Disk Array management program (for CLI) User's Guide

Considerations
Before using this Disk Array management program, read safety instructions described in this guide carefully. Be sure to observe precautions in individual chapters. Keep this guide at hand for reference at any time.

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Preface

This guide describes the operation to execute the configuration setting and display, information display, and error monitoring of the Hitachi disk array units (DF350, DF350F, DF400, and DF500, collectively called the array unit below) using the Disk Array management program (called the manager below).

For the specifications of the array unit, see the guide attached to the array unit.

This guide is common to the product and bundle versions of the Manager. If you use the bundle version of the Manager, some functions are not available. The unavailable functions are displayed in a shaded background in the table of contents and a list of functions.

Notes on use:

- This guide is intended for system administrators responsible for operation of systems including array units, system engineers for construction of systems including array units, and customer support engineer for maintenance of array units.
- When using the manager, be sure to read this guide and understand the operating procedures and instructions described herein thoroughly before starting your operation. Understand, in particular, the descriptions in the Chapter **Safety Precautions** thoroughly and follow the instructions in this guide.
- The user is presupposed to have thorough knowledge of the basic operation of Windows, Solaris, IRIX, and HP-UX.
- “Windows 95”, “Windows 98”, Windows 2000, and “Windows NT Version 4.0” are abbreviated to “Windows” in the guide.

Safety Precaution

When using this manager, read the following notes carefully, and follow the instructions to operate the manager.

Precautions before starting your operation

- Do not operate an array unit except system administrators responsible for operation of systems including array units, system engineers for construction of systems including array units, and qualified service personnel for maintenance of array units.
- Read and understand this guide thoroughly before starting your operation.
- The following attention mark heading appears in this guide to indicate a safety precaution.

CAUTION :

Indicates a potentially serious situation which, if continuing operation with negligence of the instructions where this alert appears, can cause loss of the user data stored in the Hitachi disk array subsystem. Be sure to read the instructions described in a precaution item carefully and follow them to start your operation.

Cautions while starting your operation

- While operating the manager, the contents of an error, which occurs in an array unit, may be displayed as an error message. In this case, read the user's guide or maintenance manual to look up action on the error message and handle the error according to the action.
- When performing operations in this guide with a caution attention mark indicated, be sure to read precautions before starting the operation, and follow them to operate.

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Chapter 1 Outline

1.1 Outline

The manager is a summary of the commands (to execute in line mode) for the sake of managing the array unit, referring to its status and setting its configuration, etc. The user operates these commands in a prompt state by selecting a command having the function appropriate for a user's purpose.

1.2 Notes on Using the Manager

When using this manager, take the following considerations.

CAUTION

- When using the manager on "RS232C connection", the "ERROR INF" (a function to specify an error information transfer mode to the RS232C) must be set to "OFF" (suspension of an error information transfer) by means of the system parameters setting function of the array unit.
  (The "ERROR INF" is set to "OFF" when shipped from the factory.) Otherwise, it may be caused that the manager fails to be connected to the array unit or that functions of the manager end abnormally.
- Regarding the functions to be executed by the manager, some are available and others are not available during an on-line. For details, see chapter 2.
  For a case of high I/O load, functions that are available in the on-line might cause a command time-out in the host or a recovering fault in the manager. A use during off-line is recommended.
- A logical unit, at least, must be in the array unit, to make available all of manager functions. If no logical unit are in the array unit, some functions selected can not be operated.
- The manager can operate up to 1,024 array units. When setting configuration (setting of RAID groups, logical units, etc.), set the controllers one by one, after quitting the device status failure monitoring.
- When the PC enters the suspension status during operation while the manager, the manager may not operate correctly after the PC is released from the suspension status. When you operate the manager, set the power management of the PC so that the PC should not enter the suspension status.

- When the manager is in operation, it may hang up in the following cases. If the manager hangs up, terminate it forcibly and check the array unit status and the connection status of RS232C or LAN. Then, boot up the manager once again. And start the manager again after you finish other application.
  - In case that the communication with the connected array unit fails due to controller blockage, array unit failure, or disconnected LAN connection, etc., or in case that the array unit receives a Reset/LIP from the host.
  - Other application works at the same time, and a CPU use rate is high.

- If you use the manager together other programs for one array unit, the following restrictions are placed.

Table 1.2.1 List of restrictions on the using of programs concurrently for one array unit

No.	Program name	1	2	3	4	5	6	7
1	Disk Array management program (LAN)	×	Δ	×	Δ	×	○	○
2	Disk Array management program (RS232C connection)	Δ	×	Δ	×	Δ	○	○
3	Disk Array utility (LAN)	×	Δ	×	Δ	×	○	○
4	Disk Array utility (RS232C connection)	Δ	×	Δ	×	Δ	○	○
5	Disk Array utility for Web	×	Δ	×	Δ	×	○	○
6	SNMP Agent Support Function	○	○	○	○	○	○	○
7	DF500-built-in Web Server Function	○	○	○	○	○	○	○

○: Concurrent use allowed

×: Concurrent use not allowed (operations performed with a program terminate abnormally)

Δ: Configuration in which concurrent use is allowed, but which is not recommended

If you run a combination of programs of which concurrent use is not allowed, when a program with a usage restriction placed on it has been started, start another program of the combination after terminating the running program. On how to operate other programs, refer to their respective user's guides provided with the program products.

- If any array unit failure is detected, contact with maintenance personnel.

1.3 Operating Environments

The manager is operated by connecting between the array unit and a LAN or RS232C.
When a LAN is connected, the machine (PC, UNIX server/workstation,
SGI server/workstation, or HP server/workstation) to install the manager are connected to the network and must be in correct operation.
When an RS232C is connected, the machine to install the manager require the correct operation of the RS232C port.

- PC
  - Windows 95, Windows 98, Windows 2000, or Windows NT 4.0
  - CPU: Pentium
  - Memory: 16 M byte or more is recommended.
  - Disk capacity: 7.5 M byte max.
  - Network adapter

- SUN server/workstation
  - Solaris 2.6, 2.7, 2.8
  - CPU: UltraSPARC or more is recommended.
  - Memory: 16 M byte
  - Disk capacity: product version 13.5 M byte max, bundle version 8.5 M byte max.
  - Network adapter

- SGI server/workstation
  - IRIX 6.4, 6.5
  - CPU: R10000 or more is recommended.
  - Memory: 16 M byte
  - Disk capacity: product version 23.5 M byte max, bundle version 13.5 M byte max.
  - Network adapter

- HP server/workstation
  - HP-UX 10.20, 11.0
  - CPU: HA8000 or more is recommended.
  - Memory: 16 M byte
  - Disk capacity: product version 14.5 M byte max, bundle version 9 M byte max.
  - Network adapter

- RS232C connection
  - Serial port

    baud rate: 9600

    data bit: 8

    parity: non

    stop bit: 1

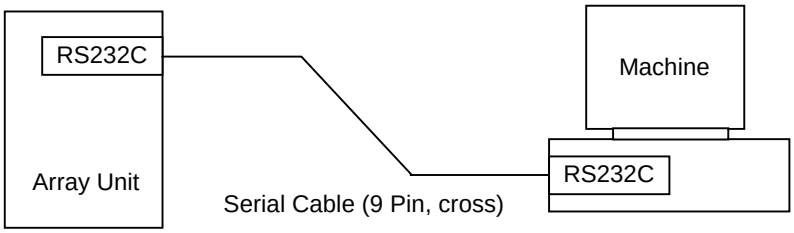
    flow control: non
  - Serial cable (9 pin, cross) for RS232C connection : 1 cable/controller

- LAN connection
  - In cases in which the array unit and the machine are connected directly, use 10BaseT/100BaseT (for the case of DF500) cable (cross) or twisted pair cable (cross). In case in which the array unit and machine are connected through a hub, use 10BaseT/100BaseT (for the case of DF500) cable or twisted pair cable.

1.4 Connection

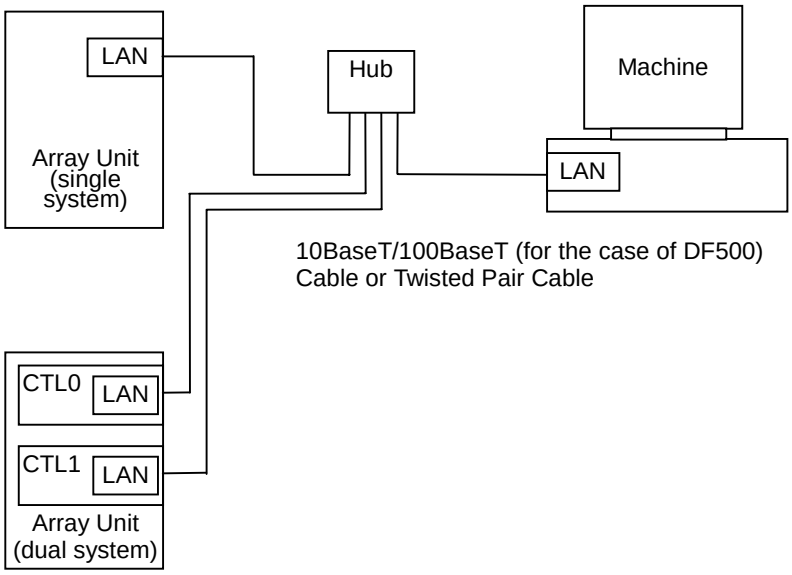
An example of connection between the machine that installed the manager and the array unit is shown in the following drawing.

- RS232C connection



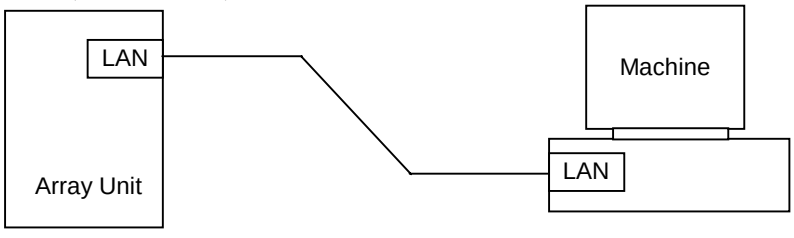
Note: In the dual system where two RS232C ports are in the machine, connect the RS232C to both of controller 0 and controller 1.

- LAN (with a Hub)



Note: When the array unit has been already LAN connected, connect the machine through the same LAN.

- LAN (without Hub)



10BaseT/100BaseT (for the case of DF500)
Cable (cross) or Twisted Pair Cable (cross)

1.5 Installing the manager

The procedures for installing and uninstalling the manager are described below.

1.5.1 Installing the manager

Installs the manager by the following procedure.

1.5.1.1 Windows

1. Start the PC, then boot up Windows.
2. Executes the setup.exe in the CLI directory of the provided CD-R.
3. Upon completion of executing the startmgr.bat (a batch file used to start the manager), a prompt screen will be displayed. Executes commands on the displayed screen.
   Or a prompt screen is displayed, the program moves to a directory in which the manager has been installed, and after the following are executed, executes commands.

   set CMDF_ROOT_DIR_PATH=.

   set LANG=ja

Note :When executing commands from other than a directory in which the manager has been installed, edits the CMDF_ROOT_DIR_PATH environment variable of the startmgr.bat in the developed file. Sets up the install directory of the manager in the CMDF_ROOT_DIR_PATH environment variable. However, if the LANG environment variable is not specified, the manager operates in English language mode.

Example : If the manager has been installed in C:\damp.
set CMDF_ROOT_DIR_PATH=C:\damp
set LANG=ja
command.com

1.5.1.2 Solaris

1. Start the SUN server/workstation.
2. Create a new directory (example: /usr/damp) for installing the manager. Copy the ArrayManage-xSxxx-CLI.tar file in the supplied CD-R to the directory created in the hard disk. (The portion xSxxx of file names varies with the version of the Manager, etc.)
3. The ArrayManage-xSxxx-CLI.tar file is a Tar format file. Expand the file referring to the example. If the directory described below is present, develop in another directory.

   Example: tar xvf ArrayManage-xSxxx-CLI.tar

   When setting /usr/damp for the install directory, the following file structure is developed.

   ```
   /usr/damp/          : command and message file of manager
         |
         |
         └──── /lib/   : common library used when running manager
   ```

4. Adds a path to the common library to the LD_LIBRARY_PATH environment variable. Example when setting DFHOME for the install directory

   If the LD_LIBRARY_PATH environment variable not yet defined (example of C shell) :

   ```
   % setenv  LD_LIBRARY_PATH  ${DFHOME}/lib
   ```

   If the LD_LIBRARY_PATH environment variable already defined (example of C shell) :

   ```
   % setenv  LD_LIBRARY_PATH  $LD_LIBRARY_PATH:${DFHOME}/lib
   ```

5. Sets up a path to the directory, in which the manager has been installed, in the CMDF_ROOT_DIR_PATH environment variable.

   Example: when setting DFHOME for the install directory (example of C shell) :

   ```
   % setenv  CMDF_ROOT_DIR_PATH  ${DFHOME}
   ```

   It is recommended that statements 4 and 5 should be described in the initial setting file (in the case of C shell : log in) of log in shell, of a user who uses the manager.

6. Logs in again.

1.5.1.3 IRIX

1. Start the SGI server/workstation.
2. Create a new directory (example: /usr/damp) for installing the manager. Copy the ArrayManage-xIxxx-CLI.tar file in the supplied CD-R to the directory created in the hard disk. (The portion xIxxx of file names varies with the version of the Manager, etc.)
3. The ArrayManage-xIxxx-CLI.tar file is a Tar format file. Expand the file referring to the example. If the directory described below is present, develop in another directory.

   Example: tar xvf ArrayManage-xIxxx-CLI.tar

   When setting /usr/damp for the install directory, the following file structure is developed.

   ```
   /usr/damp/          : Command and message file of manager
          |
          |
          └── /lib/    : Common library used when running manager
   ```

4. Adds a path to the common library to the LD_LIBRARY_PATH environment variable. Example when setting DFHOME for the install directory

   If the LD_LIBRARY_PATH environment variable not yet defined (example of C shell) :

   ```
   % setenv  LD_LIBRARY_PATH  ${DFHOME}/lib
   ```

   If the LD_LIBRARY_PATH environment variable already defined (example of C shell) :

   ```
   % setenv  LD_LIBRARY_PATH  $LD_LIBRARY_PATH:${DFHOME}/lib
   ```

5. Sets up a path to the directory, in which the manager has been installed, in the CMDF_ROOT_DIR_PATH environment variable.

   Example: when setting DFHOME for the install directory (example of C shell) :

   ```
   % setenv  CMDF_ROOT_DIR_PATH  ${DFHOME}
   ```

   It is recommended that statements 4 and 5 should be described in the initial setting file (in the case of C shell : log in) of log in shell, of a user who uses the manager.

6. Logs in again.

1.5.1.4 HP-UX

1. Start the HP server/workstation.
2. Create a new directory (example: /usr/damp) for installing the manager. Copy the ArrayManage-xHxxx-CLI.tar file in the supplied CD-R to the directory created in the hard disk. (The portion xHxxx of file names varies with the version of the Manager, etc.)
3. The ArrayManage-xHxxx-CLI.tar file is a Tar format file. Expand the file referring to the example. If the directory described below is present, develop in another directory.

   Example: tar xvf ArrayManage-xHxxx-CLI.tar

   When setting /usr/damp for the install directory, the following file structure is developed.

   ```
   /usr/damp/          : Command and message file of manager
            |
            |
            └── /lib/   : Common library used when running manager
   ```

4. Adds a path to the common library to the SHLIB_PATH environment variable. Example when setting DFHOME for the install directory

   If the SHLIB_PATH environment variable not yet defined (example of C shell) :

   ```
   % setenv  SHLIB_PATH  ${DFHOME}/lib
   ```

   If the SHLIB_PATH environment variable already defined (example of C shell) :

   ```
   % setenv  SHLIB_PATH  $SHLIB_PATH:${DFHOME}/lib
   ```

5. Sets up a path to the directory, in which the manager has been installed, in the CMDF_ROOT_DIR_PATH environment variable.

   Example: when setting DFHOME for the install directory (example of C shell) :

   ```
   % setenv  CMDF_ROOT_DIR_PATH  ${DFHOME}
   ```

   It is recommended that statements 4 and 5 should be described in the initial setting file (in the case of C shell : log in) of log in shell, of a user who uses the manager.

6. Logs in again.

1.5.2 Update

Updates the manager by the following procedure. If you update, be sure to terminate the manager before starting operations.

1.5.2.1 Windows

1. Executes the setup.exe in the CLI directory of the provided CD-R.

The updated manager will be executed without restarting Windows.

1.5.2.2 Solaris

1. Copy the ArrayManage-xSxxx-CLI.tar file in the attached CD-R to the hard disk.
2. The ArrayManage-xSxxx-CLI.tar file is a Tar type file. Open the file as described in the following example.
   (The portion xSxxx of file names varies with the version of the Manager, etc.)

   Example : tar xvf ArrayManage-xSxxx-CLI.tar

The updated manager will be executed without restarting Solaris.

1.5.2.3 IRIX

1. Copy the ArrayManage-xIxxx-CLI.tar file in the attached CD-R to the hard disk.
2. The ArrayManage-xIxxx-CLI.tar file is a Tar type file. Open the file as described in the following example.
   (The portion xIxxx of file names varies with the version of the Manager, etc.)

   Example : tar xvf ArrayManage-xIxxx-CLI.tar

The updated manager will be executed without restarting IRIX.

1.5.2.4 HP-UX

1. Copy the ArrayManage-xHxxx-CLI.tar file in the attached CD-R to the hard disk.
2. The ArrayManage-xHxxx-CLI.tar file is a Tar type file. Open the file as described in the following example.
   (The portion xHxxx of file names varies with the version of the Manager, etc.)

   Example : tar xvf ArrayManage-xHxxx-CLI.tar

The updated manager will be executed without restarting HP-UX.

1.5.3 Uninstalling

Uninstalls the manager by the following procedure.

1.5.3.1 Windows

1. Deletes the manager using the Add and Delete Application icon in the Control Panel.
2. Deletes the directory generated in the hard disk for installing the manager.

1.5.3.2 Solaris, IRIX, and HP-UX

1. Deletes the directory generated in the hard disk for installing the manager.
2. Deletes the statement of a path to the common library from the set contents of the LD_LIBRARY_PATH environment variable.
3. Invalidates the CMDF_ROOT_DIR_PATH environment variable.

Chapter 2 Command List

2.1 Command List

Table 2.1 shows a list of manager commands.
There are two types of manager's commands : one type is the standard command that is used in standard mode, and the other the administration command that is used in administration mode. When executing an administration command, a password must be set and entered. Of the administration commands, the commands that require password entry are shown with symbols "○" marked in the password column of Table 2.1. These commands can be either used or not during on-line. Commands that can be used during on-line are shown each with symbols "○" marked in the on-line use column in Table 2.1.
In addition, some commands, unless logging in, cannot be executed when a user ID has been registered by using the Password Protection function. The commands that require log in if a user ID has been registered are shown with symbols "○" marked in the log in column of Table 2.1.

Table 2.1 List of Manager Commands

Classification	Function	Command	On-line use	Password	Log in
Array unit registration	Referencing array unit information	auunitref	○	×	×
	Adding array unit information	auunitadd	○	×	×
	Changing array unit information	auunitchg	○	×	×
	Deleting array unit information	auunitdel	○	×	×
	Setting password	aupasswd	○	○	×
Array unit management by user ID	Setting user ID	auuidadd	○	○	○
	Changing user ID	auuidchg	○	○	○
	Deleting user ID	auuiddel	○	○	○
	Changing password	aupwdchg	○	○	○
	Logging into array unit	aulogin	○	○	×
	Logging out from array unit	aulogout	○	○	○
	Checking log in	auchkuid	○	×	○
Array unit status	Displaying microprogram revision	aurev	○	×	×
	Displaying drive configuration information	audrive	○	×	×
	Displaying cache configuration information	aucache	○	×	×
	Displaying status of power supply/fan/battery	ausupply	○	×	×
	Displaying current IP address	aucrlan	○	×	×

Portions in a shaded background of functions are not available in the bundle version.

Table 2.1 List of Manager Commands (Continued)

Classification	Function	Command	On-line use	Password	Log in
RAID /LU	Referencing RAID group	aurgref	○	×	×
	Setting up RAID group	aurgadd	○	○	○
	Expanding RAID group	aurgexp	○	○	○
	Deleting RAID group	aurgdel	×	○	○
	Referencing LU	auluref	○	×	×
	Setting up LU	auluadd	○	○	○
	Formatting LU	auformat	○	○	○
	Displaying progress of LU formatting	auformatst	○	○	×
	Expanding LU	auluexp	○	○	○
	Deleting LU	auludel	×	○	○
	Changing default controller of LU	auluchg	○	○	○
	Setting turbo LU (See Note 1.)	auturbolu	○	○	○
System parameters	Referencing/setting system parameters (See Note 1.)	ausysparam	×	○	○
	Referencing/setting RTC (See Note 1.)	aurtc	×	○	○
	Referencing/setting target information (See Note 1.)	autarget	○	○	○
	Referencing/setting LAN information (See Note 1.)	aulan	○	○	○
	Referencing/setting SCSI transfer rate (See Note 1.)	ausync	○	○	○
	Referencing/setting port option	auportop	○	○	○
	Referencing/setting target information during on-line	auontarget	○	○	○
Setting up configuration	Referencing/setting fibre channel information	aufibre aufibrel	×	○	○
	Spare HDU setup	auspare	○	○	○
	Fee-Basis option reference/setup	auopt	○	○	○
	Referencing/setting drive restoration control information	audrecopt	×	○	○
	Referencing/setting online verify information	auonlineverify	×	○	○

Portions in a shaded background of functions are not available in the bundle version.

Table 2.1 List of Manager Commands (Continued)

Classification	Function	Command	On-line use	Password	Log in
Setting up configuration	Referencing/setting MRCF-Lite information	aumrcfdev	○	○	○
	Displaying coupled- LU of the MRCF-Lite	aumrcfluc	○	○	○
File output of the RAID/LU configuration information	File output of the RAID/LU configuration information and component conditions	auconfigout	○	×	×
RAID/LU configuration setup in file	RAID/LU configuration setup from file	auconfigset	○	○	○
File output of system parameters	File output of system parameters	ausyspout	○	×	×
System parameters setup in file	System parameters setup from file	ausyspset	○	○	○
Microprogram replacement	Downloading/replacing microprogram	aumicro	×/○ See Note 2.	○	○
SNMP environment information	Setting SNMP environment information and outputting its file (See Note 1.)	ausnmp	×/○ See Note 3.	○	○
Displaying statistical information	Displaying statistical information	austatistics	○	×	×
Obtaining performance information	Outputting performance information file	auperform	○	×	×
Monitoring errors	Setting up E-Mail reports	aumail	○	×	×
	Setting the starting of application	auextprog	○	×	×
	Monitoring errors	auerroralert	○	×	×

Note 1: Set items do not become effective unless restarting the array unit.

Note 2: When connecting the DF400, the function is available during on-line.

Note 3: When connecting the DF350, the function is available during on-line.

Commands that require log in, if reference is specified by the option, can be executed without logging in.

Portions in a shaded background of functions are not available in the bundle version.

2.2 Applying Support Functions of Microprograms

Functions of the manager may be disabled depending on the revision number of the microprogram of the array unit connected. Table 2.2 shows the revision numbers of the microprogram which support the manager functions and the manager operations when the microprogram does not support the manager functions.

Table 2.2 Microprogram Revision Numbers and Their Supports for Manager Functions

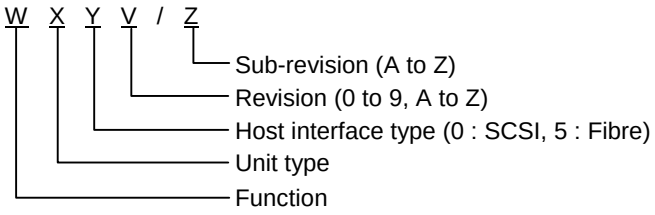
No.	Function	Revision Nos. of microprogram which support the manager			Remarks
		DF350/DF350F	DF400	DF500	
1	Current IP address display	Not supported	0404, 4404, 0454, 4454, or later respectively	All	
2	RAID group expansion	All	All	0552, or later respectively	
3	LU expansion				
	LU formatting : (Single)	0304, 1304, 4304, 0354, 4354, or later respectively		All	
	LU formatting : (Multi)	Not supported	0406, 4406, 0456, 4456, or later respectively		
	Setting of TURBO LU Assignment		0404, 4404, 0454, 4454, or later respectively	0552, or later respectively	
4	Setting and display of the Fibre Channel information		0450, 4450, or later respectively	All	
5	Referencing/ setting system parameters		0406, 4406, 0456, 4456, or later respectively		
6	Setting target information	0304, 1304, 4304, or later respectively	All		DF350F is not supported.
7	Setting spare disk	Not supported	Not supported		
8	Setting LAN information	0307/P, 4307/P, or later respectively	0401/A, 4401/A, 0451/A, 4451/A, or later respectively		DF350F is not supported.
	DHCP mode setting	Not supported	0404, 4404, 0454, 4454, or later respectively		
9	SCSI transfer rate setting		All	0503, or later	

Table 2.2 Microprogram Revision Numbers and Their Supports for Manager Functions

(Continued)

No.	Function	Revision Nos. of microprogram which support the manager			Remarks
		DF350/DF350F	DF400	DF500	
10	Setting drive restoration control information Interleave (priority mode)	Not supported	0406, 4406, 0456, 4456, or later respectively	All	
11	Dynamic sparing setting	0304,1304, 4304, 0354, 4354, or later respectively	All		
12	Microprogram replacement	All	0404, 4404, 0454, 4454, or later respectively		DF350F is not supported.
13	Setting SNMP environment information and outputting its file	4307/P or later	4406, 4456, or later respectively		DF350F is not supported.
14	Array unit management by user ID	Not supported	040A, 440A, 045A, 445A, or later respectively (Revision of flash program: B15 or later)	0552, or later	
15	Instruction to reboot				
16	Fee-Basis option setup		Not supported	All	

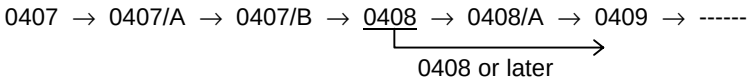
Note: Revision numbers of the microprogram are classified as shown below according to the function of the array unit.



- Host interface : SCSI
  - **030V (030V/Z):** Version for the DF350 single/dual system used in the open system
  - **130V (130V/Z):** Version for the DF350 single/dual system used in the open system and connected to the AS/400
  - **430V (430V/Z):** Version for the DF350 single/dual system used in the open system and supports the SNMP
  - **040V (040V/Z):** Version for the DF400 single/dual system used in the open system
  - **440V (440V/Z):** Version for the DF400 single/dual system used in the open system and supports the SNMP

- Host interface : Fibre Channel
  - **035V (035V/Z):** Version for the DF350F single/dual system used in the open system
  - **435V (435V/Z):** Version for the DF350F single/dual system used in the open system and supports the SNMP
  - **045V (045V/Z):** Version for the DF400 single/dual system used in the open system
  - **445V (445V/Z):** Version for the DF400 single/dual system used in the open system and supports the SNMP
  - **055V (055V/Z):** Version for the DF500 single/dual system used in the open system

Update of revision is made for each of nine revisions listed above. An example is shown below.



Sub-revision is updated in alphabetic order, however, some sub-revisions may be skipped.

Chapter 3 Command Specifications

3.1 Command Format

The command format of the manager is specified with a command name and succeeding options as shown in Figure 3.1. When specifying multiple options, the order in which options are specified does not matter. In addition, options may be omitted depending the kind of commands.

```
Command  Option 1  Option 2  Option 3 ……
```

Figure 3.1 Command Format of Manager

Commands of the manager are classified mainly into the standard command and the administrator command. The following describes specifications of each type of commands.

