RM300 E / RM400 E

Software for Configuration/Installation
(Reliant UNIX)

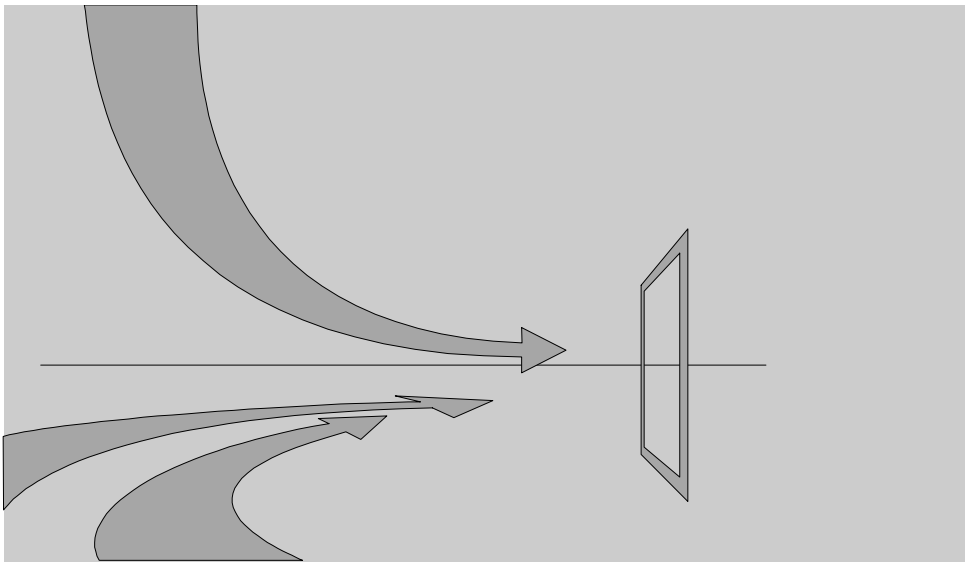
Edition September 1998

Copyright and Trademarks

This manual is printed
on paper treated with
chlorine-free bleach.

Contents

Introduction



Structure of the software description

Target group of the software description

This manual describes the software components of the Reliant UNIX operating system which are relevant to the installation and removal of modules.

Structure of the manual

You are strongly advised to read the chapter “Important notes” in the manual „RM300 E / RM400 E - General Information” **before** working with the system unit. It contains information which is necessary for the correct set-up and handling of the system unit.

This manual contains the following chapters:

- Activating Reliant UNIX for the first time
  This chapter contains information on installing the Reliant UNIX operating system for the first time and configuring your workstation.

- Switching off the system unit
  This chapter describes how to switch off the system unit using the alphanumeric console or the graphics monitor. It also describes how you can change to the system’s PROM monitor.

- Software requirements for exchanging components
  This chapter contains a more detailed description of the software components which are relevant in conjunction with the replacement of components.

- The upd_channel_i d program
  This chapter contains a detailed description of the definition of ClassCodes and the upd_channel_id program.

- Requirements for Hot Replacement
  Here you can find information on the exchange of hot replacement components within the system unit and the peripheral cabinets.

- Indices
  This chapter contains an

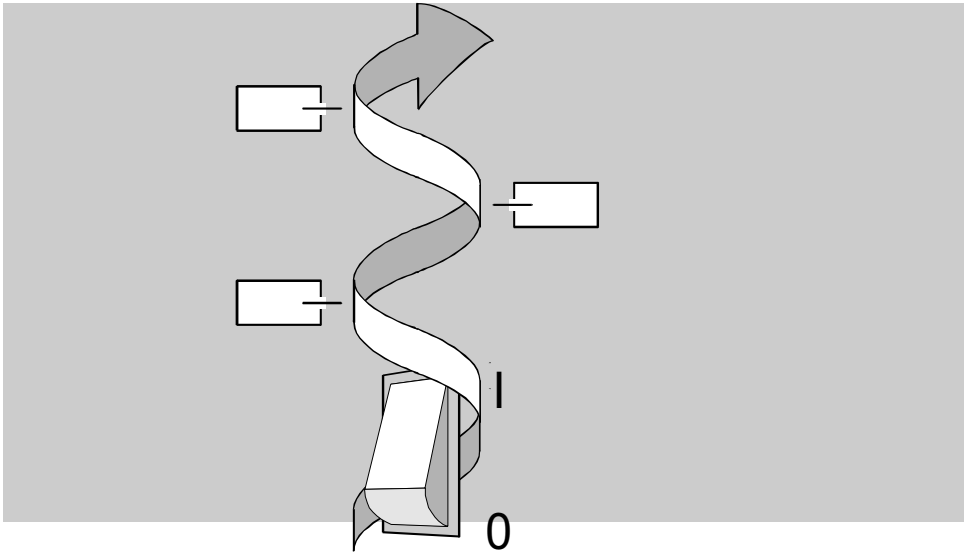
  – index of figures

  – index of keywords enabling you to locate terms easily

Target group of the software description

This software description is intended for those responsible for hardware installation and the proper operation of the system. The software description covers all the software components which are important for the hardware expansion of your RM300 E / RM400 E system.

Knowledge of the fields hardware and data transmission, plus a basic knowledge of the Reliant UNIX operating system is necessary for an understanding of the various expansion options.



Switching off the system unit

Changing to the PROM monitor

Activating Reliant UNIX for the first time

The Reliant UNIX operating system is preinstalled.

You only need to install the operating system if you want to work with a version different to the current one or if the installed operating system was damaged. For information necessary for installation, please refer to the manual “Reliant UNIX Installation and Operation – RM200, RM300, RM400”.

For installation you will require:

– Reliant UNIX (CD-ROM)

– Release notes

– Reliant UNIX installation manual

If you are working with the preinstalled version, you will only need the CD-ROM containing the operating system to install software components required for the integration of additional components.

Configuring the console, keyboard, mouse and monitor

When the computer is switched on, the system boots automatically. During the boot process control messages are issued until the system prompts you to specify which monitor you are working with.

Alphanumeric console

If you are working with an alphanumeric console, the following selection is displayed:

```
You can choose one of the following term variables for your console terminal

1. vt02
2. 97801
3. ba80/9766

Please type in the number of your terminal: _
```

► Select the appropriate type of console terminal.

Further messages are issued until the following message is displayed:

```
The system is ready.

Name_xyz

Console Login:
```

► Now please read the chapter “End of the initial boot process” on page 23.

Graphics monitor as the console

If you have a graphics monitor as the console, you will be required to configure the graphics properties of the hardware used. The graphics parameters, which you can define, are required for the following three hardware components:

– keyboard

– mouse

– monitor

First provide the following information:

Country-specific keayboard type:	e.g. German (check the type label, e.g. GER)
monitor connection used:	Graphics controller on a PCI slot
Monitor type:	33 cm (14"), 35 cm (15"), 40 cm (17") or 50 cm (21")

This information is found on device labels or can be found in the operating instructions of the device in question.

To assist you in making entries, windows are displayed containing a form for configuring the mouse, keyboard and monitor.

The entries must be made via the *SYSADM* user interface. Information on the use of *SYSADM* can be found on the next page. For further information on *SYSADM* please refer to the manual “System Administration and Hardware Configuration with SYSADM”.

