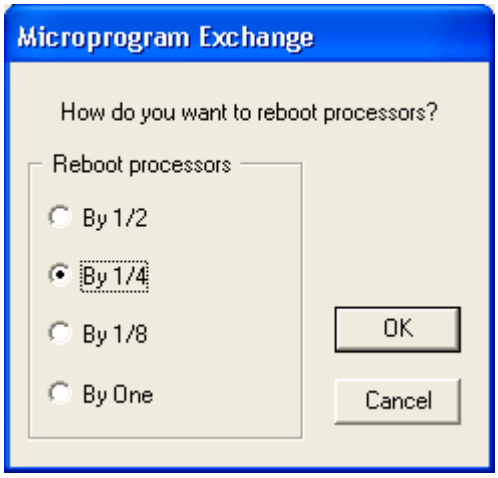
REBOOT PATTERN		BY 1/2	BY 1/4	BY 1/8	BY ONE
EXCHANGE TIME	STANDARD VALUE(*) [MINUTE](APPROX.)	14	19	37	78
		SHORT ⟷ LONG			
EFFECT ON PERFORMANCE OF DKC		BIG ⟷ SMALL			

*:MEASURE CONDITION : 32MP (CHA(SERIAL) × 4, DKA × 4), 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.

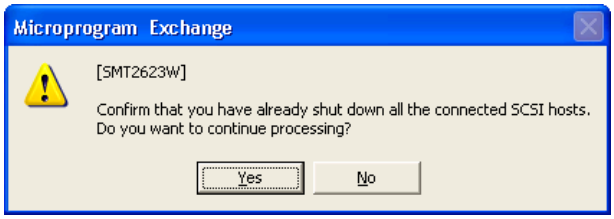
Please select (CL) one of these patterns and select (CL) [OK].

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



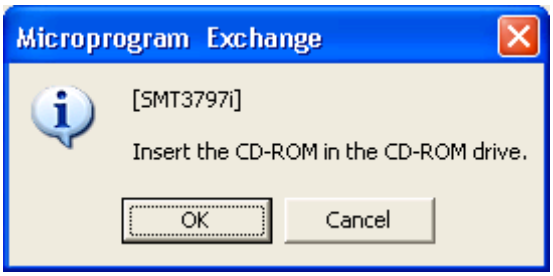
(9)

<If SCSI channel adapter is installed when DKCMAIN or RAMBOOT were selected.>
After you confirm that you have stopped all SCSI channel paths, select (CL) [Yes].



(10)

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].



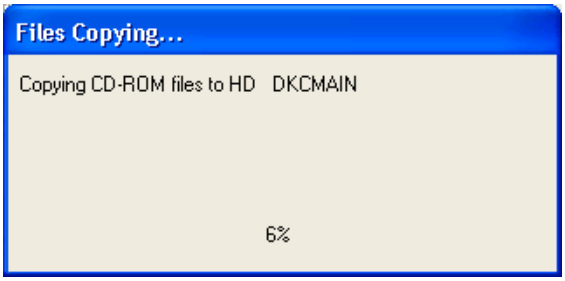
<<Error>>
No CD-ROM or uncorrect CD-ROM in the disk drive:
The Message “Insert the correct CD-ROM.” is displayed.
Insert the correct CD-ROM and select (CL) [Retry].
Internal error:

- “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.”

---

(11)

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."

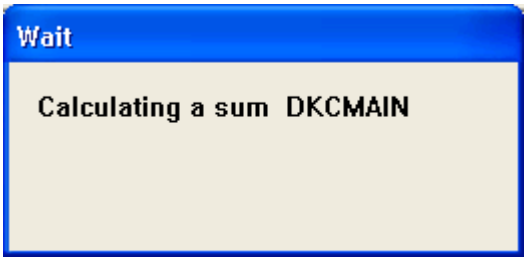
Note : When the error message "File I/O error has occurred." or "Memory error has occurred." is displayed, power SVP off and on again if the same message appears after reexecuting the micro-program exchange (see SVP01-180 in the SVP SECTION).
Then execute the same micro-program exchange again. If the same error occurs (the same error message is displayed), replace the SVP hardware (see REP01-300 in the REPLACE SECTION.).

---

(12)

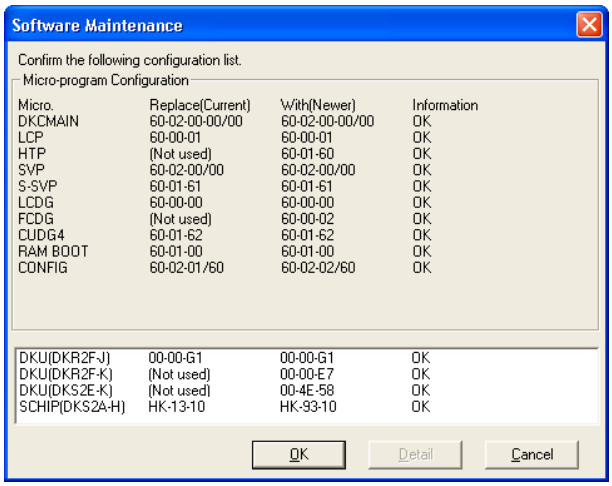
If you select CD-ROM, a dialog "Remove the CD-ROM." appears.
Remove the CD-ROM and select (CL) [OK].
If you select floppy disk, upon completion of reading from all floppy disks, the message "Remove the FD" appears.
In response to this message, remove the floppy disk and select (CL) [OK].

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



(13)

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

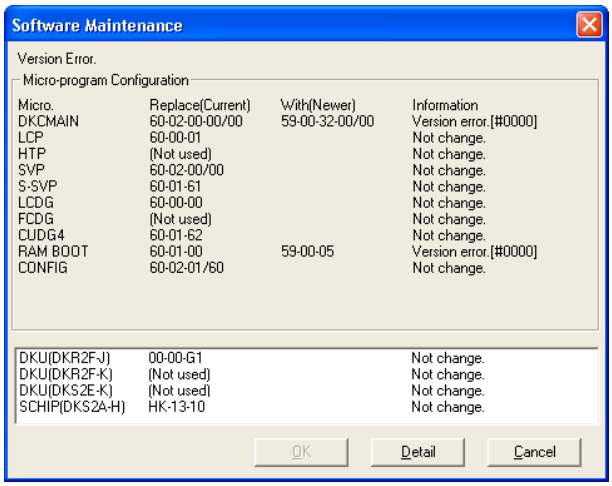


CAUTION

If "Warning" is displayed. Select (CL) "Detail" surely. Confirm the contents and ask the technical support division for decision for selecting "OK" or "Cancel" according to the contents. 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.

<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 not displayed.)
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.



See Version Check Message Table (MICRO03-90).

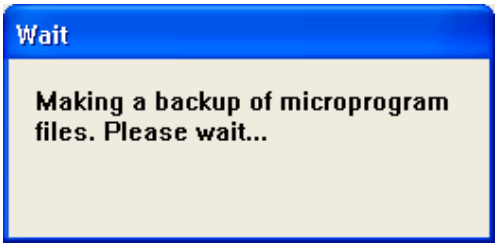
Note: Select (CL) [Detail] to display detailed error information, and confirm the cause of these error

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

---

(14)

The message "Making a backup of micro-program files. Please Wait..." appears.

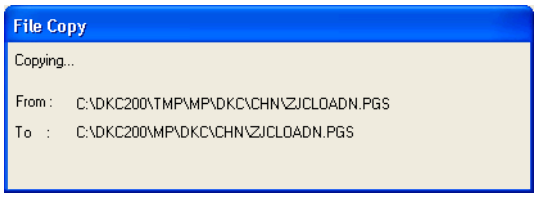


---

(15)

File copy in SVP

- DKC/DKU: go to 4.3.1 (MICRO04-120).
- SSVP: go to 4.3.2 (1) (MICRO04-160).
- SVP: go to 4.3.2 (2) (MICRO04-160).
- Config: go to 4.3.3 (MICRO04-180).



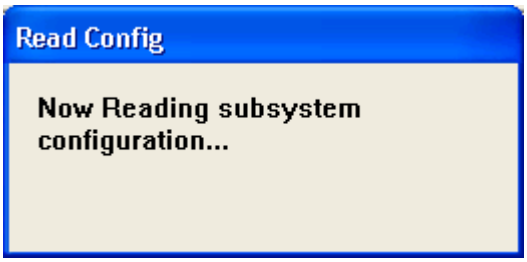
4.3 Transferring micro-programs

4.3.1 Transferring micro-programs to the DKC/DKU

(1)

The message “Now Reading subsystem configuration...” appears.

Read the current DKC configuration.



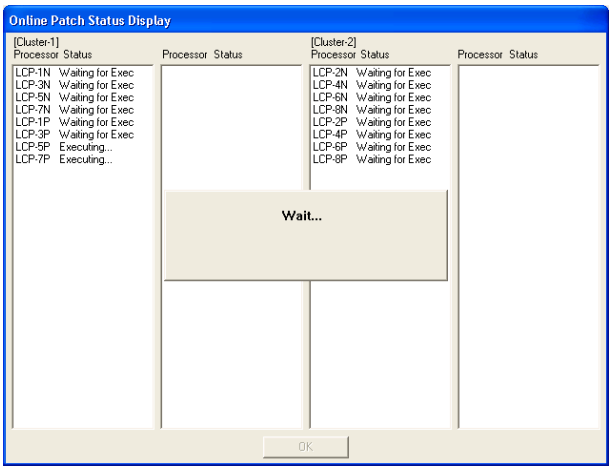
Note: When a match is not found in the version and revision between the micro-program in the DKC and that on the SVP hard disk, the micro-program cannot be exchanged on on-line. In this case, the message “Is the device off-line?” appears, and the exchange is canceled.
When a processor is blocked due 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 in downloading micro-programs, resolve the cause of an error using Maintenance Display (SVP section), Action Code (Action Code section), and other information to execute the exchange again. Then start from the beginning of the MICRO procedure. At this time, you can select [Hard Disk] at 4.4 (MICRO04-200) or [CD-ROM] at 4.2 (5) (MICRO04-30).

<LCP/HTP Micro code Exchange>
If LCP/HTP Micro code Exchange, the following message appears.

(a)

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

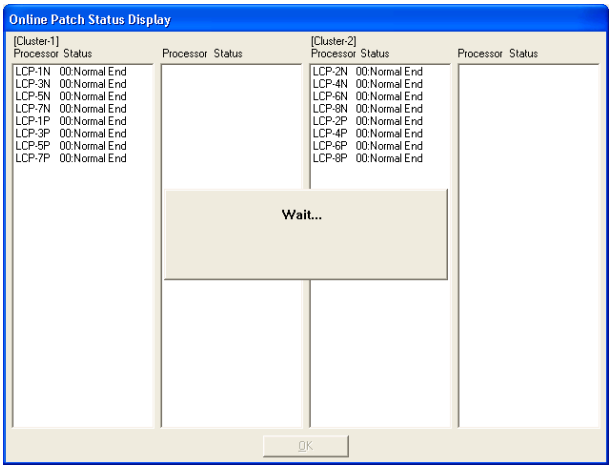


<Explanation of status>

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).



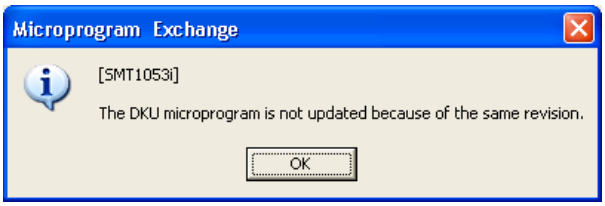
(2)

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

<Replacement of the DKU/HDD/SCHIP micro-program>

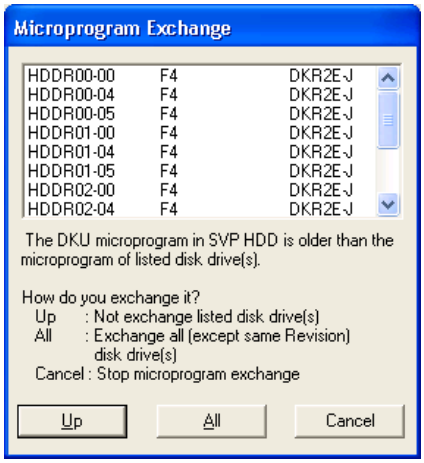
(a)

When the SVP hard disk and the HDU have DKU micro-programs of the same revision, the replacement of the DKU micro-program ends with the following message on the screen: “The DKU microprogram is not updated because of the same revision.”

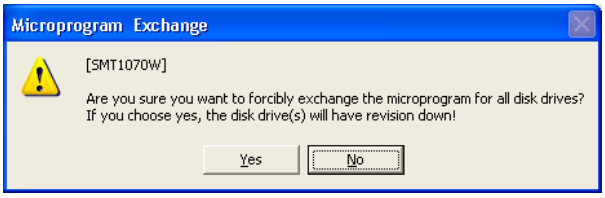


(b)

When the revision of the DKU/HDD/SCHIP micro-program in the HDU is older than that in the SVP hard disk, the HDD location number and the revision are displayed in the Revision Down HDU list.
When you select (CL) [Up], the DKU micro-program in the revised HDU only is updated.



When you select (CL) [All], the message shown on the right is displayed.
When you select (CL) [Yes] in response to the message, DKU micro-programs of the HDUs having micro-programs of different versions are updated.



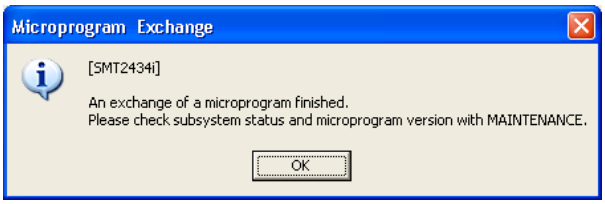
(3)

The message “Now MP Rebooting... Group# n/N” appears.
The processor is recovered.
SVP executes steps (2) and (3) for each exchanging unit.

---

(4)

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

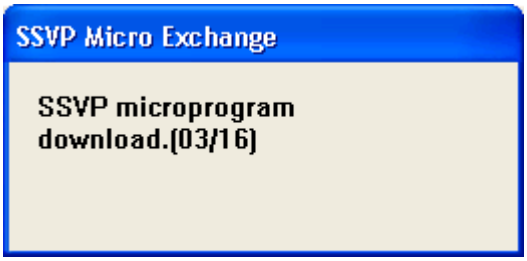


Go to 4.6. (MICRO04-230)

4.3.2 Transferring micro-programs to SVP/SSVP

(1)

The message “SSVP microprogram download.” Is displayed.



---

(2)

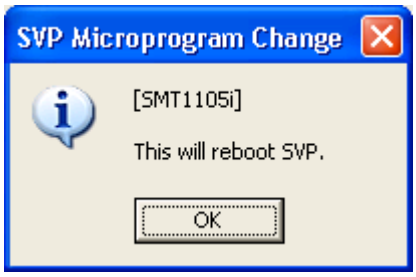
Start of the exchange (SVP).
The message “Blocking SVP-SSVP communication. Wait...” is displayed.

<<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].
Terminate some application programs, so SVP is rebooted automatically.

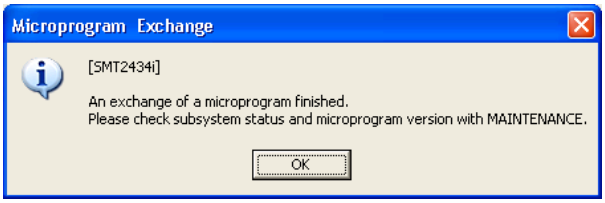


Note: After SVP reboot, because the connection with the Clients PC and the SVP goes out, make re-connection (refer SVP 1.5.2) and check surely the message of the microprogram exchange end.

---

(4)

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

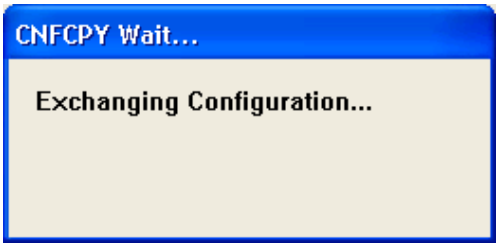


Go to 4.6. (MICRO04-230)

4.3.3 Config Update

(1)

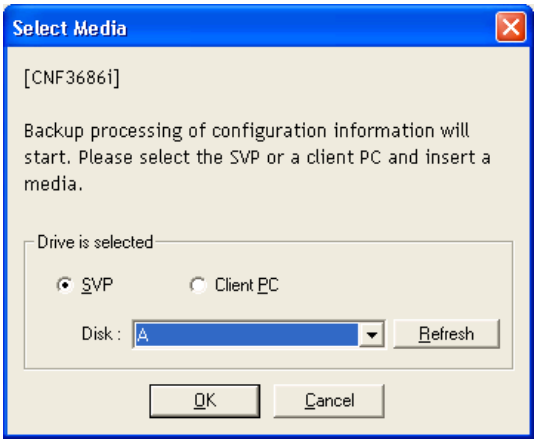
The message “Executing Configuration…” Is displayed.



(2)

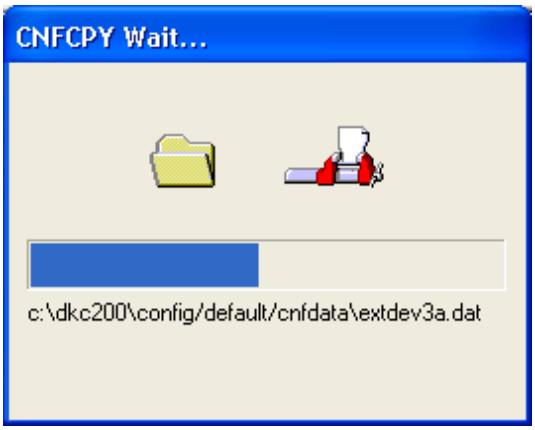
Execute an operation for backing up the configuration information.
Prepare the removable disk for backup and insert the media.
Select (CL) the drive and the PC in which the media was inserted. Select (CL) the [OK] button.

Note: When you select (CL) the [Refresh] button, drive list is renewed to latest.



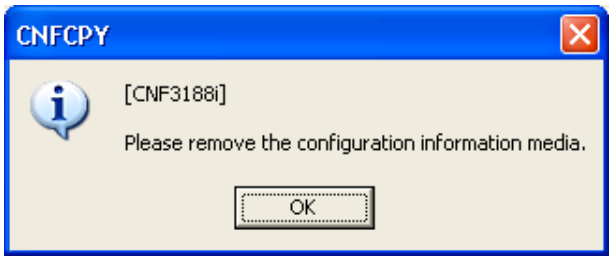
(3)

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



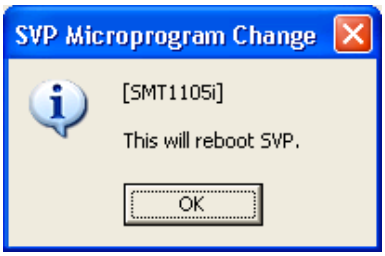
(4)

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



(5)

End of the exchange (SVP).
Select (CL) [OK].
Terminate some application programs, so SVP is rebooted automatically.