3.1.1 Standard command

The standard command is a command used mainly for reference. Figure 3.2 and Figure 3.3 show the formats of the standard command. When executing a standard command, the execution result will be displayed following its execution. If an error is detected in specification of options or while processing, you are notified of an error message.

```
%Command  Option 1  Option 2 Option 3
Result
%
```

Figure 3.2 Format of Standard Command (when terminating normally)

```
%Command  Option 1  Option 2 Option 3
Error message
%
```

Figure 3.3 Format of Standard Command (when an error is detected)

3.1.2 Administration command

The administration command is a command used to setup a configuration for the array unit. Taking into consideration the integrity and security of data, this command prompts you to enter a password when executing it, and is executed if the password can be authenticated. When reference is specified by the option, a password must be also entered.
Figure 3.4 and Figure 3.5 show the formats of the administration command. When entering an administrator command, this command prompts you to enter a password following the entry. This time, when you enter a preset password, the command will be executed. When, in particular, performing operations associated with data configurations such as deletion of a RAID group or logical unit, commands prompt you to confirm whether or not to execute the function itself before entering a password (see Figure 3.5).

```
%Command  Option 1  Option 2 Option 3 ……
Password: (Entering a already-set password)
%
```

Figure 3.4 Format 1 of Administration Command

```
%Command  Option 1  Option 2 Option 3 ……
Are you executing …? (y/n [n])
Password: (Entering a already-set password)
%
```

Figure 3.5 Format 2 of Administration Command

3.1.3 Referencing command syntax

When you want to reference the syntax of a command, specify the -help option in the command, then the Usage information will be displayed, as shown in Figure 3.6.
The Usage display is the same in the description of each command as [Synopsis].

```
% auunitadd –help
Disk Array management program
Version 5.11
Copyright (C) 2000, 2001, Hitachi, Ltd.

Usage:
auunitadd  -unit unit_name [ -group group_name ]  -DF350 | -DF400 | -DF500
           -single | -dual
           -RS232C | -LAN
           [ -ctl0 device | address ] [ -ctl1 device | address ] [ -watch ]
%
```

Figure 3.6 Example of Referencing Command Syntax

3.2 Registering Array Unit

3.2.1 Displaying Registration Information

- Command name

  auunitref

- Synopsis

  auunitref [-unit unit_name]

- Description

  Displays registration information of an array unit registered in the manager.
  When omitting the option of an array unit name, displays a list of information registered in the manager.
  When specifying an array unit name for the option, displays information about a specified array unit.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit whose registration information to reference. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.

- Examples of using command

  References all registered information.

```
% auunitref
Array Unit Name Group Name Array Unit Type Error Alert Connection Mode IP Address/Host Name/Device Name
df350a                     DF350 Dual      on          LAN             192.168.33.120   192.168.33.130
df400a          hsp        DF400 Dual      on          LAN             192.168.0.50     192.168.0.51
df400a0         hsp        DF400 Single    on          LAN             192.168.0.60
df400a1         hsp        DF400 Dual      off         LAN             192.168.0.62     192.168.0.63
df400b1         hsp1       DF400 Dual      on          LAN             192.168.1.100    192.168.1.101
df400b2         hsp1       DF400 Dual      off         LAN             192.168.1.102    192.168.1.103
df400c1         hsp1       DF400 Single    off         232C            COM1
df500a1         hsp1       DF500 Dual      on          LAN             192.168.2.100    192.168.2.101
df500a2         hsp1       DF500 Dual      on          LAN             192.168.2.102    192.168.2.103
%
```

  References registration information of an array unit whose name is df500a1.

```
% auunitref  -unit df500a1
Array Unit Name Group Name Array Unit Type Error Alert Connection Mode IP Address/Host Name/Device Name
df500a1         hsp1       DF500 Dual      on          LAN             192.168.0.100    192.168.0.101
%
```

3.2.2 Registering

- Command name

  auunitadd

- Synopsis

```
auunitadd  -unit unit_name  [ -group group_name ]  -DF350 | -DF400 | -DF500
           -single | -dual
           -RS232C | -LAN
           [ -ctl0 device | address ]  [ -ctl1 device | address ]  [ -watch ]
```

- Description

  Registers an array unit into the manager. Registration information consists of an array unit name, a group name, a type, an configuration, an connection interface, and device.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit whose registration information to setup. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-group group_name	Specifies the name of a group in which multiple array units are managed all together. If this option is omitted, array units are not managed in a group all together. The maximum number of groups registered is 200. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-DF350 | -DF400 | -DF500	Specifies the type of an array unit.
-single | -dual	Specifies the configuration (single system or dual system) of an array unit.
-RS232C | -LAN	Specifies the connection interface (RS232C or LAN) to an array unit.
-ctl0 device | address	Specifies the device or address used to connect to Controller 0. If "LAN" is selected as the [connection interface], specifies an "IP address" or "host name". If "RS232C", specifies a "device name". Specifies a host name with up to 15 one-byte coded characters. Specifies a device name with a RS232C port name or a device file name. (Example : Windows - COM1, Solaris - /dev/ttya)
-ctl1 device | address	Specifies the device or address used to connect to Controller 1. If "LAN" is selected as the [connection interface], specifies an "IP address" or "host name". If "RS232C", specifies a "device name". Specifies a host name with up to 15 one-byte coded characters. Specifies a device name with a RS232C port name or a device file name. (Example : Windows - COM1, Solaris - ttya)
-watch	Specifies that an array unit registered is monitored for errors. If omitted, an array unit is not monitored for errors.

Note: In the array unit in the dual system, only one controller can be used in the LAN connection mode. **Array Unit Type** is used to select an array unit type to be connected. Specify **Controller 0 IP Address/Host Name/Device Name** and **Controller 1 IP Address/ Host Name/Device Name** for the connected controller side only.
When registering the array unit in the dual system, confirm the controller to be connected to before specifying **Controller 0 IP Address/Host Name/Device Name and Controller 1 IP Address/Host Name/Device Name**. If you specified the wrong controller, depending on the specified contents the controller configuration may be set as the opposite controller side.

- Examples of using command

  Registers an DF400 with a dual system configuration and a LAN connection interface by an array unit name of df400d1.

```
% auunitadd -unit df400d1 -DF400 -dual -LAN -ctl0 192.168.1.100 -ctl1
192.168.1.101
%
```

  Registers an DF400 with a single system configuration and an RS232C connection interface by an array unit name of df400s1, and additionally subjects it to monitoring for errors.

```
% auunitadd -unit df400s1 -DF400 -single -RS232C -ctl0 /dev/ttya -watch
%
```

  Registers a DF500 with a dual system configuration and a LAN connection interface by an array unit name of df500a1.

```
% auunitadd -unit-df500a1 -DF500 -dual -LAN -ctl0 192.168.1.100 -ctl1
192.168.1.101
%
```

3.2.3 Changing Registration Information

- Command name

  auunitchg

- Synopsis

```
auunitchg  -unit unit_name
           [ -newunit unit_name ]  [ -group group_name ]
           [ -DF350 | -DF400 | -DF500 ]  [ -single | -dual ]
           [ -RS232C | -LAN ]
           [ -ctl0 device | address ]  [ -ctl1 device | address ]
           [ -watch | -ignore ]  [ -f ]
```

- Description

  Changes registration information (array unit name, group name, type, configuration, connection interface, and device) of an already-registered array unit.
  However, items of array unit information, if their options are omitted, are not changed.

- Options

Options	Description
-unit unit_name	Specifies the name of a registered array unit. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-newunit unit_name	Specifies the array unit name to change. Specifies an array unit name after change, with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-group group_name	Specifies the group name to change. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-DF350 | -DF400 | -DF500	Specifies the type of an array unit to change.
-single | -dual	Specifies the configuration (single system or dual system) of an array unit to change.
-RS232C | -LAN	Specifies the connection interface (RS232C or LAN) of an array unit to change.
-ctl0 device | address	Specifies the device or address to change, which address is used to connect to Controller 0. If the [connection interface] is "LAN", specifies an "IP address" or "host name". If "RS232C", specifies a "device name". Specifies a host name with up to 15 one-byte coded characters. Specifies a device name with a RS232C port name or a device file name. (Example : Windows - COM1, Solaris - /dev/ttya)

(Continued)

Options	Description
-ctl1 device | address	Specifies the device or address to change, which address is used to connect to Controller 1. Specifies in the same way as for Controller 0.
-watch	Specifies that an array unit is monitored for errors.
-ignore	Specifies that an array unit is not monitored for errors.
-f	The confirmation message at command execution is omitted.

- Examples of using command

  Displays registration information of an array unit whose name is df500a1, and goes on to change it. Then, checks if changes have been made to the registration information of the array unit.

```
% auunitref  -unit df500a1
Array Unit Name Group Name Array Unit Type Error Alert Connection Mode IP Address/Host Name/Device Name
df500a1         hsp        DF500 Dual      on          232C            /dev/ttya

%
% auunitchg  -unit df500a1  -LAN  -ctl0 192.168.1.100  -ctl1 192.168.1.101
change df500a1 ? (y/n [n]): y
%
% auunitref  -unit df500a1
Array Unit Name Group Name Array Unit Type Error Alert Connection Mode IP Address/Host Name/Device Name
df500a1         hsp        DF500 Dual      on          LAN             192.168.1.100    192.168.1.101

%
```

If a specified array unit name is not yet registered, the following message is displayed.

```
% auunitchg  -unit df500b1
DMEA001003 : The specified subsystem name is not registered.
%
```

3.2.4 Deleting Registration Information

- Command name

  auunitdel

- Synopsis

  auunitdel -unit unit_name [-f]

- Description

  Deletes registration information of an already-registered array unit.

- Options

Options	Description
-unit unit_name	Specifies the name of a registered array unit whose registration information to delete. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-f	Specifies that confirmation of deletion is omitted.

- Examples of using command

  Deletes registration information of an already-registered array unit whose name is df500a1.

```
% auunitdel -unit df500a1
remove df500a1 ? (y/n [n]): y
%
```

  Checks the information registered by an array unit name that has been deleted.

```
% auunitdel -unit df500b1
DMEA001003 : The specified subsystem name is not registered.
%
```

3.2.5 Setting Password in Administration Mode

- Command name

  aupasswd

- Synopsis

  aupasswd

- Description

  Sets a new password used in administration mode to execute administration commands.
  In addition, changes an already-set password.
  If a new password is set, enters the same password twice. If changed, enters an already-set password, and then enters a new password again.

- Examples of using command

  Sets a new password used in administration mode.

```
% aupasswd
New password: (Enters a password to be set newly.)
Retype new password: (Enters the same password as above.)
%
```

  Changes a password used in administration mode.

```
% aupasswd
Old password: (Enters an already-set password.)
New password: (Enters a new password.)
Retype new password: (Enters the same password as above.)
%
```

3.3 Array Unit Management by User ID

3.3.1 Setting User ID

- Command name

  auuidadd

- Synopsis

  auuidadd -unit unit_name [-num]

- Description

  Registers a user ID and its password into an array unit. Up to 20 users can be registered. Specifies the user ID and its password individually with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of 4 to 12 characters long.
  After registering, displays the number of user IDs setup in the array unit.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit into which to register a user ID. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-num	Displays the number of already-registered user IDs.

- Examples of using command

  Adds a user ID into an array unit whose name is df400a1.

```
% auuidadd -unit df400a1
Password:
User ID for array unit : (User ID to set)
Password for array unit : (Password of a user ID to set)
Retype Password for array unit : (Same password as that of a user ID to set)
Number of registered User ID : n
%
```

  Displays the number of user IDs already-registered in an array unit whose name is df400a1.

```
% auuidadd -unit df400a1 –num
Password:
Number of registered User ID : n
%
```

3.3.2 Changing User ID

- Command name

  auuidchg

- Synopsis

  auuidchg -unit unit_name

- Description

  Changes a user ID that has been setup in an array unit.
  After changing, displays the number of user IDs setup in the array unit.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit in which to change a user ID. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.

- Examples of using command

  Changes a user ID that has been registered in an array unit whose name is df400a1.

```
% auuidchg -unit df400a1
Password:
Old User ID for array unit : (Already-set user ID)
Old Password for array unit : (Password of an already-set user ID)
New User ID for array unit : (User ID to set)
New Password for array unit : (Password of a user ID to set)
Retype New Password for array unit : (Same password as that of a user ID to
set)
Number of registered User ID : n
%
```

3.3.3 Deleting User ID

- Command name

  `auuiddel`

- Synopsis

  `auuiddel -unit unit_name`

- Description

  Deletes a user ID that has been setup in an array unit.
  After deleting, displays the number of user IDs setup in the array unit.

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit in which to delete a user ID. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.

- Examples of using command

  Deletes a user ID that has been registered in an array unit whose name is df400a1.

```
% auuiddel -unit df400a1
Password:
User ID for array unit : (Already-set user ID)
Password for array unit : (Password of an already-set user ID)
Number of registered User ID : n
%
```

3.3.4 Changing Password

- Command name

  aupwdchg

- Synopsis

  aupwdchg -unit unit_name

- Description

  Changes the password of a user ID that has been setup in an array unit.
  After changing, displays the number of user IDs setup in the array unit.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit in which to change the password of a user ID. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.

- Examples of using command

  Changes the password of a user ID that has been registered in an array unit whose name is df400a1.

```
% aupwdchg -unit df400a1
Password:
User ID for array unit : : (Already-set user ID)
Old Password for array unit : (Password of an already-set user ID)
New Password for array unit : (Password of a user ID to set)
Retype New Password for array unit : (Same password as that of a user ID to
set)
Number of registered User ID : n
%
```

3.3.5 Logging In and Forcibly Logging In to Array Unit

- Command name

  `aulogin`

- Synopsis

  `aulogin -unit unit_name [ -discon ]`

- Description

  Declares an intention to log into an array unit with a user ID registered in the array unit. This log in disables to log in with any other user ID.
  When forcibly logging into an array unit to which another user has already logged in, specifies the -discon option. When forcibly logging in, the user ID of an already logged-in user is logged out.

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit to which to log in. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
`-discon`	Specifies this option when forcibly logging into an array unit to which another user has already logged in.

- Examples of using command

  Logs in, with a registered user ID, to an array unit whose name is df400a1.

```
% aulogin  -unit df400a1
Password:
User ID for array unit : (Already-set user ID)
Password for array unit : (Password of an already-set user ID)
%
```

  Logs in, with a registered user ID, to an array unit, whose name is df400a1 and to which another user has logged in.

```
% aulogin  -unit df400a1  -discon
Password:
User ID for array unit : (Already-set user ID)
Password for array unit : (Password of an already-set user ID)
User ID (xxxxxxxxxxxx) has been logged in.
Connected with (xxx.xxx.xxx.xxx). (See Note)
Do you want to forcibly log in ? (y/n [n]): y
%
```

Note: Destination of connection is indicated as "Connected with (xxx.xxx.xxx.xxx)." (an item in parentheses is an IP address)" in the case of a connection via a LAN, or "Connected with (RS232C)." in the case of a connection via RS232C.

3.3.6 Logging Out from Array Unit

- Command name

  `aulogout`

- Synopsis

  `aulogout  -unit unit_name`

- Description

  Logs out a user ID with which a user has already logged into an array unit.

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit from which to log out. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.

- Examples of using command

  Logs out a user ID with which a user has logged into an array unit whose name is df400a1.

```
% aulogout  -unit df400a1
Password:
%
```

3.3.7 Checking Login

- Command name

  auchkuid

- Synopsis

  auchkuid -unit unit_name

- Description

  Checks the user ID and connected unit of a user who has already logged in an array unit. Information about the connected unit is an IP address for LAN connection, and "RS232C" for RS232C connection.
  This command is allowed for reference only with a user ID other than that of a user who has already logged in. Though this command is issued with the user ID of a user who has already logged in, the user information cannot be referenced.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit whose log in status to check. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.

- Examples of using command

  Checks a user ID with which a user has logged into an array unit whose name is df400a1.

```
% auchkuid -unit df400a1
User ID (xxxxxxxxxxxx) has been logged in.
Connected with (xxx.xxx.xxx.xxx). (See Note)
%
```

Note: Destination of connection is indicated as "Connected with (xxx.xxx.xxx.xxx)." (an item in parentheses is an IP address)" in the case of a connection via a LAN, or "Connected with (RS232C)." in the case of a connection via RS232C.

3.4 Displaying Array Unit Status

3.4.1 Displaying Microprogram Revision

- Command name

  aurev

- Synopsis

  ```
  aurev  -unit unit_name  [ -ctl0 | -ctl1 ]
  ```

- Description

  Displays the microprogram revision of a specified unit.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to display its microprogram revision. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-ctl0 | -ctl1	Specifies the controller No. of an array unit for which to display its microprogram revision.

- Examples of using command

  Displays the microprogram revision of an array unit whose name is df500a1.

  ```
  % aurev  -unit df500a1
  Serial Number : 0777
  Microprogram Revision : 0557
  %
  ```

3.4.2 Displaying Drive Configuration Information

- Command name

  audrive

- Synopsis

  – In the case of DF350, DF400

  ```
  audrive  -unit unit_name  -status
  ```

  – In the case of DF500

  ```
  audrive  -unit unit_name  -status [ -uno unit_no  -hno hdu_no ]
  ```

  – In the case of DF350, DF400, and DF500

  ```
  audrive  -unit unit_name  -vendor
  ```

- Description

  Displays the status and type of drives in a specified array unit.
  If an HDU on which data restoration is in progress is specified, a process of restoring is displayed.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to display its drive configuration information. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-status | -vendor	The drive information is displayed. **-status:** The drive condition is displayed. **-vendor:** The vendor ID, product ID, and revision of the mounted drive are displayed. For the DF500, the storage capacity of drives is displayed.

For the exclusive use of DF500

Options	Description
-uno unit_no -hno hdu_no	Displays the operating status of the drive at a specified position. In addition, if the drive is a data drive subject to data recovery, the following information is displayed additionally. When recovery is in progress, "(nn%)" is displayed to indicate the progress rate of recovery. When no recovery is performed, "(0%)" is displayed. When recovery terminates normally or recovery is terminated forcibly, "(100%)" or "Normal" is displayed. When recovery terminates abnormally, "(nn% Aborted)" is displayed to indicate the progress rate of the recovery already processed until an abnormal termination and the resulting abnormal termination.

- Examples of using command

  Displays the status of drives in an array unit whose name is df400a1.

```
% audrive  -unit df400a1  -status
Port   Row    Type       Physics   Status
   0     0    Data       Mounted   Normal
   1     0    Data       Mounted   Normal
   2     0    Data       Mounted   Normal
   3     0    Data       Mounted   Normal
   4     0    Data       Mounted   Normal
   5     0    Spare      Mounted   Standby
   0     1    Data       Mounted   Normal
   1     1    Data       Mounted   Standby
   2     1    Undefined  Mounted   Out of RG
   3     1    Undefined  Mounted   Out of RG
   4     1    Undefined  Mounted   Out of RG
%
```

  Displays the status of drives in an array unit whose name is df500a1 (RK model).

```
% audrive  -unit df500a1  -status
Unit No.  HDU No.   Type       Physics  Status
     0        0    Data       Mounted  Normal
     0        1    Data       Mounted  Normal
     0        2    Data       Mounted  Normal
              :
              :
     0        8    Data       Mounted  Normal
     0        9    Spare      Mounted  Standby
     1        0    Undefined  Mounted  Out of RG
     1        1    Undefined  Mounted  Out of RG
              :
              :
     1        8    Undefined  Mounted  Out of RG
     1        9    Undefined  Mounted  Out of RG
              :
              :
%
```

Displays the status of drives in an array unit whose name is df500a2 (RKL model).

```
% audrive  -unit df500a2  -status
Unit No.  HDU No.   Type       Physics  Status
     0        0    Data       Mounted  Normal
     0        1    Data       Mounted  Normal
     0        2    Data       Mounted  Normal
              :
              :
     0        9    Data       Mounted  Normal
     0        10   Spare      Mounted  Standby
     0        11   Spare      Mounted  Standby
%
```

Displays the status of drive HDU No. 7 in UNIT No. 0 of an array unit whose name is df500a1.

```
% audrive  -unit df500a1  -status uno 0 hno 7
Unit No.  HDU No.  Type    Physics   Status
     0         7  Data    Mounted   Reconst
                                    (75%)
```

Displays the drive information of an array unit whose name is df400a1.

```
% audrive  -unit df400a1  -vendor
Port   Row    Vendor     Product      Revision
  0      0    HITACHI    DK328-43     D0D4
  1      0    HITACHI    DK328-43     D0D4
  2      0    HITACHI    DK328-43     D0D4
  3      0    HITACHI    DK328-43     D0D4
  4      0    HITACHI    DK328-43     D0D4
%
```

Displays the drive information of an array unit whose name is df500a1 (RK model).

```
% audrive  -unit df500a1  - vendor
Unit No.  HDU No.  Vendor     Product      Revision   Capacity
     0        0   HITACHI    DK328-43     D0D4       18GB
     0        1   HITACHI    DK328-43     D0D4       18GB
     0        2   HITACHI    DK328-43     D0D4       18GB
              :
              :
     0        8   HITACHI    DK328-43     D0D4       18GB
     0        9   HITACHI    DK328-43     D0D4       18GB
     1        0   HITACHI    DK328-43     D0D4       18GB
     1        1   HITACHI    DK328-43     D0D4       18GB
              :
              :
%
```

Displays the drive information of an array unit whose name is df500a2 (RKL model).

```
% audrive  -unit df500a2  - vendor
Unit No.  HDU No.  Vendor     Product     Revision   Capacity
      0        0   HITACHI    DK328-43    D0D4       18GB
      0        1   HITACHI    DK328-43    D0D4       18GB
               :
               :
      0        9   HITACHI    DK328-43    D0D4       18GB
      0        10  HITACHI    DK328-43    D0D4       18GB
      0        11  HITACHI    DK328-43    D0D4       18GB
%
```

3.4.3 Displaying Cache Configuration Information

- Command name
  aucache

- Synopsis
  aucache -unit unit_name

- Description
  Displays the status and capacity of cache memory.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to display cache configuration information. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.

- Examples of using command

  Displays the cache memory configuration information of an array unit whose name is df400a1.

```
% aucache  -unit df400a1
Ctl    Slot    Status          Size (MB)
 0       0    Normal                 32
 0       1    Detached          --------
 0       2    Normal            --------
 0       3    Not installed     --------
 0       4    Not installed     --------
 0       5    Not installed     --------
 0       6    Not installed     --------
 0       7    Not installed     --------
 0       8    Not installed     --------
 0       9    Not installed     --------
 0      10    Not installed     --------
 0      11    Not installed     --------
 0      12    Not installed     --------
 0      13    Not installed     --------
 0      14    Not installed     --------
 0      15    Not installed     --------
 1       0    Normal                 32
 1       1    Detached          --------
 1       2    Normal            --------
 1       3    Not installed     --------
 1       4    Not installed     --------
 1       5    Not installed     --------
 1       6    Not installed     --------
 1       7    Not installed     --------
 1       8    Not installed     --------
 1       9    Not installed     --------
 1      10    Not installed     --------
 1      11    Not installed     --------
 1      12    Not installed     --------
 1      13    Not installed     --------
 1      14    Not installed     --------
 1      15    Not installed     --------
%
```

3.4.4 Displaying Status of Power Supply/Fan/Battery/Loop/ENC

- Command name

  ausupply

- Synopsis

  ausupply -unit unit_name

- Description

  Displays the status of AC power supplies, fans, batteries, batteries backup circuits, loop, and ENC individually.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to display information. Specifies with one-byte coded alphanumerics and special symbols "- (minus)" and "_(underline)" of up to 16 characters long.

- Examples of using command

  Displays the status of power supplies, batteries, and fans of an array unit whose name is df400a1 individually.

```
% ausupply -unit df400a1
AC PS Information
  Unit  AC Status
     0   0 Normal
     0   1 Normal
     1   0 Nothing
     1   1 Nothing
     2   0 Nothing
     2   1 Nothing
     :
     :
     9   0 Nothing
     9   1 Nothing

FAN Information
  No. Status
   0  Normal
   1  Normal
```

```
Battery Information
   No. Status
    0  Normal
    1  Normal


Battery Backup Information
   No. Status
    0  Normal
    1  Normal


Loop Information
   Path  Loop  Status
     0     0  Normal
     0     1  Normal
     1     0  Normal
     1     1  Normal


ENC Information
   Unit  ENC Status
      0   0 Normal
      0   1 Normal
      1   0 Nothing
      1   1 Nothing
      2   0 Nothing
      2   1 Nothing
      :
      :
      9   0 Nothing
      9   1 Nothing
%
```

3.4.5 Displaying Current IP Address

- Command name

  aucrlan

- Synopsis

  aucrlan -unit unit_name

- Description

  The LAN information with the enabled array unit is displayed.
  For the DF350 and DF400, the IP address and the subnet mask are displayed; for the DF500, the IP address, the subnet mask, and the default gateway address are displayed.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to display LAN information. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.

- Examples of using command

  Display the LAN information with enabled array unit name df400a1.

```
% aucrlan -unit df400a1
CTL   IP Address   Subnet Mask
   0  125.0.9.98   255.255.255.0
   1  125.0.9.99   255.255.255.0
%
```

  Display the LAN information with enabled array unit name df500a1.

```
% aucrlan -unit df500a1
CTL   IP Address   Subnet Mask     Default Gateway
   0  125.0.9.98   255.255.255.0   125.0.9.5
   1  125.0.9.99   255.255.255.0   125.0.9.5
%
```

3.5 RAID/LU

3.5.1 Referencing RAID Group

- Command name

  aurgref

- Synopsis

  aurgref -unit unit_name

- Description

  The definition of the RAID groups set to the array unit is displayed in list form. The display contents include the RAID group number, the RAID level, the definition frame of the RAID group.

- Options

Options	Description
-unit unit_name	Specify the name of the array unit which references the definition of the RAID group. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.

- Examples of using command

  Reference the definition of the RAID group of the array unit name df400a1.

```
% aurgref  -unit df400a1
RG    Level  Port  Width   Row  Depth
  0       5     0      5     0      1
  2       0     0      3     1      1
  3       1     0      4     2      1
%
```

  Reference the definition of the RAID group of the array unit name df500a1.

```
% aurgref  -unit df500a1
 RAID   RAID   Start Location       Number of HDU    Number of       Remains
 Group  Level  [Unit No, HDU No.]   in parity group  parity group
     0      5          0        5                0             1   10000000
%
```

3.5.2 Setting Up RAID Group

- Command name

  aurgadd

- Synopsis

  – In the case of DF350, DF400

```
aurgadd  -unit unit_name  -rg rg_no
         -RAID0 | -RAID1 | -RAID5 | -RAID01 | -RAIDB | -RAIDC
         -row row_no  -port port_no  -width width_num  -depth depth_num
```

  – In the case of DF500

```
aurgadd  -unit unit_name  -rg rg_no
         -RAID0 | -RAID1 | -RAID5 | -RAID01
         -uno unit_no  -hno hdu_no  -hnum hdu_num  -pnum pty_num
```

- Description

  Sets up a RAID group in a specified array unit.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit in which to setup a RAID group. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-rg rg_no	Specifies the RAID group No.
-RAID0, -RAID1, -RAID5, -RAID01, -RAIDB, -RAIDC	Specifies the RAID level.

For the exclusive use of DF350, DF400

Options	Description
-row row_no	Specifies the row No. of the top HDU in a RAID group.
-port port_no	Specifies the port No. of the top HDU in a RAID group.
-width width_num	Specifies the number of HDU arranged horizontally in a RAID group (width). Sets the value of 2 or more.
-depth depth_num	Specifies the number of HDU arranged vertically in a RAID group (depth).

For the exclusive use of DF500

Options	Description
-uno unit_no	Specifies the Unit No. of the top drive in a RAID group.
-hno hdu_no	Specifies the HDU No. of the top drive in a RAID group.
-hnum hdu_num	Specify the number of HDUs in the parity group of the RAID group.
-pnum pty_num	Specify the number of parity groups of the RAID group.

- Examples of using command

  Setup a RAID group in an array unit whose name is df400a1 (DF400). Set RAID group number to 2, RAID level to RAID5, starting drive Port to 0, Row to 2, Width to 5, and Height to 1.

```
% aurgadd -unit df400a1 -rg 2 -RAID5 -port 0 -row 2 -width 5 -depth 1
Password:
%
```

  Setup the RAID group of array unit name df500a1. Set RAID group number to 2, RAID level to RAID5, starting drive Unit number to 0, HDU number to 2, number of HDUs in the parity group to 5, number of parity groups to 1.

```
% aurgadd -unit df500a1 -rg 2 -RAID5 -uno 0 -hno 0 -hnum 5 -pnum 1
Password:
%
```

3.5.3 Expanding RAID Group

- Command name

  aurgexp

- Synopsis

  – In the case of DF350, DF400

```
aurgexp  -unit unit_name  -rg rg_no  -width width_num
aurgexp  -unit unit_name  -rg rg_no  -depth depth_num
```

  – In the case of DF500

```
aurgexp  -unit unit_name  -rg rg_no  -pnum pty_num
```

- Description

  Expands the already-defined size of a RAID group.
  For DF350 and DF400, only either the width or the height is specified for the expansion direction, and specification depends on each RAID level.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit in which a RAID group whose size to expand has been defined. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-rg rg_no	Specifies the RAID group No. of a RAID group for which to expand its already-defined size.

For the exclusive use of DF350, DF400

Options	Description
-width width_num	Specifies the number of drives arranged horizontally in a RAID group (width) after expansion.
-depth depth_num	Specifies the number of drives arranged vertically in a RAID group (depth) after expansion.

For the exclusive use of DF500

Options	Description
-pnum pty_num	Specifies the number of parity groups after expansion.