Information on SYSADM

– The first time the system is put into operation the dialog is in English.

– The cursor is positioned in the first input field. Use the keys ↑, ↓ and ↵ to move the cursor to the next input field.

– You can request a help text by pressing the HELP or F1 key. The help text always refers to the input field where the cursor is currently located.

– Use the function key CHOICES or F2 to fill in each input field.
Entries can be made using the keyboard but the use of the function keys named here is preferable. This ensures that you are offered all the permissible vales for selection, either in the input field or in an additional list. If a list of this type if available, position the cursor on the required entry using the keys ↑ and ↓ and copy this value to the input field by pressing ↵.

– Then press SAVE or F3.
If you do not wish to change the default parameters, you may also EXIT or F8 instead.

Configuring the keyboard

With the graphics monitor you can work in both graphics and alphanumeric emulation. The keyboard must be configured for both types of emulation. First, find out which parameters have to be entered before you set up the two types of emulation.

The names of the country codes have the following syntax:

<Language>_<Country>.<Codeset>-<Version>

Some countries have several country codes available. They usually have a different codeset. There are two types of codeset:

– ISO 8859 codesets Examples: 8859*n*, I_*n*, ISO
– PC codesets Examples: 437, 850, 852

where *n* stands for the digits 1, 2, 5, 7 or 9. Which codeset you should select depends on which application is to run on the system in the future or, as the case may be, what data is already there. For Reliant UNIX applications, the ISO 8859 standard is customary.

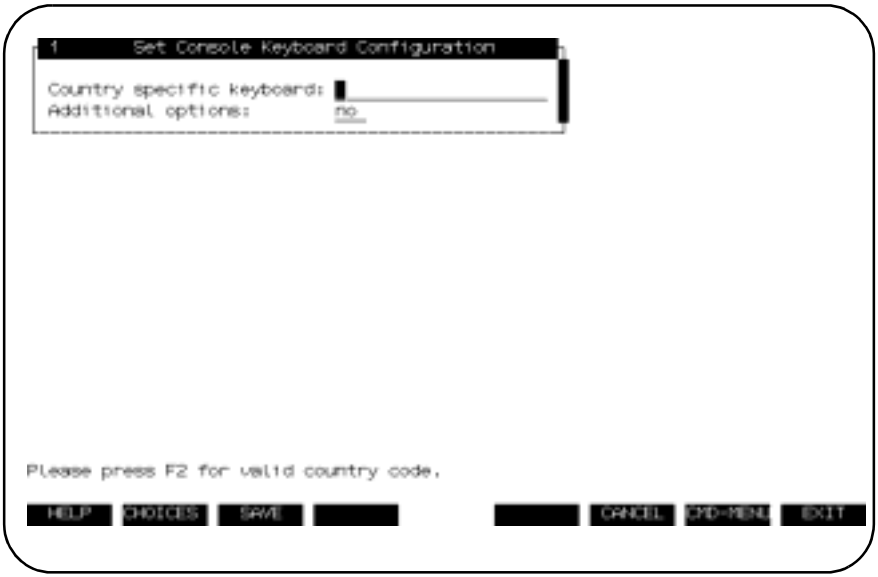
Examples showing the configuration of the keyboard parameters:

	Alphanumeric emulation	**Graphics emulation**
Terminal emulation	ANSI	x97801
Keyboard type	MF2	MF2
Country-specific keyboard English: French: German:	 En_US.ISO-1 Fr_FR.I_1-1 De_DE.ISO-1	 En_US.88591-1 Fr_FR.88591-1 De_DE.88591-1

Proceed as follows:

- ► Enter the parameters for alphanumeric emulation by pressing CHOICES or F2.
- ► Save the parameters by pressing SAVE or F3.
  An additional window is opened with the message that the keyboard has been configured successfully.
- ► Close this window by pressing CANCEL or F6.
- ► Enter the parameters for graphics emulation by changing the existing parameters (CHOICES or F2).

An example showing the configuration of the keyboard under Reliant UNIX (graphics emulation):



Notes on the parameters:

Country specific keyboard
Key assignment on keyboards is specific to a particular country. If you press CHOICES or F2, you will get an overview of all the country codes which are supported. If you do not know which code is the right one for you, you can request a help text using HELP or F1. It shows the assignment of the available options to the keyboard type. Details can be found on the type label on the bottom of the keyboard.

Additional options
Possible values: *no*, *yes*
If required, you may enter *yes* here (using the CHOICES function key). An additional menu is then displayed in which you may change some default settings (see next screen).

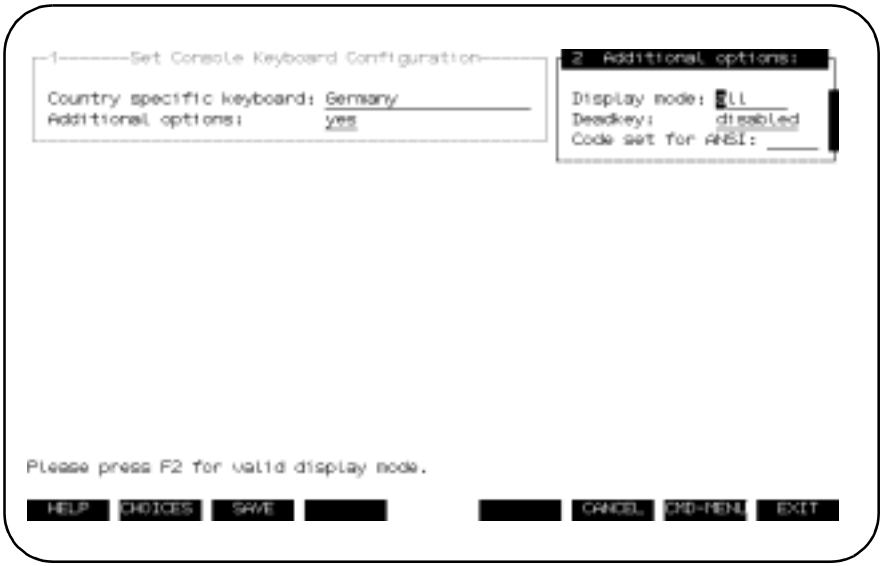
Proceed as follows:

- ► Fill in the form.
- ► Save the values by pressing SAVE.

If you entered the value *no* in the *Additional Options* field, please read the section “Finish configuring the keyboard” on page 15.

Specifying additional options

If you entered *yes* in the *Additional Options* field, the following form will be displayed:



Notes on the parameters:

Display mode Possible values: *all*, *alpha*, *graphic*
The keyboard setting only applies to one particular display mode. If you wish to change the default *all*, you may use the CHOICES function key.

Deadkey
Possible values: *disabled*, *enabled*
Diacritical signs (e.g. accents) should occur as independent characters (*disabled*) or only in combination with an appropriate basic symbol (*enabled*). If you wish to change the default *disabled*, you may use the CHOICES function key.

Code set for ANSI
Possible values: *88591*, *850*
Here you can specify which PC code table should be used for ANSI terminal emulation(s). The code table may be based on either the ISO 8859 standard or the PC industry standard. 97801 terminal emulation (x97801) basically only supports ISO 8859. If you wish to change the default, you may use the CHOICES function key.