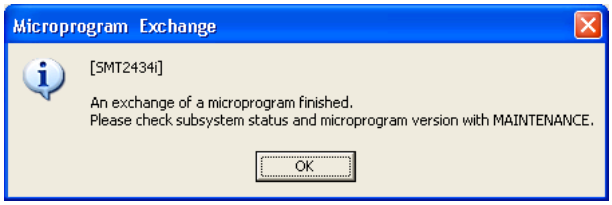


Note: After SVP reboot, because the connection with the Clients PC and the SVP goes out, make re-connection (refer SVP 1.5.2) and check surely the message of the microprogram exchange end.

---

(6)

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



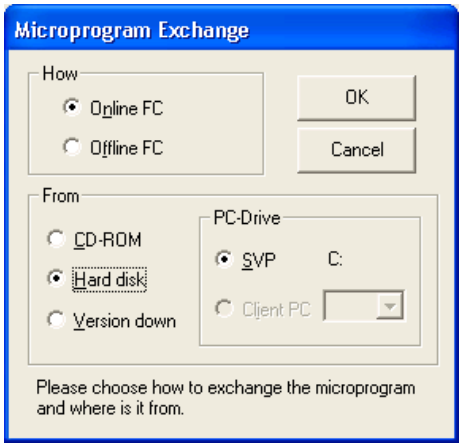
Go to 4.6. (MICRO04-230)

4.4 Hard Disk Download

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

(1)

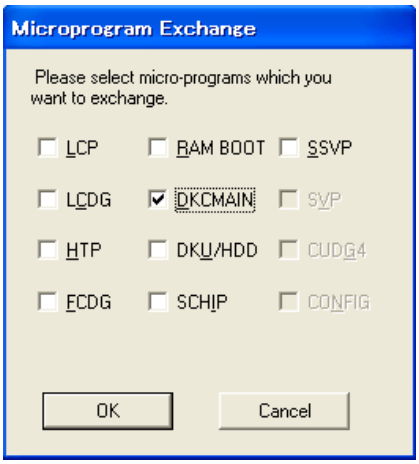
[How]: Select (CL) [Online].
[From]: Select (CL) [Hard Disk] in the 'Microprogram Exchange' dialog box.
And select (CL) [OK].



(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)

Go to 4.2 (7) (MICRO04-40).

(4)

Execute from 4.3.1 (1).
Go to 4.3.1 (1) (MICRO04-120).

4.5 Version Down

CAUTION

Ask the technical support division about the appropriateness of the operation.
Please do not execute the Version Down function during initial copy or resynchronization of TrueCopy or UniversalReplicator. If you execute it, the micro-program exchange may fail.

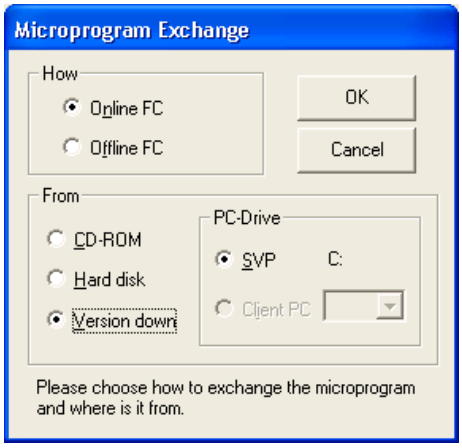
If you want to restore micro-programs to the previous versions of the micro-programs after the exchange (by CD-ROM, Floppy Disk or Remote function), execute the Version Down function.

(1) Reinstalling Apache
It is required to reinstall Apache when changing the version from 60-02-00/00 or later to less than 60-02-00/00. Reinstall Apache referring to the following.
Procedure 1: Uninstalling Apache 2.2.4 (Refer to REP04-511.)
Procedure 2: Installing Apache 2.0.54

---

(2)

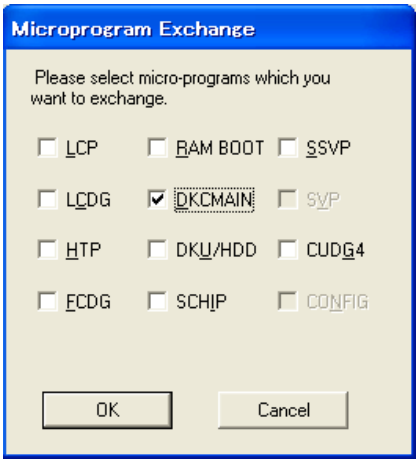
[How]: Select (CL) [Online].
[From]: Select (CL) [Version Down] in the 'Microprogram Exchange' dialog box.
And select (CL) [OK].



---

(3)

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



(4)

Go to 4.2 (7) (MICRO04-40).

---

(5)

Copy source and copy destination are displayed.

Execute 4.3 (1).
Go to 4.3.1 (1) (MICRO04-120)

Note:

- The Version Down function can restore only micro-programs that have been exchanged by or Remote function of the MICRO.
  When the MICRO (Remote function) has not been executed the Version Down function cannot be executed until the next MICRO is done.
- After LCP/HTP Version Down, replace the PCB.

4.6 Checking the functions after exchange

Conduct the same testing which was performed at the installation.
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.)

Note: If you find "??-??…" or incompatibility version, recover the status following the section 7.1.

You must exit and restart all Web browsers on the Storage Navigator PC, when the microprogram is updated on the SVP.

4.7 Checking the status of TrueCopy, UniversalReplicator, and the path of the external connection

Perform the microprogram replacement operation in the status that TrueCopy, UniversalReplicator, and the path of the external connection are normal.
Check if the path is in the cluster configuration at the time of the microprogram replacement start, and check the status of the alternate path before executing the MP reboot.

(1) Check at the time of the microprogram replacement start
When the path is not in the alternate path configuration from two clusters at the time of the microprogram replacement start, the following messages are displayed and microprogram replacement is stopped temporarily before the microprogram replacement start.

- The pair of the remote copy may Suspend when the microprogram replacement is continued as it is because the path of the remote copy is not in the alternate path configuration.
  Check SIM and recover it when the path cutting occurs.
- It may not be able to access the external LU when the microprogram replacement is continued as it is because the path of the external LU is not in the alternate path configuration.
  Check SIM and recover it when the path cutting occurs.

When the above-mentioned message is displayed because the pass is blocked, SIM RC=2180 (TrueCopy, UniversalReplicator) or RC=21D0 (external connection) occurs. Therefore, execute the microprogram replacement again after recovering the blocked path referring to the Troubleshooting Section.

(2) Check before the MP reboot
When the path is not recovered by the MP reboot, etc. or it is not in the alternate path configuration and the alternate path disappears, monitor the path to recover.
In that case, when the path does not recover for five minutes, the following message is displayed, and the microprogram replacement is stopped temporarily until it responses.
The pair of TrueCopy and UniversalReplicator may suspend or the external LU may not be able to access.

- The pair of the remote copy may Suspend when the microprogram replacement is continued as it is.
- It may not be able to access the external LU when the microprogram replacement is continued as it is.

When the above-mentioned message is displayed because the path did not recover at the time of the microprogram replacement, SIM RC=2180 (TrueCopy, UniversalReplicator) or RC=21D0 (external connection) occurs. Therefore, perform the recheck after recovering the blocked path referring to the Troubleshooting Section, and continue the microprogram replacement.

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 CHA (Channel adaptor))/7901XY (for the DKA (Disk 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

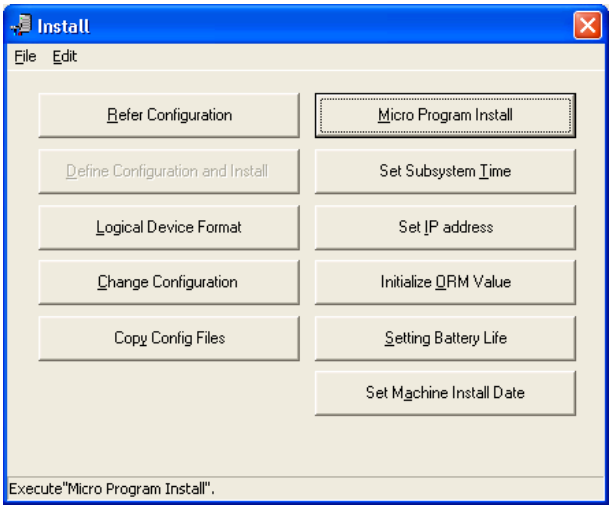
(1)

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

---

(2)

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



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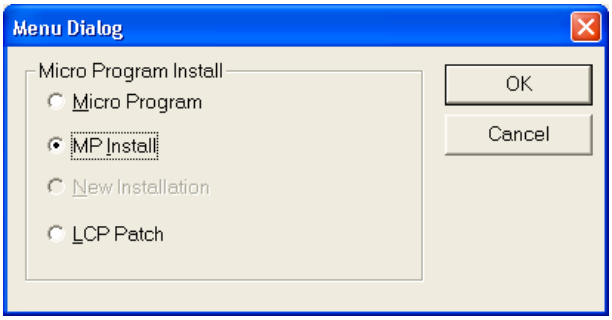
(3)

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



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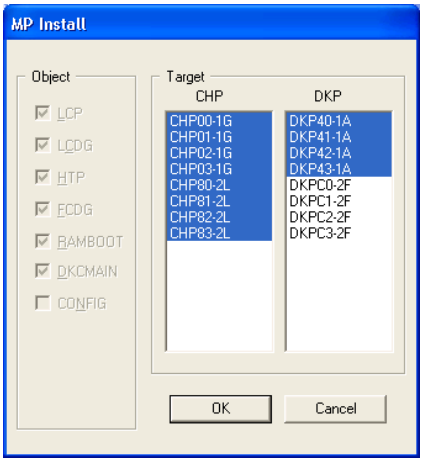
(4)

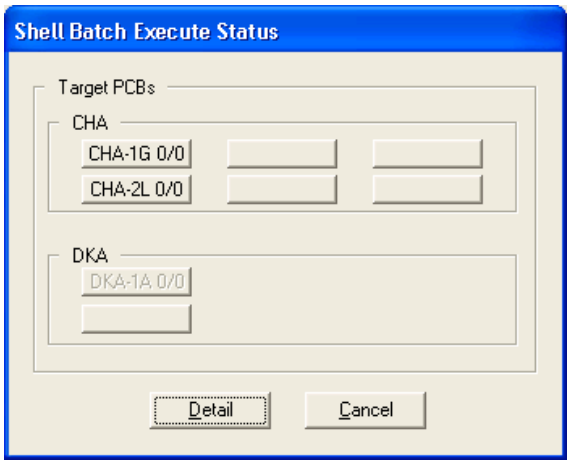
Select (CL) a processor in the 'Target' and select (CL) [OK].



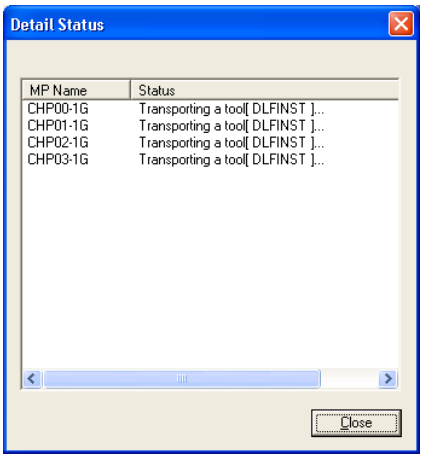
(5)

Progress Dialog appears.
Executing PCB 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. LCP Patch

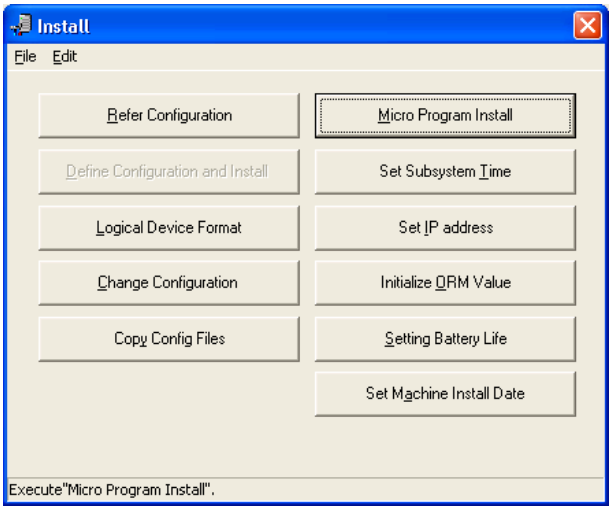
6.1 Methods of entering a patch file

6.1.1 Entering the patch file from the SVP by using a patch editor

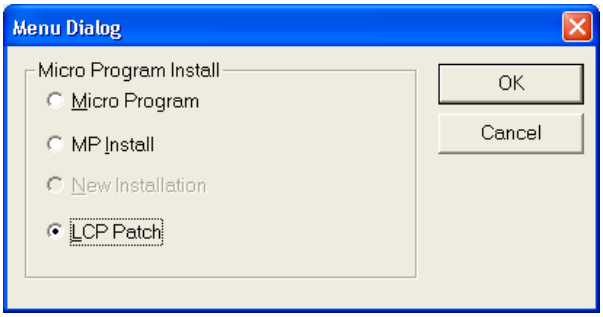
(1) <Mode Change>
Change the mode to [Modify Mode] (CL).

(2)
Select (CL) [Install].

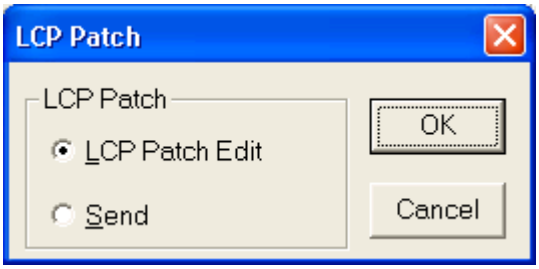
(3)
Select (CL) [Micro Program Install].



(4)
Select (CL) [LCP Patch] and select (CL) [OK].



(5)
Select (CL) [LCP Patch] and select (CL) [OK].



(6)

Editing patch data

A procedure to edit the LCP patch data is shown below as an example.

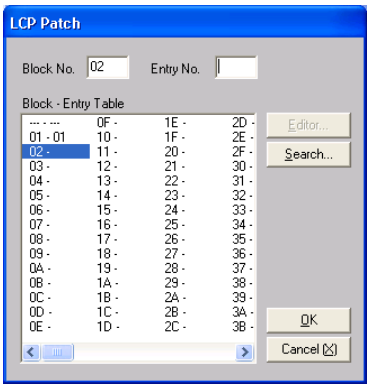
(6-1) Entry No. selection screen
(6-2) Changing patch data
(6-3) Adding patch data
(6-4) Deleting patch data
(6-5) Inserting patch data
(6-6) Clearing patch data
(6-7) Copying patch data
(6-8) Cutting patch data
(6-9) Pasting patch data
(6-10) Printing patch data
(6-11) Stopping editing
(6-12) Searching patch data

(6-1)

Entry No. selection screen

Execute “New addition (or insertion is allowed) of entry No.” or “Selection of entry No. of registered data” on the entry No. selection screen.

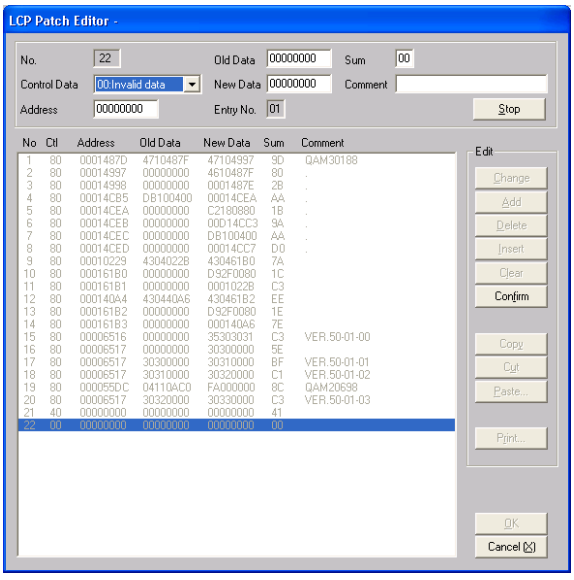
When the [Editor...] button is selected (CL), the ‘LCP Patch Editor -’ screen appears.



(6-2)

Changing patch data

(1) Select (CL) the patch data to be edited from the patch data list in the lower part of the screen and select (CL) the [Change] button. Edit the list in the upper part of the screen.
(2) After editing the list, select (CL) the [Confirm] button and register the patch data.



(6-3)

Adding patch data

(1) When the [Add] button is selected (CL), the data full of "0" is added to the end of the data list. Edit the data in the upper part of the screen.

(2) After editing, select (CL) the [Confirm] button and register the patch data.

(6-4)

Deleting patch data

(1) Select (CL) the patch data (multiple patch data can be selected) and select (CL) the [Delete] button.

(2) The selected patch data will be deleted.

(6-5)

Inserting patch data

(1) Select (CL) an insert line in the patch list and select (CL) the [Insert] button. The data full of "0" is inserted to the selected line. Edit the data in the upper part of the screen.

(2) After editing, select (CL) the [Confirm] button and register the patch data.

(6-6)

Clearing patch data

(1) Select (CL) the [Clear] button.

(2) Deletion of the patch data for each entry No.

(6-7)

Copying patch data

(1) Select (CL) the patch data (multiple patch data can be selected) and select (CL) the [Copy] button.

(2) The selected patch data will be copied.

(6-8)

Cutting patch data

(1) Select (CL) the patch data (multiple patch data can be selected) and select (CL) the [Cut] button.

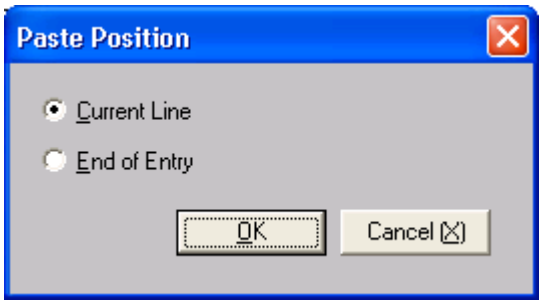
(2) The selected patch data will be cut (copied and deleted).

(6-9)

Pasting patch data

(1) Select (CL) the one line to paste the copied or cut patch data and select (CL) the [Paste...] button. The 'Paste Position' screen appears.

(2) [Current Line] : Pastes patch data to the selected line.
[End of Entry] : Pastes patch data to the end of the entry.

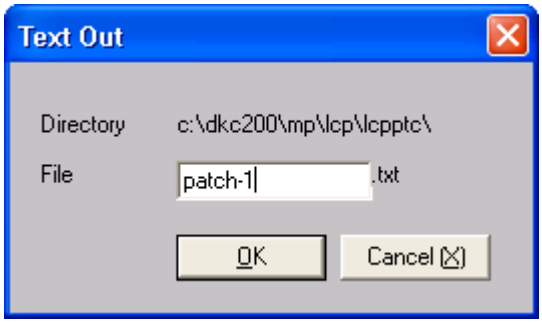


(6-10)

Printing patch data

(1) Select (CL) the patch data (multiple patch data can be selected) and select (CL) the [Print...] button. The 'Text Out' screen appears.

(2) Input a file name of "*.txt" file and select (CL) [OK].



(6-11)

Stopping editing

(1) Select (CL) the [Stop] button to stop editing (changing, adding, or inserting) patch data.