- Examples of using command

  Expands the depth of RAID group 2, which has been setup in an array unit whose name is df400a1, from 1 to 3.

```
% aurgref  -unit df400a1
RG   Level  Port  Width   Row  Depth
  2      5     0      5     0      1

%
% aurgexp  -unit df400a1  -rg 2  -depth 3
Password:
%
% aurgref  -unit df400a1
RG   Level  Port  Width   Row  Depth
  2      5     0      5     0      3

%
```

  Expands the number of parity groups of RAID group 0, which number has been set in an array unit whose name is df500a1, from 1 to 3.

```
% aurgref  -unit df500a1
RAID    RAID   Start Location      Number of HDU     Number of       Remains
Group   Level  [Unit No. HDU No.]  in parity group   parity group
    0       5         0       5                  0              1   10000000

%
% aurgexp  -unit df500a1  -rg 0  -pnum 3
Password:
%
% aurgref  -unit df500a1
RAID    RAID   Start Location      Number of HDU     Number of       Remains
Group   Level  [Unit No. HDU No.]  in parity group   parity group
    0       5         0       5                  0              3   30000000

%
```

3.5.4 Deleting RAID Group

- Command name

  aurgdel

- Synopsis

  ```
  aurgdel  -unit unit_name  -rg rg_no [ -f ]
  aurgdel  -unit unit_name  -ALL [ -f ]
  ```

- Description

  Deletes a specified RAID group or all RAID groups in an array unit.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit in which RAID groups to be deleted have been defined. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", pr "_(underline)" of up to 16 characters long.
-rg rg_no	Specifies the RAID group No. of a RAID group which to delete.
-ALL	Specifies to delete all RAID groups.
-f	The confirmation message at command execution is omitted.

- Examples of using command

  Deletes RAID group 1 that has been defined in an array unit whose name is df400a1.

  ```
  % aurgdel  -unit df400a1  -rg 1
  remove RAID group 1 ? (y/n [n]): y
  Password:
  %
  ```

  An attempt was made to delete all RAID groups that have been defined in an array unit whose name is df400a1, but the deletion was canceled.

  ```
  % aurgdel  -unit df400a1  -ALL
  This function invalidates user data of the deleted RAID groups.
  remove all RAID groups ? (y/n [n]): n
  Terminate execution.
  %
  ```

3.5.5 Referencing LU

- Command name

  auluref

- Synopsis

  auluref -unit unit_name [-lu lun …·]

- Description

  Displays already-defined LU information (capacity, status, pre-read staging amount, current controller No., default controller No., RAID group No. of a RAID group to which to belong, and its RAID level).

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to reference LU information. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-lu lun …·	When you want to reference LU information, specifies an LU No. If omitted, all already-defined LU information is displayed.

- Examples of using command

  Displays all LU information in an array unit whose name is df400a1.

```
% auluref -unit df400a1
LU   Capacity   Status  Staging   C-CTL   D-CTL   RG   RAID
 0     100352   Normal      512       0       0    0      5
 1     100352   Normal      512       0       0    0      5
 2     100352   Normal      512       0       0    0      5
 3     100352   Normal      512       0       0    0      5
%
```

  Displays information about LU 0 in an array unit whose name is df400a1.

```
% auluref -unit df400a1 -lu 0
LU   Capacity   Status  Staging   C-CTL   D-CTL   RG   RAID
 0     100352   Normal      512       0       0    0      5
%
```

3.5.6 Setting Up LU

- Command name

  auluadd

- Synopsis

  – In the case of dual system

```
auluadd  -unit unit_name  [ -lu lun ]  -rg rg_no  -size num | lest
         -ctl0 | -ctl1
```

  – In the case of single system

```
auluadd  -unit unit_name  [ -lu lun ]  -rg rg_no  -size num | lest
```

- Description

  Sets up an LU.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit to which to add an LU. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-lu lun	Specifies the LU No. of an LU to add. An LU No. to be specified must be the next number to the last of already-set numbers. If omitted, the manager automatically determines an LU No. For connection of the DF350 and DF400, the determination processing is performed with the increase in the number of set LUs, resulting in inferior response. If the LU number to be added is known, specification of the LU number is recommended.
-rg rg_no	Specifies the RAID group No. of a RAID group to which to add an LU.
-size num | lest	Specifies the capacity (number of blocks) of an LU. If "lest" is specified for the capacity, all remaining capacity of the RAID group is assigned.
-ctl0 | -ctl1	Specifies the default controller No. of an LU. This option is specified when array unit is dual system.

- Examples of using command

  Adds LU 3 to RAID group 2 in an array unit with a dual system configuration, whose name is df400a1. The capacity shall be 1,024,000, and the default controller be no. 0.

```
% auluadd  -unit df400a1  -lu 3  -size 1024000  -ctl0  -rg 2
Password:
%
```

3.5.7 Formatting LU

- Command name

  auformat

- Synopsis

  auformat -unit unit_name -N | -I | -Im -lu lun ... [-f]

- Description

  Formats a specified LU.
  If multiple LUs are specified, LUs are formatted in the ascending order of LUNs regardless of formatting methods.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit in which an LU to format has been defined. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-N | -I | -Im	Specifies the formatting method. **-N:** Formats in the Normal mode in units of LUs. Formatting is executed from the current controller controlling an LU. In registering unit information, the current controller controlling an LU that formats LUs must be registered. **-I:** Formats in the Immediate mode in units of LUs. Formatting is executed from the current controller controlling an LU. In registering unit information, the current controller controlling an LU that formats LUs must be registered. **-Im:** Formats up to six LUs concurrently in the Immediate mode. If this mode is specified, LUs are formatted from their respective controllers with which they are connected regardless of the current controller controlling an LU.
-lu lun ...	Specifies the LU Nos. of LUs which to format. When specifying, a single LU No. or multiple LU Nos. can be specified. **Single specification:** Specifies a single LU No.. **Example:** -lu 3 **Multiple specification:** Specifies multiple LU Nos.. **Example:** -lu 0 1 2 3 4 5 8 -lu 0-5 8
-f	The confirmation message at command execution is omitted.

- Examples of using command

  Formats LU 3 in an array unit, whose name is df400a1, in Normal mode.

```
% auformat  -unit df400a1  -N  -lu 3
LU will be formatted ! Are you sure ? (y/n [n]): y
Password:
LU3 format start
LU3 format end: Normal Terminated
%
```

  Formats, in the Immediate mode, LUs from LUNs 4 to 7 in an array unit whose name is df400a1.
  In addition, confirmation of whether or not to format is not done.

```
% auformat  -unit df400a1  -I  -lu 4-7  -f
Password:
LU4 format start
LU4 format end: Normal Terminated
LU5 format start
LU5 format end: Normal Terminated
LU6 format start
LU6 format end: Normal Terminated
LU7 format start
LU format end: Normal Terminated
%
```

3.5.8 Displaying Progress of LU Formatting

- Command name

  auformatst

- Synopsis

  auformatst -unit unit_name -lu lun

- Description

  Displays the progress of formatting LUs for which to specify formatting in the Immediate mode.
  When a specified LU is under formatting, the progress (in percent) of formatting is displayed. When not under formatting in such a case as immediately after an LU has been setup or its size has been expanded, or the formatting has been completed, the following indication is displayed:

  – "100%" is displayed when the LU is normal.

  – "0%" is displayed when the LU is in condition other than above.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit in which LUs have been defined. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-lu lun	Specifies the LU No. of an LU for which to check the progress.

- Examples of using command

  After specifying to format LU 4 in an array unit, whose name is df400a1, in Immediate mode, checks the progress of formatting.

```
% auformat  -unit df400a1  -lu 4  -I  -f
Password:
LU4 format start
LU4 format end: Normal Terminated
%
% auformatst  -unit df400a1  -lu 4
df400a1 LU 4 17 %
% auformatst  -unit df400a1  -lu 4
df400a1 LU 4 50 %
% auformatst  -unit df400a1  -lu 4
df400a1 LU 4 81 %
% auformatst  -unit df400a1  -lu 4
df400a1 LU 4 94 %
% auformatst  -unit df400a1  -lu 4
df400a1 LU 4 100 %
%
```

3.5.9 Expanding LU

- Command name

  `auluexp`

- Synopsis

  `auluexp -unit unit_name -lu lun -incr size | lest`

- Description

  Expands the size of an LU. Note that an LU whose size can be expanded is the last LU in each RAID group (LU with the largest LU No. assigned within each RAID group).

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit in which an LU whose size to expand has been defined. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
`-lu lun`	Specifies the LU No. of an LU for which to expand its size.
`-incr size | lest`	Specifies the increment (in the number of blocks) by which to expand. **size:** Specifies the number of blocks. **lest:** Assigns all remaining capacity of an RAID group.

- Examples of using command

  Expands the capacity of LU 3 in an array unit, whose name is df400a1, by an increment of 3,072 blocks.

```
% auluexp -unit df400a1 -lu 3 -incr 3072
Password:
%
```

  Assigns to LU 3 in an array unit, whose name is df400a1, all remaining capacity of an RAID group to which this LU belongs.

```
% auluexp -unit df400a1 -lu 3 -incr lest
Password:
%
```

3.5.10 Deleting LU

- Command name

  auludel

- Synopsis

  auludel -unit unit_name -last | -ALL [-f]

- Description

  Deletes the last of already-defined LUs or all LUs.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit in which LUs have been defined. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-last | -ALL	Specifies LUs to delete. **-last:** Deletes the last LU. **-ALL:** Deletes all LUs.
-f	The confirmation message at command execution is omitted.

- Examples of using command

  Deletes the last LU in an array unit whose name is df400a1.

```
% auludel -unit df400a1 -last
This function invalidates data on the deleted logical unit.
remove the last LU ? (y/n [n]): y
Password:
%
```

  An attempt was made to delete all LUs in an array unit whose name is df400a1, but the deletion was canceled.

```
% auludel -unit df400a1 -ALL
This function invalidates data on the deleted logical unit.
remove all LU ? (y/n [n]): n
Terminate execution
%
```

3.5.11 Changing Default Controller of LU

- Command name

  auluchg

- Synopsis

  ```
  auluchg  -unit unit_name  -lu lun
  ```

- Description

  Changes the default controller, with which an LU is connected, to another controller.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit in which LUs have been defined. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-lu lun	Specifies the LU No. of an LU whose default controller is changed.

- Examples of using command

  Changes the default controller with which LU 2 is connected in an array unit whose name is df400a1.

  ```
  % auluchg  -unit df400a1  -lu 2
  Password:
  Default controller for the LU modification completed successfully.
  Please reboot Array for changes to take effect.
  %
  ```

  Changes the default controller with which LU 2 is connected in an array unit, whose name is df400a2 and which supports restarting.

  ```
  % auluchg  -unit df400a2  -lu 2
  Password:
  Default controller for the LU modification completed successfully.
  Please reboot Array for changes to take effect.
  Array unit stops accepting input and output while rebooting.
  And if you already logged in, login status is canceled when the reboot starts.
  Do you reboot the array unit now (y/n [n]): y
  Now rebooting the array unit.  Start Time HH:MM
  Reboot has been completed.
  %
  ```

3.5.12 Setting Turbo LU

- Command name

  auturbolu

- Synopsis

```
auturbolu  -unit unit_name  -refer
auturbolu  -unit unit_name  -set
           [ -ctl0_assign enable | disable  -ctl0_lu lun ]
           [ -ctl1_assign enable | disable  -ctl1_lu lun ]
```

- Description

  References the status of whether turbo LU is resident or not, and sets the turbo LU.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to reference the LU cache residence state and in which to set LU cache resident. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-refer	References the status of whether turbo LU is resident or not.
-set	Sets turbo LU.
-ctl0_assign enable | disable -ctl1_assign enable | disable	Specifies to validate or invalidate that turbo LU of Controllers 0 and 1 is resident individually.
-ctl0_lu lun -ctl1_lu lun	Specifies the LU No. of an LU for which turbo LU is set resident.

- Examples of using command

  References the state of whether LU cache of an array unit, whose name is df400a1, is resident or not.

```
% auturbolu  -unit df400a1  -refer
Password:
Controller 0
Current Configuration
  Turbo LU Assignment       : off
  Turbo LU                  :
  Turbo LU Status           :
Reserved Configuration
  Turbo LU Assignment       : off
  Turbo LU                  :


Controller 1
Current Configuration
  Turbo LU Assignment       : off
  Turbo LU                  :
  Turbo LU Status           :
Reserved Configuration
  Turbo LU Assignment       : off
  Turbo LU                  :
%
```

  Sets LU cache resident for an array unit whose name is df400a1.

```
% auturbolu  -unit df400a1  -set  -ctl0_assign enable  -ctl0_lu 3 \
-ctl1_assign disable  -ctl1_lu 4
Password:
Turbo LU modification completed successfully.
Please reboot Array for changes to take effect.
%
```

  Sets LU cache resident for an array unit, whose name is df400a2 and which supports restarting.

```
% auturbolu  -unit df400a2  -set  -ctl0_assign enable  -ctl0_lu 3 \
-ctl1_assign disable  -ctl1_lu 4
Password:
Turbo LU modification completed successfully.
Please reboot Array for changes to take effect.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]): y
Now rebooting the array unit.  Start Time HH:MM
Reboot has been completed.
%
```

3.6 Setting Up Configuration

3.6.1 Referencing/Setting Fibre Channel Information

- Command name

  `aufibre`

- Synopsis

```
aufibre  -unit unit_name  -refer
aufibre  -unit unit_name  -set  -ctl0 | -ctl1  -port A | B
         [ -FC-AL | -Fabric ]
         [ -portinfo n_port_id ]  [ -access-guard on | off ]
         [ -permission node_name port_name [ -permission-lu lun ... ] ]
aufibre  -unit unit_name  -set  -ctl0 | -ctl1  -port A | B
         [ -FC-AL | -Fabric ]
         [ -portinfo n_port_id ]  [ -access-guard on | off ]
         [ -file filename ]
aufibre  -unit unit_name  -rm  -ctl0 | -ctl1  -port A | B
         -permission node_name port_name  [ -permission-lu lun ... ]
```

- Description

  References and sets fibre channel information.

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit for which to reference, set, and delete fibre channel information. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
`-refer`	Displays all already-set fibre channel information.
`-set`	Sets fibre channel information.
`-rm`	Deletes port security information and LUN security information.
`-ctl0 | -ctl1`	Specifies a controller for which to set and delete fibre channel information.
`-port A | B`	Specifies a port for which to set and delete fibre channel information.
`-FC-AL | -Fabric`	Sets the topology of a specified port in a specified controller. **-FC-AL:** Sets the topology to FC_AL. **-Fabric:** Sets the topology to Fabric.

(Continued)

Options	Description
-portinfo n_port_id	Specifies the N_port ID of a specified port in a specified controller. Specifies n_port_id with six hexadecimal characters.
-access-guard on | off	Specifies whether to validate or invalidate port security of a specified port in a specified controller. **on:** Validates port security (a port specified by -port option accepts security from only a host specified by -permission option). **off:** Invalidates port security (does not limit the host that accesses a port specified by -port option).
-permission node_name port_name	[-set option specified] When using port security, specifies access permission host information (node name, port name). **node_name:** Node name of a host (character string of 16 hexadecimal characters) **port_name:** Port name of a host (character string of 16 hexadecimal characters)
-permission-lu lun ...	[-set option specified] When using LUN security, specifies access permission LUNs (multiple LUNs can be specified). When specifying -permission-lu option, host information must be specified by -permission option. If host information specified by -permission is not yet set, access permission host information and LUN security information are set together at the same time. If host information specified by -permission option is already set, LUN security information is set additionally.
-file filename	When setting host security all together by file input, specifies the host permission information file.
-permission node_name port_name	[-rm option specified] Specifies host information (node name, port name) which to exclude from host security. **node_name:** Node name of a host (character string of 16 hexadecimal characters) **port_name:** Port name of a host (character string of 16 hexadecimal characters)
-permission-lu lun ...	[-rm option specified] When using LUN security, specifies LUNs (multiple LUNs can be specified) which to exclude from access permission LUs. When specifying -permission-lu option, host information must be specified by -permission option.

- Examples of using command

  References the fibre channel information of an array unit whose name is df400a1.

```
% aufibre  -unit df400a1  -refer
Password :
LUN security
  CTL 0   on
  CTL 1   on


Topology Information
  CTL   Port   Topology
    0     A      FC-AL
    0     B      FC-AL
    1     A      FC-AL
    1     B      FC-AL


Port Information
  CTL   Port   Node name           Port name           N port_ID
    0     A   50000E100000232F    50000E100000232F    0000EF
    0     B   0000000000000000    0000000000000000    0000EF
    1     A   0000000000000000    0000000000000000    0000EF
    1     B   0000000000000000    0000000000000000    777777


SFC Firmware Revision
                      Sequence   Operational  PowOnSelf
  CTL   Port  BIU       Manager    Firmware    TestFirm   ENDEC+     FC-PH
    0     A  00000004  10020193   02125805    01102000   3001506D   09/09
    0     B  00000000  00000000   00000000    00000000   00000000   00/00
    1     A  00000000  00000000   00000000    00000000   00000000   00/00
    1     B  00000000  00000000   00000000    00000000   00000000   00/00


Security Information
  CTL   Port  Access     Node name              Port name              N port_ID
              Guard
    0     A  disable    AAAAAAAAAAAA0A00       0AAAAAAAAAAAAA00       000000
                        25 30 50 60 63
    0     B  disable    0B01000000000000       0B00000000000001       0B0100

    1     A  disable    AAAAAAAAAAAA1A00       1AAAAAAAAAAAAA00       000000
                        6 12 34 43
    1     B  disable    BBBBBBBBBBBB1B00       1BBBBBBBBBBBBB00       000000
                        15 23 31 34 55

%
```

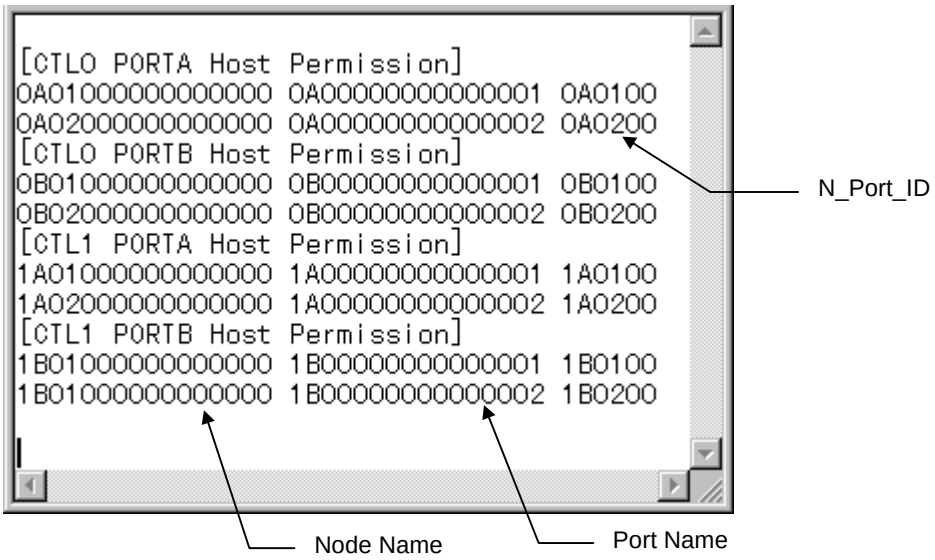
Sets to Fabric the topology of Port A on controller 0 of an array unit whose name is df400a1.

```
% aufibre  -unit df400a1  -set  -ctl0  -port A  -Fabric
Password:
Fibre channel information modification completed successfully.
Please reboot Array for changes to take effect.
%
```

Sets to Fabric the topology of Port A on controller 0 of an array unit, whose name is df400a2 and which supports restarting.

```
% aufibre  -unit df400a2  -set  -ctl0  -port A  -Fabric
Password:
Fibre channel information modification completed successfully.
Please reboot Array for changes to take effect.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]): y
Now rebooting the array unit.  Start Time HH:MM
Reboot has been completed.
%
```

The following figure shows a file format for the case where settings are performed by using "File". Input necessary items for each port. Put a space between items. If tabs are used, the setting of the line including "tab" are ignored because it is regarded as an input error.



- **Node Name:** Describes 8 bytes of data hexadecimal (with 16 characters).
- **Port Name:** Describes 8 bytes of data hexadecimal (with 16 characters).
- **N_Port_ID:** Describes 3 bytes of data hexadecimal (with 6 characters). Concerning the host identification information, this data can be omitted. When the data is omitted, it is assumed to be 0X000000.

When ";" is described at the top, the line is regarded as a comment line.

- Command name

  aufibre1

- Synopsis

  – In the case of DF350, DF400, and DF500

```
aufibre1  -unit unit_name  -refer
```

  – In the case of DF400

```
aufibre1  -unit unit_name  -set
          [ -topo ctl_no topology1 ]
          [ -portaddr ctl_no port_no port_address ]
          [ -accguard ctl_no port_no on | off ]
          [ -perm ctl_no port_no node_name port_name ]
          [ -permlu ctl_no port_no node_name port_name lun... ]
          [ -permluall ctl_no port_no node_name port_name ]
          [ -file ctl_no port_no filename ]
```

  – In the case of DF500

```
aufibre1  -unit unit_name  -set
          [ -topo ctl_no topology2 ]
          [ -rate ctl_no 1 | 2 ]
          [ -portaddr ctl_no port_no port_address ]
          [ -lus ctl_no port_no on | off ]
          [ -luschk ctl_no port_no inqc | allc ]
          [ -perm ctl_no port_no node_name port_name ]
          [ -permlu ctl_no port_no node_name port_name lun... ]
          [ -permluall ctl_no port_no node_name port_name ]
          [ -file ctl_no port_no filename ]
```

  – In the case of DF400, DF500

```
aufibre1  -unit unit_name  -rm
          [ -perm ctl_no port_no node_name port_name ]
          [ -permlu ctl_no port_no node_name port_name lun... ]
          [ -permluall ctl_no port_no node_name port_name ]
```

- Description

  References and sets fibre channel information.

- Option

Options	Description
-unit unit_name	Specifies the name of an array unit for which to reference, set, and delete fibre channel information. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-refer	Displays all already-set fibre channel information.
-set	Sets fibre channel information.
-rm	Deletes port security information and LUN security information.
-topo ctl_no topology1	Specifies the topology of the specified controller. **ctl_no:** Controller number (0 or 1) **topology1:** Type of topology **FC-AL:** FC-AL **Fabric:** Fabric Point-to-Point
-topo ctl_no port_no topology2	Specifies the topology of the specified port. **ctl_no:** Controller number (0 or 1) **port_no:** Port name (A or B) **topology2:** Type of topology **loop:** loop **ptop:** Point-to-Point
-rate ctl_no port_no 1 | 2	Specifies the fibre channel transfer rate of the specified port. **ctl_no:** Controller number (0 or 1) **port_no:** Port name (A or B) **1:** 1 (G bps) **2:** 2 (G bps)
-portaddr ctl_no port_no port-address	Specifies the port address of the specified port. **ctl_no:** Controller number (0 or 1) **port_no:** Port name (A or B) **port-address:** Port address (6 hexadecimal characters)
-accguard ctl_no port_no on | off	Specifies whether the port security of the specified port is enabled or disabled. **ctl_no:** Controller number (0 or 1) **port_no:** Port name (A or B) **on:** Enables the port security. **off:** Disables the port security.
-lus ctl_no port_no on | off	Specifies whether the LUN security of the specified port is enabled or disabled. **ctl_no:** Controller number (0 or 1) **port_no:** Port name (A or B) **on:** Enables the LUN security. **off:** Disables the LUN security.

(Continued)

Options	Description
-luschk ctl_no port_no inqc | allc	Specifies the LUN security check level of the specified port. **ctl_no:** Controller number (0 or 1) **port_no:** Port name (A or B) **inqc:** Check with an INQUIRY SCSI command. **allc:** Check with all the SCSI commands.
-perm ctl_no port_no node_name port_name	[-set option specification] Specifies host information (node name and port name) that can be accessed by the specified port. [-rm option specification] Specifies the host information to be deleted from the host information (node name and port name) that can be accessed by the specified port. **ctl_no:** Controller number (0 or 1) **port_no:** Port name (A or B) **node_name:** Node name of the host (16 hexadecimal characters) **port_name:** Port name of the host (16 hexadecimal characters)
-permlu ctl_no port_no node_name port_name lun..	[-set option specification] When using the LUN security function at a specified port, specifies LUs, to which the host is permitted to access, into host information registered with the -perm option (multiple LUs can be specified). Host information and LUN security are not allowed to be registered at the same time. [-rm option specification] Specifies the LUNs whose access permission is to be deleted from the LUN security set by the specified port. (Multiple LUs can be specified.) **ctl_no:** Controller number (0 or 1) **port_no:** Port name (A or B) **node_name:** Node name of the host (16 hexadecimal characters) **port_name:** Port name of the host (16 hexadecimal characters) **lun..:** LU number
-permluall ctl_no port_no node_name port_name	[-set option specification] When using the LUN security function at a specified port, specifies host information that is already registered with the -perm option, which specifies permission to access to all LUs. Host information and LUN security are not allowed to be registered at the same time. [-rm option specification] Specifies the host information whose access permission is to be deleted from the LUN security set by the specified port. **ctl_no:** Controller number (0 or 1) **port_no:** Port name (A or B) **node_name:** Node name of the host (16 hexadecimal characters) **port_name:** Port name of the host (16 hexadecimal characters)

(Continued)

Options	Description
-file ctl_no port_no filename	When setting host security all together by file input, specifies the host permission information file. **ctl_no:** Controller No. (0 or 1) **port_no:** Port name (A or B) **filename:** File name which to input

- Examples of using command

  Reference the fiber channel information of the array unit name df400a1. Same as aufibre.

  Reference the fiber channel information of array unit name df500a1. Same as aufibre.

  Set the topology of Port A of controller 0 of the array unit name df400a1 to Fabric.

```
% aufibre1  -unit df400a1  -set  -topo 0 Fabric
Password:
Fibre channel information modification completed successfully.
Please reboot Array for changes to take effect.
%
```

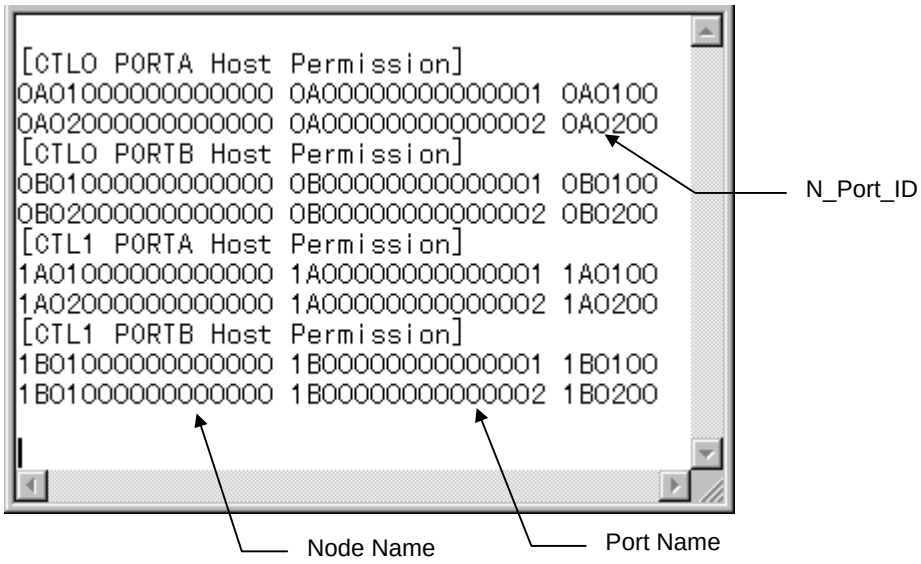
  Set the topology of Port A of controller 0 of array unit name df400a2 supporting re-activation: to Fabric.

```
% aufibre1  -unit df400a2  -set  -topo 0 Fabric
Password:
Fibre channel information modification completed successfully.
Please reboot Array for changes to take effect.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]): y
Now rebooting the array unit.  Start Time HH:MM
Reboot has been completed.
%
```

  Set the topology of Port A of controller 0 of array unit name df500a1 to loop.

```
% aufibre1  -unit df500a1  -set  -topo 0 A loop
Password:
Fibre channel information modification completed successfully.
Please reboot Array for changes to take effect.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]): y
Now rebooting the array unit.  Start Time HH:MM
Reboot has been completed.
%
```

The following figure shows a file format for the case where settings are performed by using “File”. Input necessary items for each port. Put a space between items. If tabs are used, the setting of the line including “tab” are ignored because it is regarded as an input error.



- **Node Name:** Describes 8 bytes of data hexadecimal (with 16 characters).
- **Port Name:** Describes 8 bytes of data hexadecimal (with 16 characters).
- **N_Port_ID:** Describes 3 bytes of data hexadecimal (with 6 characters). Concerning the host identification information, this data can be omitted. When the data is omitted, it is assumed to be 0X000000.

When “;” is described at the top, the line is regarded as a comment line.

3.6.2 Spare HDU Setup

- Command name

  auspare

- Synopsis

  auspare -unit unit_name -set -uno unit_no -hno hdu_no

  auspare -unit unit_name -rm -uno unit_no -hno hdu_no

- Description

  The specified HDU is setup as a spare HDU. The spare HDU attribute of the specified spare HDU is canceled.
  Not installed HDU cannot be set as spare HDU.