Proceed as follows:

- Fill in the form.
- Save the values by pressing SAVE.

Finish configuring the keyboard

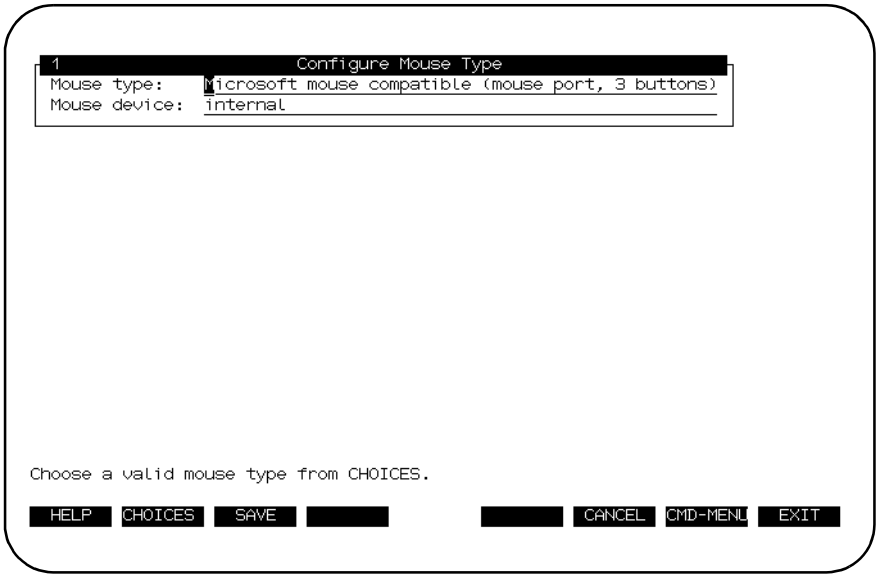
A message is issued stating that the keyboard has been successfully configured.

- Close this message by pressing CANCEL.
- End keyboard configuration by pressing EXIT.

The selected settings take effect immediately after autoboot has finished. You do not need to restart the system again. When autoboot is finished you only need to assign the correct value to the environment variable *$LANG*.

Configuring the type of mouse

Example showing how to configure the mouse:



Notes on the parameters:

Mouse type	Choose a Microsoft-compatible mouse with three buttons.
Mouse device	Mouse driver Confirm the default *internal* (round connector = PS/2).

Proceed as follows:

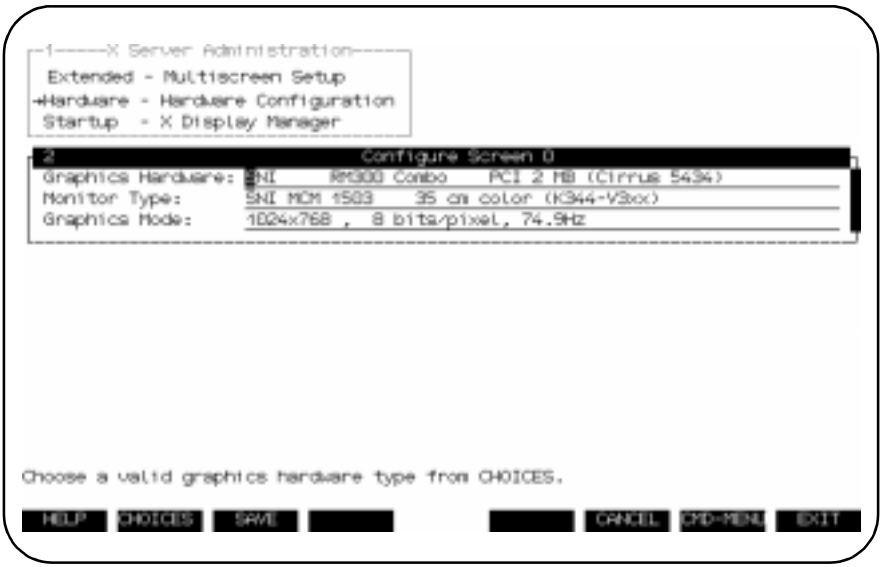
- ► Fill in the form.
- ► Save the values by pressing SAVE.

Configuring the graphics monitor

A menu with three entries: *Hardware*, *Startup* and *Extended* is displayed. Selecting one of these entries will cause a relevant submenu to be opened. The hardware **must** be configured whereas with the other two parameters you may accept the defaults.

Example showing how to configure the graphics monitor under Reliant UNIX :

Submenu *Hardware*



Notes on the parameters:

Graphics Hardware — If you have not mounted an additional graphics controller, select an onboard graphics controller (Cirrus Alpine). If you have mounted an additional graphics controller, then select an onboard graphics controller of the Millenium type. Press the CHOICES function key and select a component.

Monitor Type

Press CHOICES.
You now obtain a selection list from which you may select a monitor type. The preferred models are listed first. If your monitor is not included in the list, consult your monitor's manual to find out the horizontal frequency range which your monitor can synchronise. Then select one of the multi-frequency entries which is the most suitable.
b/w refers to black/white or monochrome.

Graphics Mode

Press CHOICES and selct a mode.
A mode covers several parameters:

– resolution
(width and height of the visible picture in pixels),
– depth (bit/pixel),
– vertical refresh rate in Hertz.

Depending on the size of the monitor, we would recommend the following resolution:
33 cm (14") Monitor: 640x480
35 cm (15") Monitor: 800x600
40 cm (17") Monitor: 1024x768
50 cm (21") Monitor: 1280x1024

Proceed as follows:

► Fill in the form.

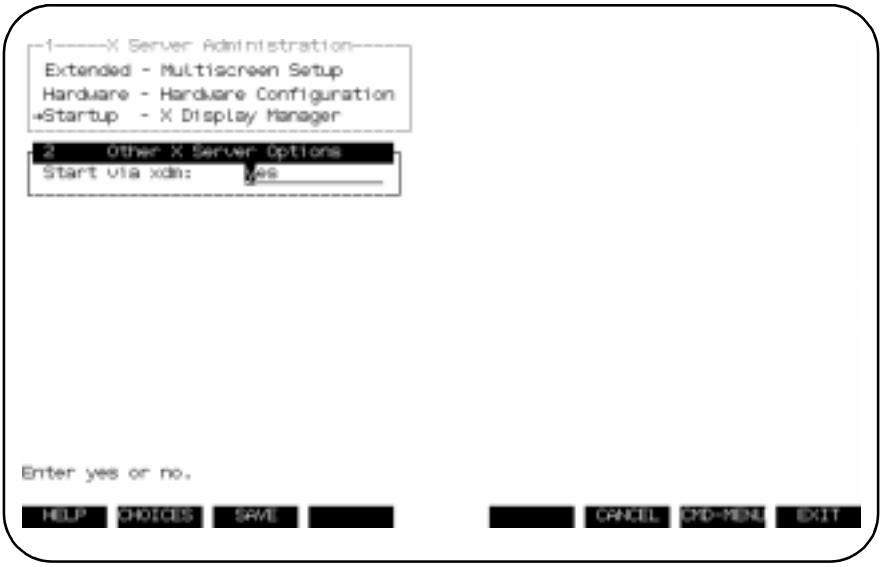
► Save the values by pressing SAVE.