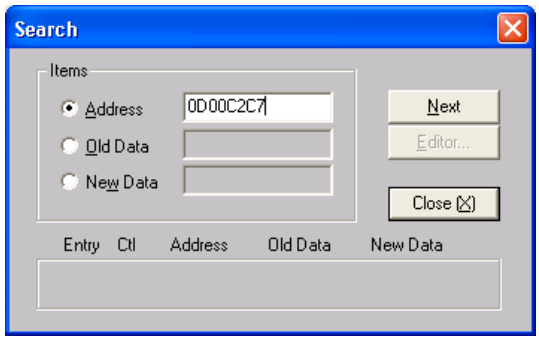
(6-12)

Searching patch data

(1) Select (CL) the [Search...] button in the entry No. selection screen. The 'Search' screen appears. Address, Old Data or New Data searching can be done.

(2) Input an Address, an Old Data or a New Data, and select (CL) the [Next] button. The data found is displayed at the bottom of this screen.

(3) If you need to edit the found patch data, select (CL) the [Editor...] button. The 'LCP Patch Editor -' screen appears. And (6-2)-(6-11) operations will be available.



6.2 Methods of sending a patch file

6.2.1 Rewriting LCP itself

This subsection describes how to send the online-patch record specified by Execute Entry NO. to the processor specified by TARGET.

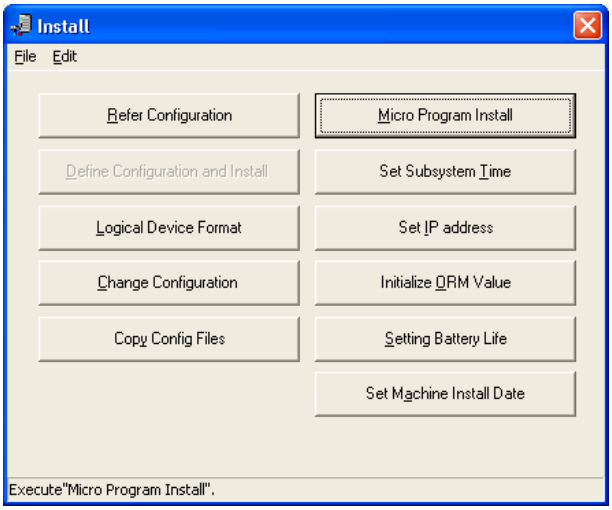
(1) <Mode Change>
Change the mode to [Modify Mode] (CL).

---

(2)
Select (CL) [Install].

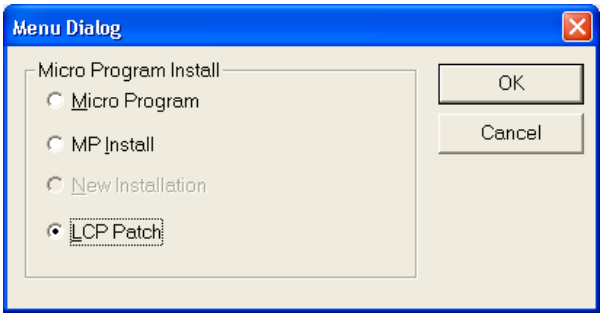
---

(3)
Select (CL) [Micro Program Install].



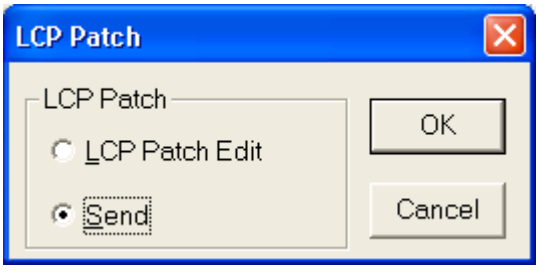
---

(4)
Select (CL) [LCP Patch] and select (CL) [OK].



---

(5)
Select (CL) [Send] and select (CL) [OK].



(6)

'LCP Online Patch' is displayed.Enter an execute entry number, then select (CL) [Execute].

Execute entry number : Specify the registration number (two-digit hexadecimal number) of the online-patch record.

---

(7)

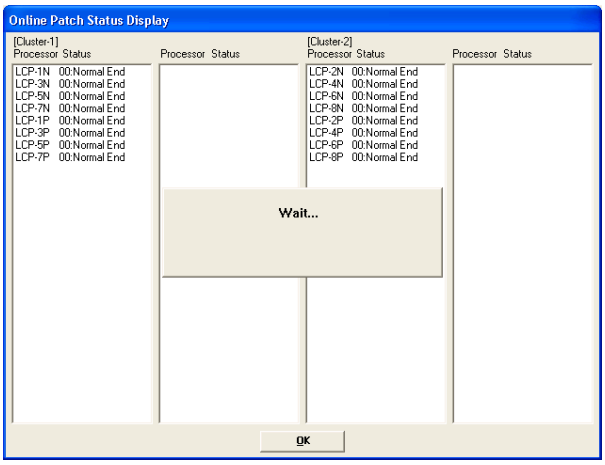
The execution status of the online patch in the installed LCP is displayed.

<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.

(8)

When execution is completed for all targets, you can now select [OK].
Select (CL) [OK].
You will return to step (6).



<Explanation of status>
Sumcheck Error
Version Error
Data Error
Bank Error
Address Error
Level Error
Record Count Over Error
ID Error
Access Mode Error
CBF CHK2 Error
Busy Time Out Error *1
Not Ready Error
Time Out Error before Patch Transfer
Time Out Error during Patch Transfer
Time Out Error after Patch Transfer
Status = “Dead”
Status = “HOLD”
Abnormal Error Check
Busy Retry Error *1
Other Frame Receive Error
Time Out Error
Abnormal Error
DMA Abnormal Error
Parameter Error
Asynchronous Error

*1: When “Execute” is performed in the processor which is going along I/O, it turns into this error.
Then, till it becomes Normal End, “Execute” is performed.

6.2.2 Including the patch into a load module and update FM

This subsection describes how to download the load module containing all records in the online-patch file to the “Executed” processor. If “Execute” is not yet done for the processor, the load module is downloaded to the processor currently specified by TARGET.

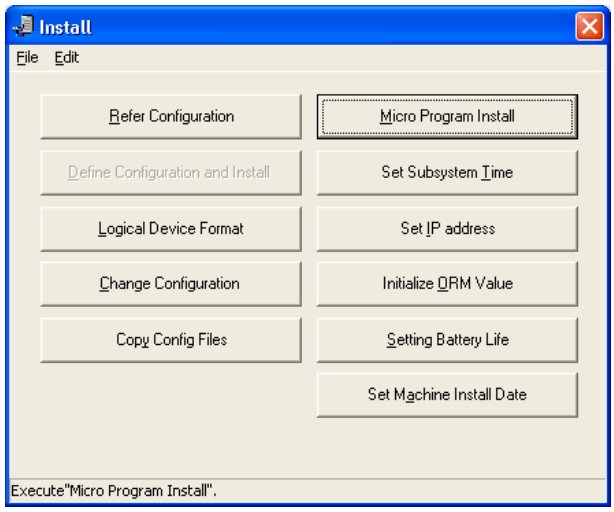
(1) <Mode Change>
Change the mode to [Modify Mode] (CL).

---

(2)
Select (CL) [Install].

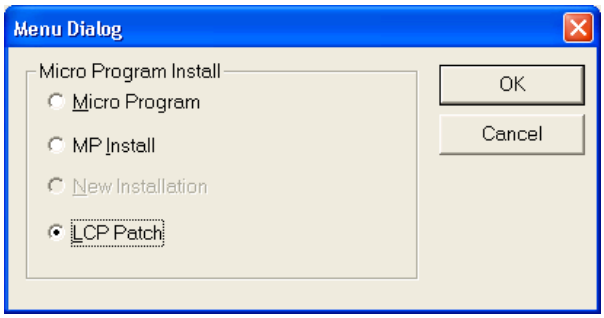
---

(3)
Select (CL) [Micro Program Install].



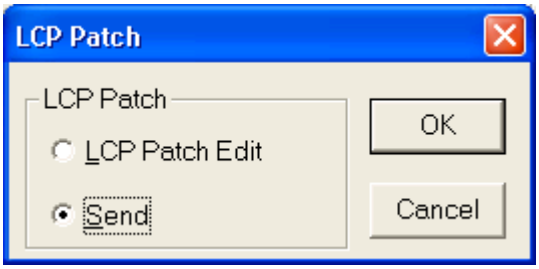
---

(4)
Select (CL) [LCP Patch] and select (CL) [OK].



---

(5)
Select (CL) [Send] and select (CL) [OK].

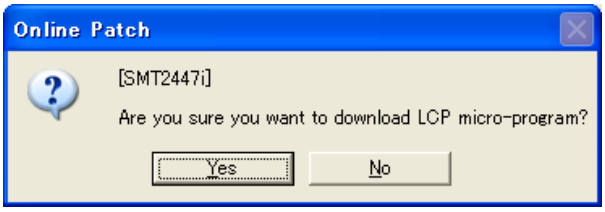


(6)

When you have mode the Execute operation on LCP Online Patch, select (CL) [Load].

(7)

The message "Are you sure you want to download LCP micro-program?" is displayed. Select (CL) [Yes].



(8)

SM is being updated. "Now Down Loading..." is displayed.

(9)

FM is being updated. "Now Down Loading... [XXX]" (XXX : PCB location) is displayed.

(10)

Upon completion of downloading, the message "An exchange of a microprogram finished." is displayed. In response to this message, select (CL) [OK].

7. Trouble Recovery Procedure in Exchanging Micro-programs

7.1 Recovery procedure in on-line menu was selected

If trouble occurs while the micro-programs are being exchanged, symptoms (1) to (8) below can be observed apparently. In these cases, use the recovery procedures shown in flowcharts [A] to [G].

Note: When Virus Checker, Monitor, etc. are in operation so that the SVP is in the heavy load state, the Micro-program exchange may fail. In this case, please wait for a while, and then perform the Micro-program exchange again.
If the Micro-program exchange operation still fails, please perform the recovery operations by following the procedures in this section.

(1) A power failure occurs.
→ Go to [A]. (MICRO07-30)

(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]. (MICRO07-60)
(c) In the case before MP reboot. (Before display the IMPL status. : Not exist SSB = 0x334F.), excepting the case (a),(b).
→ Go to [B]. (MICRO07-40)
(d) In the case after MP reboot. (After displayed the IMPL status. : Exist SSB = 0x334F.), excepting the case (a),(b).
→ Go to [C]. (MICRO07-50)
(e) In the case of except (a)–(d)
→ Go to [C]. (MICRO07-50)

(3) An AP error occurs, resulting in SVP trouble (Key-in operations are disabled and the screen disappears).
→ Go to [B]. (MICRO07-40)

(4) Recovery of a cache failure during the micro-program exchange of DKCMAIN Action.
→ MICRO07-180

(5) Procedure for returning the micro-program version to the previous version.
→ Go to [E]. (MICRO07-70)

(6) In the case of incorrect version display (“??-??...” or incompatibility). (The disagreement of a binary version (Internal administrative information) contains it.) (Refer to SVP03-410.)
→ Go to [B]. (MICRO07-40)

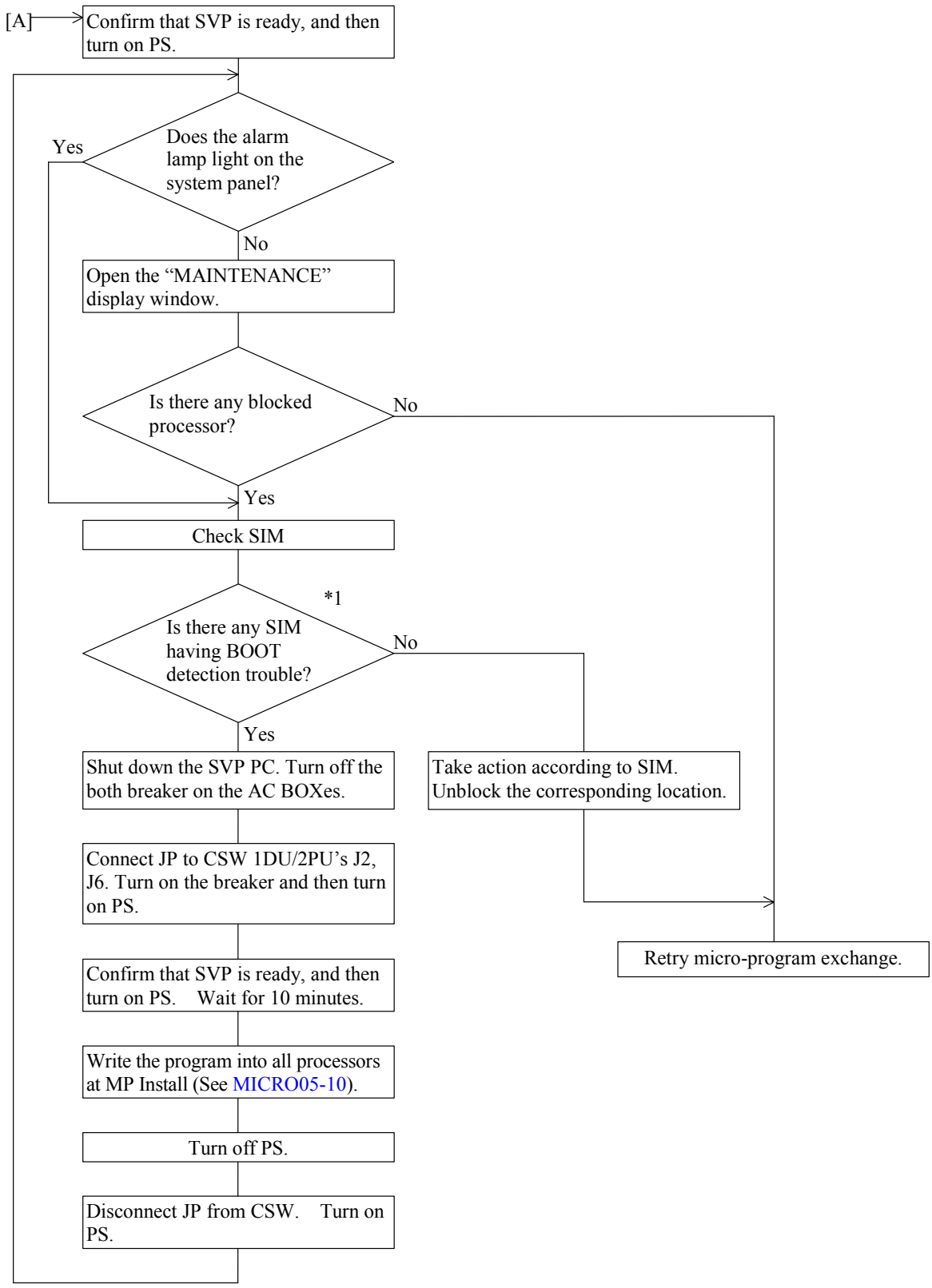
(7) An error occurs in the DKU/HDD/SCHIP micro-program replacing.
→ Go to [F]. (MICRO07-90)

(8) An error occurs in the SSVP micro-program replacing.
→ Go to [G]. (MICRO07-100)

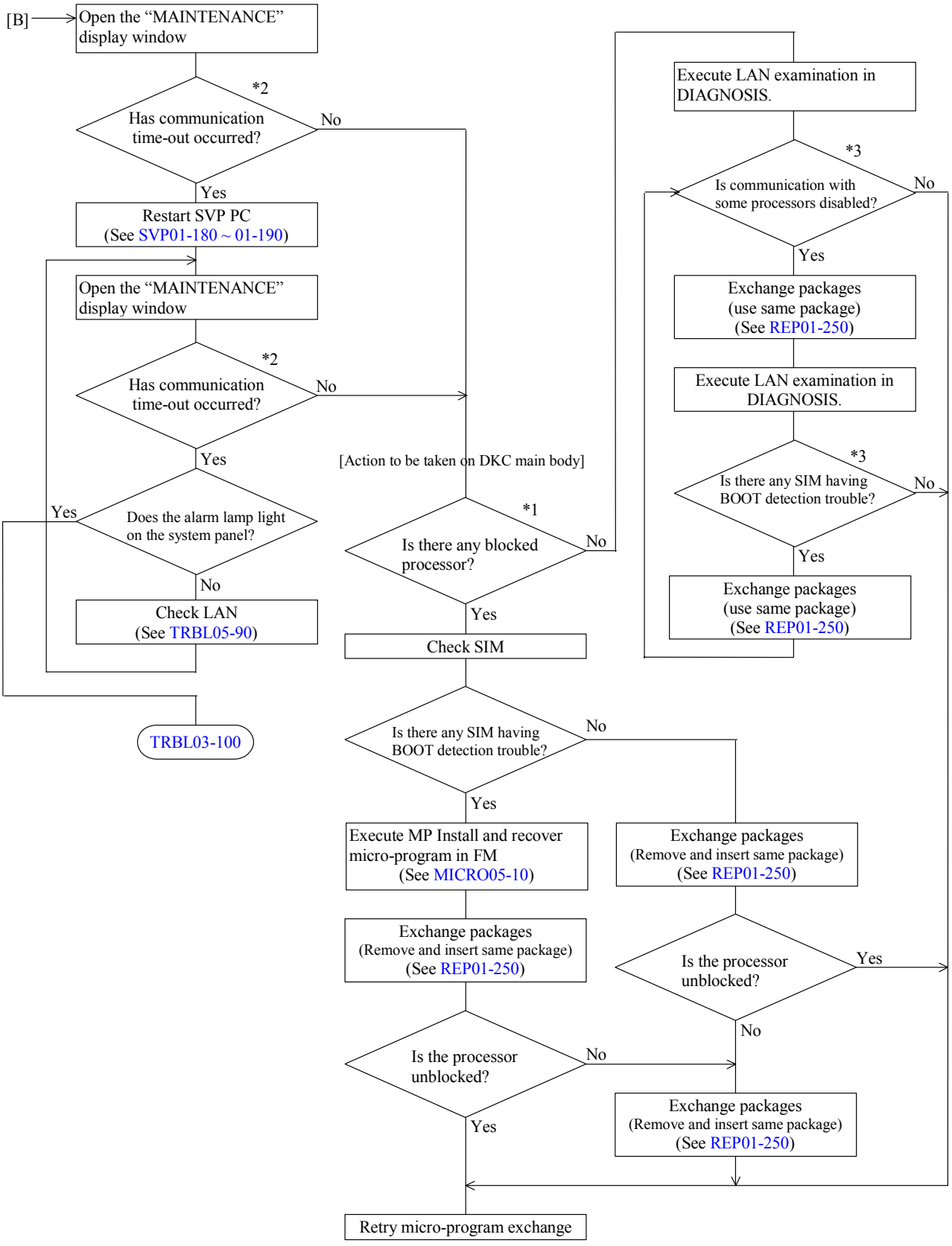
[Sections to be referenced for recovery procedure]

(i) Status display : "3.4 Main screen" on SVP section
(ii) Version display : "3.7 Version of Microprogram" on SVP section
(iii) MP installation : "5. MP Install"
(iv) Package exchange : "1. Hot Replace" on REPLACE section
(v) PC exchange : "1. Hot Replace" on REPLACE section