- Options

Options	Description
-unit unit_name	Specifies the name of the array unit to set or cancel the spare HDU. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-set	Sets up the spare HDU.
-rm	Cancels the spare HDU.
-uno unit_no	Specifies the Unit number of the spare HDU.
-hno hdu_no	Specifies the HDU number of the spare HDU.

- Examples of using command

  Setup the spare HDU of array unit name df500a1. The position of the spare HDU is the HDU position with Unit number of 0 and HDU number of 9.

```
% auspare -unit df500a1 -set -uno 0 -hno 9
Password:
%
```

  Checks, with an audrive command, settings of the spare HDU in an array unit whose name is df500a1. "Spare" is displayed in the "Type" field for HDUs that are set to "Spare".

```
% audrive -unit df500a1 -status -uno 0 -hno 9
Unit No.  HDU No.  Type    Physics   Status
     0       9    Spare   Mounted   Standby
%
```

3.6.3 Fee-Basis Option Reference/Setup

- Command name

  auopt

- Synopsis

  ```
  auopt  -unit unit_name  -refer
  ```

  – Case of used key-FD

  ```
  auopt  -unit unit_name  -lock off | on  [ -keyfd fd-path ]
  ```

  – Case of used key-code

  ```
  auopt  -unit unit_name  -lock off | on  [ -keycode key-code ]
  auopt  -unit unit_name  -option option_name  -st enable | disable
  ```

- Description

  Locks or unlocks the specified fee-basis option. Unlocks or locks can be carried out by the key FD or the key code described in key FD appended in the option.
  Enables or disables the fee-basis option after unlocking.

- Options

Options	Description
-unit unit_name	Specifies the name of the array unit to setup or reference the fee-basis option. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-refer	The unlocked fee-basis option is displayed.
-lock off | on	Specifies locking or unlocking of the fee-basis option. **off:** Unlocks the fee-basis option. **on:** Locks the fee-basis option.
-keyfd fd-path	Specifies the directory storing the key FD when it is used to unlock or lock the fee-basis option. **fd-path:** Directory in which the key FD exists
-keycode key-code	Specifies the key code when used to unlock or lock the fee-basis option. **key-code:** Key code
-option option-name	Specifies the option name when enabling or disabling the unlocked fee-basis option. **option-name:** Option name For the option name, refer to the guide for each individual fee-basis option.

(Continued)

Options	Description
-st enable | disable	Specifies whether the fee-basis option is enabled or disabled. **enable:** Enables the fee-basis option. **disable:** Disables the fee-basis option.

- Examples of using command

  Display the unlocked fee-basis option of array unit name df500a1.

```
% auopt  -unit df500a1  -refer
Password:
Option name     Status
SNMP            Enable
%
```

  Unlocks the SNMP fee-basis option that requires to restart an array unit name df500a1, using the key FD.

```
% auopt  -unit df500a1  -lock off  -keyfile a :
Password:
Option was opened.
Please reboot Array for changes to take effect.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]): y
Now rebooting the array unit.  Start Time HH:MM
Reboot has been completed.
%
```

  Enables the SNMP fee-basis option that requires to restart an array unit name df500a1.

```
% auopt  -unit df500a1  -option SNMP  -st enable
Password:
Option modification completed successfully.
Please reboot Array for changes to take effect.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]): y
Now rebooting the array unit.  Start Time HH:MM
Reboot has been completed.
%
```

  Unlocks the LUN security fee-basis option that does not require to restart an array unit name df500a1, using the key FD.

```
% auopt  -unit df500a1  -lock off  -keyfile a :
Password:
Option was opened.
%
```

3.6.4 Referencing/Setting Drive Restoration Control Information

- Command name

  audrecopt

- Synopsis

```
audrecopt  -unit unit_name  -refer
audrecopt  -unit unit_name  -set
           [ -restor back | normal | priority ]  [ -auto enable | disable ]
           [ -sparing rwv | rw | not ]  [ -interval interval_time ]
           [ -size n ]
```

- Description

  References and sets drive restoration control information.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to reference and set drive restoration control information. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-refer	References drive restoration control information.
-set	Sets drive restoration control information.
-restor back | normal | priority	Specifies the drive restoration mode. **back::** Execute the restoration processing in the intervals of the host command processing. **normal:** Gives priority to the processing of commands from the host, and executes the restoration processing at a certain interval after a host command terminates. **priority:** Executes the restoration processing at a certain interval with higher priority than that of the processing of commands from the host.
-auto enable | disable	Specifies whether or not to automatically start copying back.
-sparing rwv | rw | not	Specifies the operating mode of dynamic sparing. **rwv:** When the count of either Read/Write errors or On-line Verify errors exceeds a predetermined threshold value, starts dynamic sparing. **rw:** When the count of Read/Write errors exceeds a predetermined threshold value, starts dynamic sparing. **not:** Although the count of either Read/Write errors or On-line Verify errors exceeds a predetermined threshold value, does not start dynamic sparing.

(Continued)

Options	Description
-interval interval_time	Specifies the interval at which to execute the restoration processing. Specifies it with a value from 0 to 255 in units of 10 ms. The default value is 10, and hence executes the restoration processing at an interval of 100 ms.
-size n	Specifies the unit of restored data per single operation in the restoration processing. Specifies a value of a multiple of 32 between 32 and 65,504 in units of 512 bytes. The default value is 32, and hence restores 16 k byte data in a single operation.

- Examples of using command

  Displays the drive restoration control information of an array unit whose name is df400a1.

```
% audrecopt  -unit df400a1  -refer
Password:
Drive restoration mode        : Background
Drive restoration             : Automatically
Sparing                       : Executing (Read/Write & Online Verify)
Interval time [10ms]          : 10
Processing Unit Size [blocks] : 32
%
```

  Sets drive restoration control information for an array unit whose name is df400a1.

```
% audrecopt  -unit df400a1  -set  -restor normal  -auto enable  -interval 10
-size 64  -sparing rwv
Password:
%
% audrecopt  -unit df400a1  -refer
Password:
Drive restoration mode        : Interleave (standard)
Drive restoration             : Automatically
Sparing                       : Execution (Read/Write & Online Verify)
Interval time [10ms]          : 10
Processing Unit size [blocks] : 64
%
```

3.6.5 Referencing/Setting Online Verify Information

- Command name

  auonlineverify

- Synopsis

```
auonlineverify  -unit unit_name  -refer
auonlineverify  -unit unit_name  -set
                [ -verify enable | disable ]  [ -time time ]
```

- Description

  References and sets on-line verify information.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to reference and set on-line verify information. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-refer	References on-line verify information.
-set	Sets on-line verify information.
-verify enable | disable	Specifies whether or not to perform an on-line verify test.
-time time	Specifies the idling time (0 to 30 seconds). If "0" is specified, the idling time is set to 10 seconds.

- Examples of using command

  References the on-line verify information of an array unit whose name is df400a1.

```
% auonlineverify  -unit df400a1  -refer
Password:
Online verify test   : Yes
Idling time   [sec]  : 0
%
```

  Sets on-line verify information for an array unit whose name is df400a1, then references it.

```
% auonlineverify  -unit df400a1  -set  -verify enable  -time 5
Password:
%
% auonlineverify   -unit df400a1  -refer
Password:
Online verify test   : Yes
Idling time   [sec]  : 5
%
```

3.6.6 Referencing/Setting MRCF-Lite Information

- Command name

  aumrcfdev

- Synopsis

  ```
  aumrcfdev  -unit unit_name  -refer
  aumrcfdev  -unit unit_name  -set [ -id string ] –dev n lu
  aumrcfdev  -unit unit_name  -rm –dev n
  ```

- Description

  References and sets the command device and the serial ID.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to reference and set MRCF-Lite information. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-refer	References the command device and the serial ID.
-set	Sets the command device and the serial ID.
-rm	Deletes the command device and the serial ID.
-id string	Specifies the serial ID. **string**: One-byte coded numeral of 4 characters long.
-dev n lu on | off	Specifies parameters of the command device. **n**: The command device number (1 or 2) **lu**: The logical unit number
-dev n	Specifies the command device number to delete. **n**: The command device number (1 or 2)

- Examples of using command

  References MRCF-Lite set-up information whose array unit name is df500a1.

```
% aumrcfdev  -unit df500a1  -refer
Password:
Serial ID
  0123

Command device    LUN
1                   1
2                  10
%
```

  Sets up an array unit, whose name is df500a1, as command device 1, with its logical No. set to 0.

```
% aumrcfdev  -unit df500a1  -set –dev 1 0
Password:
%
```

3.6.7 Displaying coupled pair LUs of the MRCF-Lite

- Command name

  `aumrcfluc`

- Synopsis

  `aumrcfluc -unit unit_name`

- Description

  The status of a pair of LUs coupled is displayed.

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit for which to reference MRCF-Lite information. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.

- Examples of using command

  References the MRCF-Lite information of an array unit whose name is df500a1.

```
% aumrcfluc  -unit df500a1
Password:
        RAID     RAID
  LU    Group    Level    Capacity   D-CTL   C-CTL Status
 2/3     0/0      5/5   100000000       0       0   PAIR
 7/8     1/1      1/1   100000000       1       1   PAIR
%
```

3.7 System Parameters

3.7.1 Referencing/Setting System Parameters

- Command name

  ausysparam

- Synopsis

  – In the case of DF350, DF400, and DF500

  ```
  ausysparam  -unit unit_name  -refer
  ```

  – In the case of DF400 (SCSI version)

  ```
  ausysparam   -unit unit_name  -set
               [ -SystemStartup single | DualIDTake | DualNotIDTake |
                                HotIDTake | HotNotIDTake ]
               [ -TakingID Port_no ctl_no ]
               [ -DataShare used | notUsed ]
               [ -SpareDisk one | two | not ]
               [ -HostConnection standard | OpenVMS | TRESPASS | WolfPack |
                                 IBM7135 | NCR ]
               [ -SerialNumber string ]
               [ -DriveCapacity row_no disk_size ]
               [ -VxVM enable | disable ]
               [ -CLAM enable | disable ]
               [ -Solaris enable | disable ]
               [ -DriveDetach enable | disable ]
               [ -MP5400 enable | disable ]
               [ -OdeMapper enable | disable ]
               [ -MultipathController enable | disable ]
               [ -ReportInquiry enable | disable ]
               [ -PROCOM enable | disable ]
               [ -ReportStatus enable | disable ]
               [ -MultipathArrayUnit enable | disable ]
               [ -LuCacheWarning enable | disable ]
               [ -UASuppress enable | disable ]
               [ -DataStriping 16 | 32 | 64 ]
               [ -Buzzer on | off ]
  ```

```
[ -LuSizeReport auto | not ]
[ -ScsiResetLip on | off ]
[ -ProcessorFailures reset | shutdown ]
[ -inquiryCommandQueue on | off ]
[ -inquiryAnsiVersion 2 | 3 ]
[ -inquiryVendor string ]
[ -inquiryProduct string ]
[ -inquiryRomMicro string ]
[ -inquiryRamMicro string ]
[ -CacheMode off | random | sequential | randseq ]
[ -PortType normal | multiple ]
[ -PortTypeResetLip  ctl_no port_no on | off ]
[ -PseudoResponse ctl_no busy | notReady ]
[ -SaveDataPointer ctl_no port_no
                   nothing | data | cmd | datacmd ]
[ -ControllerIdentifer ctl_no enable | disable ]
[ -ControllerID ctl_no string1 ]
[ -Rs232cOutflow ctl_no off | normal | hitrac ]
[ -WriteVerifyExecution ctl_no on | off ]
[ -ConnectLAN ctl_no on | off ]
[ -dhcp ctl_no enable | disable ]
[ -IPAddress ctl_no inet_addr ]
[ -SubnetMask ctl_no netmask ]
[ -DefaultGateway ctl_no gateway ]
[ -setSM ctl_no port_no tid ]
[ -rmSM ctl_no port_no tid ]
[ -setMS ctl_no port_no tid lu ]
[ -rmMS ctl_no port_no tid lu ]
[ -setMM ctl_no port_no tid hlu lu ]
[ -rmMM ctl_no port_no tid hlu lu ]
[ -sync ctl_no port_no atandard | async | N5 | N10 | N13 | N20 |
       N33 | N40 | W10 | W20 | W26 | W40 | W66 | W80 ]
[ -fd on | off ]
```

– In the case of DF400 (Fibre version)

```
ausysparam -unit unit_name –set
           [ -SystemStartup single | Dual | DualIDTake | DualNotIDTake |
                            HotIDTake | HotNotIDTake ]
           [ -TakingID Port_no ctl_no ]
           [ -DataShare used | notUsed ]
           [ -SpareDisk one | two | not ]
           [ -HostConnection standard | OpenVMS | TRESPASS | WolfPack ]
           [ -SerialNumber string ]
           [ -DriveCapacity row_num disk_size ]
           [ -VxVM enable | disable ]
           [ -CLAM enable | disable ]
           [ -Solaris enable | disable ]
           [ -DriveDetach enable | disable ]
           [ -HPUX enable | disable ]
           [ -MultipathController enable | disable ]
           [ -ReportInquiry enable | disable ]
           [ -PROCOM enable | disable ]
           [ -ReportStatus enable | disable ]
           [ -MultipathArrayUnit enable | disable ]
           [ -LuCacheWarning enable | disable ]
           [ -UASuppress enable | disable ]
           [ -SGI enable | disable ]
           [ -PortIdTaking enable | disable ]
           [ -DataStriping 16 | 32 | 64 ]
           [ -Buzzer on | off ]
           [ -ScsiResetLip on | off ]
           [ -ProcessorFailures reset | shutdown ]
           [ -inquiryCommandQueue on | off ]
           [ -inquiryVendor string ]
           [ -inquiryProduct string ]
           [ -inquiryRomMicro string ]
           [ -inquiryRamMicro string ]
           [ -CacheMode off | random | sequential | randseq ]
           [ -PortType normal | multiple ]
           [ -PortTypeResetLip  ctl_no port_no on | off ]
           [ -PortTypeOption ctl_no port_no SGI | HP enable | disable ]
           [ -ControllerIdentifer ctl_no enable | disable ]
           [ -ControllerID ctl_no string1 ]
           [ -Rs232cOutflow ctl_no off | normal | hitrac ]
           [ -WriteVerifyExecution ctl_no on | off ]
           [ -ConnectLAN ctl_no on | off ]
           [ -dhcp ctl_no enable | disable ]
           [ -IPAddress ctl_no inet_addr ]
           [ -SubnetMask ctl_no netmask ]
           [ -DefaultGateway ctl_no gateway ]
           [ -setMM ctl_no port_no hlu lu ]
           [ -rmMM ctl_no port_no hlu lu ]
           [ -fd on | off ]
```

– In the case of DF500 (SCSI version)

```
ausysparam -unit unit_name -set
           [ -SystemStartup Single | DuaIlDTake | DualNotIDTake |
                            HotIDTake | HotNotIDTake ]
           [ -TakingID port_no ctl_no ]
           [ -DataShare used | notUsed ]
           [ -HostConnection ctl_no port_no
                            standard | OpenVMS | TRESPASS | WolfPack |
                            IBM7135 | NCR ]
           [ -SerialNumber string ]
           [ -VxVM ctl_no port_no enable | disable ]
           [ -DriveDetach enable | disable ]
           [ -OdeMapper ctl_no port_no enable | disable ]
           [ -ReportInquiry ctl_no port_no enable | disable ]
           [ -MultipathController enable | disable ]
           [ -PROCOM enable | disable ]
           [ -ReportStatus enable | disable ]
           [ -MultipathArrayUnit enable | disable ]
           [ -LuCacheWarning enable | disable ]
           [ -UASuppress ctl_no port_no enable | disable ]
           [ -HISUP ctl_no port_no enable | disable ]
           [ -CCHS ctl_no port_no enable | disable ]
           [ -InquiryStandard ctl_no port_no enable | disable ]
           [ -ProdidDF400 ctl_no port_no enable | disable ]
           [ -DataStriping 16 | 32 | 64 ]
           [ -LuSizeReport auto | not ]
           [ -ProcessorFailures reset | shutdown ]
           [ -inquiryCommandQueue on | off ]
           [ -inquiryAnsiVersion 2 | 3 ]
           [ -inquiryVendor string ]
           [ -inquiryProduct string ]
           [ -inquiryRomMicro string ]
           [ -inquiryRamMicro string ]
           [ -WebTitle string ]
           [ -CacheMode off | random ]
           [ -PortTypeOption ctl_no port_no
                            ResetLipSignal | ResetLipProcess |
                            TargetReset | Reserve enable | disable ]
           [ -PseudoResponse ctl_no busy | notReady ]
           [ -SaveDataPointer ctl_no port_no
                            nothing | data | cmd | datacmd ]
           [ -ControllerIdentifier ctl_no enable | disable ]
           [ -ControllerID ctl_no string ]
           [ -Rs232cOutflow ctl_no off | normal | hitrack ]
           [ -WriteVerifyExecution ctl_no on | off ]
           [ -dhcp ctl_no enable | disable ]
           [ -IPAddress ctl_no inet_addr ]
           [ -SubnetMask ctl_no netmask ]
           [ -DefaultGateway ctl_no gateway ]
           [ -setSM ctl_no port_no tid ]
           [ -rmSM ctl_no port_no tid ]
           [ -setMS ctl_no port_no tid lu ]
           [ -rmMS ctl_no port_no tid lu ]
           [ -setMM ctl_no port_no tid hlu lu ]
           [ -rmMM ctl_no port_no tid hlu lu ]
           [ -sync ctl_no port_no standard | async |
                            N5 | N10 | N20 | N40 | W10 | W20 | W40 | W80 ]
           [ -fd on | off ]
```

– In the case of DF500 (Fibre version)

```
ausysparam -unit unit_name –set
           [ -SystemStartup Single | DualIDTake | DualNotIDTake |
                            HotIDTake | HotNotIDTake ]
           [ -TakingID Port_no ctl_no ]
           [ -DataShare used | notUsed ]
           [ -HostConnection ctl_no port_no
                             standard | OpenVMS | TRESPASS | WolfPack ]
           [ -SerialNumber string ]
           [ -VxVM ctl_no port_no enable | disable ]
           [ -DriveDetach enable | disable ]
           [ -HPUX ctl_no port_no enable | disable ]
           [ -ReportInquiry ctl_no port_no enable | disable ]
           [ -MultipathController enable | disable ]
           [ -PROCOM enable | disable ]
           [ -ReportStatus enable | disable ]
           [ -MultipathArrayUnit enable | disable ]
           [ -LuCacheWarning enable | disable ]
           [ -UASuppress ctl_no port_no enable | disable]
           [ -HISUP ctl_no port_no enable | disable ]
           [ -CCHS ctl_no port_no enable | disable ]
           [ -InquiryStandard ctl_no port_no enable | disable ]
           [ -ProdidDF400 ctl_no port_no enable | disable ]
           [ -LinkSeparation enable | disable ]
           [ -DataStriping 16 | 32 | 64 ]
           [ -ProcessorFailures reset | shutdown ]
           [ -inquiryCommandQueue on | off ]
           [ -inquiryVendor string ]
           [ -inquiryProduct string ]
           [ -inquiryRomMicro string ]
           [ -inquiryRamMicro string ]
           [ -WebTitle string ]
           [ -CacheMode off | random ]
           [ -PortTypeOption ctl_no port_no
                             ResetLipSignal | ResetLipProcess |
                             LipPortAllReset | TargetReset |
                             Reserve | LUReset | TPRLO
                             enable | disable ]
           [ -ControllerIdentifer ctl_no enable | disable ]
           [ -ControllerID ctl_no string1 ]
           [ -Rs232cOutflow ctl_no off | normal | hitrac ]
           [ -WriteVerifyExecution ctl_no on | off ]
           [ -dhcp ctl_no enable | disable ]
           [ -IPAddress ctl_no inet_addr ]
           [ -SubnetMask ctl_no netmask ]
           [ -DefaultGateway ctl_no gateway ]
           [ -setMM ctl_no port_no hlu lu ]
           [ -rmMM ctl_no port_no hlu lu ]
           [ -fd on | off ]
```

- Description

  References the contents of system parameters or set the parameters.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to reference and set system parameters. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-refer	References system parameters.
-set	Sets system parameters.
-SystemStartup Single | DualIDTake | DualNotIDTake | HotIDTake | HotNotIDTake	Specifies the configuration of an array unit. **Single:** Single **DualIDTake:** Dual active (with the taking over of SCSI ID) **DualNotIDTake:** Dual active (without the taking over of SCSI ID) **HotIDTake:** Hot standby (with the taking over of SCSI ID) **HotNotIDTake:** Hot standby (without the taking over of SCSI ID)
-TakingID port_no ctl_no	Specifies the default controller of each port when specifying a dual active configuration in which the taking over of SCSI IDs is used. **port_no:** Port number (A, B, C, D) **ctl_no:** Controller number (0, 1)
-DataShare used | notUsed	Specifies the data share mode. **used:** Uses the data share mode. **notUsed:** Does not use the data share mode.
-SerialNumber string	Specifies the lower four digits of the manufacturing serial number of an array unit with numeric characters. **The number is reflected on the fiber version of WWN, so do not set any value except for the lower four digits of the manufacturing serial number.** Factory set is the lower four digits of the manufacturing serial number of an array unit.
-DriveDetach enable | disable	Specifies whether to set the drive blockade mode effective or ineffective. **enable:** Enables the drive blockade mode. **disable:** Disables the drive blockade mode.
-MultipathController enable | disable	Specifies whether or not to perform sequential judgment for each controller. **enable:** Sequential decision at the controller unit. **disable:** Sequential decision at the port unit.
-PROCOM enable | disable	Specifies whether to set the PROCOM mode effective or ineffective. **enable:** Enables the PROCOM mode. **disable:** Disables the PROCOM mode.
-ReportStatus enable | disable	Specifies whether to set the warning status reporting mode effective or ineffective. **enable:** Enables the warning status report. **disable:** Disables the warning status report.

(Continued)

Options	Description
-MultipathArrayUnit enable | disable	Specifies whether or not to perform sequential judgment for each array unit. **enable:** Sequential decision at array unit. **disable:** Sequential decision at port unit.
-LuCacheWarning enable | disable	Specifies whether or not to report a warning when the turbo LU function is set effective. **enable:** Reports the warning. **disable:** Dose not report the warning.
-DataStriping 16 | 32 | 64	Specifies the data striping size. **16 :** To treat as 16 k byte. **32 :** To treat as 32 k byte. **64 :** To treat as 64 k byte.
-ProcessorFailures reset | shutdown	Specifies action when a processor failure occurs. **reset:** Resets the failure and restarts the controller. **shutdown:** Shuts down the array unit.
-inquiryAnsiVersion 2 | 3	Sets the ANSI version of standard INQUIRY data. **2:** SCSI2 **3:** SCSI3
-inquiryCommandQueue on | off	Specifies execution of command queuing of INQUIRY response information. **on:** Executes command queuing. **off:** Suppresses command queuing.
-inquiryVendor string	Specifies the vendor name of Inquiry response information with up to eight characters.
-inquiryProduct string	Specifies the product type of Inquiry response information with up to sixteen characters.
-inquiryRomMicro string	Specifies the ROM microprogram version of Inquiry response information with up to two characters.
-inquiryRamMicro string	Specifies the RAM microprogram version of Inquiry response information with up to two characters.
-CacheMode off | random | sequential |randseq	Specifies the method of allocating cache memory. **off:** Uses cache memory by the common allocation method. **random:** Uses it by allocating to the buffer for random read only. **sequential:** Uses it by allocating to the buffer for sequential read only. **randseq:** Uses it by allocating to the buffers for both random read and sequential read only.
-ControllerIdentifer ctl_no enable | disable	Specifies whether the controller identifier is valid or invalid. **ctl:** 0, 1 **enable/disable:** Valid/Invalid

(Continued)

Options	Description
-ControllerID ctl string1	Specifies the controller ID. **ctl:** 0, 1 **string1:** Controller ID (up to eight characters)
-LuSizeReport auto | not	Specifies the LU size to be reported to the host. Valid for the SCSI version only. **auto:** The LU size is automatically determined by the array unit. **not:** The LU size is set to an identical value.
-PseudoResponse ctl_no busy | notReady	Sets the response mode for duration from power on until the controller gets ready (in the case of SCSI version). **ctl_no**: Controller number (0, 1) **busy**: Responds with Busy. **notReady:** Respond with Not Ready.
-SaveDataPointer ctl port nothing | data | cmd | datacmd	Specifies the request for the controller to report a Save Data Pointer to the host. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B, C, D) **nothing:** Does not report. **data:** Reports after transferring data. **cmd:** Reports after receiving a command. **datacmd:** Reports after transferring data and after receiving a command.
-sync ctl_no port_no standard | async | N5 | N10 | N13 | N20 | N33 | N40 | W10 | W20 | W26 | W40 | W66 | W80	Specifies the SCSI transfer rate of a port. When connecting the DF500, do not specify **N13**, **W26**, **N33**, and **W66**, because they are all not supported. **standard:** Sets to a value so as to match the transfer rate of an interface board mounted. **async:** Transfers in the mode in which synchronous transfer is not used. **N5:** Sets the maximum transfer rate to Narrow 5 [MB/s]. **N10:** Sets the maximum transfer rate to Narrow 10 [MB/s]. **N13:** Sets the maximum transfer rate to Narrow 13 [MB/s]. **N20:** Sets the maximum transfer rate to Narrow 20 [MB/s]. **N33:** Sets the maximum transfer rate to Narrow 33 [MB/s]. **N40:** Sets the maximum transfer rate to Narrow 40 [MB/s]. **W10:** Sets the maximum transfer rate to Wide 10 [MB/s]. **W20:** Sets the maximum transfer rate to Wide 20 [MB/s]. **W26:** Sets the maximum transfer rate to Wide 26 [MB/s]. **W40:** Sets the maximum transfer rate to Wide 40 [MB/s]. **W66:** Sets the maximum transfer rate to Wide 66 [MB/s]. **W80:** Sets the maximum transfer rate to Wide 80 [MB/s].

(Continued)

Options	Description
-WriteVerifyExecution ctl_no on | off	Specifies execution of a write & verify operation **ctl_no:** Controller No. (0, 1) **on:** Executes a write & verify operation. **off:** Does not execute a write & verify operation.
-Rs232cOutflow ctl_no off | normal | hitrac	Sets the mode of sending out error information onto RS232C. **ctl_no:** Controller No. (0, 1) **off:** Does not send out information. **normal:** Sends out information. **hitrac:** Sends out information in the HITRAC mode.
-dhcp ctl_no enable | disable	Specifies whether the DHCP mode is enable or disable. **ctl_no:** Controller number (0, 1) **enable:** Enables the DHCP mode **disable:** Disables the DHCP mode.
-IPAddress ctl_no inet_addr	Specifies the IP address. **ctl_no:** Controller number (0, 1) **inet_addr:** IP address (format xxx.xxx.xxx.xxx)
-SubnetMask ctl_no netmask	Specifies the subnet mask. **ctl_no:** Controller number (0, 1) **netmask:** Subnet mask (format xxx.xxx.xxx.xxx)
-DefaultGateway ctl_no gateway	Specifies the default gateway. **ctl_no:** Controller number (0, 1) **gateway:** Default gateway (format xxx.xxx.xxx.xxx)
-setSM ctl_no port_no tid	Sets the target ID by S-TID, M-LUN modes. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B, C, D) **tid:** Target ID
-rmSM ctl_no port_no tid	Deletes the target ID by S-TID, M-LUN modes. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B, C, D) **tid:** Target ID

Note: If LAN configuration information (such as an IP Address) is modified, an error message (Interface Error) may be displayed without displaying a restart completion message when restarting an array unit. When modifying LAN configuration information, restart an array unit by not specifying restart.

(Continued)

Options	Description
-setMS ctl_no port_no tid lu	Sets the target ID by M-TID, S-LUN modes. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B, C, D) **tid:** Target ID **lu:** LU number
-rmMS ctl_no port_no tid lu	Deletes the target ID by M-TID, S-LUN modes. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B, C, D) **tid:** Target ID **lu:** LU number
-setMM ctl_no port_no tid hlu lu	Sets the target ID by M-TID, M-LUN modes. (for the case of SCSI version) **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B, C, D) **tid:** Target ID **hlu:** LU number recognized by the host **lu:** LU number
-rmMM ctl_no port_no tid hlu lu	Deletes the target ID by M-TID, M-LUN modes. (for the case of SCSI version) **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B, C, D) **tid:** Target ID **hlu:** LU number recognized by the host **lu:** LU number
-setMM ctl_no port_no hlu lu	Sets the target ID by M-TID, M-LUN modes. (for the case of Fibre version) **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B) **hlu:** LU number recognized by the host **lu:** LU number
-rmMM ctl_no port_no hlu lu	Deletes the target ID by M-TID, M-LUN modes. (for the case of Fibre version) **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B) **hlu:** LU number recognized by the host **lu:** LU number

(Continued)

Options	Description
-fd on | off	Specifies whether or not to make a backup copy to the FD. System parameters information is already saved in the backup FD in an array unit. When settings are modified, the information must be saved again, and hence be sure to specify on. **on:** Makes a backup copy. **off:** Does not make a backup copy.