You now return to the *X Server Administration* window. Depending on whether you wish to configure the parameters *Startup* and *Extended*, you may now do the following:

► If you wish to end the configuration of the X server:
Press EXIT. Read the section "Checking the test picture" on page 21 or

► Select the *Startup* menu entry

Submenu *Startup*



Notes on the parameters:

Start via xdm If you enter *yes*, the SINIX/windows graphical interface is automatically started when the system is started up.

If, on the other hand, you enter *no*, the X server is only started when you enter the command from the shell: *startx &* or *startrx &*. This means that you must first log in on the Alpha monitor.

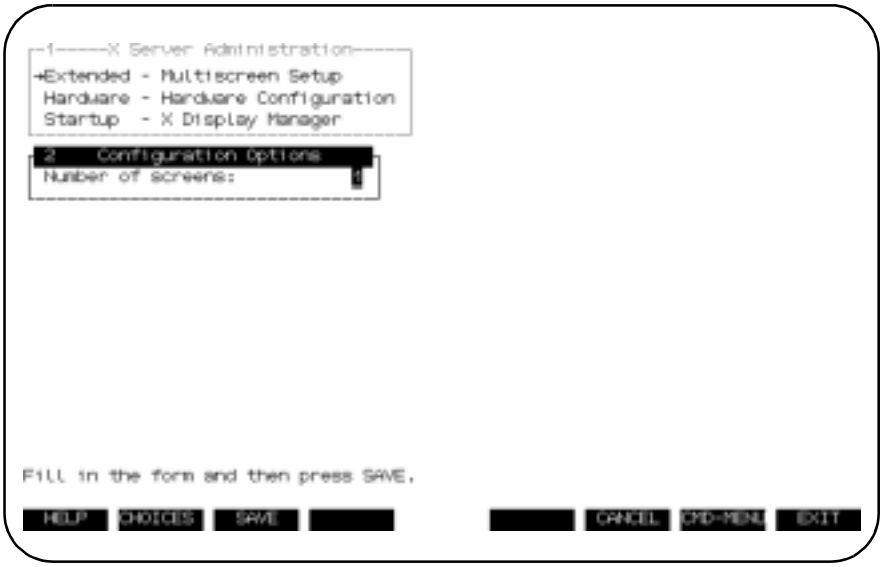
Proceed as follows:

- ► Fill in the form.
- ► Save the values by pressing SAVE.

You now return to the *X Server Administration* window.

- ► Select the menu entry *Extended*.

Submenu *Extended*



Notes on the parameters:

Number of screens If several screens are connected to your computer, you may enter the number here (maximum of 4). Each screen requires a different graphics card. All screens are operated using a single keyboard and a single mouse.
The *DISPLAY* variable is set as follows:
<computername>:0.0 for the first screen,
<computername>:0.1 for the second screen (etc.).

Proceed as follows:

- Fill in the form.
- Save the values by pressing SAVE.

You now return to the *X Server Administration* window .

- Press EXIT.

Checking the test picture

A test picture is then displayed. Check whether the colours and grey scale are acceptable and whether the mouse is functioning correctly.

```
Server Test Utility
Please try to move the mouse and press some buttons.
Press any key to exit.
```

Then press any key. You must now decide whether the graphics parameters are correct.

```
Mouse and X11 Server ok? [y/n] > _
```

- If the test picture is ok and the mouse is functioning correctly:

  ► Enter *y* and read the chapter “End of the configuration process” on page 22.

- If the test picture is not ok:

  ► Enter *n*.

The windows for configuring the mouse and graphics monitor are displayed again.

► Correct the parameters until the test picture is ok.

You may also correct the configurations of the graphics parameters after installation is completed. To find out how to do this, please refer to the manual “Reliant UNIX Installaiton and Operation – RM200, RM300, RM400”.

End of the configuration process

When you have configured the monitor, the system asks you to enter a new system administrator password and confirm your entry by pressing ↵.

Then you have to enter the password again.

```
Please set your System-Administrator password now
New password:
Re-enter new password:
```

Some messages are then issued, the screen is cleared and the login display mode of the graphical user interface is displayed.

Switching between ANSI display mode and graphic display mode

If you wish to switch from graphic display mode to ANSI display mode (alphanumeric display mode), you must press the key combination ALT Sys-Rq and H.

Press the key combination ALT Sys-Rq and F1 to return to graphic display mode.

End of the initial boot process

► Enter the user id *root* and confirm by pressing ↵.

► Now enter a password and confirm your entry by pressing ↵.

For security reasons the systems asks for the password again.

► Enter the password again and confirm by pressing ↵.

The system unit then switches to multi-user mode.

If you are working with an alphanumeric console, you will see the flashing cursor in the command line.

If you are working with a graphics monitor, the SINIX/windows opening screen is displayed.

Your system is now operational with immediate effect.

You can now begin with the configuration of the connected peripheral devices, the system, definition of printer groups, creation of users and the installation of software products. Information about this can be found in the manuals listed in the bibliography and in the manuals of the related products.

You may also first continue with the installation of the hardware until all peripheral devices have been connected. In this case, you must first switch off the system and remove the plug.

Switching off the system unit

Depending on the type of console used, proceed as follows:

- **Alphanumeric console**

  ► Log in under *root* an.

  ► Enter the command *shutdown -i0 -g20 -y* ein.

  The option *-g* defines that the operating system is shut down in an orderly manner after, for example *20* seconds (*-g20*).

- **Graphics monitor**

  ► Log in under *root* an.

  Depending on the desktop used, proceed as follows:

  ► Change to the *Main Desktop* window (SINIX desktop) or start the *Application Manager* (CDE desktop).

  ► Select *File* (SINIX desktop) from the title bar or *System Administration* (CDE desktop) and the icon *Shutdown* in this menu.

  ► If you wish to use a different period of time than the default value of 20 seconds for shutting the system down, you must now shift the button for the period of grace accordingly.

  ► Click on the *Start* icon.

If other users are logged on to the system, you will be automatically informed that the operating system will be shut down in an orderly manner after the period of time set. When this period of time has expired, the users are informed once more and the operating system is shut down. Finally, the mains voltage is automatically switched off, the green LEDs are not lit any more.

► Now switch off the external peripheral devices and the console separately.

For information about *shutdown* see also the manual “Reliant UNIX Installation and Operation – RM200, RM300, RM400”.

In the case of emergency, you can switch off the system unit using the power switch at the back or by unplugging the device from the mains. This could result in data loss.

Changing to the PROM monitor

First change to the PROM monitor or firmware monitor. The required procedure depends on two factors: the system's current operating status and the selected boot mode.

If the system is not shut down in an orderly manner (for example due to a power failure or because the key switch is pressed), the file systems might be inconsistent and you may not be able to mount them the next time you start the system.

Changing to the PROM monitor after switching on the system

Whe you switch on the computer, the firmware performs a number of actions which depend on the selected boot mode. If the autoboot function is disabled (boot mode *d* or *m*), the PROM monitor or the firmware monitor is started automatically. If the autoboot function is enabled (boot mode *c*), you can abort the boot process with CTRL C when the following message is displayed:

```
Autoboot: Waiting to load dkncr(0,0,10)sash (CTRL-C to abort, RETURN to expedite)
```

Depending on the selected system disk, *dkpcs* or *dkdpt* is output instead of *dkncr*.