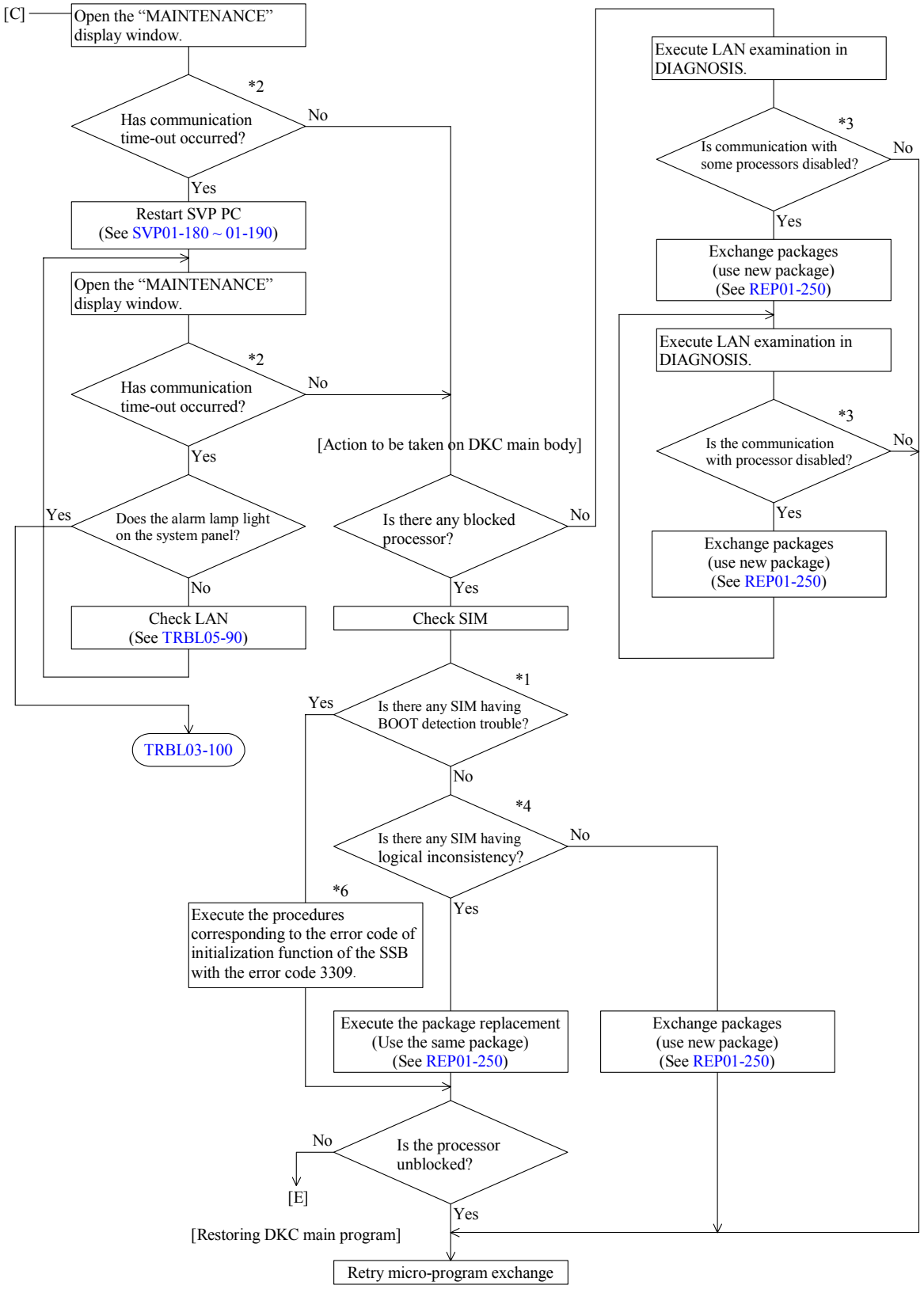
[Recovery Procedure for Power Failure]



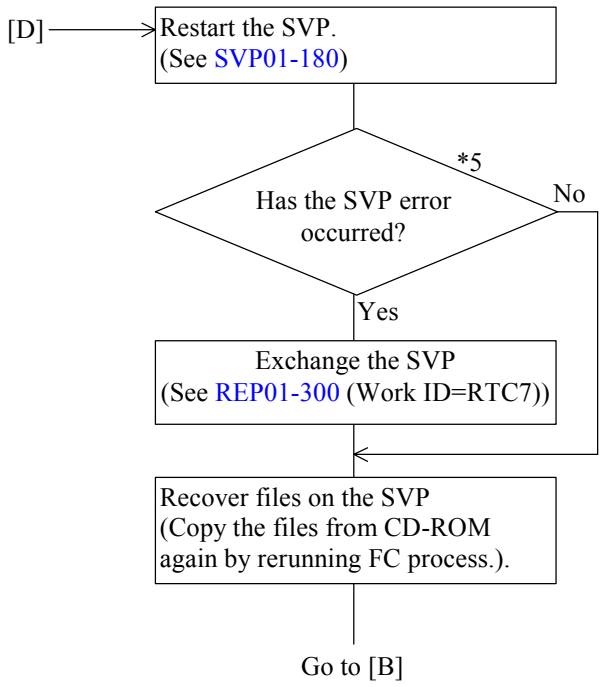
[Recovery Procedure for Communication Time-out/PC Trouble in Downloading Micro-program /Version incompatibility]



[Recovery Procedure for Communication Time-out in Blocking/Unblocking Processor]



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



*1: Reference code "7900XY" or "7901XY"
XY: Shows processor id. (See SIMRC02-510)
For details of the trouble, refer to the explanation about the BOOT detected error at SSB (Byte27 =8C).
(See SSBLOG05-1800)

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

*3: Each LAN error processor button blinks.

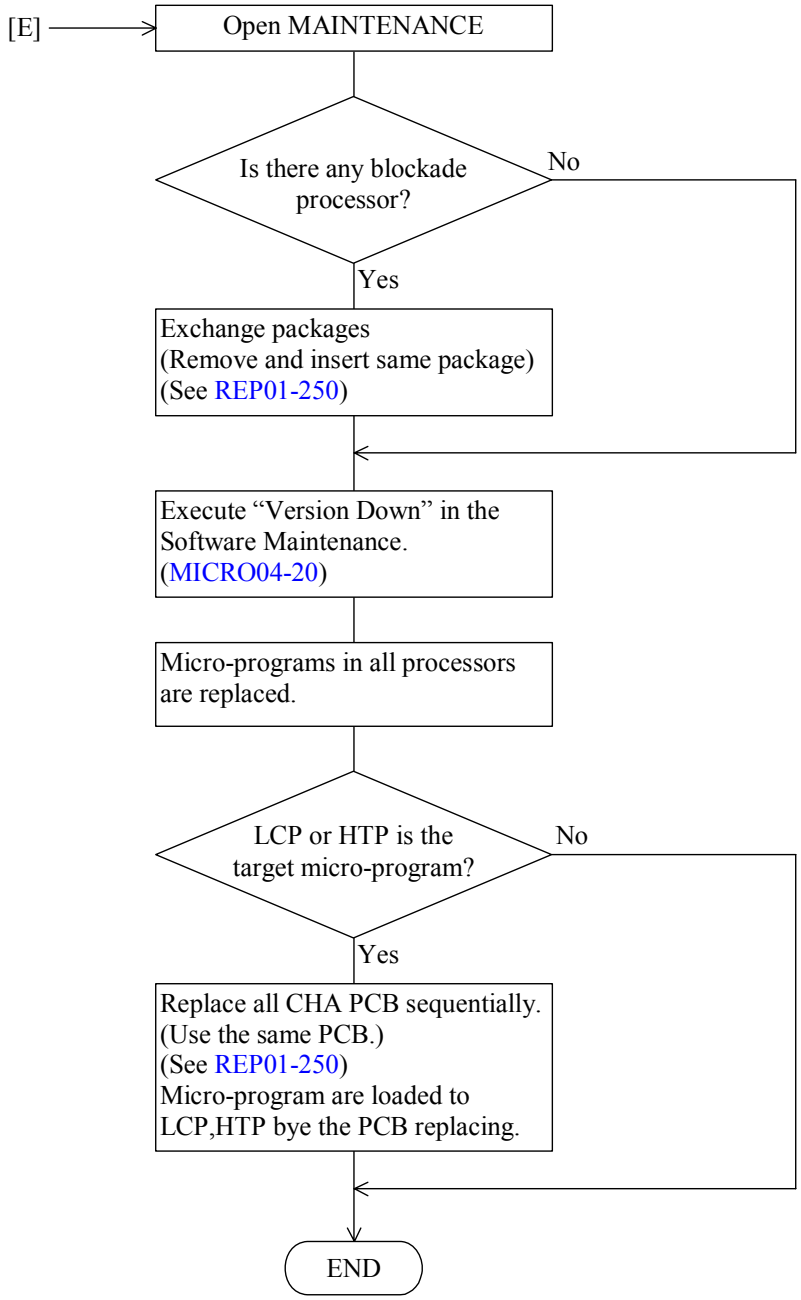
*4: Reference code
3080x0:Indicates that a WCHK1 dump has occurred.
3081x0:Indicates that an ABEND dump has occurred.
x: Shows processor id.

*5: The message "Please turn off SVP and replace it" is displayed.

*6: Refer to "SSBLOG05-1800" 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	Use the same package in ③. Refer to "REP01-300 (Work ID : RTC7)" for SVP Replace.
others	① MP Install ② Package Replace	Use the same package in ②.

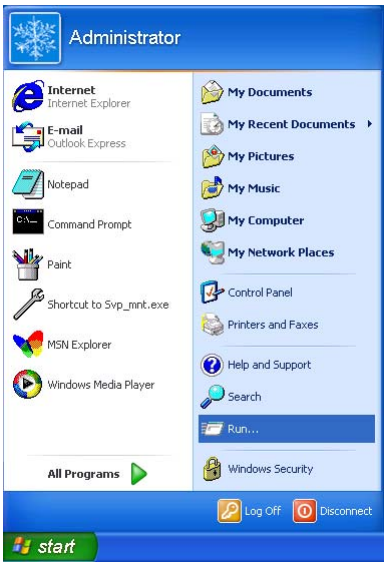
[Procedure for returning the micro-program version to the previous version]



[Copy to program files from backup files on the SVP hard disk]

(1)

Select (CL) [Run...] from the [Start] button.

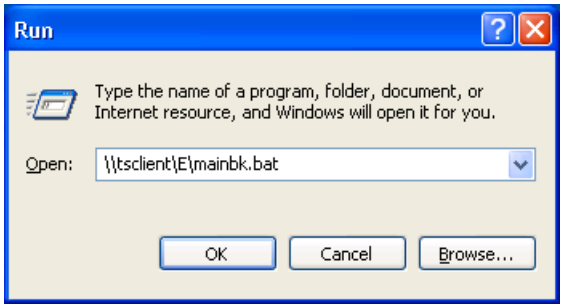


(2)

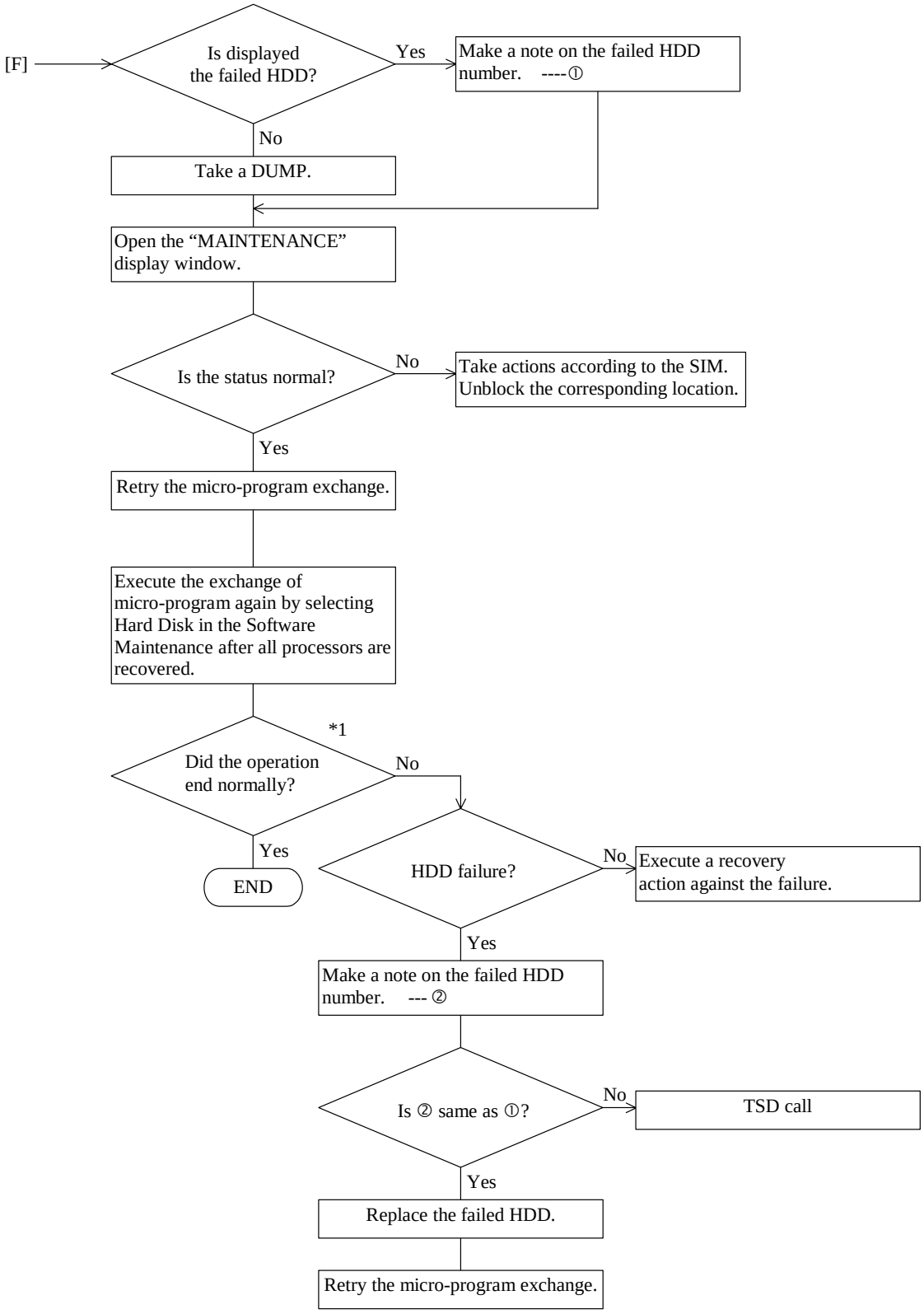
Insert the Micro-program media (CD-ROM) in the CD-ROM drive, and wait until the CD-ROM drive recognizes the CD-ROM.

(3)

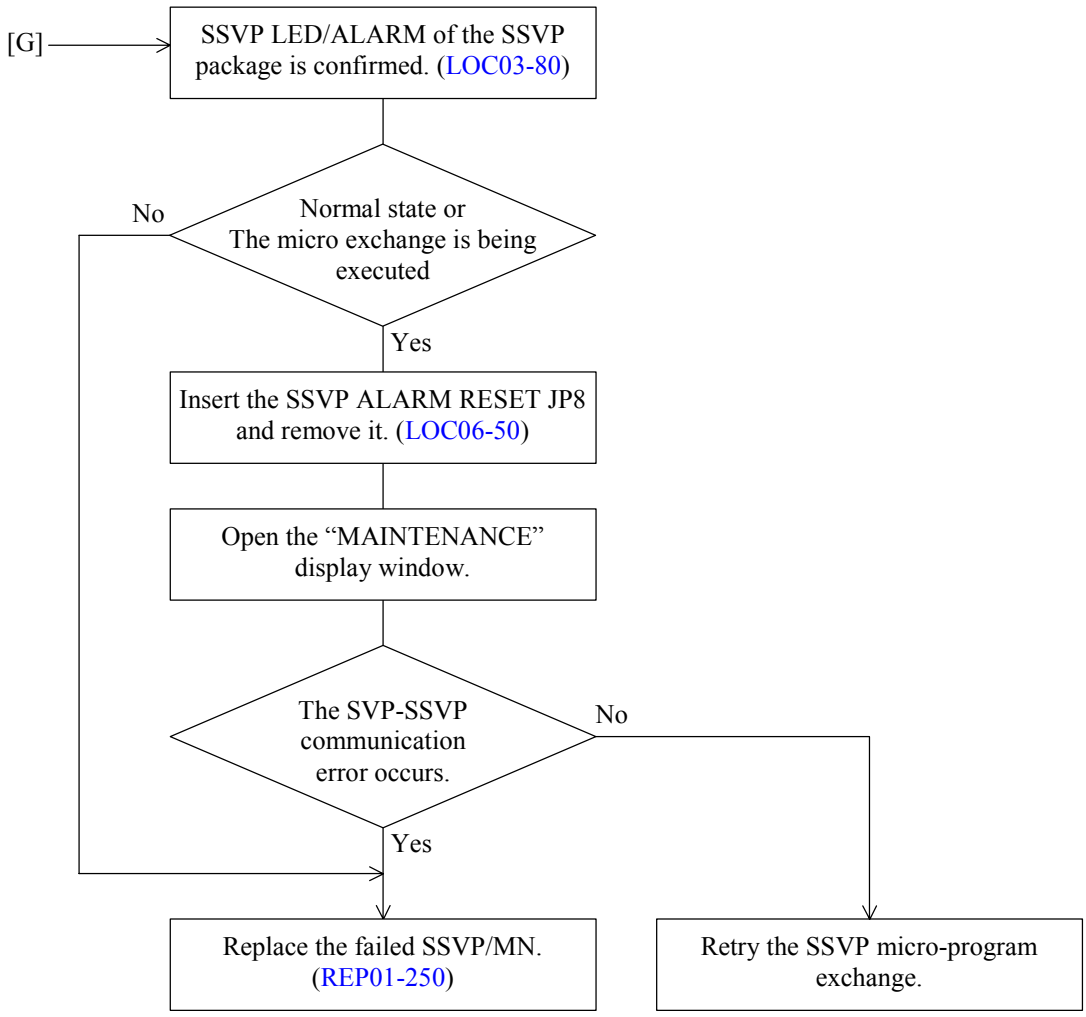
Input the file name "\\tsclient\E\mainbk.bat" in 'Open' and select (CL) [OK].



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



[Recovery procedure SSVP micro-program]



7.2 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].

> Note: When Virus Checker, Monitor, etc. are in operation so that the SVP is in the heavy load state, the Micro-program exchange may fail. In this case, please wait for a while, and then perform the Micro-program exchange again.
> If the Micro-program exchange operation still fails, please perform the recovery operations by following the procedures in this section.