In case of the DF400

Options	Description
-SpareDisk one | two | not	Specifies the configuration of spare disk drives. **one:** Uses one spare disk drive. **two:** Uses two spare disk drives. **not:** Dose not use spare disk drive.
-HostConnection standard | OpenVMS | TRESPASS | WolfPack | IBM7135 | NCR	Specifies the mode to be emulated. **standard:** Open system emulation mode **OpenVMS:** Open VMS mode **TRESPASS:** TRESPASS mode **WolfPack:** WolfPack mode **IBM7135:** IBM7135 I/O path switching emulation mode **NCR:** NCR I/O path switching emulation mode
-DriveCapacity row_num disk_size	Specifies the capacity of installed drives in units of rows. ROW 0 cannot be specified. **row_num:** 1, 2, 3, 4, 5 **disk_size:** 4, 9, 18, 36, 72 (G byte) 0xXXXXXXXX (user-specified value : hex. value)
-VxVM enable | disable	Specifies whether to set the VxVM mode effective or ineffective. **enable:** Enables the VxVM mode. **disable:** Disables the VxVM mode.
-OdeMapper enable | disable	Specifies whether to set the ODE Mapper mode effective or ineffective. **enable:** Enables the ODE Mapper mode. **disable:** Disables the ODE Mapper mode.
-HPUX enable | disable	Specifies whether to set the HP connection mode effective or ineffective. **enable:** Enables the HP connection mode. **disable:** Disables the HP connection mode.
-ReportInquiry enable | disable	Specifies whether to set the Inquiry Page : 83 reporting mode effective or ineffective. **enable:** Enables the report of Inquiry Page : 83. **disable:** Disables the report of Inquiry Page : 83.

(Continued)

Options	Description
-UASuppress enable | disable	Specifies whether or not to suppress a unit attention (06/2A00). **enable:** Suppress the unit attention. **disable:** Dose not suppress the unit attention.
-Buzzer on | off	Specifies whether to set the buzzer in the sounding mode or silent mode. **on:** Turn on the buzzer. **off:** Turn off the buzzer.
-PortTypeOption ctl_no port_no SGI | HP enable | disable	For the fibre version of the array unit, options can be specified for each port. **ctl_no:** Controller number (0, 1) **port:** Port number (A, B, C, D) **SGI:** Sets the SGI mode. **HP:** Sets the HP connection mode. **enable:** Enables the setting of SGI mode and HP connection mode. **disable:** Disables the setting of SGI mode and HP connection mode.
-CLAM enable | disable	Specifies whether to set the CLAM mode effective or ineffective. **enable:** Enables the CLAM mode. **disable:** Disables the CLAM mode.
-Solaris enable | disable	Specifies whether to set the SUN Solaris2.5.1 mode effective or ineffective. **enable:** Enables the SUN Solaris2.5.1 mode. **disable:** Disables the SUN Solaris2.5.1 mode.
-MP5400 enable | disable	Specifies whether to set the MP5400 mode effective or ineffective. **enable:** Enables the MP5400 mode. **disable:** Disables the MP5400 mode.
-OdeMapper enable | disable	Specifies whether to enable or disable the ODE Mapper mode. **enable:** Enables the ODE Mapper mode. **disable:** Disables the ODE Mapper mode.
-SGI enable | disable	Specifies whether to set the SGI mode effective or ineffective. **enable:** Enables the SGI mode. **disable:** Disables the SGI mode.
-PortIdTaking enable | disable	Specifies whether to set the taking over of port IDs effective or ineffective. **enable:** Enables the taking over of port ID. **disable:** Disables the taking over of port ID.
-ScsiResetLip on | off	For the SCSI version, sets the reset mode when receiving a SCSI reset from other ports. For the fibre version, sets the LIP mode when receiving an LIP from other ports. When the -PortType option is multiple, the setting is invalid. **on:** Sets a SCSI reset/LIP from other ports effective. **off:** Sets a SCSI reset/LIP from other ports ineffective.

(Continued)

Options	Description
-PortType normal | multiple	Sets the multi-port expansion function. **normal:** Validates the setting specified with -ScsiResetLip option. **multiple:** Sets the SCSI reset/LIP mode for each port.
-PortTypeResetLip ctl_no port_no on | off	Sets the SCSI reset/LIP mode for each controller and each port. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B, C, D) **on:** Sets a SCSI reset/LIP from other ports effective. **off:** Sets a SCSI reset/LIP from other ports ineffective.
-ConnectLAN ctl_no on | off	Specifies the validity/invalidity of interface with applications through LAN **ctl_no:** Controller number (0, 1) **on:** Enable **off:** Disable

In case of the DF500

Options	Description
-HostConnection ctl_no port_no standard | OpenVMS | TRESPASS | WolfPack |	Specifies the mode to be emulated. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B) **standard:** Open system emulation mode **OpenVMS:** Open VMS mode **TRESPASS:** TRESPASS mode **WolfPack:** WolfPack mode
-VxVM ctl_no port_no enable | disable	Specifies whether to set the VxVM mode effective or ineffective. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B) **enable:** Enables the VxVM mode. **disable:** Disables the VxVM mode.
-OdeMapper ctl_no port_no enable | disable	Specifies whether to set the ODE Mapper mode effective or ineffective. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B) **enable:** Enables the ODE Mapper mode. **disable:** Disables the ODE Mapper mode.
-HPUX ctl_no port_no enable | disable	Specifies whether to set the HP connection mode effective or ineffective. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B) **enable:** Enables the HP connection mode. **disable:** Disables the HP connection mode.
-HISUP ctl_no port_no enable | disable	Specifies whether to set the HISUP mode effective or ineffective. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B) **enable:** Enables the HISUP mode. **disable:** Disables the HISUP mode.
-CCHS ctl_no port_no enable | disable	Specifies whether to set the CCHS convert mode effective or ineffective. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B) **enable:** Enables the CCHS convert mode. **disable:** Disables the CCHS convert mode.
-InquiryStandard ctl_no port_no enable | disable	Specifies whether to set the Standard INQUIRY data expand mode effective or ineffective. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B) **enable:** Enables the Standard INQUIRY data expand mode. **disable:** Disables the Standard INQUIRY data expand mode.

(Continued)

Options	Description
-ProdidDF400 ctl_no port_no enable | disable	Specifies whether to set the Product ID DF400 mode effective or ineffective. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B) **enable:** Enables the Product ID DF400 mode. **disable:** Disables the Product ID DF400 mode.
-WebTitle string	If the home page of the array unit is displayed with the browser, specifies a character string displayed on the title bar of the browser. Enter up to 32 one-byte coded alphanumerics or characters (except for the ‘ (single quotation mark), “ (double quotation mark), and \ (backslash) symbols) other than numeric.
-LinkSeparation enable | disable	Specifies whether to set the Link Separation effective or ineffective. **enable:** Enables the Link Separation. **disable:** Disables the Link Separation.
-ReportInquiry ctl_no port_no enable | disable	Specifies whether to set the Inquiry Page : 83 reporting mode effective or ineffective. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B) **enable:** Enables the report of Inquiry Page : 83. **disable:** Disables the report of Inquiry Page : 83.
-UASuppress ctl_no port_no enable | disable	Specifies whether or not to suppress a unit attention (06/2A00). **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B) **enable:** Suppress the unit attention. **disable:** Dose not suppress the unit attention.
-PortTypeOption ctl_no port_no ResetLipSignal | ResetLipProcess | LipPortAllReset | TargetReset | Reserve | LUReset | TPRLO enable | disable	For the Fibre Channel version of array units, sets options for individual ports. **ctl_no:** Controller No. (0, 1) **port_no:** Port No. (A, B, C, D) **ResetLipSignal:** Sets ResetLip (signal). **ResetLipProcess:** Sets ResetLip (processing). **LipPortAllReset:** Sets the resetting of all ports by an LIP. **TargetReset:** Enables the Target rest. **Reserve:** Enables the Reserve. **LUReset:** Enables the LU reset. **TPRLO:** Sets Third Party Process Logout Mode. **enable:** Enables the settings described above. **disable:** Disables the settings described above.

- Examples of using command

  References the system parameters of an array unit whose name is df500a1.

```
% ausysparam  -unit df500a1  -refer
Password:
System parameter list.


DF Name : df500a1
Date : 2000/06/01 13:00:00
Micro Program Revision : 0553
Flash Program Revision : 0553
Array Unit Type : DF500


---- Common Parameter ----
System Startup Attribute = Dual Active Mode
  SCSI ID/Port ID Take-over Mode = ---
  Default Controller
    Port A = ---
    Port B = ---
  Data Share Mode = Not Used
Host Connection Mode 1
  Port 0A = Standard Mode
  Port 0B = Standard Mode
  Port 1A = Standard Mode
  Port 1B = Standard Mode
Host Connection Mode 2
  Port 0A
    VxVM DMP mode enable = OFF
    ODE Mapper mode enable = ---
    HP Connection mode enable = OFF
    Report Inquiry page 83H = OFF
    UA (06/2A00) suppress mode enable = OFF
    HISUP mode enable = OFF
    CCHS convert mode enable = OFF
    Standard INQUIRY data expand mode = OFF
    Product ID DF400 mode = OFF
  Port 0B
    VxVM DMP mode enable = OFF
    ODE Mapper mode enable = ---
    HP Connection mode enable = OFF
    Report Inquiry page 83H = OFF
    UA (06/2A00) suppress mode enable = OFF
    HISUP mode enable = OFF
    CCHS convert mode enable = OFF
    Standard INQUIRY data expand mode = OFF
    Product ID DF400 mode = OFF
  Port 1A
    VxVM DMP mode enable = OFF
    ODE Mapper mode enable = ---
    HP Connection mode enable = OFF
    Report Inquiry page 83H = OFF
    UA (06/2A00) suppress mode enable = OFF
    HISUP mode enable = OFF
    CCHS convert mode enable = OFF
    Standard INQUIRY data expand mode = OFF
    Product ID DF400 mode = OFF
```

```
  Port 1B
    VxVM DMP mode enable = OFF
    ODE Mapper mode enable = ---
    HP Connection mode enable = OFF
    Report Inquiry page 83H = OFF
    UA (06/2A00) suppress mode enable = OFF
    HISUP mode enable = OFF
    CCHS convert mode enable = OFF
    Standard INQUIRY data expand mode = OFF
    Product ID DF400 mode = OFF
Serial Number =
Option 1
  Drive Detach mode enable = OFF
Option 2
  Multipath (Controller) = OFF
  PROCOM mode enable = OFF
  Report Status (normal / warning) = OFF
  Multipath (Array Unit) = OFF
  Turbo LU Warning = OFF
Data Striping Size = 64KB
Operation if the Processor failures Occurs = Reset a Fault
INQUIRY information
  Command Queuing = ON
  ANSI Version = ---
  Vendor ID = HITACHI
  Product ID = DF500F
  ROM Microprogram Version =
  RAM Microprogram Version =
Web Title
  Web Title = ""
Cache Mode = All OFF
Host Connection Mode
  Link Separation
```

```
---- CTL0 Parameter ----
Target ID
  S-TID, M-LUN : NO
  M-TID, S-LUN : NO
  M-TID, M-LUN : YES


  Data
  Port  Target ID  H-LUN  LUN
  0A       --         0    1
  0A       --         1    3
Port Type
  Port Option
    Reset/LIP Mode (Signal)
      Port A = OFF
      Port B = OFF
    Reset/LIP Mode (Process)
      Port A = OFF
      Port B = OFF
    LIP Port All Reset Mode
      Port A = OFF
      Port B = OFF
    Target Reset (Bus Device Reset) Mode
      Port A = OFF
      Port B = OFF
    Reserve Mode
      Port A = OFF
      Port B = OFF
    Logical Unit Reset Mode
      Port A = OFF
      Port B = OFF
    Third Party Process Logout Mode
      Port A = OFF
      Port B = OFF
ROM Pseudo-response command processing = ---
Save Data pointer response
  Port A = ---
  Port B = ---
Controller Identifier = Disable
RS232C Error Information Outflow Mode = OFF
Write & Verify Execution Mode = ON
LAN Const
  DHCP = OFF
  IP Address = 0.0.0.0
  Subnet Mask = 0.0.0.0
  Default Gateway = 0.0.0.0
  Ether Address = 00:00:87:70:9F:F3
SCSI transfer rate
  Port A = ---
  Port B = ---
```

```
---- CTL1 Parameter ----
Target ID
  S-TID, M-LUN : NO
  M-TID, S-LUN : NO
  M-TID, M-LUN : YES


  Data
  Port  Target ID  H-LUN  LUN
  1A       --         0    2
Port Type
  Port Option
    Reset/LIP Mode (Signal)
      Port A = OFF
      Port B = OFF
    Reset/LIP Mode (Process)
      Port A = OFF
      Port B = OFF
    LIP Port All Reset Mode
      Port A = OFF
      Port B = OFF
    Target Reset (Bus Device Reset) Mode
      Port A = OFF
      Port B = OFF
    Reserve Mode
      Port A = OFF
      Port B = OFF
    Logical Unit Reset Mode
      Port A = OFF
      Port B = OFF
    Third Party Process Logout Mode
      Port A = OFF
      Port B = OFF
ROM Pseudo-response command processing = ---
Save Data pointer response
  Port A = ---
  Port B = ---
Controller Identifier = Disable
RS232C Error Information Outflow Mode = OFF
Write & Verify Execution Mode = ON
LAN Const
  DHCP = OFF
  IP Address = 0.0.0.0
  Subnet Mask = 0.0.0.0
  Default Gateway = 0.0.0.0
  Ether Address = 00:00:87:70:9F:F3
SCSI transfer rate
  Port A = ---
  Port B = ---
--- Parameter ---
FD Back Up = YES
%
```

Sets a system parameter (to suppress the mode in which to send error information to an RS232C interface) of an array unit whose name is df500a1.

```
% ausysparam  -unit df500a1  -set  -Rs232cOutflow off
This command will cause Array to stop communicating with all attached Hosts.
Continue (y/n [n]): y
Password:
System Parameter modification completed successfully.
Please reboot Array for changes to take effect.
%
```

Sets a system parameter (to set the buzzer in the sounding mode) of an array unit, whose name is df400a1 and which supports restarting.

```
%ausysparam  -unit df400a1  -set  -Buzzer on
This command will cause Array to stop communicating with all attached Hosts.
Continue (y/n [n]): y
Password:
System Parameter modification completed successfully.
Please reboot Array for changes to take effect.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]): y
Now rebooting the array unit.  Start Time HH:MM
Reboot has been completed.
%
```

Note: When setting all system parameters with Windows, you cannot set them on a prompt screen because of a limitation on the number of characters. Create the contents of settings on a Bat file, then execute appropriate commands.

3.7.2 Referencing/Setting RTC

- Command name

  aurtc

- Synopsis

```
aurtc  -unit unit_name  -refer
aurtc  -unit unit_name  -set -auto  [ -f ]
aurtc  -unit unit_name  -set -manual  -date yyyy/mm/dd  -time HH:MM:SS  [ -f ]
```

- Description

  References and sets RTC.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to reference and set RTC. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-refer	References RTC.
-set	Sets RTC.
-auto	Sets RTC by the date and time of the machine on which the manager is running.
-manual	Sets to RTC the date and time specified by -date and -time options, respectively.
-date yyyy/mm/dd	Specifies the date to set. **yyyy :** in A.D. (1900 to 2089) **mm :** month (01 to 12) **dd :** day (01 to 31)
-time HH:MM:SS	Specifies the time to set. **HH :** hour (00 to 23) **MM :** minute (00 to 59) **SS :** second (00 to 59)

- Examples of using command

  References RTC of an array unit whose name is df500a1.

```
% aurtc  -unit df500a1  -refer
Password:
Date 2001/05/10    Time 18:14:28
%
```

Automatically sets RTC of an array unit whose name is df500a1.

```
% aurtc  -unit df500a1  -set  -auto
Continue (y/n [n]): y
This command will cause Array to stop communicating with all attached Hosts.
Password:
RTC modification completed successfully.
Please reboot Array for changes to take effect.
%
```

Sets RTC of an array unit, whose name is df500a1, by specifying the date and time.

```
% aurtc  -unit df500a1  -set  -manual  -date 2000/01/01  -time 12:34:56
Continue (y/n [n]): y
This command will cause Array to stop communicating with all attached Hosts.
Password:
RTC modification completed successfully.
Please reboot Array for changes to take effect.
%
```

By specifying the date and time, sets RTC of an array unit, whose name is df400a1 and which supports restarting.

```
% aurtc  -unit df400a1  -set  -manual  -date 2000/01/01  -time 12:34:56
Continue (y/n [n]): y
This command will cause Array to stop communicating with all attached Hosts.
Password:
RTC modification completed successfully.
Please reboot Array for changes to take effect.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]): y
Now rebooting the array unit.  Start Time HH:MM
Reboot has been completed.
%
```

3.7.3 Referencing/Setting Target Information

- Command name

  autarget

- Synopsis

  – In the case of DF350, DF400, and DF500

```
autarget  -unit unit_name  -refer
```

  – In the case of DF350

```
autarget  -unit unit_name  -set -rm  -mode SM
          -ctl0 | -ctl1  -tid n  [ -fd on | off ]
autarget  -unit unit_name  -set | -rm  -mode MS
          -ctl0 | -ctl1  -tid n  -lu num  [ -fd on | off ]
```

  – In the case of DF400 (SCSI version)

```
autarget  -unit unit_name  -set | -rm  -mode SM
          -ctl0 | -ctl1  -port A | B | C | D  -tid n  [ -fd on | off ]
autarget  -unit unit_name  -set | -rm  -mode MS
          -ctl0 | -ctl1  -port A | B | C | D  -tid n  -lu lun
          [ -fd on | off ]
autarget  -unit unit_name  -set | -rm  -mode MS
          -ctl0 | -ctl1  -port A | B | C | D  -tid num  -hlu lun  -lu lun
          [ -fd on | off ]
```

  – In the case of DF400 (Fibre Channel version), DF500 (Fibre Channel version)

```
autarget  -unit unit_name  -set | -rm  -mode MM
          -ctl0 | -ctl1  -port A | B  -hlu lun  -lu lun  [ -fd on | off ]
```

  – In the case of DF500 (SCSI version)

```
autarget -unit unit_name -set | -rm -mode SM
          -ctl0 | -ctl1 -port A -tid n [ -fd on | off ]
autarget -unit unit_name -set | -rm -mode MS
          -ctl0 | -ctl1 -port A -tid n -lu lun [ -fd on | off ]
autarget -unit unit_name -set | -rm -mode MM
          -ctl0 | -ctl1 -port A -tid n -hlu lun -lu lun [ -fd on | off ]
```

  – In the case of DF400, DF500

```
autarget  -unit unit_name  -file filename  [ -fd on | off ]
```

- Description

  References and sets target ID information.
  DF350F has not been supported.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to reference and set target ID information. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-refer	References target ID information.
-set	Adds target ID information.
-rm	Deletes target ID information.
-mode SM | MS | MM	Specifies individual types of a target ID and a LUN configuration. **SM:** Single target ID and multi-LUN (Sets the target ID for a port, and the host uses an LUN shared by the port for the same LUN.) **MS:** Multi-target ID and single LUN (Sets the port and target ID for an LUN, and the host uses with a set target ID as LUN="0".) **MM:** LU mapping (Sets the port, target ID, and H-LUN for an LUN by mapping, and the host uses with a set configuration)
-ctl0 | -ctl1	Specifies the controller No.
-port A | B | C | D -port A | B	Specifies the port No.
-tid n	Specifies the target ID for the SCSI version. Cannot specify it for the fibre version.
-hlu n	Specifies the LUN recognized from the host.
-lu n	Specifies the internal LUN in the array unit.
-file filename	Specifies the target ID configuration file. If this option is specified, reads a target ID configuration file, and sets according to its contents.
-fd on | off	Specifies whether or not to make a backup copy of the FD. Target ID information has been saved in the backup FD in the array unit as system parameters information. When changing settings, target ID information needs to be saved again, so be sure to specify "on".

- Examples of using command

  Displays target ID information in an array unit (SCSI version) whose name is df400a1.

  [S-TID, M-LUN]

```
% autarget  -unit df400a1  -refer
Password:
Current target ID mode
   CTL0  S-TID, M-LUN
   CTL1  S-TID, M-LUN
CTL     PORT   T-ID    H-LUN    LUN
  0       A      0       --     --
  0       B      1       --     --
  1       A      2       --     --
  1       B      3       --     --

Reserved target ID mode
   CTL0  S-TID, M-LUN
   CTL1  S-TID, M-LUN
CTL     PORT   T-ID    H-LUN    LUN
  0       A      0       --     --
  0       B      0       --     --
  1       A      0       --     --
  1       B      0       --     --

%
```

  Displays target ID information in an array unit (SCSI version) whose name is df400b1.

  [M-TID, S-LUN]

```
% autarget  -unit df400b1  -refer
Password:
Current target ID mode
   CTL0  M-TID, S-LUN
   CTL0  M-TID, S-LUN
CTL     PORT   T-ID    H-LUN    LUN
  0       A      0       --      0
  0       A      1       --      1
  0       B      2       --      2
  0       B      3       --      3
  1       A      0       --      4
  1       A      1       --      5
  1       B      2       --      6
  1       B      3       --      7


Reserved target ID mode
   CTL0  M-TID, S-LUN
   CTL1  M-TID, S-LUN
CTL     PORT   T-ID    H-LUN    LUN
  0       A      0       --      0
  0       A      2       --      1
  0       B      4       --      2
  0       B      6       --      3
  1       A      1       --      4
  1       A      3       --      5
  1       B      5       --      6
  1       B      7       --      7

%
```

Displays target ID information in an array unit (SCSI version) whose name is df400c1.

[LU mapping]

```
% autarget  -unit df400c1  -refer
Password:
Current target ID mode
   CTL0  M-TID, M-LUN
   CTL1  M-TID, M-LUN
CTL     PORT   T-ID   H-LUN    LUN
  0       A      0       0      0
  0       B      1       2      4
  1       A      2       0      1
  1       B      3       2      5

Reserved target ID mode
   CTL0  M-TID, M-LUN
   CTL1  M-TID, M-LUN
CTL     PORT   T-ID   H-LUN    LUN
  0       A      0       1      2
  0       B      1       3      6
  1       A      2       1      3
  1       B      3       3      7

%
```

Displays target ID information in an array unit (Fibre version) whose name is df500a1.

[LU mapping]

```
% autarget  -unit df500a1  -refer
Password:
Current target ID mode
   CTL0  M-TID, M-LUN
   CTL1  M-TID, M-LUN
CTL     PORT   T-ID   H-LUN    LUN
  0       A     --       0      0
  0       B     --       2      4
  1       A     --       0      1
  1       B     --       2      5

Reserved target ID mode
   CTL0  M-TID, M-LUN
   CTL1  M-TID, M-LUN
CTL     PORT   T-ID   H-LUN    LUN
  0       A     --       1      2
  0       B     --       3      6
  1       A     --       1      3
  1       B     --       3      7

%
```

Sets target ID information in an array unit (SCSI version) whose name is df400a1. Sets the target ID of Controller 0, Port A to 0 with a single target ID and multi-LUN configuration.

```
% autarget  -unit df400a1  -set -mode SM  -ctl0  -port A  -tid 0  -fd on
Password:
Target ID modification completed successfully.
Please reboot Array for changes to take effect.
%
```

Sets target ID information in an array unit (SCSI version), whose name is df400a2 and which supports restarting. Sets the target ID of Controller 0, Port A to 0 with a single target ID and multi-LUN configuration.

```
% autarget  -unit df400a2  -set -mode SM  -ctl0  -port A  -tid 0  -fd on
Password:
Target ID modification completed successfully.
Please reboot Array for changes to take effect.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot.
Do you reboot the array unit now (y/n [n]): y
Now rebooting the array unit.  Start Time HH:MM
Reboot has been completed.
%
```

The format of the target ID configuration file when setting by file input is shown in the figure below.
Enter the **Target ID** by specifying “Yes” or “No”. Input necessary data for **Port**, **Target ID**, **H-LUN**, and **LUN**. Put spaces between the items. If the tabulating function is used, they are regarded as input errors and the inputs are ignored.

Example 1 LU mapping mode

```
Information file for Target ID configuration

S-TID,M-LUN : NO
M-TID,S-LUN : NO
M-TID,M-LUN : YES

Data
Port  Target ID  H-LUN  LUN
 OA        0         0    0
 OA        0         1    1
 OA        0         2    2
 OA        0         3    3
 OA        0         4    4
 OA        0         5    5
 OA        0         6    6
 OA        0         7    7
 OB        1         0    8
 OB        1         1    9
 OB        1         2   10
 OB        1         3   11
 OB        1         4   12
 OB        1         5   13
 OB        1         6   14
 OB        1         7   15
```

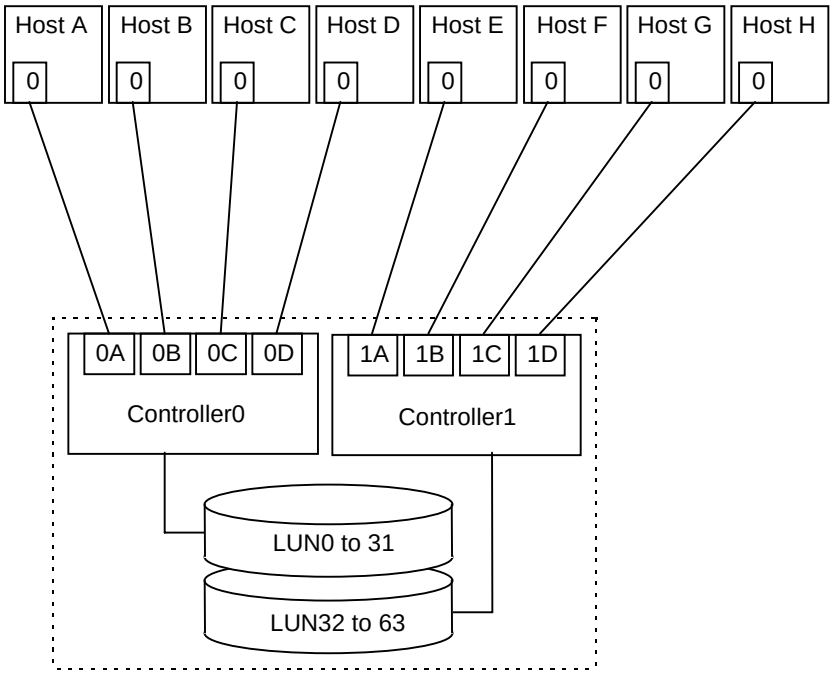
Example 2 Single target ID and multi-LUN mode

```
Information file for Target ID configuration

S-TID,M-LUN : YES
M-TID,S-LUN : NO
M-TID,M-LUN : NO

Data
Port  Target ID  H-LUN  LUN
 OA        0
 OB        1
 1A        2
 1B        3
```

Note: When the manager is connected to array unit with the Fibre Channel connection, set ‘--’ for the **T-ID**.

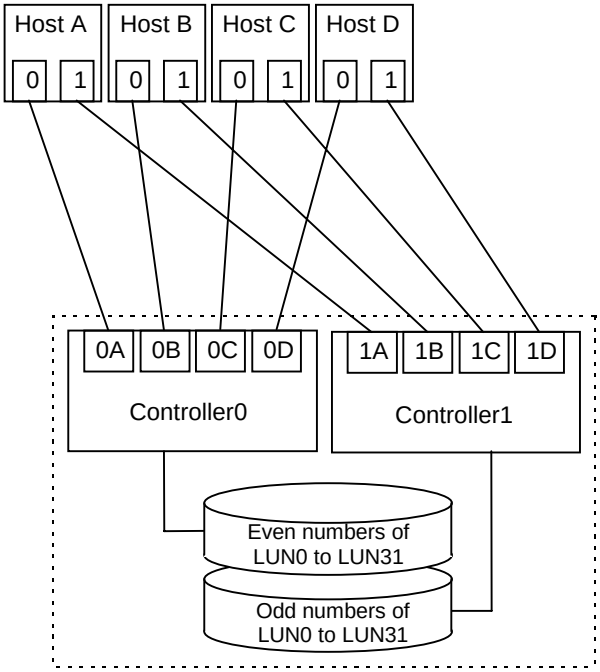
Two types of the sample files when setting by file input are provided. The sample file configuration is shown below.