Changing to the PROM monitor from SINIX

If the computer is already switched on with UNIX already running, you can reach the PROM monitor or firmware monitor by changing to operating status 5. The selected boot mode is not relevant here.

If the system is in multi-user mode, use the *who*(1) command to find out whether any other users are logged on.

who(1) does not show whether the system is being accessed by other computers via *nfs* or *pcnfs*.

```
# cd /
# shutdown -i5 -g900
```

The *-g900* option causes a delay of 900 seconds (i.e. 15 minutes). You should choose this delay if other users are logged on. Otherwise you can specify the *-g0* option.

The boot process automatically ends in the PROM monitor or firmware monitor.

Changing to the firmware monitor

Once the firmware messages have been displayed, the following prompt is issued

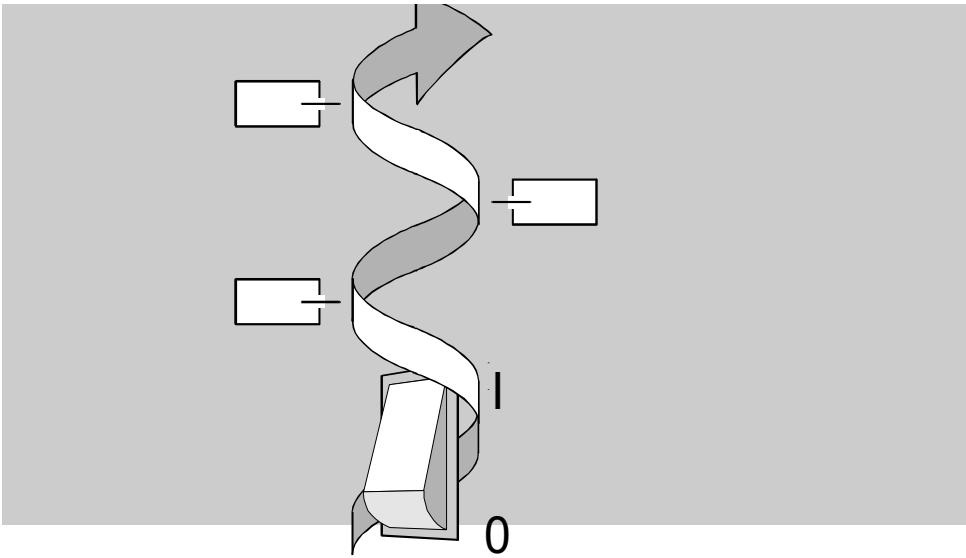
```
Hit any key to continue ..
```

Press any key. The firmware monitor main menu is displayed.

For more information on this topic refer to the following manual:

Reliant UNIX 5.44
Reliant UNIX Installation and Operation (1)
RM200, RM300, RM400
Installation Guide

Software requirements



Booting an alternative operating system kernel

Reconfiguring the system disk

Messages when loading Reliant UNIX

Software requirements for exchanging modules

Modules should only be exchanged considering the current system parameters. These parameters control both the boot process and the assignment of the connected peripherals.

Especially exchanging RAID and SCSI controllers has a direct influence on these parameters. When a controller of this type is exchanged, new device assignments might be made. This would lead to existing link and mount commands not running correctly.

These commands are also used in the case of errors in the boot process. These might be the following:

- NVRAM deleted
  - beause the basic board has an error or has been exchanged
  - NVRAM and backup on disk are inconsistent
- booting alternative Reliant UNIX kernel.

Special commands have been incorporated into Reliant UNIX for gathering this information. These commands are described in this chapter.

It is always recommended that you document the most important system data. The boot string, for example, cannot be found out if the basic board is broken.

Error handling

If an error occurs during start-up, the message *FAILED* is displayed instead of *PASSED*. The boot mode is automatically set to *e* (error) to prevent the PROM monitor from loading the Reliant UNIX operating system. In addition, any tests relying on components whose tests failed are skipped. In this case *SKIPPED* is displayed instead of *PASSED* (e.g. the *DATA Cache MATS+* test is skipped if the *Cache Test 1* failed.)

The following example shows a failure of the SCSI 0 read/write test. This error was caused by a connection breakdown in the computer.

```
<previous startup tests>

SCSI CONTROLLER 0:
   Read/Write Test (fail:0a)...FAILED

<following startup tests>
```

The following is output on the console. Note that the memory configuration on your system might have different values.

```
SNI Monitor Version 3.0005 SNI_R4000 OPT 'date' 'Time' 'Author'
Memory size: 32 MBytes (0x2000000 bytes)
Bank 0: 64MBytes                Bank 1: 0MByte
Bank 2: 00MBytes                Bank 3: 0MByte
CPU : R4400 SC. Revision 4.0
Primary I-cache size: 16384 (0x4000) bytes
Primary D-cache size: 16384 (0x4000) bytes
Secondary cache size: 1024 Kbytes (0x100000 bytes)

***** Power-On Diagnostic result:
      0x2000<SCSI 0>

***** Problems on <Motherboard>
>>
```

The boot mode is automatically set to *e* and the PROM monitor is waiting for user input after the prompt >>.

To be able to boot Reliant UNIX, you must first eliminate the problem (or have it eliminated).

Then reset the boot mode to *c* using the *setenv bootmode c* command. Finally you must perform the following steps:

- Press the RESET button for at least one second (perform a reset).
- Switch the computer off and on again (do a cold start).
- Enter the *auto* command and confirm it by pressing Enter.

In the case of the first two steps the start-up tests are run again to make sure that the problem really has been eliminated.

The following sections contain brief descriptions of causes of errors and possible remedies.

Eliminating NVRAM problems

The values saved in the NVRAM can be lost due to NVRAM hardware problems or when the basic board is exchanged.

If, during booting of Reliant UNIX, an inconsistency is detected between the parameters saved in the NVRAM and the backup on the system disk, the system boots in single user mode.

- The *upd_channel_id* command, which is described in this chapter, allows you to correct the values in the NVRAM.

```
>> upd_channel_id
```

- Then reboot the operating system:

```
# init 6
```

If the message **cannot mount root** is displayed during booting, the problem may also be an inconsistency between the data saved in the NVRAM and the corresponding backup on the system disk.

- Use the *checkchid* <*chidbootstring*> command to check for an inconsistency. For *chidbootstring* enter the same value as when booting the SASH, for example:

```
>> checkchid dkpcs(0,0,0,10)
```

- If the *checkchid* command finds an inconsistency, the inconsistency can be corrected with *putchid* <*chidbootstring*>. For *chidbootstring* enter the same value as when booting the SASH, for example:

```
>> putchid dkpcs(0,0,0,10)
```

  The *putchid* command restores a backup of the channel IDs from partition 10 of the system disk, adjusting the NVRAM and the backup created from the operating system settings.

► Then boot the operating system:

```
>> auto
```

When exchanging the motherboard, all the data saved in the NVRAM is lost. To restore the NVRAM data, proceed as follows:

► When exchanging the motherboard, note that you must find out the boot string beforehand. To do this, use the *printenv* command.

```
>> printenv bootfile
```

You must declare the boot string to the system again after installing the new motherboard.