(1) A power failure occurs.
→ Go to [A]. (MICRO07-130)

(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]. (MICRO07-170)
(c) In the case before MP reboot. (Before display the IMPL status. : Not exist SSB = 0x334F), excepting the case (a),(b).
→ Go to [B]. (MICRO07-140)
(d) In the case after MP reboot. (After displayed the IMPL status. : Exist SSB = 0x334F.), excepting the case (a),(b).
→ Go to [D]. (MICRO07-150)
(e) In the case of except (a)–(d)
→ Go to [C]. (MICRO07-140)

(3) An AP error occurs, resulting in SVP trouble (Key-in operations are disabled and the screen disappears).
→ Go to [E]. (MICRO07-160)

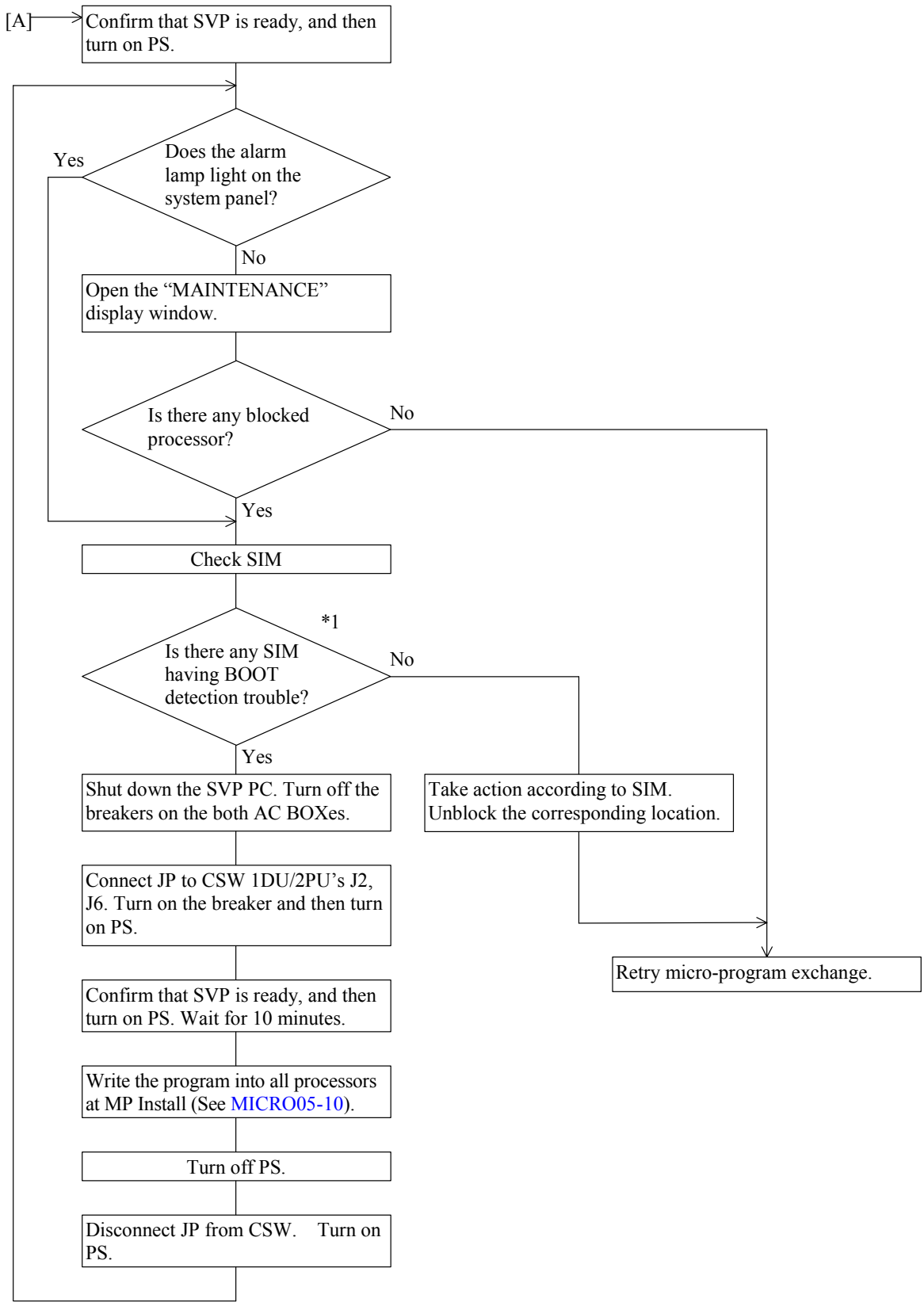
(4) Recovery of a cache failure during the micro-program exchange of DKCMAIN Action.
→ MICRO07-180

(5) In the case of incorrect version display (“??-??…” or incompatibility). (The disagreement of a binary version (Internal administrative information) contains it.) (Refer to SVP03-410.)
→ Go to [B]. (MICRO07-140)

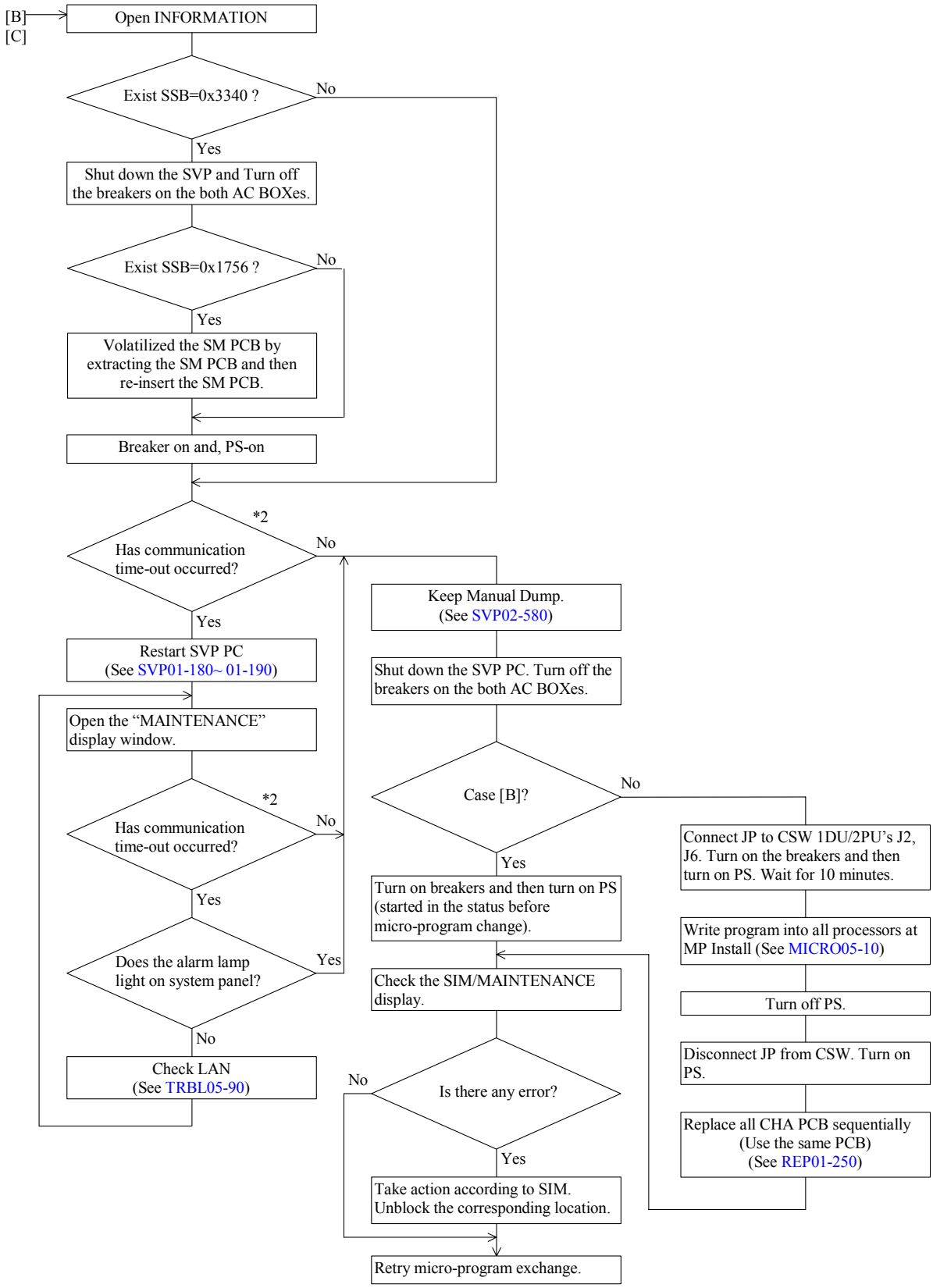
[Sections to be referenced for recovery procedure]

(i) Status display : “3.4 Main screen” on SVP section
(ii) Version display : “3.7 Version of Microprogram” on SVP section
(iii) MP installation : “5. MP Install”
(iv) Package exchange : “1. Hot Replace” on REPLACE section
(v) PC exchange : “1. Hot Replace” on REPLACE section

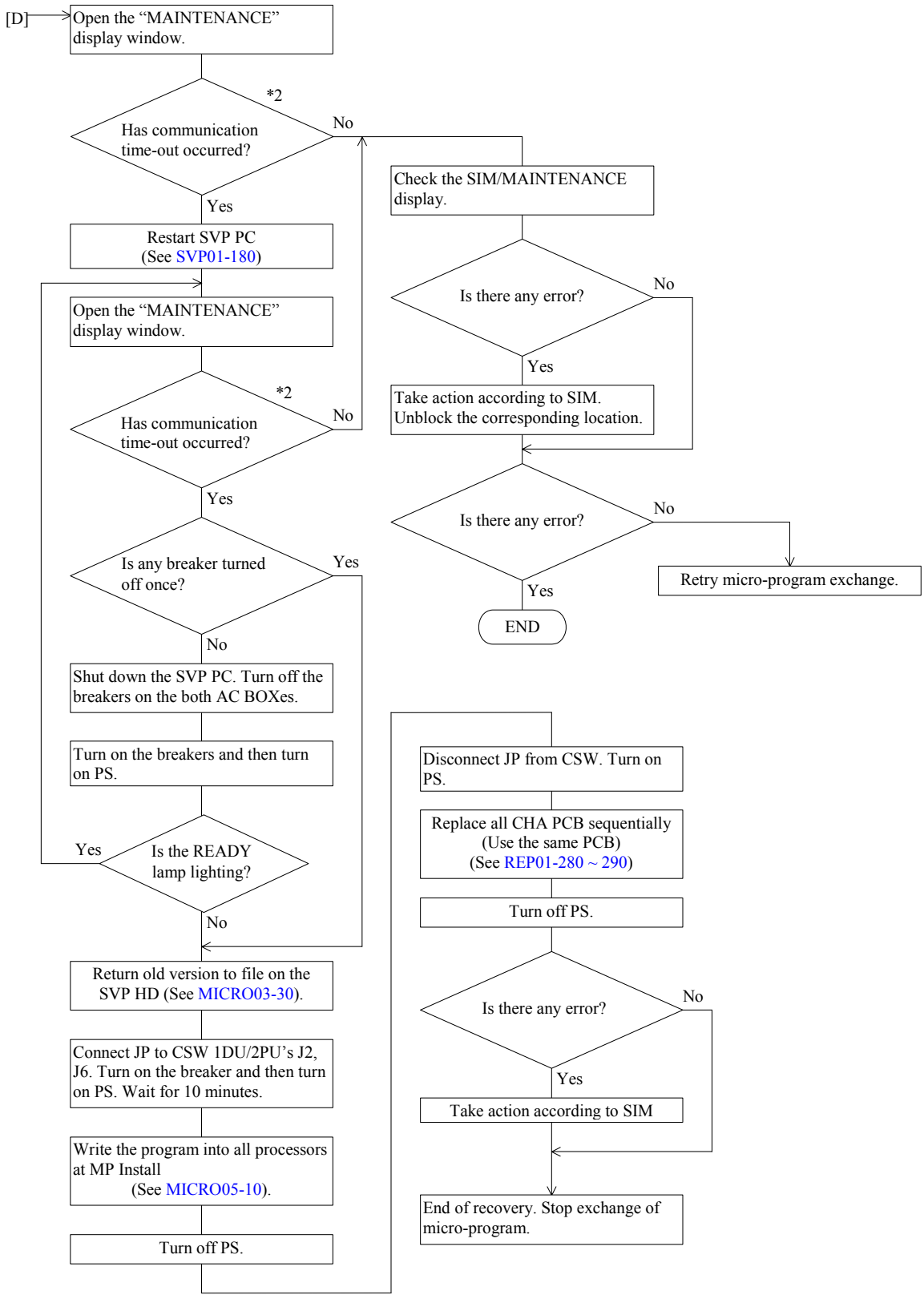
[Recovery Procedure for Power Failure]



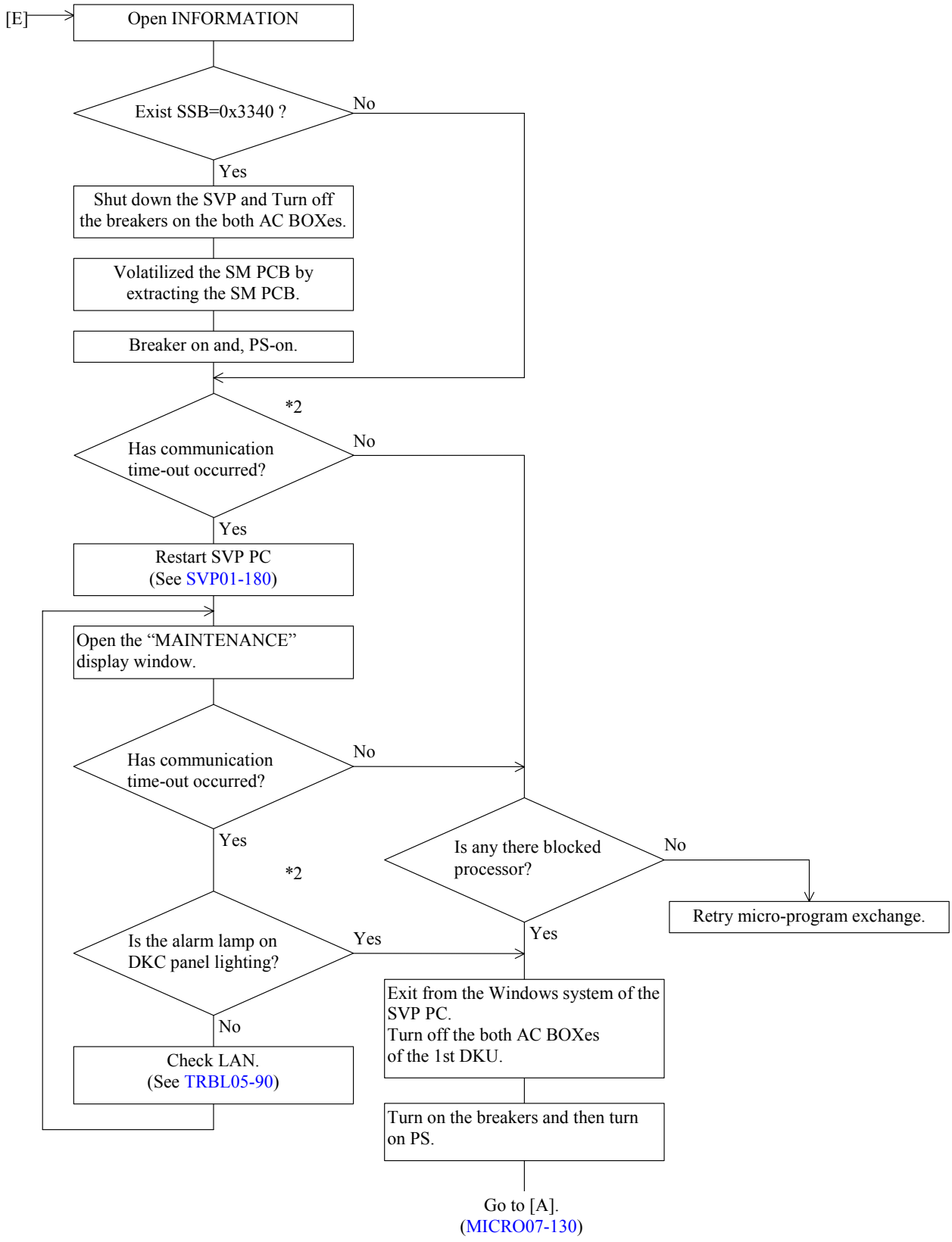
[Recovery procedure for communication time-out during system block processing/micro-program downloading/Version incompatibility]



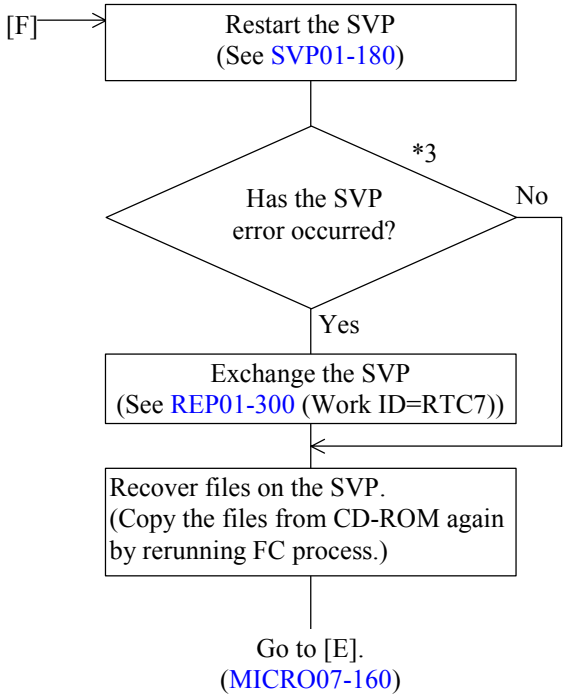
[Recovery procedure for communication time-out during system recovery processing]



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



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



*1: Reference code “7900XY” or “7901XY”
XY: Shows processor id. (See SIMRC02-510)
For details of the trouble, refer to the explanation about the BOOT detected error at SSB (Byte27 =8C).
(See SSBLOG05-1800)

*2: The message “connection error occurred SVP-DKC” is displayed.

*3: The message “Please turn off SVP and replace it” is displayed.

<Recovery of a cache failure during the micro-program exchange of DKCMAIN Action>

1. Retry micro-program exchange of DKCMAIN program.
   - For Version up by Offline FC : Refer to MICRO03-310.
   - For Version up by Online FC : Refer to MICRO04-200.
   - For Version down by Offline FC : Refer to MICRO03-330.
   - For Version down by Online FC : Refer to MICRO04-210.

   <Note>
   - The processors which had finished the micro-program exchange to new version will be skipped.
   - Password is necessary.