Sample file : id00.txt --- Host LU independent access type



Host	Port	Target ID	H-LUN	LUN
A	0A	0	0 to 7	0 to 7
B	0B	1	0 to 7	8 to 15
C	0C	2	0 to 7	16 to 23
D	0D	3	0 to 7	24 to 31
E	1A	0	0 to 7	32 to 39
F	1B	1	0 to 7	40 to 47
G	1C	2	0 to 7	48 to 55
H	1D	3	0 to 7	56 to 63

Sample file : id01.txt --- Host alternate path access type



Host	Port	Target ID	H-LUN	LUN
A-Path0	0A	0	0 to 7	0 to 7
A-Path1	0B	1	0 to 7	8 to 15
B-Path0	0C	2	0 to 7	16 to 23
B-Path1	0D	3	0 to 7	24 to 31
C-Path0	1A	0	0 to 7	0 to 7
C-Path1	1B	1	0 to 7	8 to 15
D-Path0	1C	2	0 to 7	16 to 23
D-Path1	1D	3	0 to 7	24 to 31

3.7.4 Referencing/Setting LAN Information

- Command name

  aulan

- Synopsis

  – In the case of DF350, DF400, and DF500

```
aulan  -unit unit_name  -refer
```

  – In the case of DF350

```
aulan  -unit unit_name  -set  -ctl0 | -ctl1
       [ -addr inet_addr]  [-mask netmask]  [-gate gateway]
       [ -fd on | off ]
```

  – In the case of DF400

```
aulan  -unit unit_name  -set  -ctl0 | -ctl1
       [ -addr inet_addr]  [-mask netmask]  [-gate gateway]
       [ -link enable | disable ]  [ -dhcp enable | disable ]
       [ -fd on | off ]
```

  – In the case of DF500

```
aulan  -unit unit_name  -set  -ctl0 | -ctl1
       [ -addr inet_addr ]  [ -mask netmask ]  [ -gate gateway ]
       [ -dhcp enable | disable ]  [ -fd on | off ]
```

- Description

  Displays and sets LAN information of the array unit.
  DF350F has not been supported.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to reference and set LAN information. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-refer	References LAN information.
-set	Sets LAN information.
-ctl0 | -ctl1	Specifies the controller.
-addr inet_addr	Specifies individual IP addresses.
-mask netmask	Specifies individual subnet masks.

(Continued)

Options	Description
-gate gateway	Specifies individual default gateways.
-link enable | disable	Specifies whether LAN connection is valid or invalid.
-dhcp enable | disable	Specifies whether the DHCP mode is set enable or disable.
-fd on | off	Specifies whether or not to make a backup copy of the FD. LAN information has been saved in the backup FD in the array unit as system parameters information. When changing settings, LAN information needs to be saved again, so be sure to specify "on".

- Examples of using command

  References LAN information of an array unit whose name is df500a1.

```
% aulan  -unit df500a1  -refer
Password:
CTL   IP Address     Subnet mask      Gateway    Ethernet address  DHCP
  0   125.0.9.98   255.255.255.0   125.0.9.15   00:00:87:50:78:AF   OFF
  1   125.0.9.99   255.255.255.0   125.0.9.15   00:00:87:50:78:9F   OFF
%
```

  References LAN information of an array unit (DF350) whose name is df350a1.

```
% aulan  -unit df350a1  -refer
Password:
CTL   IP Address     Subnet mask      Gateway    Ethernet address
  0   125.0.9.98   255.255.255.0   125.0.9.15   00:00:87:50:78:AF
  1   125.0.9.99   255.255.255.0   125.0.9.15   00:00:87:50:78:9F
%
```

  Sets LAN information for the Controller 0 side of an array unit (DF350) whose name is df350b1.

```
% aulan  -unit df350b1  -set  -ctl0
-addr 192.168.100.100 -mask 255.255.255.0 -gate 192.168.100.3
Password:
%
```

  Sets LAN information for the Controller 0 side of an array unit whose name is df500a1.

```
% aulan  -unit df500a1  -set  -ctl0
-addr 192.168.100.100  -mask 255.255.255.0  -gate 192.168.100.5
Password:
LAN information modification completed successfully.
Please reboot Array for changes to take effect.
%
```

Sets LAN information for the Controller 0 side of an array unit whose name is df400a1 and which supports restarting.

```
% aulan  -unit df400a1  -set  -ctl0
-addr 192.168.100.100  -mask 255.255.255.0  -gate 192.168.100.5
Password:
LAN information modification completed successfully.
Please reboot Array for changes to take effect.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]): y
Now rebooting the array unit.  Start Time HH:MM
Reboot has been completed.
%
```

3.7.5 Referencing/Setting SCSI Transfer Rate

- Command name

  ausync

- Synopsis

  – In the case of DF400, DF500

  ```
  ausync  -unit unit_name  -refer
  ```

  – In the case of DF400

  ```
  ausync  -unit unit_name  -set  -ctl0 | -ctl1  -port A | B | C | D
          -sync standard | async | N5 | N10 | N13 | N20 | N33 | N40 | W10 |
          W20 | W26 | W40 | W66 | W80
          [ -fd on | off ]
  ```

  – In the case of DF500

  ```
  ausync -unit unit_name -set -ctl0 | -ctl1 -port A
          -sync standard | async | N5 | N10 | N20 | N40 |
          W10 | W20 | W40 | W80
          [ -fd on|off ]
  ```

- Description

  Displays and sets the SCSI transfer rate of each port. When setting, one entry of the command can set the transfer rate only for one port.

■ Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to reference and set the SCSI transfer rate. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-refer	References SCSI transfer rate information.
-set	Sets SCSI transfer rate information.
-ctl0 | -ctl1	Specifies the controller for which to set information.
-port A | B | C | D	Specifies the port for which to set information.
-sync standard | async | N5 | N10 | N13 | N20 | N33 | N40 | W10 | W20 | W26 | W40 | W66 | W80	Specifies the transfer rate of a port. When connecting the DF500, do not specify **N13**, **W26**, **N33**, and **W66**, because they are all not supported. **standard:** Sets the transfer rate so as to match that of a mounted interface board. **async:** Transfers in a mode in which synchronous transfer is not used. **N5, W10:** Maximum transfer rate: Narrow 5 [MB/s], Wide 10 [MB/s] **N10, W20:** Maximum transfer rate: Narrow 10 [MB/s], Wide 20 [MB/s] **N13, W26:** Maximum transfer rate: Narrow 13 [MB/s], Wide 26 [MB/s] **N20, W40:** Maximum transfer rate: Narrow 20 [MB/s], Wide 40 [MB/s] **N33, W66:** Maximum transfer rate: Narrow 33 [MB/s], Wide 66 [MB/s] **N40, W80:** Maximum transfer rate: Narrow 40 [MB/s], Wide 80 [MB/s]
-fd on | off	Specifies whether or not to make a backup copy of the FD. SCSI transfer rate information has been saved in the backup FD in the array unit as system parameters information. When changing settings, SCSI transfer rate information needs to be saved again, so be sure to specify "on".

- Examples of using command

  References the SCSI transfer rate information of an array unit whose name is df400a1.

```
% ausync  -unit df400a1  -refer
Password:
CTL   Port    I/F board type    Velocity
  0     A     no set            standard
  0     B     no set            standard
  0     C     no set            standard
  0     D     differential      async
  1     A     no set            standard
  1     B     differential      5 (10) MB
  1     C     no set            standard
  1     D     no set            standard
%
```

  Sets SCSI transfer rate information for port A on Controller 0 side of an array unit whose name is df400a1.

```
% ausync  -unit df400a1  -set  -ctl0  -port A  -sync standard  -fd on
Password:
SYNC CONTROL modification completed successfully.
Please reboot Array for changes to take effect.
%
```

  Sets SCSI transfer rate information for port A on Controller 0 side of an array unit, whose name is df400a2 and which supports restarting.

```
% ausync  -unit df400a2  -set  -ctl0  -port A  -sync standard  -fd on
Password:
SYNC CONTROL modification completed successfully.
Please reboot Array for changes to take effect.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]): y
Now rebooting the array unit.  Start Time HH:MM
Reboot has been completed.
%
```

3.7.6 Referencing/Setting the port option and controller identifier

- Command name

  auportop

- Synopsis

  – In the case of DF500

```
auportop   -unit unit_name  -refer
```

  – In the case of SCSI version

```
auportop   -unit unit_name  -set
           [ -HostConnection ctl_no port_no
                             standard | OpenVMS | TRESPASS | WolfPack |
                              IBM7135 | NCR ]
           [ -VxVM ctl_no port_no enable | disable ]
           [ -OdeMapper ctl_no port_no enable | disable ]
           [ -ReportInquiry ctl_no port_no enable | disable ]
           [ -UASuppress ctl_no port_no enable | disable ]
           [ -HISUP ctl_no port_no enable | disable ]
           [ -CCHS ctl_no port_no enable | disable ]
           [ -InquiryStandard ctl_no port_no enable | disable ]
           [ -ProdidDF400 ctl_no port_no enable | disable ]
           [ -PortTypeOption ctl_no port_no
                           ResetLipSignal | ResetLipProcess |
                           TargetReset | Reserve enable | disable ]
           [ -ControllerID ctl_no string ]
           [ -fd on | off ]
```

  – In the case of Fibre version

```
auportop   -unit unit_name  -set
           [ -HostConnection ctl_no port_no
                             standard | OpenVMS | TRESPASS | WolfPack |
           [ -VxVM ctl_no port_no enable | disable ]
           [ -HPUX ctl_no port_no enable | disable ]
           [ -ReportInquiry ctl_no port_no enable | disable ]
           [ -UASuppress ctl_no port_no enable | disable ]
           [ -HISUP ctl_no port_no enable | disable ]
           [ -CCHS ctl_no port_no enable | disable ]
           [ -InquiryStandard ctl_no port_no enable | disable ]
           [ -ProdidDF400 ctl_no port_no enable | disable ]
           [ -PortTypeOption ctl_no port_no
                           ResetLipSignal | ResetLipProcess |
                           LipPortAllReset | TargetReset |
                           Reserve | LUReset | TPRLO
                           enable | disable ]
           [ -ControllerID ctl_no string ]
           [ -fd on | off ]
```

- Description

  Referencing and setting the port option of the system parameters and controller identifier during online.

  Setting is allowed only if the Target ID mode of an array unit which to set up has been set to [M-TID, M-LUN] (mapping). In addition, additions to mapping information can be set for Target IDs that are not set.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to reference and set system parameters. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-refer	References system parameters.
-set	Sets system parameters.
-HostConnection ctl_no port_no standard | OpenVMS | TRESPASS | WolfPack | IBM7135 | NCR	Specifies the mode to be emulated. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B) **standard:** Open system emulation mode **OpenVMS:** Open VMS mode **TRESPASS:** TRESPASS mode **WolfPack:** WolfPack mode **IBM7135**: IBM7135 mode **NCR**: NCR mode
-VxVM ctl_no port_no enable | disable	Specifies whether to set the VxVM mode effective or ineffective. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B) **enable:** Enables the VxVM mode. **disable:** Disables the VxVM mode.
-OdeMapper ctl_no port_no enable | disable	Specifies whether to set the ODE Mapper mode effective or ineffective. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B) **enable:** Enables the ODE Mapper mode. **disable:** Disables the ODE Mapper mode.
-HPUX ctl_no port_no enable | disable	Specifies whether to set the HP connection mode effective or ineffective. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B) **enable:** Enables the HP connection mode. **disable:** Disables the HP connection mode.

(Continued)

Options	Description
-ReportInquiry ctl_no port_no enable | disable	Specifies whether to set the Inquiry Page : 83 reporting mode effective or ineffective. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B) **enable:** Enables the report of Inquiry Page : 83. **disable:** Disables the report of Inquiry Page : 83.
-UASuppress ctl_no port_no enable | disable	Specifies whether or not to suppress a unit attention (06/2A00). **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B) **enable:** Suppress the unit attention. **disable:** Dose not suppress the unit attention.
-HISUP ctl_no port_no enable | disable	Specifies whether to set the HISUP mode effective or ineffective. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B) **enable:** Enables the HISUP mode. **disable:** Disables the HISUP mode.
-CCHS ctl_no port_no enable | disable	Specifies whether to set the CCHS convert mode effective or ineffective. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B) **enable:** Enables the CCHS convert mode. **disable:** Disables the CCHS convert mode.
-InquiryStandard ctl_no port_no enable | disable	Specifies whether to set the Standard INQUIRY data expand mode effective or ineffective. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B) **enable:** Enables the Standard INQUIRY data expand mode. **disable:** Disables the Standard INQUIRY data expand mode.
-ProdidDF400 ctl_no port_no enable | disable	Specifies whether to set the Product ID DF400 mode effective or ineffective. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B) **enable:** Enables the Product ID DF400 mode. **disable:** Disables the Product ID DF400 mode.

(Continued)

Options	Description
-PortTypeOption ctl_no port_no ResetLipSignal | ResetLipProcess | LipPortAllReset | TargetReset | Reserve | LUReset | TPRLO enable | disable	For the Fibre Channel version of array units, sets options for individual ports. **ctl_no:** Controller No. (0, 1) **port_no:** Port No. (A, B, C, D) **ResetLipSignal:** Sets ResetLip (signal). **ResetLipProcess:** Sets ResetLip (processing). **LipPortAllReset:** Sets the resetting of all ports by an LIP. **TargetReset:** Enables the Target rest. **Reserve:** Enables the Reserve. **LUReset:** Enables the LU reset. **TPRLO:** Sets Third Party Process Logout Mode. **enable:** Enables the settings described above. **disable:** Disables the settings described above.
-ControllerID ctl string1	Specifies the controller ID. **ctl:** 0, 1 **string1:** Controller ID (up to eight characters)
-fd on | off	Specifies whether or not to make a backup copy to the FD. System parameters information is already saved in the backup FD in an array unit. When settings are modified, the information must be saved again, and hence be sure to specify on. **on:** Makes a backup copy. **off:** Does not make a backup copy.

- Examples of using command

  References the system parameters of an array unit whose name is df500a1.

```
% auportop  -unit df500a1  -refer
Password:
Host Connection Mode 1
  Port 0A = Standard Mode
  Port 0B = Standard Mode
  Port 1A = Standard Mode
  Port 1B = Standard Mode

Host Connection Mode 2
VxVM DMP Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
HP Connection Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
Report inquiry page 83H
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
UA(06/2A00) suppress Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
HISUP Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
CCHS Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
Standrad INQUIRY data expand Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
Product ID DF400 Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
```

```
Port Option
Reset/LIP Mode (Signal)
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
Reset/LIP Mode (Process)
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
Reset All LIP Port Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
Reset Target (Reset Bus Device) Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
Reserve Mode
  Port 0A = OFF
  Port 0B = OFF
  Port 1A = OFF
  Port 1B = OFF
Reset Logical Unit Mode
  0A = disable
  0B = disable
  1A = disable
  1B = disable
Reset Logout of Third Party Process Mode
  0A = disable
  0B = disable
  1A = disable
  1B = disable

Controller Identifier
  CTL0 = DF500-00 C0
  CTL1 = DF500-00 C1
```

Sets the unit attention option “UA(06/2A00) suppress mode” by the system parameters for port A on controller 0 side of an array unit whose name is df500a1.

```
% auportop  -unit df500a1  -set –UASuppress 0 A enable
Password:
%
```

3.7.7 Setting Target Information during online

- Command name

  auontarget

- Synopsis

  – In the case of SCSI version

```
auontarget  -unit unit_name  -add ctl_no port_no tid hlu lu [ -fd on | off ]
auontarget  -unit unit_name  -chg ctl_no port_no tid hlu lu [ -fd on | off ]
auontarget  -unit unit_name  -rm ctl_no port_no tid hlu lu [ -fd on | off ]
```

  – In the case of Fibre version

```
auontarget  -unit unit_name  -add ctl_no port_no hlu lu [ -fd on | off ]
auontarget  -unit unit_name  -chg ctl_no port_no hlu lu [ -fd on | off ]
auontarget  -unit unit_name  -rm ctl_no port_no hlu lu [ -fd on | off ]
```

- Description

  Mapping information is set during online.

  Setting is allowed only if the Target ID mode of an array unit which to set up has been set to [M-TID, M-LUN] (mapping). In addition, additions to mapping information can be set for Target IDs that are already set.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to reference and set system parameters. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-add ctl_no port_no tid hlu lu	Adds the mapping information. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B) **tid:** Target ID (Fibre version is unnecessary) **hlu:** LU number recognized by the host **lu:** LU number of the array unit
-chg ctl_no port_no tid hlu lu	Changes the mapping information. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B) **tid:** Target ID (Fibre version is unnecessary) **hlu:** LU number recognized by the host **lu:** LU number of the array unit
-rm ctl_no port_no tid hlu lu	Deletes the mapping information. **ctl_no:** Controller number (0, 1) **port_no:** Port number (A, B) **tid:** Target ID (Fibre version is unnecessary) **hlu:** LU number recognized by the host **lu:** LU number of the array unit

- Examples of using command

  Sets up an LU with an internal LUN 3 of an array unit, whose name is df500a1, as Controller 0, Port A, Target ID 1, and Host LUN 2.

```
% auontarget  -unit df500a1  -add 0 A 1 2 3
Password:
%
```

  Changes the setup of an LU with an internal LUN 0 of an array unit, whose name is df500a1, to Controller 0, Port A, Target ID 1, and Host LUN 3.

```
% auontarget  -unit df500a1  -chg 0 A 1 3 0
Password:
%
```

  Deletes the setup, as Controller 0, Port A, Target ID 1, and Host LUN 2, of an LU with an internal LUN 0 of an array unit whose name is df500a1.

```
% auontarget  -unit df500a1  -rm 0 A 1 2 0
Password:
%
```

3.8 File Output of Configuration and Configuration Setting by File

To output in a text file the configuration information of the array unit, or to set its configuration using a text file.
The configuration information output in the text file is the status of the system parameters, and those of the constituent parts of the RAID/LU and the array unit. The configuration to be set is the system parameters and RAID/LU. The status of the constituent parts of the array unit cannot be set.
The configuration information is handled with separate text files for the system parameters and for RAID/LU.
The copying of configuration between array units can be carried out, by outputting a text file of the configuration from an array unit, and then by using the output text file to set another array unit.
Editing a text file to set an array unit can be carried out, but it is requested that this function be used for the configuration of the same array unit. As for a change in the configuration, please carry it out by the individual functions.

3.8.1 File Output of the Configuration : System Parameters

- Command name

  ausyspout

- Synopsis

  ```
  ausyspout  -unit unit_name  -file file_name
  ```

- Description

  Output in text form to a specified file the setting content of the system parameters set in the array unit.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit whose system parameters are to be output into the file. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-file file_name	Specifies the name the file (path) to output the system parameters.

- Examples of using command

  Output the setting information of the system parameters of the array unit with the name : df500a1 in a file with the name : sysprm.txt in the directory where the manager is installed.

```
% ausysypout  -unit df500a1  -file sysprm.txt
Password:
%
```

The format of the output file consists of the following items. The outline of the layout of the output file is shown in Figure 3.7.

- File header
- Registration name with the manager of the array unit
- Output time (Time of the machine where the manager is installed)
- Microprogram revision
- Array unit type
- Common controller parameters
- Controller 0 parameters
- Controller 1 parameters
- Direction for FD backup

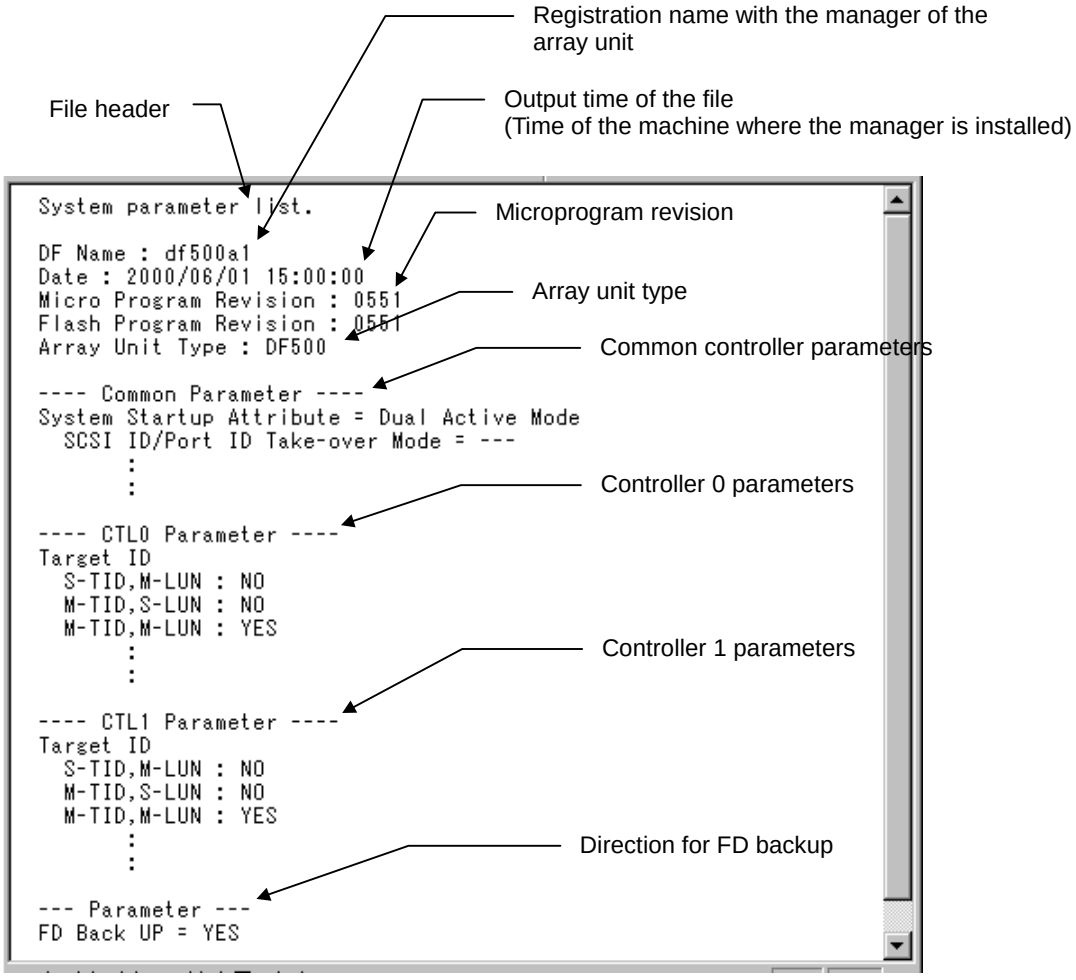


Figure 3.7 Outline of the format of the system parameters output file

If DF300, DF350, and DF350F units are connected, the item of the revision of the flash program is displayed as "---". In addition, the type of array units is not displayed.

- Common Controller Parameters

  The common system parameters of the array unit are output. An output example of the system parameters of DF500 is shown in Figure 3.8.

```
---- Common Parameter ----
System Startup Attribute = Dual Active Mode
  SCSI ID/Port ID Take-over Mode = ---
  Default Controller
    Port A = ---
    Port B = ---
  Data Share Mode = Used
Host Connection Mode 1
  Port 0A = Standard Mode
  Port 0B = Standard Mode
  Port 1A = Standard Mode
  Port 1B = Standard Mode
Host Connection Mode 2
  Port 0A
    VxVM DMP mode enable = OFF
    ODE Mapper mode enable = OFF
    HP Connection mode enable = ---
    Report inquiry page 83H = ON
    UA(06/2A00) suppress mode enable = OFF
    HISUP mode enable = OFF
    CCHS convert mode enable = OFF
  Port 0B
    VxVM DMP mode enable = OFF
    ODE Mapper mode enable = OFF
    HP Connection mode enable = ---
    Report inquiry page 83H = ON
    UA(06/2A00) suppress mode enable = OFF
    HISUP mode enable = OFF
    CCHS convert mode enable = OFF
  Port 1A
    VxVM DMP mode enable = OFF
    ODE Mapper mode enable = OFF
    HP Connection mode enable = ---
    Report inquiry page 83H = ON
    UA(06/2A00) suppress mode enable = OFF
    HISUP mode enable = OFF
    CCHS convert mode enable = OFF
  Port 1B
    VxVM DMP mode enable = OFF
    ODE Mapper mode enable = OFF
    HP Connection mode enable = ---
    Report inquiry page 83H = ON
    UA(06/2A00) suppress mode enable = OFF
    HISUP mode enable = OFF
    CCHS convert mode enable = OFF
Serial Number =
Option 1
  Drive Detach mode enable = OFF
Option 2
  Multipath(Controller) = OFF
  PROCOM mode enable = OFF
  Report status (normal / warning) = OFF
  Multipath (Array Unit) = OFF
  Turbo LU Warning = OFF
Data Striping Size = 64KB
Operation if the Processor failures Occurs = Reset a Fault
INQUIRY Information
  Command Queuing = ON
  ANSI Version = ---
  Vendor ID =
  Product ID =
  ROM Microprogram Version =
  RAM Microprogram Version =
Web Title
  Web Title = ""
Cache Mode = All OFF
```

Figure 3.8 System parameters: output example of common parameters

The common parameters are the items shown in Table 3.1.

Table 3.1 List of common parameters

No.	Parameter	Option
1	System Startup Attribute	-SystemStartup
	Single Mode	Single
	Dual Active Mode	DualIDTake
	Hot Standby Mode	DualNotIDTake
	SCSI ID/Port ID Take-over Mode	
	Used	HotIDTake
	Not Used	HotNotIDTake
	Default Controller	-TakingID
	Data Share Mode	-DataShare
2	Spare Disk	-SpareDisk
	One spare disk is valid	one
	Two spare disk is valid	two
	Spare disk not mounted	not
3	Host Connection Mode 1	-HostConnenction
	Standard Mode	standard
	Open VMS Mode	OpenVMS
	TRESSPASS Mode	TRESSPASS
	Wolfpack Mode	WolfPack
	IBM7135 I/O path switch emulation Mode	IBM7135
	NCR I/O path switch emulation Mode	NCR
4	Host Connection Mode 2	
	VxVM DMP mode enable	-VxVM
	ODE Mapper mode enable	-OdeMappar
	HP Connection mode enable	-HPUX
	Report inquiry page 83H	-ReportInquiry
	UA (06/2A00) suppress mode enable	-UASuppress
	HISUP mode enable	-HISUP
	CCHS convert mode enable	-CCHS
	Standard INQURITY data expand mode	-InquiryStandard
	Product ID DF400 mode	-ProdidDF400
5	Serial Number	-SerialNumber
6	Drive Capacity (ROW LAST LBA)	-DriveCapacity

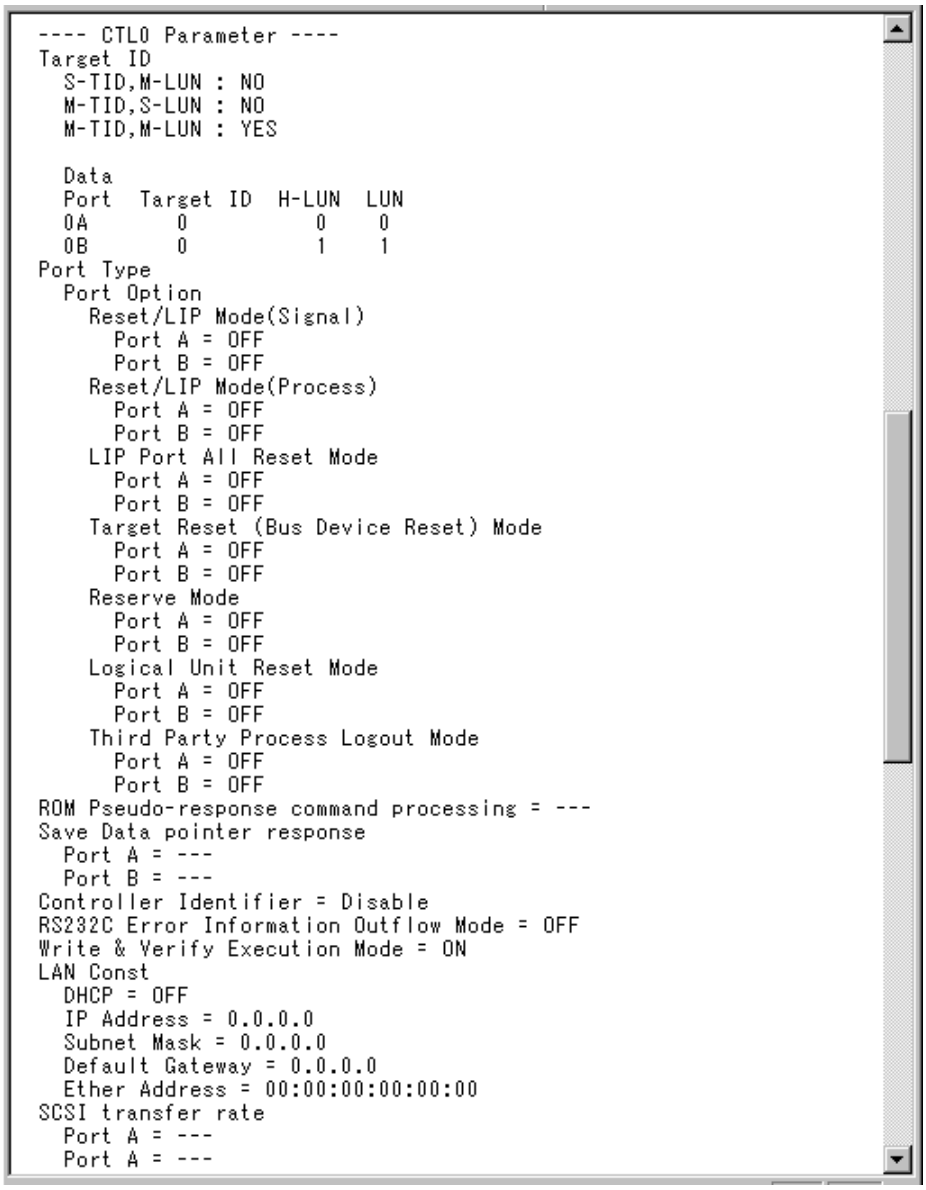
Table 3.1 List of common parameters (Continued)

No.	Parameter	Option
7	Option 1	
	VxVM DMP mode enable	-VxVM
	CLAM mode enable	-CLAM
	SUN Solaris2.5.1 mode enable	-Solaris
	Drive Detach mode enable	-DriveDetach
	MP5400 mode enable	-MP5400
	ODE Mapper mode enable	-OdeMappar
	HP Connection mode enable	-HPUX
8	Option 2	
	Multi path (Controller)	-MultipathController
	Report inquiry page 83H	-ReportInquiry
	PROCOM mode enable	-PROCOM
	Report status (normal/warning)	-ResetStatus
	Multi path (Array Unit)	-MultipathArrayUnit
	Turbo LU Warning	-LuCacheWarning
	UA (06/2A00) suppress mode enable	-UASuppress
	SGI mode enable	-SGI
	Port-ID Taking-over enable	-PortIdTaking
9	Data Striping Size	-DataStriping
10	Buzzer	-Buzzer
11	LU size Report to the Host	-LuSizeReport
12	SCSI Reset/LIP Mode for all Ports	-ScsiResetLip
13	Operation if the Processor failures Occurs	-ProcessorFailures
14	INQUIRY Information	
	Command Queuing	-inquryCommandQueue
	ANSI Version	-inquryAnsiVersion
	Vendor ID	-inquryVendor
	Product ID	-inquryProduct
	ROM Microprogram Version	-inquryRomMicro
	RAM Microprogram Version	-inquryRammicro
15	Cache Mode	-CacheMode
	All OFF	off
	Random mode	random
	Sequential mode	sequential
	Random & Sequential mode	randseq
16	Web Title	-WebTitle
17	Host Connection Mode	
	Link Separation	-LinkSeparation

Depending on the array unit in connection, there are items that do not need to be set, and these items will not be output in the file. Moreover, if the value of an item in the parameters is given as "---" it is an item not supported in the configuration of the array unit.