► After exchanging the motherboard call the *putchid* <*chidbootstring*> command in the PROM monitor. For *chidbootstring* enter the same value as when booting the SASH, for example:

```
>> putchid dkpcs(0,0,0,10)
```

The *putchid* command restores a backup of the channel IDs from partition 10 of the system disk.

► Enter the old boot string with the *setenv* command, for example:

```
>> setenv bootfile dkpcs(0,0,0,10)sash
```

► Then boot the operating system:

```
>> auto
```

Booting an alternative operating system kernel

There are a few cases in which the new system kernel cannot be booted correctly. This might be the case, for example, if you have changed a system parameter or a combination of parameters in such a way that the new system kernel is too large or does not initialize correctly.

In this case, you must first boot the old kernel again to have a running operating system. To do this, proceed as follows:

- Change to the PROM monitor or firmware monitor.

  Determine the boot string with the *printenv* firmware command:

```
>> printenv bootfile
```

- Boot the SASH, for example:

```
>> boot -f dkpcs(0,0,0,10)sash
```

- Boot the old system kernel.

```
sash boot -f dkpcs(0,0,0,0) /stand/unix.old
```

  This kernel was renamed to */unix.old* when Reliant UNIX was booted the last time. Instead of *unix.old* you can also boot a specially saved system kernel.

- Log on to the system as *root*.

- Save the bootable system kernel for the event that the next version might not be running either.

```
# mv /unix.old /unix.sav
```

► Run the *etc/conf/bin/idbuild* command again.

► Boot Reliant UNIX again.

If, for any reason, this kernel should not be functioning either, boot from */unix.sav* instead of */unix.old* and try again.

Every kernel uses approximately 10 Mbytes in the */stand* directory!

Booting from a mirror disk

If your system disk is no longer available, you can boot from a mirror disk, provided there is one.

► Use the *dkprint* command to find out which numbers the firmware has assigned to the channel IDs, for example:

```
>> dkprint
PCI-Path      Channel-ID     Bootstring              Comment
PCI#1/0       12             dkpcs(0,0,0,10)sash
PCI#1/1       13             dkpcs(0,1,1,10)sash
PCI#3.0       2              dkpcs(0,0,0,10)sash
PCI#3.1       3              -
PCI#4         -              -
```

If a hyphen *(-)* is displayed in the *Channel-ID* column, no channel ID has been assigned. A hyphen in the *Bootstring* column states that the disk is not bootable.

► Boot the operating system. If the mirror disk is known as */ios0/sdisk131*, for example, the system can be booted using the following command:

```
>> boot dkpcs(0,1,2,0) /stand/unix root=ios0/sdisk131s0 swap=ios0/sdisk131s1
```

It is always recommended that you note the most important system data. When configuring the mirror root, for example, you should write down the logical name of the mirror disks.

If you cannot establish a logical assignment, you have the option of installing the mirror disk in the slot of the original disk and booting the operating system without further intervention.

Booting from an alternative disk

If the system disk is no longer available, you can boot the operating system from another disk.

If you cannot establish a logical link for the new disk, execute the *dkprint* command as described in the section “Booting from a mirror disk”.

Boot the SASH with the *boot <bootstring>* command, for example:

```
>> boot -f dkpcs(0,0,0,10)sash
```

Then you can boot the operating system, for example:

```
sash dkpcs(0,0,0,0)unix
```

You can also use the *printenv* command to define the *bootfile* variable and start the operating system directly from the PROM monitor. As the new *bootfile* value is saved in this way, it is automatically available for all subsequent system starts, for example:

```
>> setenv bootfile dkpcs(0,0,0,10)sash
>> auto
```

If any incompatible modifications have been made in the system (e.g. channel IDs set incorrectly with *upd_channel_id*), you must reconfigure the system disk. The relevant procedure is described in the next section.

Reconfiguring the system disk

If the remedies described have not been successful, you can also reconfigure the system disk.

You must reconfigure the system disk when it is attached to a different SCSI ID, a different SCSI channel or a different controller.

- ► To reconfigure a system disk, first boot the mini root file system from CD-ROM. Proceed as described under „Loading the Mini System main menu“ in the manual “Reliant UNIXInstallation and Operation - RM200, RM300, RM400”.

- ► Call the mini root file system using the *rr* command. This command produces a list of the following form:

```
bootable system(s) found on:
/dev/ios0/sdisk055s0   dkdpt(1,0,5,0)  sash found  # bzw. unix but no sash
....
```

- ► The command now expects you to specify the system disk.

- ► */dev/ios0/sdisk055s0*

  Then the corresponding nodes *(/dev/ios0)* are established or modified and files */etc/initab* and */etc/default/boot)* and NVRAM entries *(bootfile)* are corrected. Then the system is rebooted. This ensures that the system boots up to single user mode.

The system administrator is responsible for all the other modifications (e.g. */etc/vfstab, /etc/dktab*).

If none of the measures described here is successful, you must reinstall the operating system.

Messages when loading the SASH

When the SASH is being loaded, the following message is displayed, e.g.:

```
loading
415848+0+431180 entry: 0xa0e0000
SNI Standalone Shell Version 5.0304 Tue Nov 25 18:21:43 MET 1997 livsapci
```

Messages when loading Reliant UNIX

When Reliant UNIX is being loaded, the corresponding message is displayed:

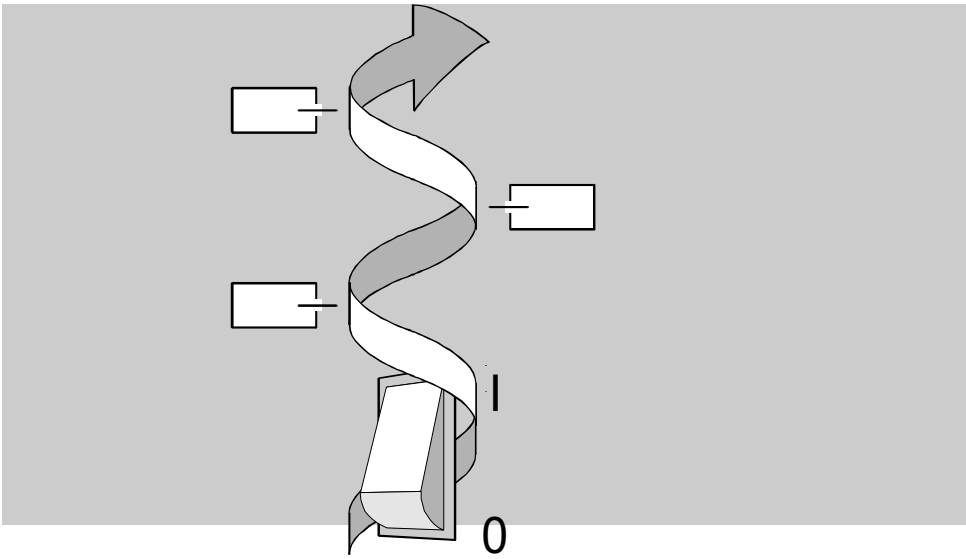
```
loading dkncr(0,0,0)unix
2185644+1468592+6661592 entry: 0x80021000

SNI RM400
UNIX(R) Reliant UNIX Release 5.44 Version A00
Copyright (c) 1984, 1986, 1987, 1988, 1989, 1990, 1991, 1992 Pyramid Technolog
y C
Copyright (c) 1984, 1986, 1987, 1988, 1989, 1990, 1991, 1992 AT&T
Copyright (c) 1991, 1992, 1993, 1994 Siemens Nixdorf Informationssysteme AG
All Rights Reserved

Processor Configuration:
    Boot  processor:   Cpu #0 (p0)
    Other processor(s):    None
```

A number of further messages is displayed, which depend on the hardware installed in the system and on how Reliant UNIX is configured. The messages are logged in the */var/adm/log/osm* file.