2. Then, replace the failure parts according to SIM message and M.M.

8. Config Exchange Procedure

8.1 Config Version Up

(1)

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

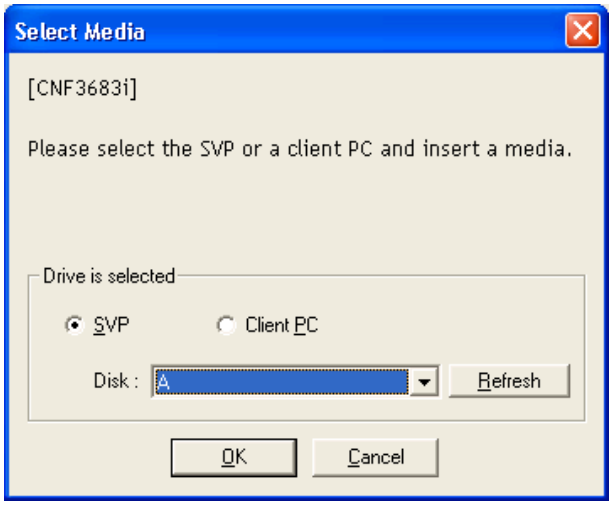
(2)

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

(3)

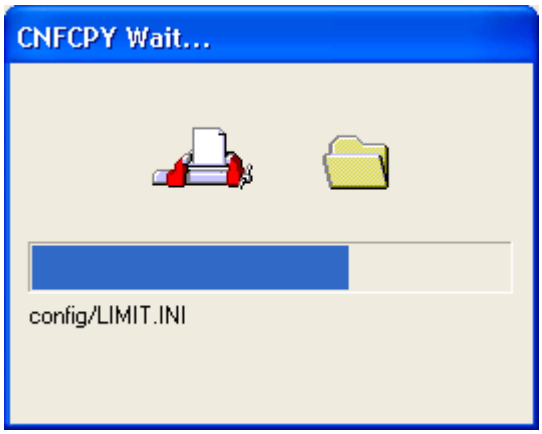
Insert the media for version up.
Select (CL) the PC (SVP or Client PC) in which the media was inserted, select the drive in which the media has been inserted, and then select (CL) the [OK] button.

If the [Refresh] button is pressed, Disk is updated to the newest information.



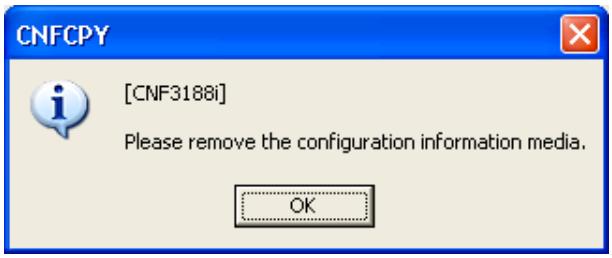
(4)

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



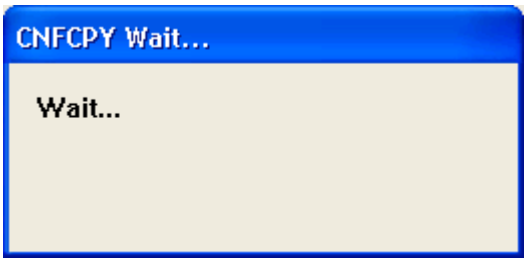
(5)

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



(6)

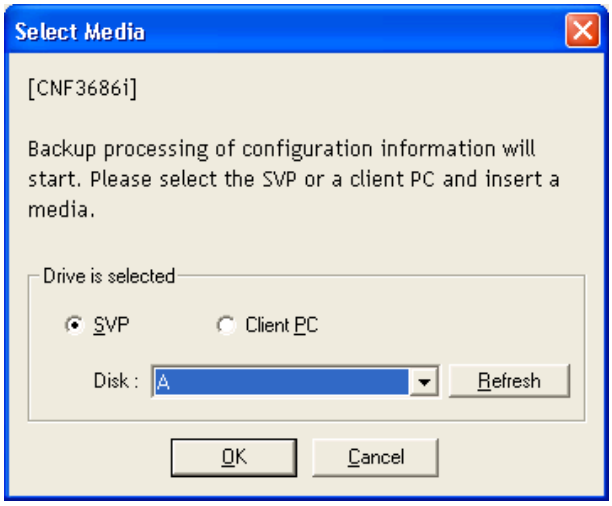
Processing for reflecting composition information is performed.
In the meantime, the wait window is displayed.



(7)

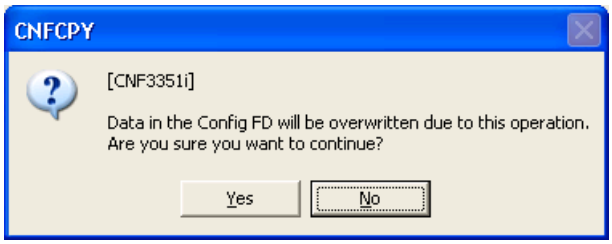
Execute an operation for backing up the configuration information.
Prepare the removable media for backup and insert the media.
Select (CL) the drive and the PC (SVP or Client PC) in which the media was inserted.
Select (CL) the [OK] button.

If the [Refresh] button is pressed, Disk is updated to the newest information.



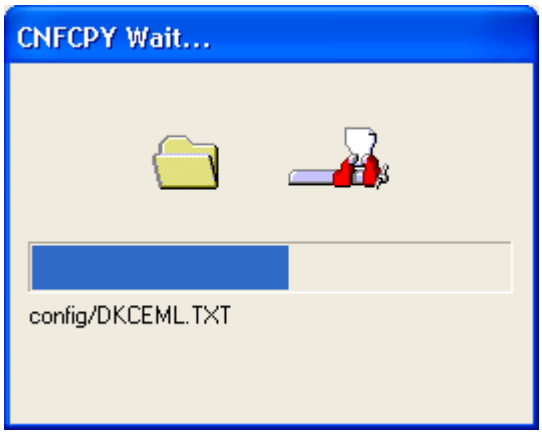
(8)

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



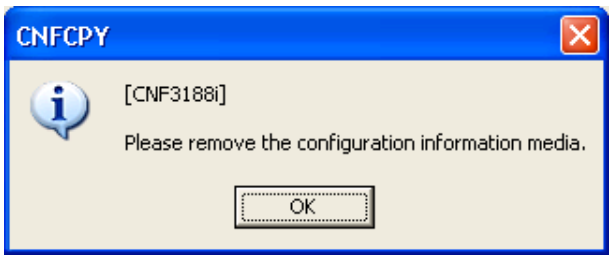
(9)

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



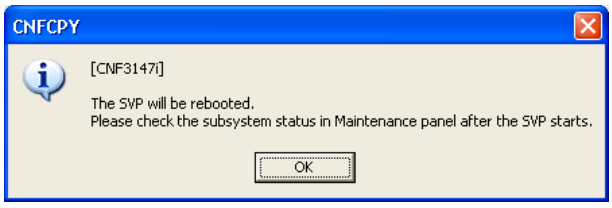
(10)

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



(11)

When Selecting [OK] to the message 'The SVP will be rebooted. Please check the subsystem status in Maintenance panel after the SVP status.' SVP PC reboots.



Note: After the SVP reboot, re-connect to the SVP with the Client PC.

(12)

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

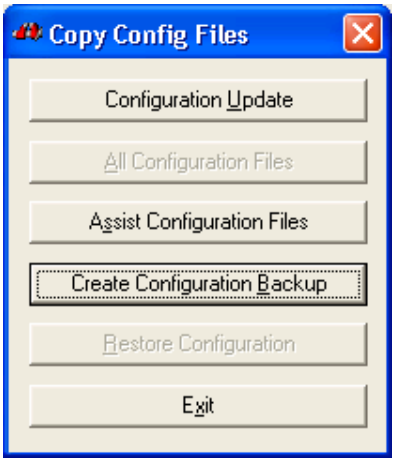
8.2 Config Backup

(1)

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

(2)

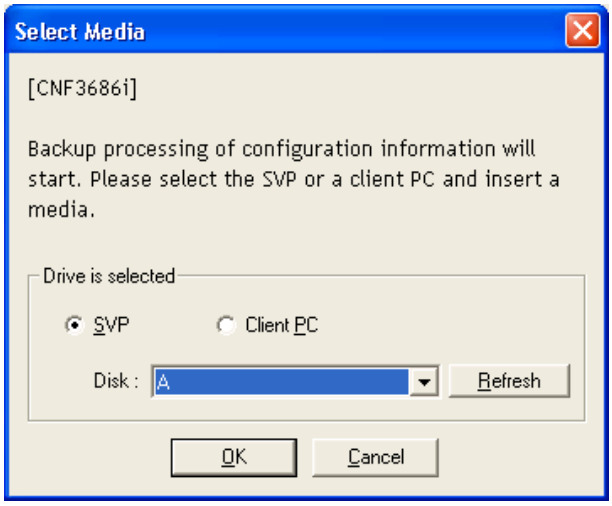
Select (CL) [Create Configuration Backup] in the 'Copy Config Files'.



(3)

Execute an operation for backing up the configuration information.
Prepare the removable media for backup and insert the media.
Select (CL) the drive and the PC (SVP or Client PC) in which the media was inserted.
Select (CL) the [OK] button.

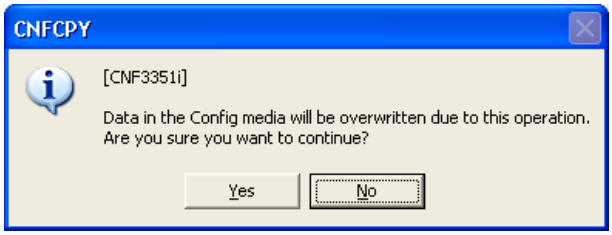
If the [Refresh] button is pressed, Disk is updated to the newest information.



Note: For the procedure of backing up the configuration information to a CD-R, see page MICRO08-140.

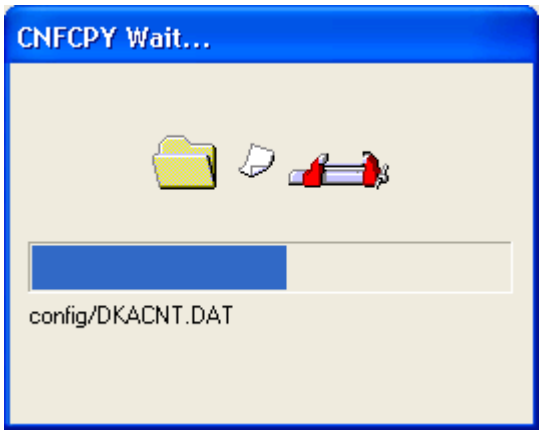
(4)

When you want to continue the process, select the [Yes] button. When the backup to the Config media is not necessary, select the [No] button.



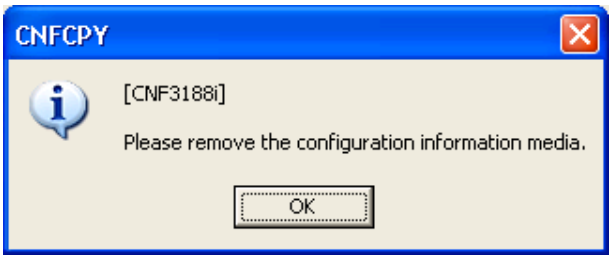
(5)

Backup the configuration information to the Config media for backup. 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 configuration information media.".



(7)

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

8.3 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'.

---

(2)

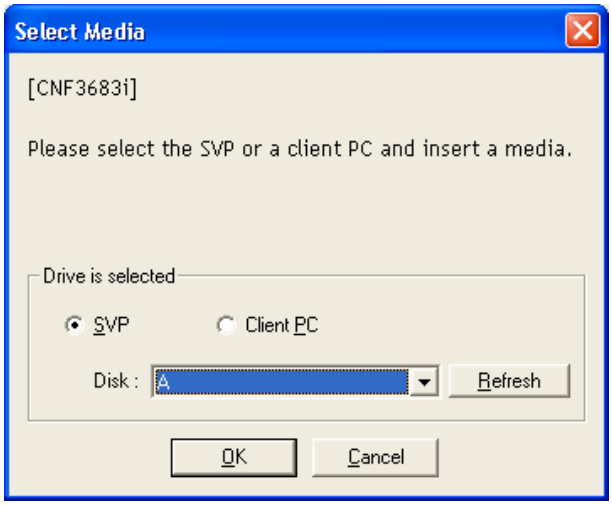
Select (CL) [All Configuration Files...] in the 'Copy Config Files'.

---

(3)

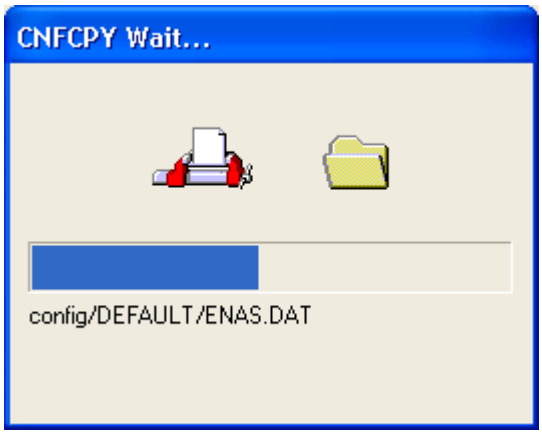
Insert the media.
Select (CL) the drive and the PC (SVP or Client PC) in which the media was inserted.
Select (CL) the [OK] button.

If the [Refresh] button is pressed, Disk is updated to the newest information.



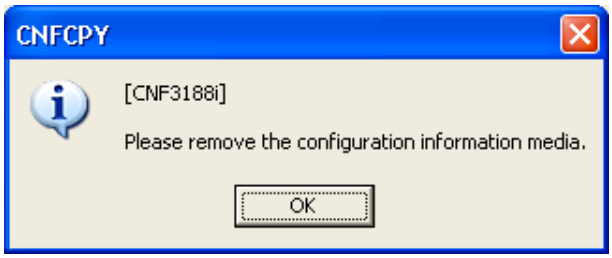
(4)

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 configuration information media.".



(6)

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

8.4 Restoring Configuration Information

(1)

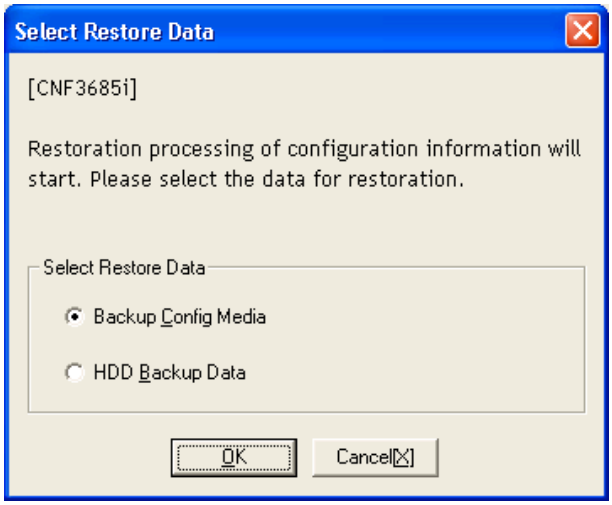
In the 'SVP' window, change the mode to Initial Setting.
(Press the [Shift] + [Ctrl] + [I] keys and select (CL) the [OK] button after entering a password.)
Then select (CL) [Install]. Select (CL) [Copy Config Files] in the 'Install' window.

(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.

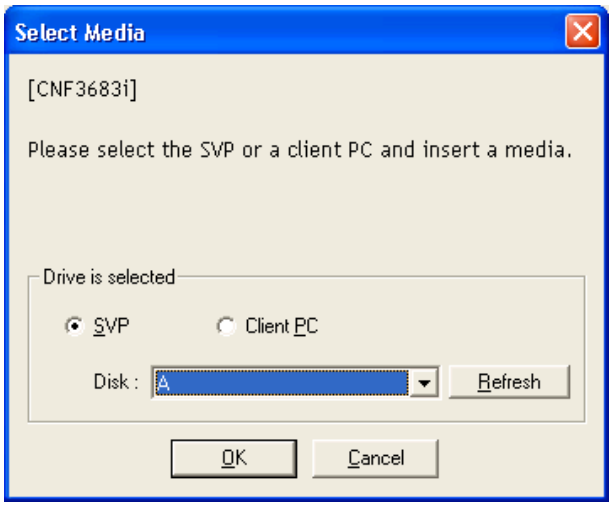


When you have selected the "Backup Config Media", go to Step (4).
When you have selected the "HDD Backup Data", go to Step (5).

(4)

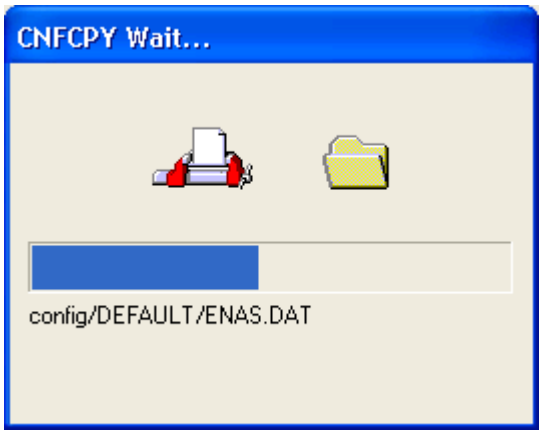
After the media is inserted, select (CL) the drive and the PC (SVP or Client PC) in which the media was inserted. Select (CL) the [OK] button.

If the [Refresh] button is pressed, Disk is updated to the newest information.



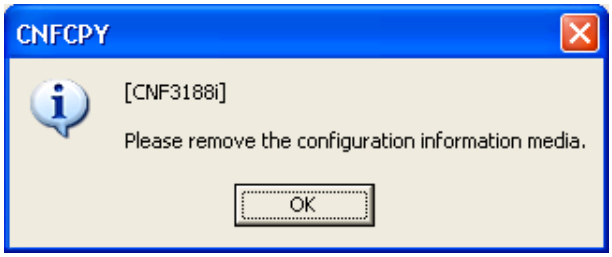
(5)

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



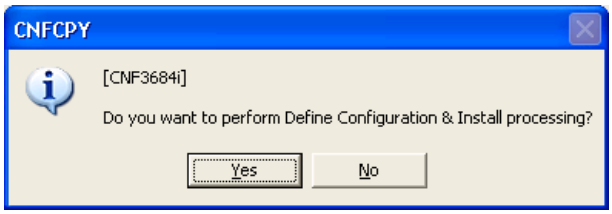
(6)

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



(7)

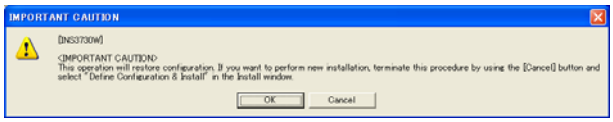
When you restore the configuration information successively, select (CL) the [Yes].
When you want to abort the restoration, select (CL) the [No].
When you have selected [Yes], go to Step (8).



(8)

⚠ CAUTION

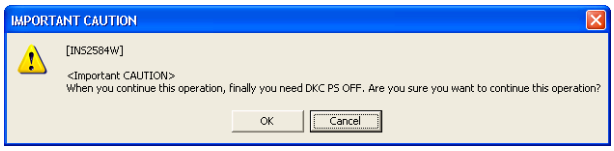
This is a special (exceptional) operation that requires entry of a password and may cause a serious failure such as a system down and a data loss if executed in a case other than the restoration of the configuration information. Ask the Technical Support Division for propriety of the operation and enter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

---

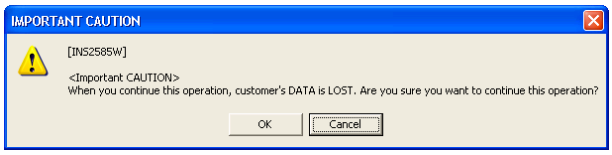
(9)



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?".

---

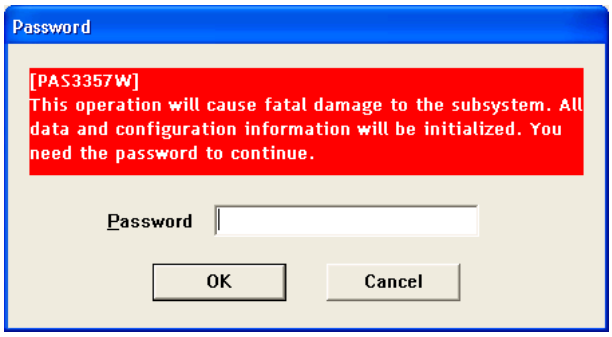
(10)



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.