- Controller 0 Parameters

  The parameters of controller 0 in the system parameters of the array unit that make the output are output.



```
---- CTL0 Parameter ----
Target ID
  S-TID,M-LUN : NO
  M-TID,S-LUN : NO
  M-TID,M-LUN : YES

  Data
  Port  Target ID  H-LUN  LUN
  0A       0          0    0
  0B       0          1    1
Port Type
  Port Option
    Reset/LIP Mode(Signal)
      Port A = OFF
      Port B = OFF
    Reset/LIP Mode(Process)
      Port A = OFF
      Port B = OFF
    LIP Port All Reset Mode
      Port A = OFF
      Port B = OFF
    Target Reset (Bus Device Reset) Mode
      Port A = OFF
      Port B = OFF
    Reserve Mode
      Port A = OFF
      Port B = OFF
    Logical Unit Reset Mode
      Port A = OFF
      Port B = OFF
    Third Party Process Logout Mode
      Port A = OFF
      Port B = OFF
ROM Pseudo-response command processing = ---
Save Data pointer response
  Port A = ---
  Port B = ---
Controller Identifier = Disable
RS232C Error Information Outflow Mode = OFF
Write & Verify Execution Mode = ON
LAN Const
  DHCP = OFF
  IP Address = 0.0.0.0
  Subnet Mask = 0.0.0.0
  Default Gateway = 0.0.0.0
  Ether Address = 00:00:00:00:00:00
SCSI transfer rate
  Port A = ---
  Port A = ---
```

Figure 3.9 System parameters: output example of controller 0 parameters

The parameters of controller 0 are the items shown in Table 3.2.

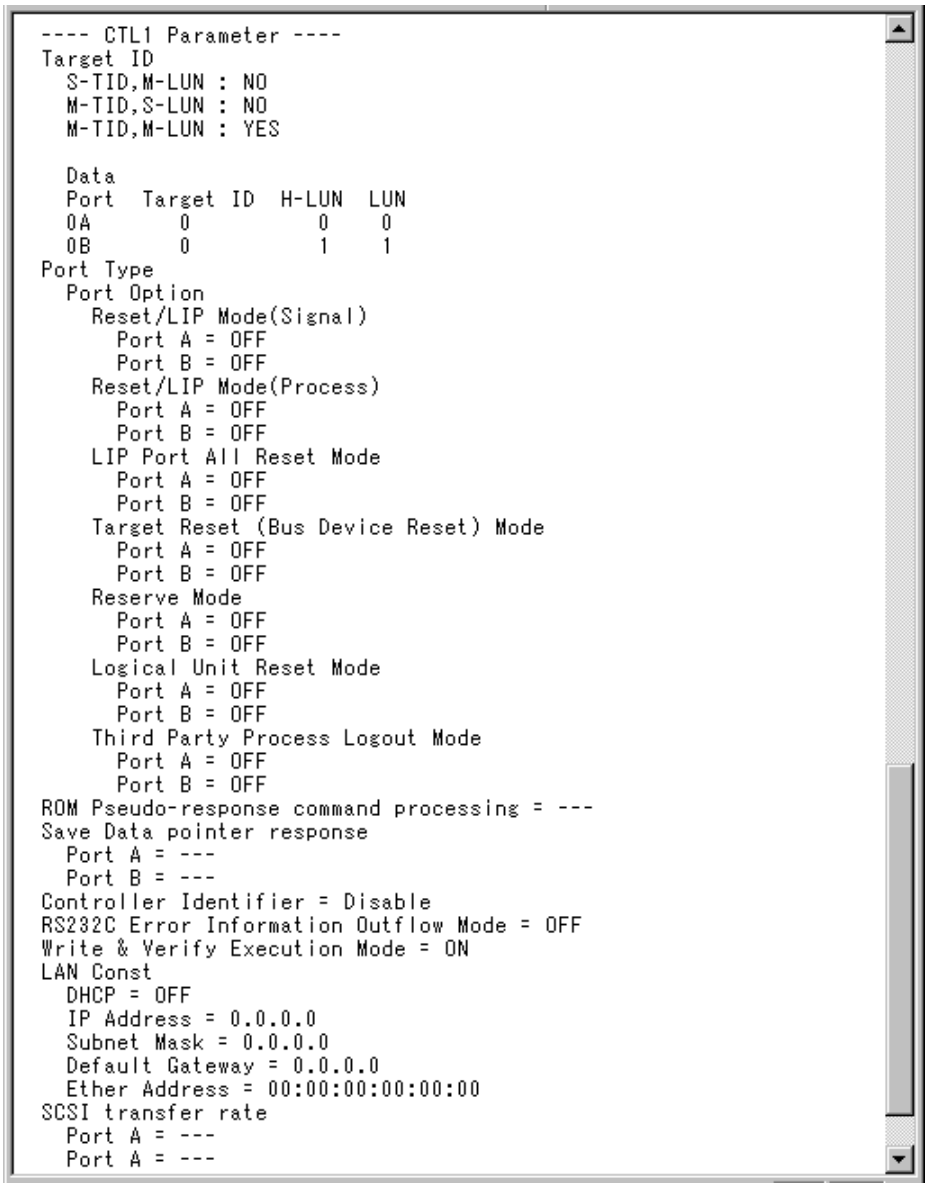
Table 3.2 List of parameters of controller 0

No.	Parameter	Option
1	Target ID	-setSM -rmSM -setMS -rmMS -setMM -rmMM
2	Port Type	-PortType -PortTypeResetLp
3	ROM Pseudo-response command processing	-PseudoResponse
4	Save Data pointer resource	-SaveDataPointer
5	Controller Identifier	-ControllerIdentifier -ControllerID
6	RS232C Error Information Outflow Mode	-Rs232cOutflow
7	Write & Verify Execution Mode	-WriteVerifyExecution
8	LAN Const	 -ConnectLAN -dhcp -IPAddress -SubnetMask -DefaultGateway
9	SCSI transfer rate	-sync

Depending on the array unit in connection, there are items that do not need to be set, and these items will not be output in the file. Moreover, if the value of an item in the parameters is given as "---" it is an item not supported in the configuration of the array unit.

- Controller 1 Parameters

  The parameters of controller 1 in the system parameters of the array unit that make the output are output.



```
---- CTL1 Parameter ----
Target ID
  S-TID,M-LUN : NO
  M-TID,S-LUN : NO
  M-TID,M-LUN : YES

  Data
  Port  Target ID  H-LUN  LUN
  0A       0          0    0
  0B       0          1    1
Port Type
  Port Option
    Reset/LIP Mode(Signal)
      Port A = OFF
      Port B = OFF
    Reset/LIP Mode(Process)
      Port A = OFF
      Port B = OFF
    LIP Port All Reset Mode
      Port A = OFF
      Port B = OFF
    Target Reset (Bus Device Reset) Mode
      Port A = OFF
      Port B = OFF
    Reserve Mode
      Port A = OFF
      Port B = OFF
    Logical Unit Reset Mode
      Port A = OFF
      Port B = OFF
    Third Party Process Logout Mode
      Port A = OFF
      Port B = OFF
ROM Pseudo-response command processing = ---
Save Data pointer response
  Port A = ---
  Port B = ---
Controller Identifier = Disable
RS232C Error Information Outflow Mode = OFF
Write & Verify Execution Mode = ON
LAN Const
  DHCP = OFF
  IP Address = 0.0.0.0
  Subnet Mask = 0.0.0.0
  Default Gateway = 0.0.0.0
  Ether Address = 00:00:00:00:00:00
SCSI transfer rate
  Port A = ---
  Port A = ---
```

Figure 3.10 System parameters: output example of the parameters of controller 1

The parameters of controller 1 are the items shown in Table 3.3.

Table 3.3 List of parameters of controller 1

No.	Parameter	Option
1	Target ID	-setSM -rmSM -setMS -rmMS -setMM -rmMM
2	Port Type	-PortType -PortTypeResetLp
3	ROM Pseudo-response command processing	-PseudoResponse
4	Save Data pointer resource	-SaveDataPointer
5	Controller Identifier	-ControllerIdentifier -ControllerID
6	RS232C Error Information Outflow Mode	-Rs232cOutflow
7	Write & Verify Execution Mode	-WriteVerifyExecution
8	LAN Const	-ConnectLAN -dhcp -IPAddress -SubnetMask -DefaultGateway
9	SCSI transfer rate	-sync

Depending on the array unit in connection, there are items that do not need to be set, and these items will not be output in the file. Moreover, if the value of an item in the parameters is given as "---" it is an item not supported in the configuration of the array unit.

- Controller 1 Parameters

  The parameters of controller 1 in the system parameters of the array unit that make the output are output.

Figure 3.11 Output example for FD backup specification

3.8.2 File output of the configuration : the status of RAID/LU and constituent parts

- Command name

  auconfigout

- Synopsis

  auconfigout -unit unit_name -file file_name

- Description

  RAID/LU configuration information already set in an array unit is output to a specified file in a text format.

- Options

Options	Description
-unit unit_name	Specifies the name of the array unit that outputs the RAID/LU information file. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-file file_name	Specifies the name of a file (path) into which to output configuration information.

- Examples of using command

  Outputs RAID/LU configuration information of an array unit, whose name is df500a1, by a file name of config.txt into a directory in which the manager has been installed.

```
% auconfigout -unit df500a1 -file config.txt
%
```

The format of the output file consists of the following items. The outline of the layout of the output file is shown in Figure 3.12. Figure 3.12 is the outline of the layout of the output file for the case of DF500.

- File header
- Registration name at the manager of the array unit
- Output time (Time of the machine where the manager is installed)
- Microprogram revision
- Array unit type
- RAID/LU configuration
- Status of constituent parts

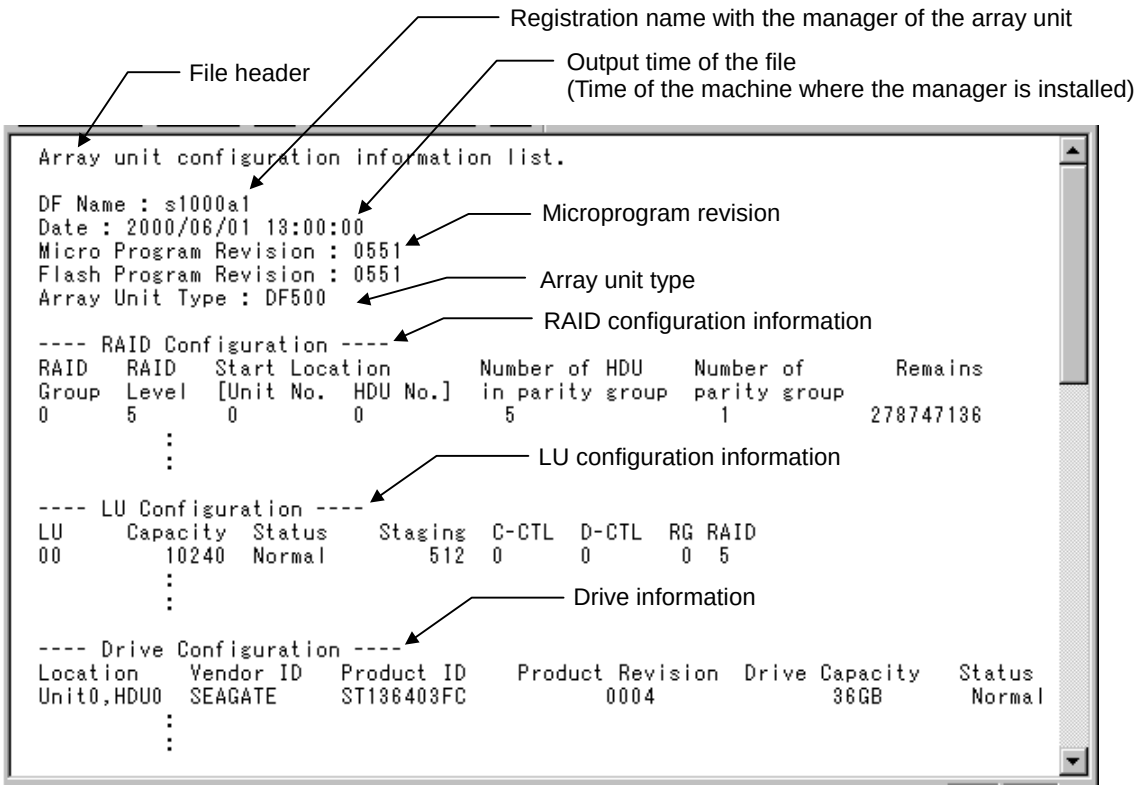


Figure 3.12 The outline of the format of RAID/LU configuration information output file

If DF300, DF350, and DF350F units are connected, the item of the revision of the flash program is displayed as "---". In addition, the type of array units is not displayed.

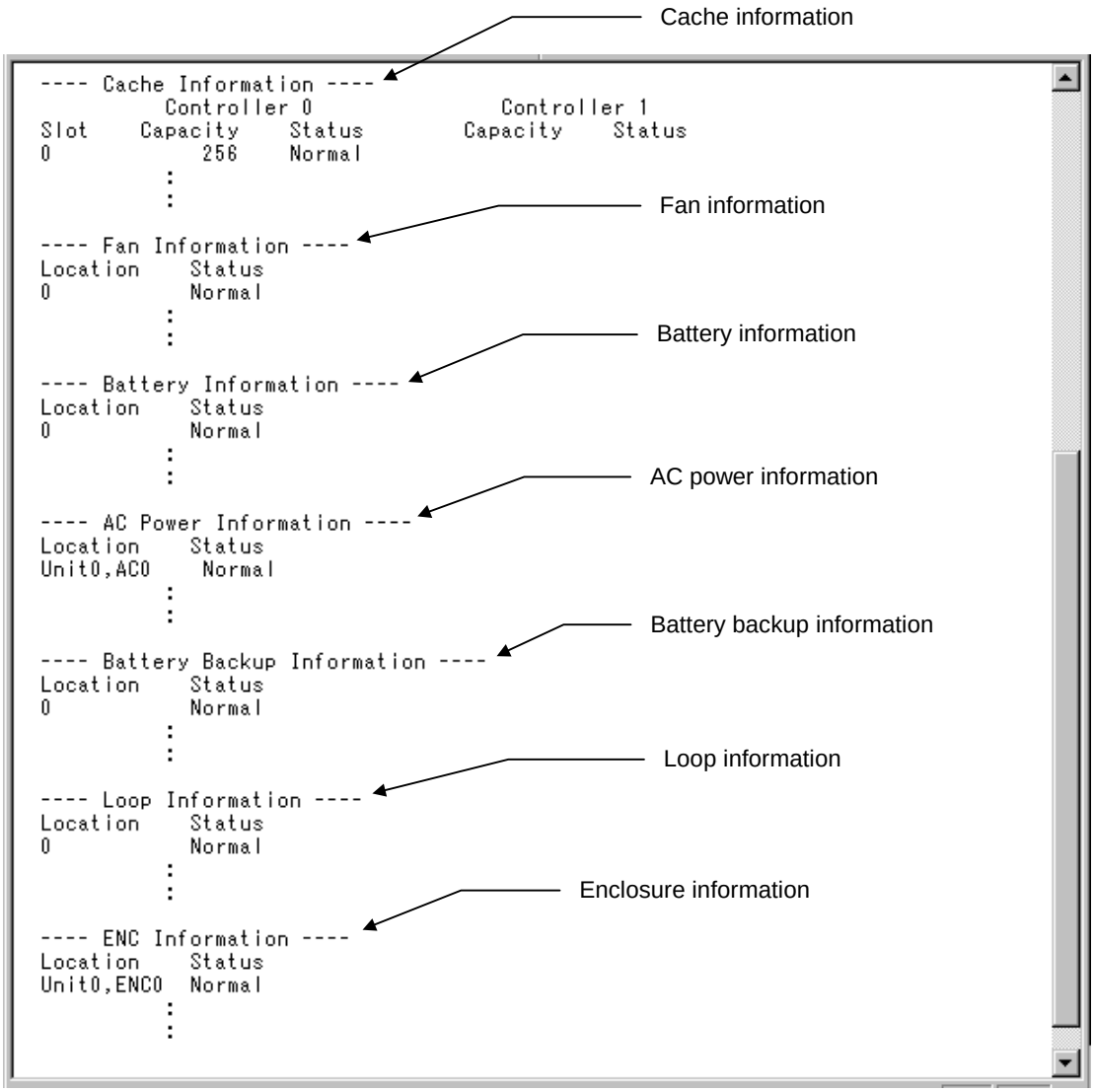


Figure 3.12 The outline of the format of RAID/LU configuration information output file (Continued)

- Format of RAID configuration information

  The function outputs the RAID configuration of the array unit. RAID groups which have not been created are displayed as "-" in the "Level" column.

  For the case of DF350, DF400

```
---- RAID Configuration ----
RAID   RAID
Group  Level  Row  Port  Width  Depth
0      5       0    0     5       1
1      5       1    0     5       1
2      -
3      -
4      -
5      -
```

  - **RAID Group:** RAID group number
  - **RAID Level:** RAID level
    When no RAID is set, "-" is displayed. No other information is displayed.
  - **Row:** Starting row number of RAID group
  - **Port:** Starting port number of RAID group
  - **Width:** Width of RAID group
  - **Depth:** Depth of RAID group

  For the case of DF500

```
---- RAID Configuration ----
RAID   RAID   Start Location       Number of HDU    Number of       Remains
Group  Level  [Unit No.  HDU No.]  in parity group  parity group
0      5       0          0          5                1           278747136
1      5       0          5          5                1           278747136
          :
          :
18     -
19     -
```

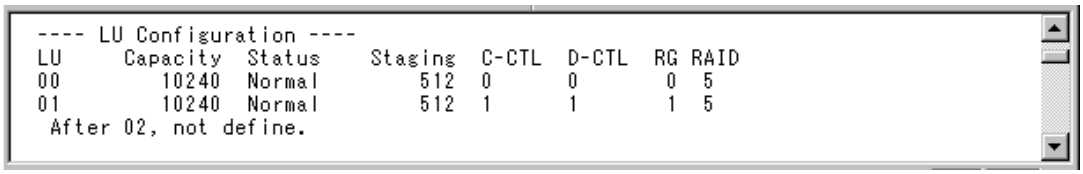
  - **RAID Group:** RAID group number
  - **RAID Level:** RAID level
    When no RAID is set, "-" is displayed. No other information is displayed.
  - **Start Location:**

    Unit No.: Starting unit number of RAID group

    HDU No.: Starting HDU number of RAID group
  - **Number of HDU in parity group:** The number of HDU in the parity group of the RAID group
  - **Number of parity group:** The number of parity groups in the RAID group
  - **Remains:** The capacity [Block] that can be defined by LU of the RAID group

- Formatting LU configuration information

  The LU configuration of the array unit is output. The information is displayed up to the created LU numbers .



```
---- LU Configuration ----
LU     Capacity  Status    Staging  C-CTL  D-CTL  RG RAID
00        10240  Normal        512  0      0       0  5
01        10240  Normal        512  1      1       1  5
 After 02, not define.
```

  - **LU:** LU number
  - **Capacity:** LU capacity (in units of block)
  - **Status:** The status of the LU

    Normal: Normal status in which the LU is defined and formatted

    Unformat: Status in which the LU is defined but not formatted

    Detached: Status in which the LU is blocked

    Regressed: Status in which the LU is regressed
  - **Staging Size:** Preread data amount (in units of block)
  - **C-CTL:** The number of the controller currently in use
  - **D-CTL:** Default number of controller controlling the LU
  - **RG:** The number of the RAID group that creates the LU
  - **RAID:** The RAID level of the RAID group that creates the LU

- Format for Drive Information

  The information and status of the drive of the array unit are output.

  For the case of DF400

```
---- Drive Configuration ----
Location    Vendor ID   Product ID    Product Revision  Drive Capacity   Status
Row0,Port0  HITACHI     DK319H-18WS          APY6              4GB      Normal
Row0,Port1  HITACHI     DK319H-18WS          APY6              4GB      Normal
Row0,Port2  HITACHI     DK319H-18WS          APY6              4GB      Normal
          :
          :
Row5,Port3  Nothing
Row5,Port4  Nothing
Row5,Port5  Nothing
```

  For the case of DF500

```
---- Drive Configuration ----
Location    Vendor ID   Product ID    Product Revision  Drive Capacity   Status
Unit0,HDU0  SEAGATE     ST136403FC           0004              36GB      Normal
Unit0,HDU1  SEAGATE     ST136403FC           0004              36GB      Normal
Unit0,HDU2  SEAGATE     ST136403FC           0004              36GB      Normal
          :
          :
Unit9,HDU7  Nothing
Unit9,HDU8  Nothing
Unit9,HDU9  Nothing
```

  - **Location:** The installation location of the drive
  - **Vendor ID:** The vendor ID of the drive
  - **Product ID:** The product ID of the drive
  - **Product Revision:** Firmwave revision of the drive
  - **Drive Capacity:** The capacity of the drive
  - **Status:** The status of the drive

    Normal: Normal (RAID, LU defined)

    Detached: Detached

    Standby: Normal (LU undefined)

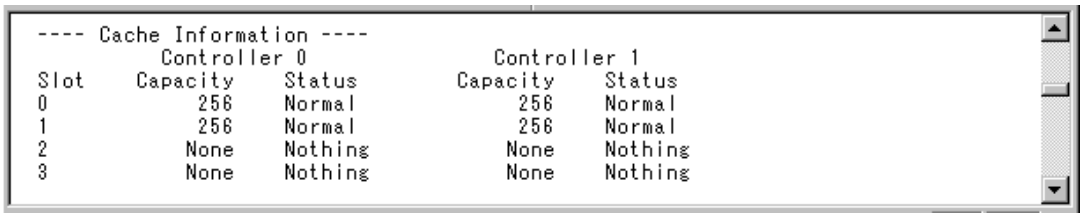
    Undefine: Normal (RAID undefined)

    Recon.: Reconfigurating (copying from collection or backup)

  “Nothing” is shown after **Location** for the location of a HDU not installed.

- Format for Cache Information

  The configuration information and status of the cache of the array unit are output.



```
---- Cache Information ----
          Controller 0              Controller 1
Slot    Capacity    Status        Capacity    Status
0            256    Normal             256    Normal
1            256    Normal             256    Normal
2           None    Nothing           None    Nothing
3           None    Nothing           None    Nothing
```

  – **Slot:** The installation location of the cache

  Controller 0

  – **Capacity:** The capacity [M byte] of the cache of controller 0

  – **Status:** The status of the cache of controller 0

    Normal: Normal

    Detached: Detached

    Nothing: Not installed

    ---: Slot not supported

  Controller 1

  – **Capacity:** The capacity [M byte] of the cache of controller 1

  – **Status:** The status of the cache of controller 1

    Normal: Normal

    Detached: Detached

    Nothing: Not installed

    ---: Slot not supported

- Format for Fan Information

  The status of the fan of the array unit is output.

```
---- Fan Information ----
Location    Status
0           Normal
```

  – **Location:** The installation location of the fan

  – **Status:** The status of the fan

    Normal: Normal

    Alarm: Abnormal

    Nothing: Not installed

- Format for Battery Information

  The status of the battery of the array unit is output.

  - **Location:** The installation location of the battery
  - **Status:** The status of the battery

    Normal: Normal

    Alarm: Abnormal

    Nothing: Not installed

- Format for DC power (Controller) Information : for connection with DF400

  The status of the DC power supply (controller) of the array unit is output.

  - **Location:** The installation location of the DC power supply (controller)
  - **Status:** The status of the DC power supply (controller)

    Normal: Normal

    Alarm: Abnormal

    Nothing: Not installed

- Format for DC power (Driver) Information : for connection with DF400

  The status of the DC power supply (driver) of the array unit is output.

```
---- DC Power Information(Drive) ----
Location        Status
0               Normal
1               Normal
2               Normal
3               Normal
```

  - **Location:** The installation location of the DC power supply (driver)
  - **Status:** The status of the DC power supply (driver)

    Normal: Normal

    Alarm: Abnormal

    Nothing: Not installed

- Format for DC power Information : for connection with DF350 or DF350F

  The status of the DC power supply of the array unit is output.

```
---- DC Power Information ----
Location        Status
0               Normal
1               Normal
2               Normal
3               Normal
4               Normal
```

  - **Location:** The installation location of the DC power supply
  - **Status:** The status of the DC power supply

    Normal: Normal

    Alarm: Abnormal

    Nothing: Not installed

- Format for AC power Information : for connection with DF400 or DF500

  The status of the AC power supply of the array unit is output.

  For the case of DF400

```
---- AC Power Information ----
Location        Status
0               Normal
1               Normal
```

  For the case of DF500

```
---- AC Power Information ----
Location    Status
Unit0,AC0    Normal
Unit0,AC1    Normal
          :
          :
Unit9,AC0    Nothing
Unit9,AC1    Nothing
```

  - **Location:** The installation location of the AC power supply
  - **Status:** The status of the AC power supply

    Normal: Normal

    Alarm: Abnormal

    Nothing: Not installed

- Format for Battery Backup Status Information : for connection with DF400 or DF500

  The status of the battery backup circuit of the array unit is output.

```
---- Battery Backup Information ----
Location    Status
0           Normal
1           Normal
```

  - **Location:** The installation location of the battery backup circuit
  - **Status:** The status of the battery backup circuit

    Normal: Normal

    Alarm: Abnormal

- Format for Loop Information : for connection with DF500

  The status of the loop of the array unit is output.

  - **Location:** The installation location of the loop
  - **Status:** The status of the loop

    Normal: Normal

    Alarm: Abnormal

    Nothing: Not installed

- Format for Enclosure Information : for connection with DF500

  The status of the enclosure of the array unit is output.

  - **Location:** The installation location of the enclosure
  - **Status:** The status of the enclosure

    Normal: Normal

    Alarm: Abnormal

    Nothing: Not installed

3.8.3 Setting the configuration with a file : System parameters

- Command name

  ausyspset

- Synopsis

  ausyspset -unit unit_name -file file_name

- Description

  To set the array unit with the setting information for the system parameters described in the file.
  If you set by use of a file that was output under the condition in which any priced optional feature is in an unlocked state, setting may terminate abnormally. For a file for setting, use a file that was output under the condition in which all priced optional features are in a locked state.
  Files have a standard format. The format of files is the same as that of files that are output from an array unit. For the file format and the contents of settings in files, see the following individually:. When specifying individual items of a file, insert one space character after a "=".

  – For the file format, see Subsection **3.8.1 File Output of the Configuration : System Parameters**.

  – For setting items, see Subsection **3.7.1 Referencing/Setting System Parameters**, and Subsection **3.8.1 File Output of the Configuration : System Parameters**.