During this time you must in no case switch off the computer or press the RESET button! Otherwise data may be lost.

As of Reliant UNIX, only systems with at least 32 Mbytes main memory are supported. We recommend at least 64 Mbytes main memory.

The upd_channel_id program



The **upd_channel_id** program

Defining the ClassCode

The upd_channel_id program

The channel IDs replace the logical IDs used under Reliant UNIX 5.43. Unlike the logical IDs, the channel IDs also differentiate between the different SCSI channels of a controller. Now PCI and EISA adapters are handled in the same way. The channel IDs are edited with the *upd_channel_id* command which replaces the *updeisa* command.

The assignment of the channel IDs to the EISA/PCI slots is stored in the NVRAM/EEPROM of the basic board and is retained in the event of a reset. The channel ID has a value range of 0 to 99. The channel ID is output as part of a device name, e.g. */dev/ios1/scon**09***.

The *upd_channel_id* program is only used when EISA or PCI adapters are exchanged or installed in a system under Reliant UNIX 5.43.

When the hardware configuration of a system is changed, the channel ID may have to be edited:

– if the basic board is exchanged

– if the EISA-SCSI adapter is upgraded to a PCI adapter and the SCSI devices are to keep their device names.

– if a module is changed from slot A to slot B.

When new adapters are added to the EISA or PCI bus, a new free channel ID is assigned automatically. This ID is used to identify the adapter in the system. The ID remains assigned to the adapter even if adapters of the same type are mounted on other slots. The UNIX algorithms for forming device names for the adapter use this channel ID to prevent identical names.

The program should only be used by trained Reliant UNIX system administrators, as the entries have a direct influence on the system environment.

The *upd_channel_id* program is used to modify the channel ID stored in the NVRAM. The program provides the following functions:

-l Lists all the entries stored in the NVRAM on Reliant UNIX *stdout*. If the output is redirected, the output file can be rewritten after any modifications with the flag *-w*.

-o Recalculates the (old) logical IDs to (new) channel IDs. This is usually necessary once for the update installation. Displays a table of all channe IDs on the screen (*stdout*). The channel ID is calculated according to the old (updeisa) algorithm. This flag is only necessary if the old device names need to be retained.

-c Deletes all channel ID entries from the NVRAM.

-w Reads the table with the channel ID entries from the specified file, checks the specifications and stores them in the NVRAM. The structure of this file is explained in this chapter.

-f Performs the read/write to the NVRAM also for root channels.

The structure of the upd_channel_id call:

```
upd_channel_id –i | –o | –c | {–w <file>}
```

The *upd_channel_id* program also supports entries which still use the old logical EISA ID.

The input and output format of the upd_channel_id program:

The *channel_id* entries can be stored in a temporary file and must have the following structure:

```
slot[.subchannel], channel_id, [class_code], [driver], [option],
[comment]
```

The meaning of the individual entries is as follows:

slot	EISA#1 | EISA#2 | ... | PCI#0 | ... | PCI#14/14/14
subchannel	0 ... 9, for EISA 0 ... 7
channel_id	0 ... 99, for logical EISA ID 0 ... 31
class_code	MISC | SCSI | FLOPPY | MASSSTORE | ETHER | TOKEN | FDDI | NETWORK | DISPLAY | MULTIMEDIA | COMMDEV Entries which still use the old logical ID do not have a class code.
driver	Name of the corresponding driver, e.g. *adp*
option	Optional parameter specified, for example, for the SCSI-ID.
comment	A brief description of the adapter in use.

The specifications for *channel_id* and *option* can be modified. All the other specifications are only displayed and not modifiable.

Special features of EISA logical ID entries:

Some drivers use the (old) logical EISA IDs instead of the channel IDs. These are also supported by *upd_channel_id* but are subject to the following restrictions:

The digit in the *channel_id* field corresponds to the *logid*. These entries do not have a class code. The *option* field cannot be set. There is no output in the *comment* field.

Output example of upd_channel_id::

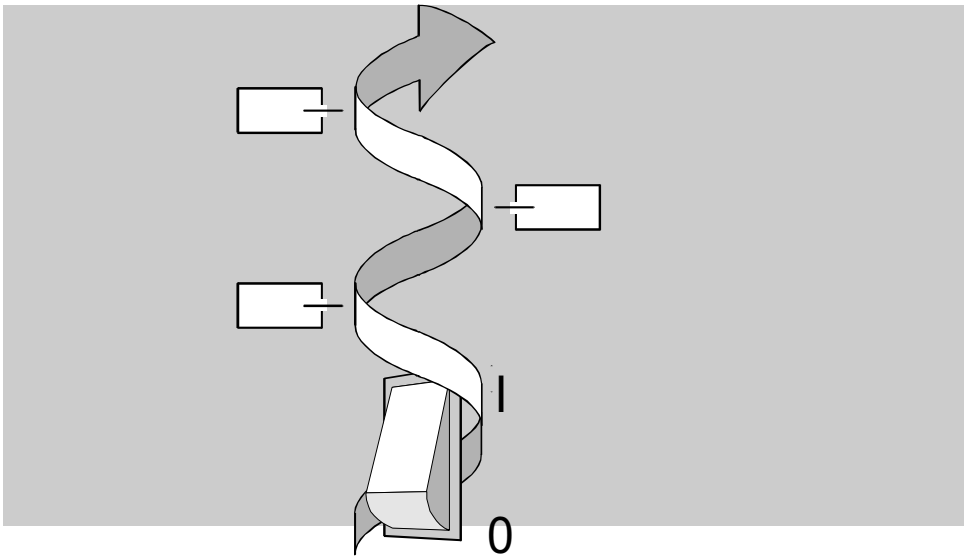
```
#
slot.subchannel  channel_id  class_code  driver   option   comment
#
EISA#1,          1,          SCSI,       adp,     0x07,    SCSI ADP ADP1740A DE
EISA#2,          2,          ,           iopr,    ,
PCI#2.0,         3,          SCSI,       dpt,     0x00,    SCSI DPT PM3222 SE
```

Defining the ClassCode

The *class_code* entries required by the *upd_channel_id* program were defined on the basis of the PCI specifications. To assign the *channel_id*, it is sufficient to choose a class code from a selection of *class_code* entries. In this version, the following *class_code* entries are defined, which are determined by the software:

ID	ClassCode	BaseClass	Sub-Class	Meaning
1	SCSI	01h	00h	SCSI bus controller
2	FLOPPY	01h	02h	Floppy disk controller
3	MASSSTORE	01h	80h	Hard disk controller
4	ETHER	02h	00h	Ethernet adapter
5	TOKEN	02h	01h	Token Ring adapter
6	FDDI	02h	02h	FDDI adapter
7	NETWORK	02h	80h	Other network adapters
8	DISPLAY	03h	80h	Display controller
9	MULTIMEDIA	04h	80h	Multimedia device
10	COMMDEV	---	---	Communications device
11	---			
12	---			
13	---			
14	---			
15	---			
0	MISC	00h	00h	... other devices

Hot Replacement



Requirements

Identifying a defective magnetic disk

Configuring a replacement magnetic disk

Requirements for hot replacement

The term hot replacement refers to the relacement of defective hard disks which are currently in operation. Hot replacement can be carried out under the following condition:

– under Reliant UNIX with a RAID controller or

– with the program *Config/XConfig*

Hot replacement is one of the high availability components provided in the system cabinet of the RM300 E / RM400 E system and the peripheral cabinet DU40. Hot replacement guarantees safe and stable systems operation.