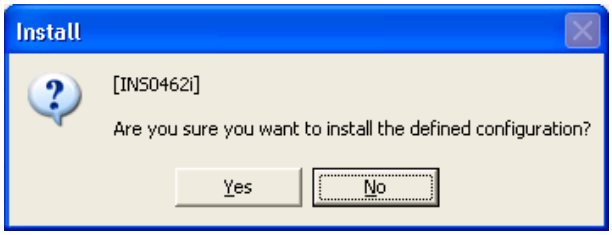
(12)

The window for subsystem configuration information reference, in which the configuration information is to be restored, is displayed.
For details of the subsystem configuration information reference window, refer to "Step 3 <DKC Configuration window> and following steps in Subsection 5.2.4, Refer Configuration (on page INST05-440)".

---

(13)

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

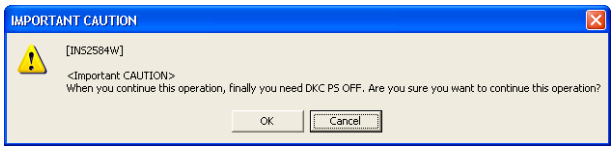


(When the [No] button is selected, the restoration of the configuration information is suppressed and the procedure for the restoration is terminated.)

---

(14)

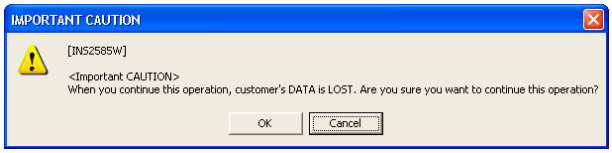
Select (CL) the [OK] button in response to the confirmatory message, "<Important CAUTION> When you continue this operation, finally you need DKC PS OFF. Are you sure you want to continue this operation?".



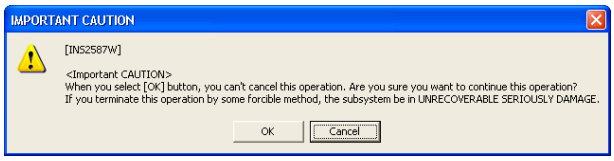
---

(15)

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?".



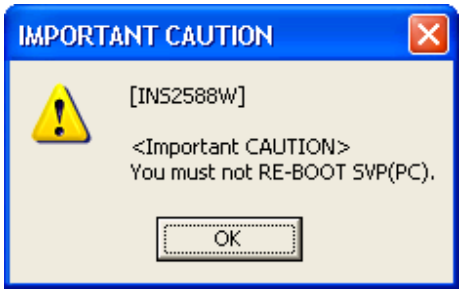
(16)



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 subsystem be in UNRECOVERABLE SERIOUSLY DAMAGE.".

---

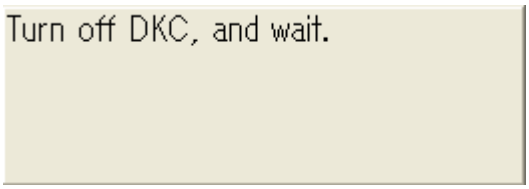
(17)



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

---

(18)



After making sure that the message, "Turn off DKC, and wait." is displayed, execute the powering off procedure through the DKC maintenance panel.

After a while, "Loading configuration..." is displayed.

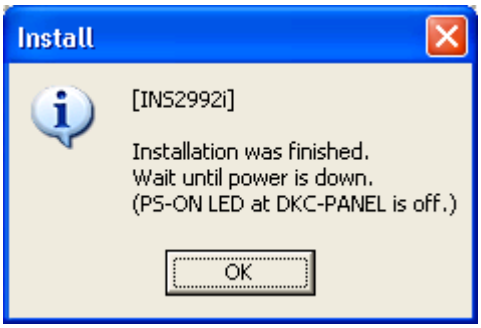
---

(19)

When this step is executed, the restored configuration information is loaded on the SM and FM.

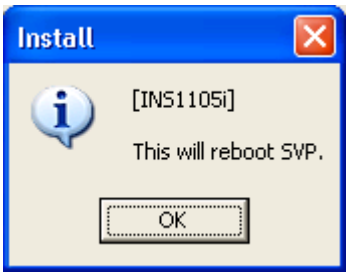
(20)

Make sure that the DKC power has been turned off, select (CL) the [OK] button in response to the message, “Installation was finished. Wait until power is down. (PS-ON LED at DKC-PANEL is off.)”.



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.



(21)

Execute the Config Version UP (MICRO08-10) with a floppy disk that is used in this operation.

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

(1)

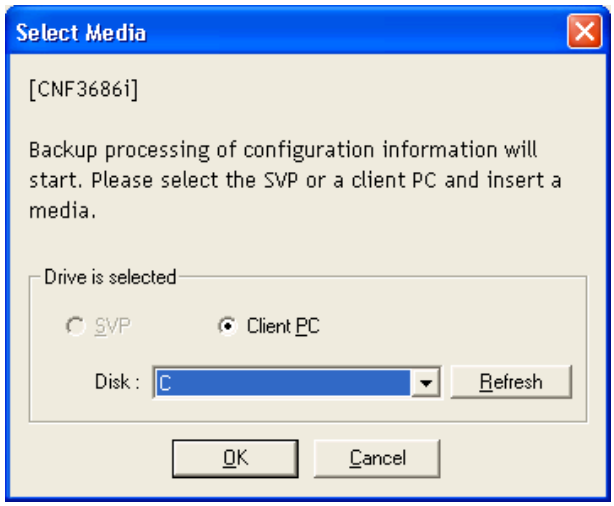
To store a backup of the config, prepare a blank CD-R.

(2)

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

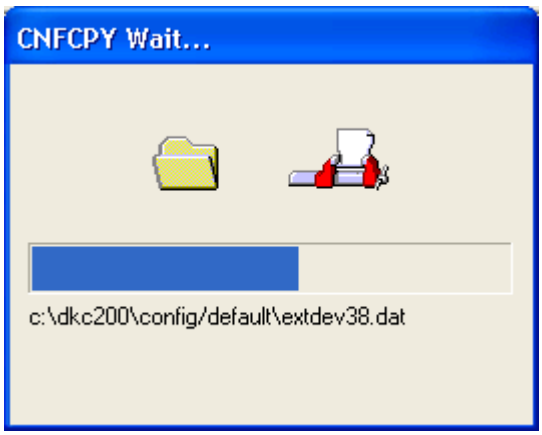
(3)

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



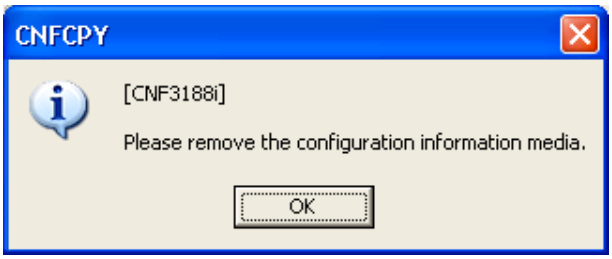
(4)

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).

9. Microprogram Exchange Wizard

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

• The starting method

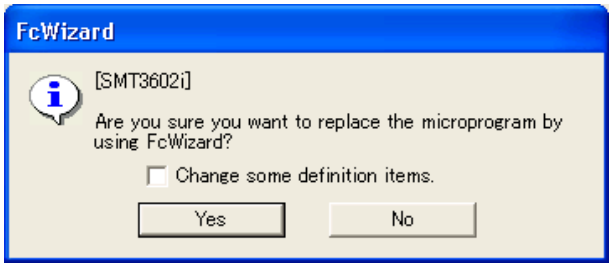
(1)
Connect the Client PC to the SVP PC.

(2)
Insert CD-ROM that the micro program was stored in the CD-ROM drive of the Client PC.

(3)
Change the SVP mode to “MODIFY”.

(4)
Select (CL) [FcWizaed].

(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 microprograms contains DKCMAIN or RAMBOOT, you can select (CL) processors’ reboot pattern.
Refer 4.2 (8)

[SCSI change mode] dialog
If SCSI channel adapter is equipped you can select (CL) the exchange mode.
Refer 4.2 (7)

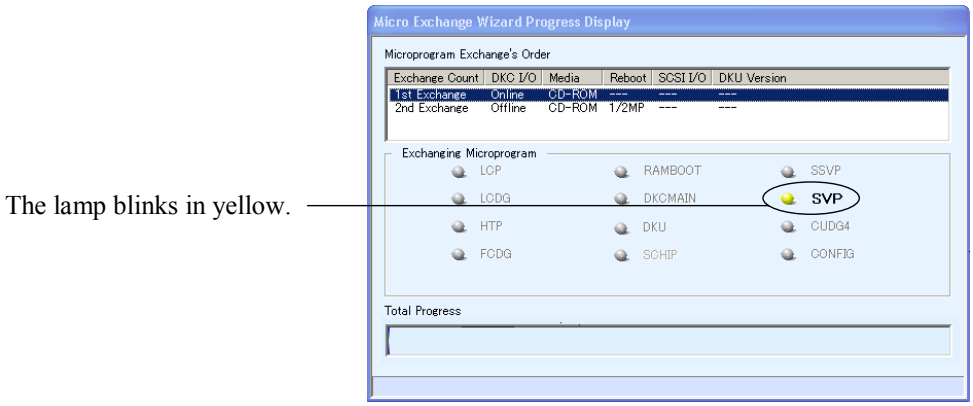
(6)

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.)

---

(7)

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



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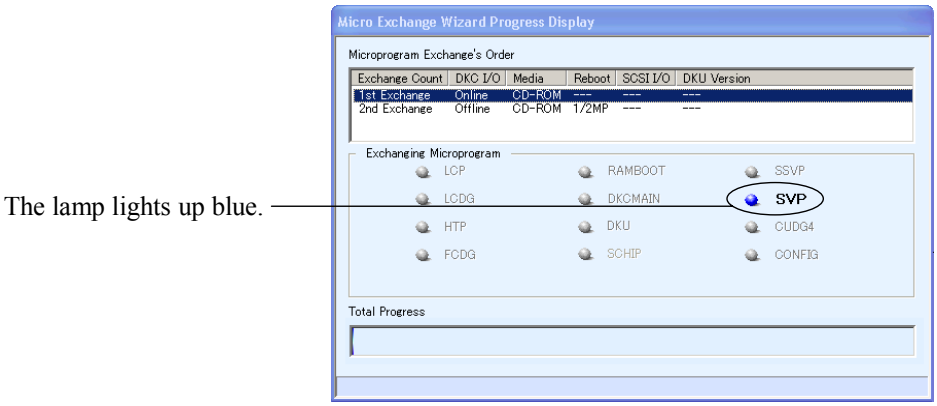
(8)

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

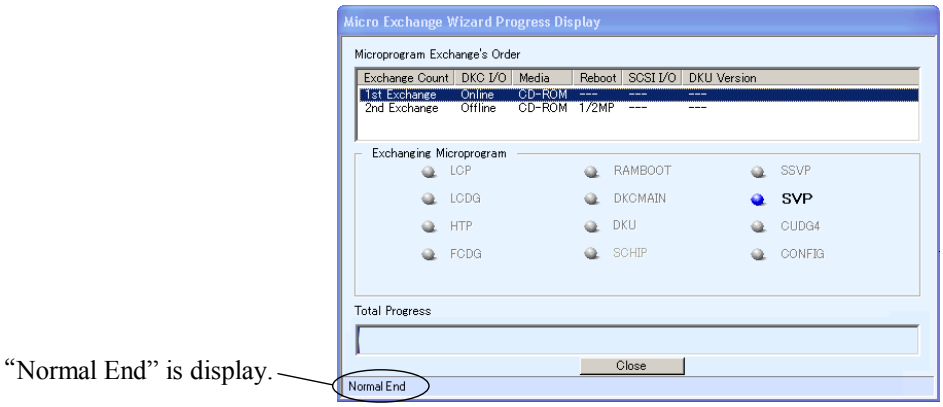


(9)

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

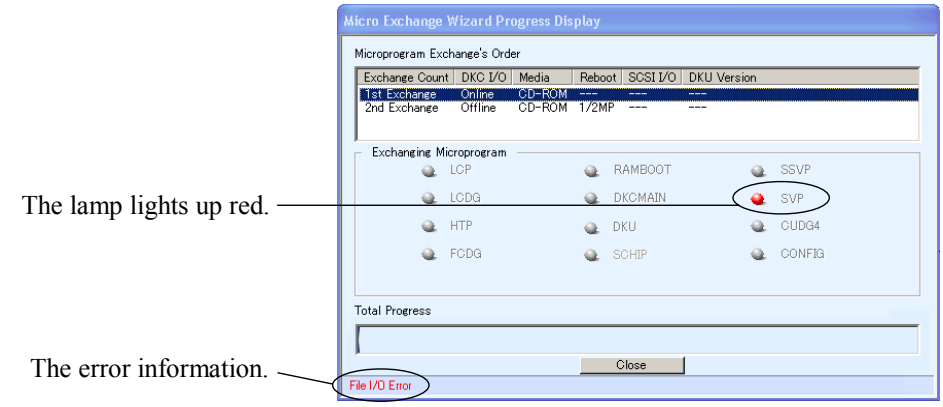
Normal End:

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.



(10)

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

(11)

Change the SVP mode to “VIEW”.

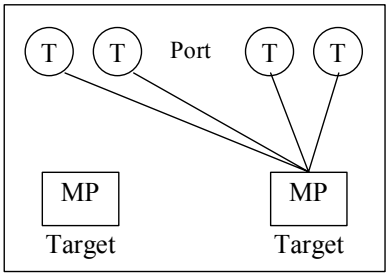
10. Microprogram Replacement with Non Stop SCSI Host

10.1 Outline

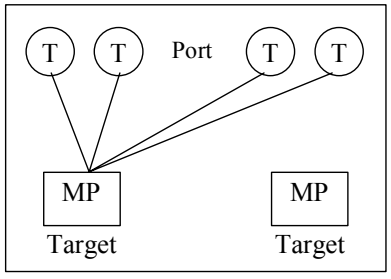
Replacement of the microprogram can be done without making a host connected to the CHF stop issuing I/O instructions. (That is to say, microprogram replacement with non stop SCSI host is possible.)
The microprogram replacement is possible without a fail-over even for a configuration with an alternative path.

10.2 Procedure for Replacing the Microprogram

(1) Select Non-Stop SCSI host.
(2) Check if the microprogram replacement with non stop host is possible.
(3) Check the configuration for connecting with the TrueCopy / external device / Universal Replicator (Presence of the alternate path).
(4) Download the microprogram.
(5) The operating rate of the processors is Less than 50%.
(6) Reboot the MPs with even ordinal numbers.
(7) Reboot the MPs with odd ordinal numbers.



The case of (6) above



The case of (7) above

T : Target
MP : MicroProcessor

10.3 Prerequisite for Microprogram Exchange

Before executing a NonStopSCSI mode microprogram exchange, confirm that the following prerequisites are satisfied.

1. Confirm that the operating rate of the processors, as illustrated in the figure in MICRO10-10, is Less than 50%. *1 *2
2. For the TrueCopy / Universal Volume Manager / Universal Replicator Initiator or External port, confirm that the same alternative paths are defined in both Cluster 1 and Cluster 2.

   Note:

   (1) When the following conditions are satisfied, some of the I/O operations may be discarded during the microprogram exchange.
   ① A failure occurred during the microprogram exchange.
   ② The recovery action for the defect in the I/F controller chip is added.

   (2) During the period from when the microprogram exchange starts until it ends normally, TrueCopy / Universal Replicator path/pair operations cannot be performed, and the PPRC commands cannot be executed. Moreover, FlashCopy pair operations cannot be performed when FlashCopy is made to cooperate to TrueCopy in the FlashCopy to PPRC Primary Volume Function. FlashCopy pair operations cannot be performed when FlashCopy is made to cooperate to UR-MF in the FlashCopy to UR Primary Volume Function. Do not try to operate them.

   (3) If you define a RAID600 as an RCU target when connecting it with an older model, SIM=2180 may be generated. In such a configuration, complete the generated SIM.

   (4) If the number of active paths during the microprogram exchange operation is smaller than the minimum number of paths specified in the TrueCopy / Universal Replicator RCU option, the TrueCopy / Universal Replicator pairs will suspend.
   Please confirm that the number of active paths is always larger than the minimum number of paths.

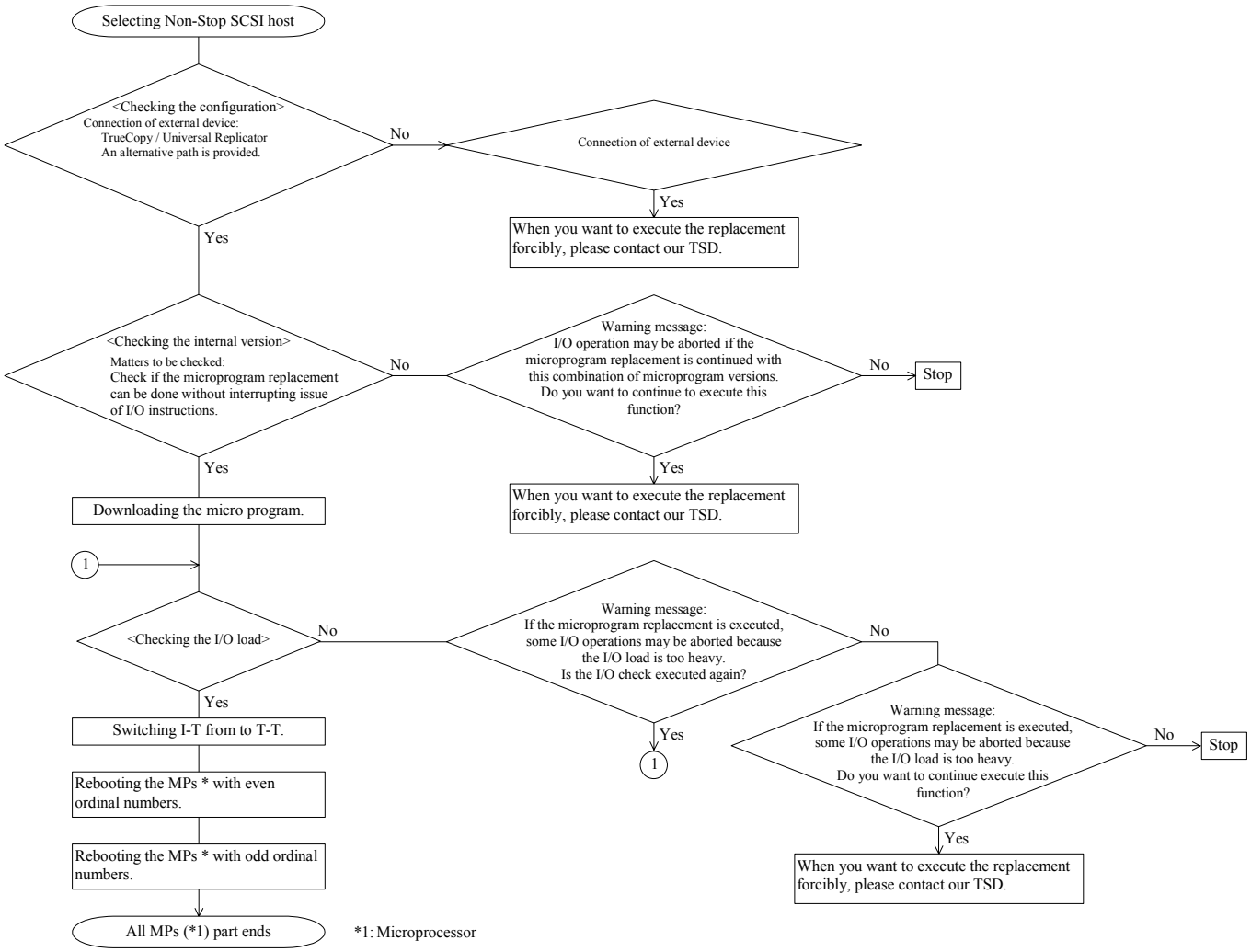
   (5) When the apparatuses of diskarray are connected by the TrueCopy / Universal Volume Manager / Universal Replicator function, do not carry out micro exchange or the apparatuses of diskarray simultaneously.