  For setting items for backup in system parameters information, the set system parameters must be saved into the backup FD in an array unit, and hence be sure to specify "Yes".

  In the case of connection with a dual system, setting will not be carried out if one of the controllers is detached. Please confirm that the array unit is not in warning status before using it.
  When executing the command, an array unit is disabled to execute commands from both the host and the Manager. In addition, to make the set system parameters effective, restart an array unit. Until the unit is restarted up, the previous settings remain effective.
  After setting is finished, restart an array unit, make sure that the unit has started up, and then connect the unit to the host and the Manager.
  After initiating the restarting of an array unit, the unit is not ready to accept access from the host until restarting is complete. After making sure that the host has stopped accessing, restart the unit.

- Options

Options	Description
-unit unit_name	Specifies the name of the array unit to be set with the configuration information for the system parameters. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-file file_name	Specifies the name of the file (path) to output the configuration information.

- Examples of using command

  Sets the array unit with name : df400a1 according to the configuration system parameters described in the text file with name : sysprm.txt.

```
% ausyspset  -unit df400a1  -file sysprm.txt
This command will cause Array to stop communicating with all attached Hosts.
Continue (y/n [n]): y
Password:
System parameter modification completed successfully.
Please reboot Array for changes to take effect.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]): y
Now rebooting the array unit.  Start Time HH:MM
Reboot has been completed.
%
```

  Sets the array unit with name: df500a1 according to the configuration system parameters described in the text file with name : sysprm.txt.

```
% ausyspset  -unit df500a1  -file sysprm.txt
This command will cause Array to stop communicating with all attached Hosts.
Continue (y/n [n]): y
Password:
System parameter modification completed successfully.
Please reboot Array for changes to take effect.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]): y
Now rebooting the array unit.  Start Time HH:MM
Reboot has been completed.
%
```

3.8.4 Setting the configuration with a file : RAID/LU definition

- Command name
  `auconfigset`

- Synopsis
  `auconfigset -unit unit_name -file file_name`

- Description

  To set the array unit according to the RAID/LU setting information described in the file. In the case of setting RAID/LU, as the current RAID/LU will all be first deleted, all the user data before setting will be lost. If the user data is needed, please do the setting after carrying out a backup.

  Files have a standard format. The format of files is the same as that of files that are output from an array unit. For the file format, see the following:

  – Subsection **3.8.2 File output of the configuration : the status of RAID/LU and constituent parts**.

  Setting items in files are “RAID configuration information”, “LU configuration information”, and “drive information” in the format of output files. The output files include items about the status of configuration components, but the items are ignored at the time of setting. The contents of setting items are described below.

  RAID configuration information : Sets up an RAID configuration.
  Specifies the RAID level, the RAID group No., and the RAID size.
  For RAID groups that are not setup, enter “-” for “Level”, and other items are not set.

  LU configuration information : Sets up an LU configuration.
  Specifies the LU No., the LU capacity, the amount of data pre-read, the No. of the current controller controlling an LU, the No. of the default controller controlling an LU, the RAID group No., the RAID level, and the status of an LU.
  When formatting, specifies “Normal” for the LU status. If other status is specified, formatting is not executed.
  If all capacity contained in an RAID group is allocated to one LU in the group, specifies “All” for “Capacity”.
  Although “0’ or “1” is specified for the No. of the current controller controlling an LU, the current controller No. is set to the same as the No. of the default controller controlling an LU.
  Up to 64 LUs can be setup for the DF400 and the DF500, and up to 16 LUs for the DF300, the DF350 and the DF350F. When setting up LUs less than the maximum, specifies “After nn, not define” (nn : the last LU No. + 1) at the end.

  Drive information : Sets up the configuration of HDUs mounted in array unit for which to set drive information.
  Specifies the drive capacity. Other items are not set, but the items are listed.
  Specifies “Nothing” for not-mounted HDUs.
  If a capacity larger than a total capacity of mounted HDUs is specified, it is handled as an error, and an HDU configuration is not setup.

- Options

Options	Description
-unit uniat_name	Specifies the name of the array unit to be set with the RAID/LU configuration. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-file file_name	Specifies the name of the file (path) to output the configuration information.

- Examples of using command

  Sets the array unit with name : df500a1 according to the RAID/LU configuration described in the text file with name : config.txt.

```
% auconfigset  -unit df500a1  -file config.txt
The new RAID/LU configuration will be set in array unit.
When setup process starts, current RAID/LU configuration will be deleted.
Are you sure (y/n [n]): y
Password:
RAID configuration setting start.
RAID configuration setting complete.
LU configuration setting start.
LU configuration setting complete.
LUx format start
LUy format start
LUx format end : Normally terminated
LUz format start
LUx format end : CHECK CONDITION : xx-xxxx
        :
        :
%
```

3.9 Microprogram Replacement

3.9.1 Downloading/Replacing Microprogram

- Command name

  `aumicro`

- Synopsis

  – In the case of DF350, DF400, and DF500

  ```
  aumicro  -unit unit_name  -read  -path disk01 disk02 disk03 ...
  aumicro  -revision
  aumicro  -clean
  ```

  – In the case of DF350

  ```
  aumicro  -unit unit_name  -upload |
  ```

  – In the case of DF400, DF500

  ```
  aumicro  -unit unit_name  -upload  -time time  -check on | off
  aumicro  -unit unit_name  -change  -ctl0 | -ctl1
  ```

- Description

  Downloads a microprogram into the array unit. In addition, replaces the current microprogram with a downloaded microprogram.

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit whose microprogram to download and replace. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
`-read`	Reads a microprogram onto the manager.
`-path disk01 disk02 disk03 ...`	Specifies sequentially the path names to individual directories in which each FD file of a microprogram to be downloaded is stored.
`-upload`	Downloads a microprogram into an array unit.
`-time time`	Specifies the time interval (1 to 60 seconds) at which to download a microprogram. When downloading into the DF350, specification of the interval time is ignored. See Note.
`-check on | off`	Specifies whether or not to check the revision of a microprogram.

(Continued)

Options	Description
-change	Replaces a microprogram.
-ctl0 | -ctl1	Specifies the controller whose microprogram to replace.
-revision	Displays the revision of a microprogram with which to replace.
-clean	Deletes the microprogram read in.

Note: the time interval can be specified from 0 second, however, values over 3 seconds are recommended if execution is carried out while ON.

- Examples of using command

  Downloads a microprogram into an array unit whose name is df500a1, and afterward performs microprogram replacement.

  Checks the revision of a microprogram of an array unit, whose name is df500a1, when downloading it.

```
% aurev  -unit df500a1
Serial Number : 0777
Microprogram Revision : 0500
%
```

  First reads in a microprogram to be downloaded. The microprogram is provided in a multiple number of floppy disks, the contents in every floppy disk have operation examples, in the case that they are stored under each of the directories disk01, disk02, disk03, disk04, disk05.

```
% aumicro  -unit df500a1  -read  -path  disk01  disk02  disk03  disk04  disk05
Password:
Read disk : disk01 disk02 disk03 disk04 disk05
%
```

  Checks the revision of the microprogram read in.

```
% aumicro  -revision
Password:
New Revision : 0501
%
```

  Downloads the read-in microprogram into an array unit whose name is df500a1. Sets the time interval to 3 seconds, and specifies checking of the microprogram revision. While downloading, the number of files already downloaded: mmm and the total number of files to be downloaded: nnn are shown.

```
% aumicro  -unit df500a1  -upload  -time 3  -check on
Password:
df500a1 : mmm/nnn done.
%
```

Replaces the current microprogram with the downloaded microprogram. Replaces the microprogram on the controller 0 side and controller 1 side, in that order.

```
% aumicro  -unit df500a1  -change  -ctl0
Password:
%
% aumicro  -unit df500a1  -change  -ctl1
Password:
%
```

Because micro-program downloading and replacing were completed, the microprogram read in manager is removed.

```
% aumicro  -clean
Password:
%
```

Downloads a microprogram into an array unit whose name is df350a1.
Checks the revision of the microprogram of an array unit, whose name is df350a1, in advance when downloading it.

```
% aurev  -unit df350a1
Serial Number : 0666
Microprogram Revision : 0307
```

A microprogram to download is read in manager. Though a microprogram is stored in several floppy disks, the operation example when the contents of each floppy disk are stored under each directory of disk01, disk02, disk03, and disk04 is shown.

```
% aumicro  -unit df350a1  -read  -path  disk01  disk02  disk03  disk04
Password:
Read disk : disk01 disk02 disk03 disk04
%
```

Revision of the read microprogram is confirmed.

```
% aumicro   -revision
Password:
New Revision : 0308
%
```

Downloads the read-in microprogram into an array unit whose name is df350a1. While downloading, the number of files already downloaded: mmm and the total number of files to be downloaded: nnn are shown.

```
% aumicro   -unit df350a1  -upload
Password:
df350a1 : mmm/nnn done.
%
```

Because microprogram downloading was completed, the microprogram read in manager is removed.

```
% aumicro   -clean
Password:
%
```

3.10 SNMP Environment Information

3.10.1 Setting SNMP Environment Information and Outputting Its File

- Command name

  ausnmp

- Synopsis

```
ausnmp  -unit unit_name  -get  [ -config config.txt ]  [ -name name.txt ]
ausnmp  -unit unit_name  -set  [ -config config.txt ]  [ -name name.txt ]
```

- Description

  Reads and sets up the SNMP environment file.

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to read and setup an SNMP environment file. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-get	Reads SNMP environment information and outputs it into a specified file.
-set	Sets up the contents of a specified SNMP environment information file in the array unit.
-config config.txt	Specifies the file name of SNMP config information.
-name name.txt	Specifies the file name of SNMP name information.

- Examples of using command

  Acquires config.txt information and name.txt information from an array unit whose name is df500a1.

```
% ausnmp  -unit df500a1  -refer  -config config.txt  -name name.txt
%
```

  Sets up config.txt information and name.txt information in an array unit (DF350) whose name is df350a1.

```
% ausnmp  -unit df350a1  -set  -config config.txt  -name name.txt
Password:
%
```

  Sets config.txt and name.txt information individually for an array unit, whose name is df400a1 and that does not support the restart.

```
% ausnmp  -unit df400a1  -set  -config config.txt  -name name.txt
This command will cause Array to stop communicating with all attached Hosts.
Continue (y/n [n]): y
Password:
SNMP Configuration modification completed successfully.
Please reboot Array for changes to take effect.
%
```

  Sets up config.txt information and name.txt information in an array unit whose name is df500a1.

```
% ausnmp  -unit df500a1  -set  -config config.txt  -name name.txt
This command will cause Array to stop communicating with all attached Hosts.
Continue (y/n [n]): y
Password:
SNMP Configuration modification completed successfully.
Please reboot Array for changes to take effect.
Array unit stops accepting input and output while rebooting.
And if you already logged in, login status is canceled when the reboot starts.
Do you reboot the array unit now (y/n [n]): y
Now rebooting the array unit.  Start Time HH:MM
Reboot has been completed.
%
```

3.11 Displaying Statistical Information

3.11.1 Displaying Statistical Information

- Command name

  `austatistics`

- Synopsis

  `austatistics -unit unit_name -memory | -drive`

- Description

  Displays statistical information that has been accumulated in the array unit. Items to be displayed are as follows:

  – Controller use condition
  – Number of host commands received
  – Command execution condition
  – Cache load condition

- Options

Options	Description
`-unit unit_name`	Specifies the name of an array unit for which to display statistical information. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
`-memory | -drive`	Specifies the location of the statistical information to be displayed. **-memory:** The statistical information (the current information) in the current memory is displayed. **-drive:** The statistical information stored in the system drive (the information at the time of activation of the array unit) is displayed.

- Examples of using command

  Displays statistical information of an array unit whose name is df500a1.

```
% austatistics -unit df500a1 -memory
Controller
  Array Time
  Controller Acting Time (Integrated) [minute(s)] :      4676
  Controller Acting Time (Work)       [m second]  : 256969390
```

```
  CTL0
    Power On Times    :        22      22
    H-SCSI Reset Time :      4676    4676
  CTL1
    Power On Times    :        22      22
    H-SCSI Reset Time :       676     676
Host Commands
   CTL     LU   READ    WRITE
      0     0   2677     3261
      0     1   2752     2835
      0     2   2506     2860
      0     3   2614     2829
      0     4      0        0
      :     :      :        :
      0    61      0        0
      0    62      0        0
      0    63      0        0
      1     0      0        0
      1     1      0        0
      1     2      0        0
      1     3      0        0
      1     4      0        0
      :     :      :        :
      1    61      0        0
      1    62      0        0
      1    63      0        0

Execution
            Read        Write       Sequential  Sequential  Prefetch   Write Through  Reassigned
   CTL   LU Cache Hits  Cache Hits  Reads       Writes      Stagings   Operation      Blocks
      0   0       1067        2904         384         424     31229              0           0
      0   1        969        2651         387         386     30291              0           0
      0   2        937        2664         374         371     26475              0           0
      0   3        846        2629         360         368     24916              0           0
      0   4          0           0           0           0         0              0           0
      :   :          :           :           :           :         :              :           :

Cache Load
  Number of Inflow Threshold Reached
  CTL 0 :            0
  CTL 1 :            0
%
```

3.12 Obtaining Performance Information

3.12.1 Outputting Performance Information File

- Command name
  `auperform`

- Synopsis
  ```
  auperform  -unit unit_name  -manual
  auperform  -unit unit_name  -auto  time  [ -count nn ]
  ```

- Description

  Acquires the command operational condition of each LU in an array unit, and outputs their respective information in a text-file format into the current directory.

  Items to be acquired are the following six ones.

  – Number of Read commands received
  – Number of the cache-hitting ones of Read commands received
  – Rate of the number of the cache-hitting ones to the number of Read commands received
  – Number of Write commands received
  – Number of the cache-hitting ones of Write commands received
  – Rate of the number of the cache-hitting ones to the number of Write commands received

  The output file names are as follows:

  For acquiring manually: “pfms??.txt” for a single configuration, and “pfmd??.txt” for a dual configuration (“??” is a number from 00 to 99.)

  For acquiring automatically: “pfmsing.txt” for a single configuration, and “pfmdual.txt” for a dual configuration

- Options

Options	Description
-unit unit_name	Specifies the name of an array unit for which to acquire performance information. Specifies with one-byte coded alphanumerics, special symbols "- (minus)", or "_(underline)" of up to 16 characters long.
-manual	Acquires performance information manually.
-auto time	Automatically acquires performance information at an interval of time (1 to 1439 minutes) specified for this option.
-count nn	If automatical acquisition is specified, specifies the number of times acquisition is repeated (1 to 99).

- Examples of using command

  Acquires the performance information of an array unit, whose name is df500a1, only once at an interval of 10 minutes.

```
% auperform  -unit df500a1  -auto 10
Day yy mm hh:mm:ss yyyy: count = n
%
```

3.13 Monitoring Errors

3.13.1 Setting Up E-Mail Reports

- Command name

  `aumail`

- Synopsis

```
aumail  -refer
aumail  -set  [ -domain domain_name ]  [ -srv mail_server_addr ]
        [ -from from_addr ]  [ -add to_addr ]  [ -rm to_addr ]
aumail  -test
```

- Description

  Sets E-Mail information that is transmitted when an error is detected while monitoring errors.

- Options

Options	Description
`-refer`	Displays the E-Mail information set currently.
`-set`	Sets E-Mail information.
`-domain domain_name`	Specifies the domain name. Specify it in 39 or less alphanumeric characters or a code.
`-srv mail_server_addr`	Specifies the IP address or host name of a mail server. Specify the host name in 99 or less alphanumeric characters.
`-from from_addr`	Specifies the mail address of an E-Mail sender. Specify it in 99 or less alphanumeric characters or a code.
`-add to_addr`	Adds the mail address of an E-Mail receiver. Specify it in 99 or less alphanumeric characters or a code. Up to 20 addresses can be set as receivers.
`-rm to_addr`	Deletes the mail address of an E-Mail receiver.
`-test`	Performs a test of originating an E-Mail.

- Examples of using command

  Displays the contents of an E-Mail information setup.

```
% aumail  -refer
Domain Name         : abc.hitachi.co.jp
Mail Server Address : server1.abc.hitachi.co.jp
From Address        : sender1@str.hitachi.co.jp
Send to Address     : receiver1@abc.hitachi.co.jp
%
```

  Sets E-Mail information

```
% aumail  -set  -domain abc.hitachi.co.jp  -srv server1.abc.hitachi.co.jp
-from sender2@abc.hitachi.co.jp  -add receiver2@abc.hitachi.co.jp
%
```

  Adds a receiver address.

```
% aumail  -set  -add receiver3@abc.hitachi.co.jp
%
```

If an error is detected on the array unit while error monitoring is executed, the following error information will be reported by E-Mail.
Usually, the subject is appended before E-Mail is transmitted.

- E-Mail subject

  In the case of E-Mail, the failed part can be judged by the subject, so the failed part is appended to the subject as a matter of format. The subject format is shown below. Table 3.4 shows a list of subjects.

  Manager/Obstruction (failed part)

Table 3.4 List of E-Mail Subjects

No.	Subject	Meaning
1	Disk	A drive blockade occurred.
2	DC Power	A DC power supply failure occurred.
3	Battery	A battery voltage error occurred.
4	Fan	A fan failure occurred.
5	Controller	A controller blockade occurred. (This occurs only in the dual controller configuration.)
6	AC Power	An AC power supply error occurs.
7	Cache Memory	A cache failure occurred.
8	Cache Backup Circuit	A backup circuit failure occurred.
9	ENC	An enclosure error occurs.
10	loop	A loop error occurs.
11	Warning	The array unit entered the warning state.
12	Array connection	A failure occurred in the connection with the array unit. A power OFF or a failure occurred in the array unit.

- E-Mail message text

  The E-mail reports a failed section with a message text. The format of the message text is shown below. A list of message texts is shown in Table 3.5.

  Day, Mon.dd hh:mm:ss yyyy/DF Name/ARRAY message text

  Day: Day of the week **hh:mm:ss:** Hours, minutes, and seconds

  Mon: Month **yyyy:** Year

  dd: Date

Table 3.5 List of E-Mail Message Texts

No.	Message text	Meaning of message
1	ARRAY Drive Detached ARRAY Detached Drive Position Port No.X Row No.Y	A drive blockade occurred. (The blocked drive is indicated with a set of a Port No. and a Row No.)
2	ARRAY DC Power Supply Failure	A DC power supply failure occurred.
3	ARRAY Battery Alarm	A battery voltage error occurred.
4	ARRAY Fan Alarm	A fan failure occurred.
5	ARRAY CONTROLLER Detached	A controller blockade occurred. (This occurs only in the dual controller configuration.)
6	ARRAY AC Power Supply Failure	An AC power supply error occurs.
7	ARRAY Cache Memory Alarm	A cache failure occurred.
8	ARRAY Cache Backup Circuit Alarm	A backup circuit failure occurred.
9	ARRAY ENC Alarm	An enclosure error occurs.
10	ARRAY Loop Alarm	A loop error occurs.
11	ARRAY Warning	The array unit entered the warning state.
12	ARRAY Manager Interface error occurred	A failure occurred in the connection with the array unit. A power OFF or a failure occurred in the array unit.

3.13.2 Setting the Starting of Application

- Command name

  auextprog

- Synopsis

  auextprog -refer

  auextprog -set command

  auextprog -test

- Description

  Sets up an external program that is started when an error is detected while monitoring errors.

- Options

Options	Description
-refer	Displays (references) the external program setup.
-set command	Sets up an external program that is started when an error is detected while monitoring errors.
-test	Starts an external program specified by the -set option.

- Examples of using command

  Sets up the application “go” to be started.

```
% auextprog -set go
%
```

  Displays an application setup to be started.

```
% auextprog -refer
Application Name : go
%
```

3.13.3 Monitoring Errors

- Command name

  auerroralert

- Synopsis

  auerroralert [-time uptime] [-mail] [-prog every | once]

- Description

  Monitors an array unit subject to monitoring (an array unit registered by specifying the -watch option) for errors. While monitoring errors, the word "Execution" indicating that monitoring is in execution, and information on failures that are detected by the error monitor are displayed. The contents of failure information displayed are the same as those of messages output to a log file. The word "Execution" indicating that monitoring is in execution is displayed repeatedly on a line, and the time for which monitoring is in execution is updated and displayed.
  Terminates forcibly to stop monitoring for errors (for example, press "ctl" + "c").

- Options

Options	Description
-time uptime	Specifies the time interval at which to monitor errors. Specifies a value from 1 to 720 (minutes). If omitted, monitors only once.
-mail	Originates an E-Mail when an error is detected.
-prog every | once	Starts an external program when an error is detected. **every:** After error monitoring is started, a specified application is started when an error is detected. If the same error is detected while monitoring errors, the application is no longer started from the second detection onward. **once:** After error monitoring is started, a specified application is started when an error is detected for the first time. If errors are detected continuously, the application is not started. After a specified application is started, in order to start the application again when an error is detected, terminate and then restart error monitoring.

- Examples of using command

  Monitors errors at an interval of 10 minutes. During error monitoring, a battery failure is detected in an array unit whose name is df400a1.

```
% auerroralert  -time 1
Mon, May 01 10:10:00 2000 Executing
Mon, May 01 10:30:00 2000/df400a1/ARRAY Battery Alarm
Mon, May 01 10:40:00 2000 Executing
```

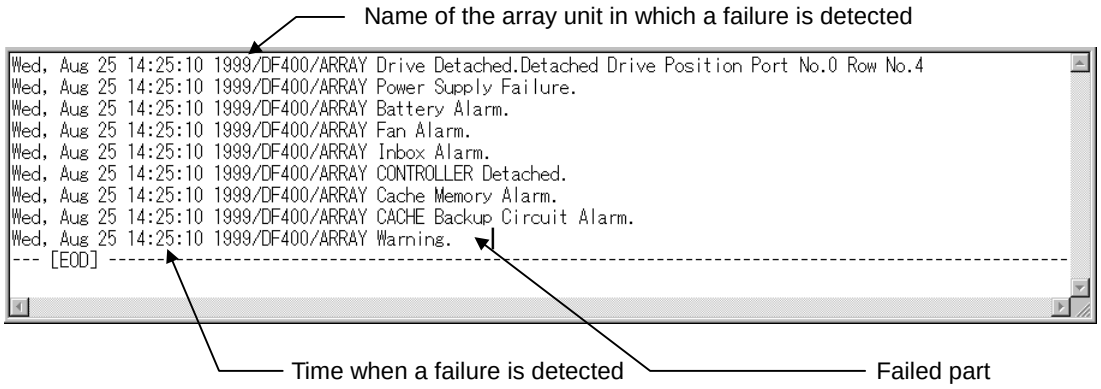
When a failure is detected in the array unit in the case where the error monitoring is executed, the function outputs the failure information to a log file.
The log file is output, with a file name: errlog.txt and in a text file format, onto a path setup by the DAMP_ROOT_DIR_PATH environmental variable. The file format is shown in the following figure.

Error monitoring start — Error monitoring suspension

Normal → Fan failure → Drive failure (Row 2 and Port 1) → ①

Error monitoring start — Error monitoring suspension — Error monitoring start

① → Normal → Battery failure → Normal



The log file is output up to 223 k byte or up to 2,000 events. When the log information exceeds the limit, the log information is overwritten from the top of the file and output. "--- end ---" is output is at the end of log information, and hence search for "--- end ---" to determine the latest information.

Note: The failure detection time is a time of the clock on a personal computer or SUN server/workstation in which the Manager has been installed.

The log information to be output reports the failed part using a message text. The format of message text is shown below. A list of message texts is shown in Table 3.6.

Day, Mon. dd hh:mm:ss yyyy/DF Name/ARRAY message text

Day: Day of the week **hh:mm:ss:** Hours, minutes, and seconds

Mon: Month **yyyy :** Year

dd: Date

Table 3.6 List of Message Texts to be Output

No.	Message text	Meaning of message
1	Alert Started.	The error monitoring is started.
2	ARRAY Drive Detached. Detached Drive Position Port No.X Row No.Y	A drive blockade occurred. (The blocked drive is indicated with a set of a port No. and a row No.)
3	ARRAY DC Power Supply Failure	A DC power supply failure occurred.
4	ARRAY Battery Alarm	A battery voltage error occurred.
5	ARRAY Fan Alarm	A fan failure occurred.
6	ARRAY CONTROLLER Detached	A controller blockade occurred. (This occurs only in the dual controller configuration.)
7	ARRAY AC Power Supply Failure	An AC power supply error occurs.
8	ARRAY Cache Memory Alarm	A cache failure occurred.
9	ARRAY Cache Backup Circuit Alarm	A backup circuit failure occurred.
10	ARRAY ENC Alarm	An enclosure error occurs.
11	ARRAY Loop Alarm	A loop error occurs.
12	ARRAY Warning	The array unit entered the warning state.
13	ARRAY Manager Interface error occurred	A failure occurred in the connection with the array unit. A power OFF and a failure occurred in the array unit.
14	ARRAY Manager Interface error occurred. Error Code (nnnnn).	When the array unit was connected via an LAN, a connection disability occurred. **nnnnn:** Winsock error code
15	ARRAY Manager Interface error occurred.	When the array unit was connected via RS232C, a connection disability occurred.
16	Errinf.Txt File Error (xxxx).	A failure occurred in an access to a work file. **xxxx:** OPEN : File open failure xxxx: File operation failure

Chapter 4 Manager Operation Procedure

The following describes basic operation procedures of the manager after installation.

4.1 Executing commands by setting administrator mode

1. Setting password

   When, as an administrator of the array unit, performing operations on the manager such as setting up the configuration of an array unit, a password is required. For this, first sets a password. Use an aupasswd command to set a password. A password, if set once, is saved in the workstation, so a password does not need setting at every operation.
   Note that changing a password at regular intervals is recommended. An aupasswd command is also used to change a password.

2. Registering array unit

   Registers in the manager an array unit that you operate. Uses an auunitadd command to register an array unit. When registering, gives a unique unit name (up to 16 alphanumeric characters) to one array unit, and registers information such as the unit type (DF350, DF400, DF500), a configuration (Single, Dual), and a connection interface (LAN, RS232C). This time, a registered array unit name is used as a key word to specify an array unit with individual commands of the manager. Array unit information, if registered once, is kept under control of the manager, so array unit information does not need registering at every operation.
   In addition, uses an auunitchg command to change the registered contents. In such a case as when a unit no longer needs to be controlled by the manager, registered unit information can be deleted with an auunitdel command.

3. Operations with various commands

   After an array unit is placed under control of the manager by registering the unit, performs operations on the array unit such as referencing, setting, and monitoring by use of various manager commands.

4.2 Executing commands using a user ID

1. Setting user ID

   Registers the user ID of a user who manages an array unit that has been registered in the Manager. Uses an auuidadd command to setup a user ID.
   Note that once a user ID is registered, commands cannot be executed on the relevant array units without entering the user ID (log in : aulogin).

2. Logging into array unit

   Logs into an array unit with a registered user ID. Uses an aulogin command.
   When forcibly logging into an array unit to which another user has already logged in, uses an aulogin command with the -discon option appended.

3. Operations with various commands

   After an array unit is placed under control of the Manager by registering the array unit, performs operations on the array unit such as referencing, setting, and monitoring by use of various Manager commands. When executing commands after logged in, you are not prompted to enter the user ID used for logging in and the password.

4. Logging out from array unit

   Logs out from an array unit to which you have logged in. Uses an aulogout command.

Chapter 5 Examples of Using Command

The following shows an example in which one RAID group is setup in an array unit, and then one logical unit is setup.

```
% aupasswd                          ---------- For registering a password.
New password :                      ---------- Enters a password.
Retype new password :               ---------- Enters the password again.
%
% auunitadd  -unit array01  -DF400  -dual  -LAN  -ctl0 125.0.9.98  -ctl1 125.0.9.99
                                    ---------- Registers a DF400 array unit with a dual
                                               configuration by unit name array01.  The connection
                                               interface is LAN connection for both unit.
% auunitref                         ---------- Checks that registration is complete.
Array Unit Name Group Name Array Unit Type Error Alert Connection Mode IP Address/Host Name/Device Name
df350a                   DF400 Dual      on          LAN             192.168.33.120   192.168.33.130
%
% aurgadd  -unit array01  -rg 0  -RAID5  -row 0  -port 0  -width 5  -depth 1
                                    ---------- Adds a RAID group with a RAID5 level.
Password:                           ---------- Enters a already-registered password.
%
% auluadd  -unit array01            ---------- Checks that a RAID group has been configured.
 RG  Level  Port  Width   Row  Depth
   0      5     0      5     0      1
%
% auliadd  -unit array01  -lu 0  -rg 0  -size 100352  -ctl0--- Adds LU0.
Password:                           ---------- Enters a already-registered password.
%
% auluref  -unit array01            ---------- Checks that an LU has been configured.
 LU     Capacity   Status    Staging  C-CTL    D-CTL    RG   RAID
  0       100352   Unformat      512      0        0     0      5
```

Disk Array management program
(for CLI)

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