For the procedure of microprogram exchange, see MICRO04-30.
After the microprogram exchange, confirm the status as described in MICRO10-40.

*1: This operation is to issue a warning when the operation rates of the microprocessors, which concern the I/O takeover, for five minutes before the microprogram exchange exceeds 50 percents.
Make sure that the operation rates of the processors shown in the figure on page MICRO10-10 is not higher than 50 percent using the SVP monitor before executing the microprogram exchange.

*2: Please wait for the operating rate to lower, and select re-execution of processing if it becomes an error because of the check on operating rate.
When operating rate of the processor is high, it becomes an error again.

10.4 Flowchart of Microprogram Replacement

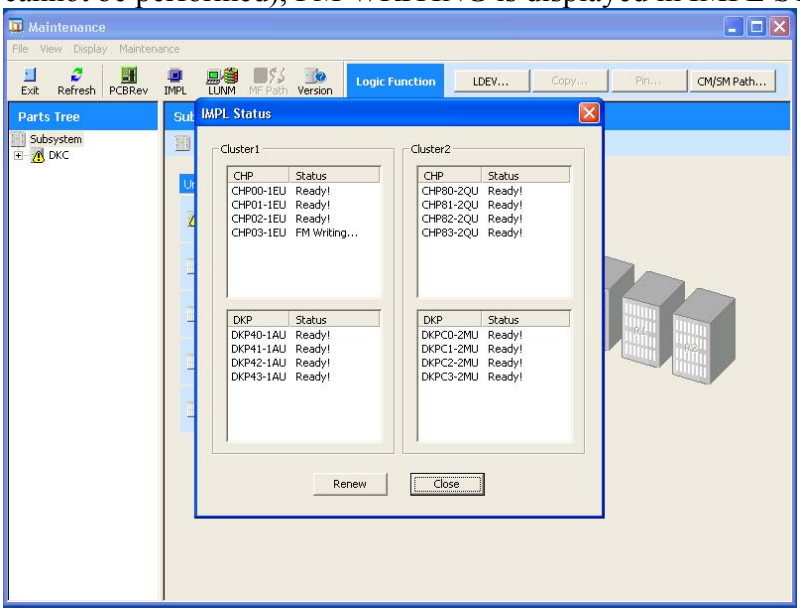


10.5 Notes on Hot Replacement of the Microprogram

After the microprogram has been exchanged in the NON STOP SCSI mode, STOP SCSI mode and Alternate SCSI mode, the microprogram is written to the flash memory for each package. It takes approximately 20 minutes.
Therefore, the following maintenance operations cannot be performed until the microprogram is completely written to the flash memory.

- CHF PCB replacement (Including Multi PCB replacement)
- CHF PCB installation
- Microprogram exchange
  (Including other modes, such as the Alternate Path, STOP SCSI, OFFLINE mode)
- Blocking of Cluster

The maintenance operations that cannot be performed are shown in the panel below.
When the microprogram is being written to the flash memory (when the maintenance operations cannot be performed), FM WRITING is displayed in IMPL STATUS.



NonStopSCSI	STOP SCSI	Alternate SCSI
The microprogram is being written to the flash memory with I/O background.	The microprogram is being written to the flash memory with I/O background.	The microprogram is being written to the flash memory with I/O background.

11. Procedures for online microprogram exchange and CHF replacement using alternate path

11.1 Outline

The alternate path function enables a microprogram exchange and a CHF replacement without stopping an I/O operation of the host connected to the CHF (that is, online exchange/replacement).

11.2 Prior confirmation of alternate path

An alternate path must be correctly established and the path switching must function at the time of exchange/replacement in order to exchange a microprogram or replace the CHF during the online operation. Confirm the path state by asking an SE concerned or a customer.
See “Procedures for Confirming Alternate Path State and Recovering It” shown in Table 11.5-1.

11.3 Types of microprogram exchange

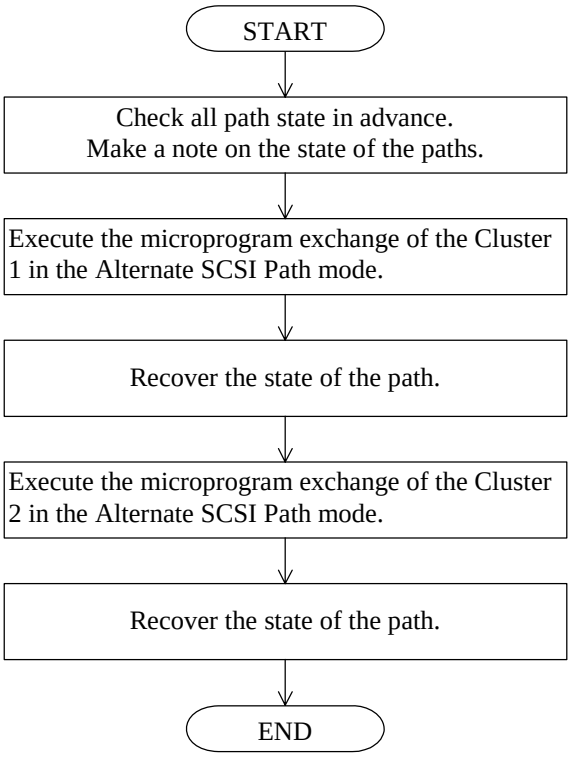
HP-UX, Solaris, AIX, Windows2000/2003 and RedHat Linux: Alternate SCSI Path mode

11.4 Restrictions

(1) Check that the alternate path is correctly set.
(2) Online exchange/replacement is possible when both primary and alternate paths are normal. If the path state is abnormal, recover it to be normal, then perform the online exchange/replacement.
(3) An alternate path function cannot be used with respect to HMDE volume.
Disable I/Os to the HMDE volume concerned when exchanging a microprogram or replacing the CHF.
(4) Disable I/Os to the LDEV for which the alternate path is not set.
(5) The microprogram exchange on HP-UX, Solaris, AIX, Windows2000/2003 and RedHat Linux is executed in the Alternate SCSI Path mode. When these coexist on the same DKC, determine the mode to be the Alternate SCSI Path mode in which to exchange a microprogram, and disable I/Os of a platform in the other mode before exchanging a microprogram.
(6) In the case of the Dual Active configuration, a load may concentrate on one of the two paths during the microprogram exchange or CHF replacement. Take preventive measures against it such as to choose a period (time zone) when the host load is low to perform the online exchange/replacement.
(7) When RAID Manager is used with Windows OS's Path Manager, the alternate path can't work. So RAID Manager must be shutdown during microprogram exchange.

11.5 Procedures for online microprogram exchange and CHF replacement

(1) Procedures for microprogram exchange executed on HP-UX, Solaris, AIX or Windows 2000/2003, RedHat Linux

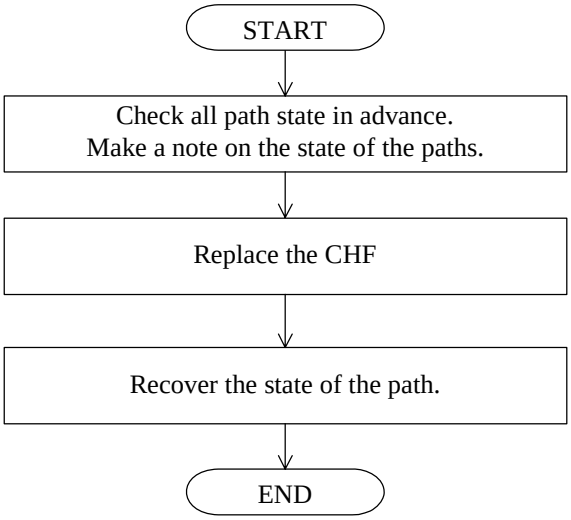


For the confirmation procedure, see Table 11.5-1.

For the recovery procedure, see Table 11.5-1.

For the recovery procedure, see Table 11.5-1.

(2) Procedures for CHF replacement executed on Solaris, AIX or Windows 2000/2003, RedHat Linux



For the confirmation procedure, see Table 11.5-1.

For the recovery procedure, see Table 11.5-1.

Table 11.5-1 Procedures for Confirming and Recovering Alternate Path State (1/8)

No.	Platform	Alternate path state confirmation procedure	Recovery procedure
1	HP	Display and confirm the path states (Pstates) of all the devices (LUs) by the “vgdisplay-v” command. If “PV Name” is displayed as Alternate Link, the path has been switched to the alternate path. ○When the primary path is switched, the following message is output. (1) Path failover vmunix: SCSI: Async write error – vmunix: SCSI: Read error -- vmunix: LVM: Performed aswitch for LUN ID… vmunix: LVM: Recoverd Path… vmunix: LVM: vg[18]: pvnum=1 is PO WERFAILED (2) Path failback vmunix: LVM: Restored PV 0 to VG 19	Automatic recovery Display and confirm the path states (Pstates) of all the devices (LUs) by the “vgdisplay-v” command.

Table 11.5-1 Procedures for Confirming and Recovering Alternate Path State (2/8)

No.	Platform	Alternate path state confirmation procedure	Recovery procedure
1	HP	[HDLM] Confirm the states of all adapters by using the "dlnkmgr view –path" command. Perform one of the following operations depending on the Adapter State. • All ONLINE: All paths are in use. It is possible to exchange microprogram or replace CHF. • All OFFLINE: The path is faulty. Recover the path failure, then set the path online according to the Recovery procedure. ○Perform one of the following operations depending on the path state. (1) Path failover dlmmgr:KAPL08019-E The path detected an error. dlmmgr: KAPL08022-E A path error occurred. (2) Path failback 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 replacement of the microprogram of one of the clusters. Step ②: Make sure of a number of the adapter that is offline using the "dlnkmgr view-path" command. Step ③: Execute the "dlnkmgr online -pathid x-s" command. (As for the command name above, x is a number of the adapter for which the microprogram is to have been replaced.) Step ④: Make sure that statuses of all the adapters have been returned to online using the "dlnkmgr view-path" command. Execute the Steps ① to ④ for the cluster on the opposite side. • All the adapters are online ... All paths are usable. • All the adapters are offline ... A status in which a failure has occurred in the path. Execute the procedure over again from Step ① after the microprogram or the CHF is replaced and the path is recovered from the failure, or execute the procedure over again from Step ① after the path is recovered from the failure.

Table 11.5-1 Procedures for Confirming and Recovering Alternate Path State (3/8)

No.	Platform	Alternate path state confirmation procedure	Recovery procedure
2	Solaris	[VxVM DMP] Display and confirm the path states of all the devices (LUs) by the "vxdisk list *diskxx*" or "vxdisk list *cxtxdxsx*" command of VxVM. Perform one of the following operations depending on the path state. • Disabled: The path is faulty. (Or, after the microprogram exchange or CHF replacement, the path concerned has not been recovered yet.) After recovery, check it again according to this procedure. • Enabled: After recording this state, execute the microprogram exchange or CHF replacement. Note: If there is at least one failed path, do not execute the online microprogram exchange or CHF replacement. Be sure to execute the exchange or replacement after recovering the failure. ○Perform one of the following operations depending on the path state. (1) Path failover vxdmp: Path failure on 32/0x17dd4 vxvm:vxdmp: disabled path 32/0x17dd0 belonging to the dmpnode 106/0x20 (2) Path failback vxvm:vxdmp: enabled path 32/0x17db8 belonging to the dmpnode 106/0x8	[VxVM DMP] Step ①: Enable the path, which has been disabled from being used, to be used with the "vxdmpadm ctlr = cx (cx: Controller number)" command. Step ②: Make sure that all the devices are enabled to be used (in the default status) with the "vxdisk list diskxx" or "vxdisk list cxtxdxsx" command. If the path(s) disabled from being used remains, execute the procedure over again from Step ①.

Table 11.5-1 Procedures for Confirming and Recovering Alternate Path State (4/8)

No.	Platform	Alternate path state confirmation procedure	Recovery procedure
2	Solaris	[SUN StorEdge Traffic Manager (MpxIO)] Display and confirm the path states of all the devices (LUs) by the “display /dev/rdsk/ cxtxdxsx ” • ONLINE: All paths are in use. It is possible to exchange microprogram or replace CHF. • OFFLINE: The path is faulty. Recover the path failure, then set the path online according to the Recovery procedure. ○Perform one of the following operations depending on the path state. (1) Path failover e4500-2 SCSI transport failed: reason ‘aborted’: retrying command mpxio:⋯ “device name” multipath status: degraded, path ⋯ to target address: WWN,6 is offline (2) Path failback multipath status: optimal, path ⋯ to target address: WWN,7 is online	[SUN StorEdge Traffic Manager (MpxIO)] Automatic recovery luxadm display /dev/rdsk/ cxtxdxsx

Table 11.5-1 Procedures for Confirming and Recovering Alternate Path State (5/8)

No.	Platform	Alternate path state confirmation procedure	Recovery procedure
2	Solaris	[HDLM] Confirm the states of all adapters by using the "dlnkmgr view –path" command. Perform one of the following operations depending on the Adapter State. • All ONLINE: All paths are in use. It is possible to exchange microprogram or replace CHF. • All OFFLINE: The path is faulty. Recover the path failure, then set the path online according to the Recovery procedure. ○Perform one of the following operations depending on the path state. (1) Path failover dlmmgr:KAPL08019-E The path detected an error. Dlmmgr: KAPL08022-E A path error occurred. (2) Path failback 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 replacement of the microprogram of one of the clusters. Step ②: Make sure of a number of the adapter that is offline using the "dlnkmgr view-path" command. Step ③: Execute the "dlnkmgr online -pathid x-s" command. (As for the command name above, x is a number of the adapter for which the microprogram is to have been replaced.) Step ④: Make sure that statuses of all the adapters have been returned to online using the "dlnkmgr view-path" command. Execute the Steps ① to ④ for the cluster on the opposite side. • All the adapters are online ... All paths are usable. • All the adapters are offline ... A status in which a failure has occurred in the path. Execute the procedure over again from Step ① after the microprogram or the CHF is replaced and the path is recovered from the failure, or execute the procedure over again from Step ① after the path is recovered from the failure.

Table 11.5-1 Procedures for Confirming and Recovering Alternate Path State (6/8)

No.	Platform	Alternate path state confirmation procedure	Recovery procedure
3	Windows 2000/ 2003	[HDLM] Confirm the states of all adapters by using the "dlnkmgr view –path" command. Perform one of the following operations depending on the Adapter State. • All ONLINE: All paths are in use. It is possible to exchange microprogram or replace CHF. • All OFFLINE: The path is faulty. Recover the path failure, then set the path online according to the Recovery procedure. ○Perform one of the following operations depending on the path state. (1) Path failover dlmmgr : KAPL08019-E The path detected an error. Dlmmgr : KAPL08022-E A path error occurred.	[HDLM] Step ①: Perform the replacement of the microprogram of one of the clusters. Step ②: Make sure of a number of the adapter that is offline using the "dlnkmgr view-path" command. Step ③: Execute the "dlnkmgr online -pathid x-s" command. (As for the command name above, x is a number of the adapter for which the microprogram is to have been replaced.) Step ④: Make sure that statuses of all the adapters have been returned to online using the "dlnkmgr view-path" command. Execute the Steps ① to ④ for the cluster on the opposite side. • All the adapters are online ... All paths are usable. • All the adapters are offline ... A status in which a failure has occurred in the path. Execute the procedure over again from Step ① after the microprogram or the CHF is replaced and the path is recovered from the failure, or execute the procedure over again from Step ① after the path is recovered from the failure.

Table 11.5-1 Procedures for Confirming and Recovering Alternate Path State (7/8)

No.	Platform	Alternate path state confirmation procedure	Recovery procedure
4	AIX	[HDLM] Confirm the states of all adapters by using the "dlnkmgr view –path" command. Perform one of the following operations depending on the Adapter State. • All ONLINE: All paths are in use. It is possible to exchange microprogram or replace CHF. • All OFFLINE: The path is faulty. Recover the path failure, then set the path online according to the Recovery procedure. ○Perform one of the following operations depending on the path state. (1) Path failover Link Failure Software Program Error Disk Operation Error	[HDLM] Step ①: Perform the replacement of the microprogram of one of the clusters. Step ②: Make sure of a number of the adapter that is offline using the "dlnkmgr view-path" command. Step ③: Execute the "dlnkmgr online -pathid x-s" command. (As for the command name above, x is a number of the adapter for which the microprogram is to have been replaced.) Step ④: Make sure that statuses of all the adapters have been returned to online using the "dlnkmgr view-path" command. Execute the Steps ① to ④ for the cluster on the opposite side. • All the adapters are online ... All paths are usable. • All the adapters are offline ... A status in which a failure has occurred in the path. Execute the procedure over again from Step ① after the microprogram or the CHF is replaced and the path is recovered from the failure, or execute the procedure over again from Step ① after the path is recovered from the failure.

Table 11.5-1 Procedures for Confirming and Recovering Alternate Path State (8/8)

No.	Platform	Alternate path state confirmation procedure	Recovery procedure
5	RedHat Linux	[HDLM] Confirm that Auto failback mode is set to ON by using the “dlnkmgr view –afb” command. Confirm the states of all adapters by using the “dlnkmgr view –path” command. Perform one of the following operations depending on the Adapter State. • All ONLINE: All paths are in use. It is possible to exchange microprogram or replace CHF. • All OFFLINE: The path is faulty. Recover the path failure, then set the path online according to the Recovery procedure. ○Perform one of the following operations depending on the path state. (1) Path failover 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) Path failback 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: Perform the replacement of the microprogram of one of the cluster. Step ②: Make sure of a number of the adapter that is offline using “dlnkmgr view –path” command. Step ③: Execute the “dlnkmgr online –path” command. Step ④: Make sure that statuses of all adapters have been returned to online using “dlnkmgr view –path” command. • All the adapters are online ... All paths are usable. • All the adapters are offline ... A status in which a failure has occurred in the path. Execute the procedure over again from Step ① after the microprogram or the CHF is replaced and the path is recovered from the failure, or execute the procedure over again from Step ① after the path is recovered from the failure.