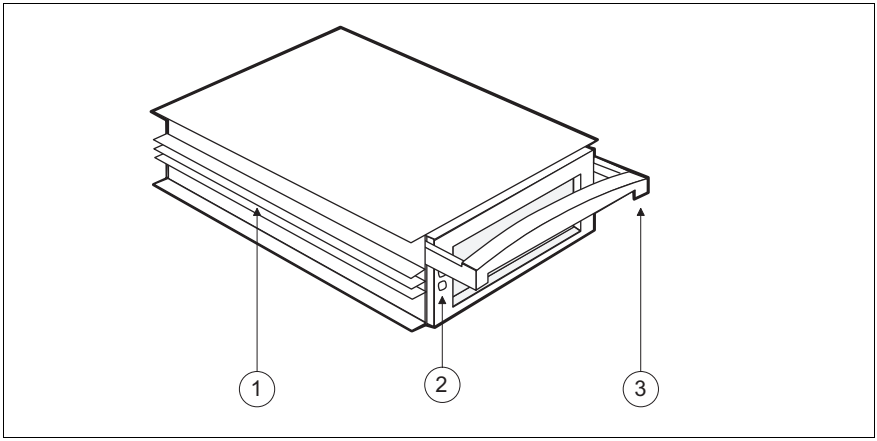


Figure 1: Hard disk in a hot replacement module frame

Hot-replacement hard disks which can be replaced using the hot replacement procedure are mounted in a hot-replacement module frame. The module frame has a handle support and two LEDs at the front.

(**1**) Module frame

(**2**) LEDs

green	Access to the hard disk. In this mode the hard disk may not be replaced.
constantly orange	Deactivated hard disk. The hard disk may now be replaced.
flashing orange	The configuration is being determined. In this mode the hard disk may not be replaced.

(**3**) Handle of the hot replacement module frame
It must be pulled out if you wish to pull a hard disk out of the peripheral cabinet.

Hot replacement may be carried out by experienced system administrators with the appropriate training, if the configuration of the magnetic disks, the magnetic disks inserted and the hot replacement module frame satisfy certain conditions.

Requirements to be met by the system administrator

– sound knowledge of the operating system (Reliant UNIX 5.44)

– sound knowledge of system administration

– experience in operating the graphical interface of the hardware configuration tool Config under SINIX/windows (referred to as *XConfig* in the following)

– or experience in operating the character-oriented user interface of *Config* under the menu option *Konfiguration von SYSADM* (referred to as *Config* in the following).

Requirements to be met by the hard disks and the configuration

– Die $3^1/_2$ inch hard disks must be mounted in a hot replacement module frame. The new hard disk must be the same type as the defective one.

– Mirror disk mode

  – Only hard disks may be connected to the internal SCSI channel. These must be mounted in a $3^1/_2$ inch hot-replacement module frame.

  – The assignment of both SCSI channels to the corresponding controllers must be carried out with *XConfig* or *Config*.

  – The original disk and the mirror disk must be the same type of disk, have the same partitioning and have the same SCSI ID.

    See also the manual “Virtual Disks”.

or

– RAID operation using the RAIDmaster controller (CS35)

  Hot replacement can be used for RAID 1 arrays and RAID 5 arrays. See also the manual “RAIDmaster -Introductory Guide for System Administrators”.

Identifying a defective magnetic disk

The red LED on the hot-replacement module frame indicates a deactivated hard disk which may be replaced.

Depending on the type of monitor, you can identify the defective magnetic disk using *XConfig* (graphics monitor) or *SYSADM* (alphanumeric monitor). Under *XConfig* the LED of magnetic disks which are defective or deactivated are red, under *SYSADM* an error message is issued for every defective or deactivated magnetic disk when the hardware configuration is called.

You can also identify the defective magnetic disks with the help of the *RAIDmaster Storage Manager* (see the manual “RAIDmaster – Introductory Guide for System Administrators“).

Identifying a defective magnetic disk with XConfig

You require a graphics monitor to be able to work with *XConfig*.

See the manual “Hardware Configuration with Config under SINIX/windows“.

Defective or deactivated devices appear in red on a colour screen. On a black and white screen the defective or deactivated device is marked by a different grey scale.

- ► To replace the defective device select the menu option *storage device* in the *Config* main menu.
- ► Mark the corresponding hard disk and select the menu option *Replace disk xxx online* from the *Edit* menu.

You can read more about this procedure online in the help text „*Replace disk online*“ under *Index*.

XConfig checks the requirements, terminates mirror disk mode for the defective magnetic disk and deactivates the defective magnetic disk. A message on screen informs the user where the magnetic disk is located in the system. The question *Exchanging disk done?* is then issued. When the red LED on the appropriate hard disk is lit, the defective hard disk can be removed and the replacement hard disk may be installed.

Identifying a defective magnetic disk under SYSADM (alphanumeric monitor)

See the manual “System Administration and Hardware Configuration with SYSADM“.

Defective or deactivated devices are reported on the console and are logged in */var/adm/log/.osm*.

SCSI log files can be viewed using *SYSADM*:

- ► Start *SYSADM*.
- ► Select the following menu options, one after the other and confirm your selction each time with ↵:

  logs - Log - iosdisk - Select Error File - current - SAVE

The disk errors are displayed.

You can display failed mirror disks under the system administrator ID using the command *dkmirror -lv*.

► To replace the disks in question select the following menu options, one after the other and confirm your selection each time with ↵:

configuration – load – storage device – disk<s>

► Now select the *operation->Replace disk xxx online* by pressing the Aktionen key.

Config checks the requirements, terminates mirror disk mode for the defective magnetic disk and deactivates the defective magnetic disk. A message on screen informs the user where the magnetic disk is located in the system. The question *Exchanging disk done?* is then issued. When the red LED on the appropriate hard disk is lit, the defective hard disk can be removed and the replacement hard disk may be installed.

Identifying a defective magnetic disk with the RAIDmaster Storage Manager

If you are working in RAID mode you can identify a defective magnetic disk with the RAIDmaster Storage Manager. See also the manual “RAIDmaster - Introductory Guide for System Administrators”.

Configuring the replacement magnetic disk

When you have inserted the replacement magnetic disk

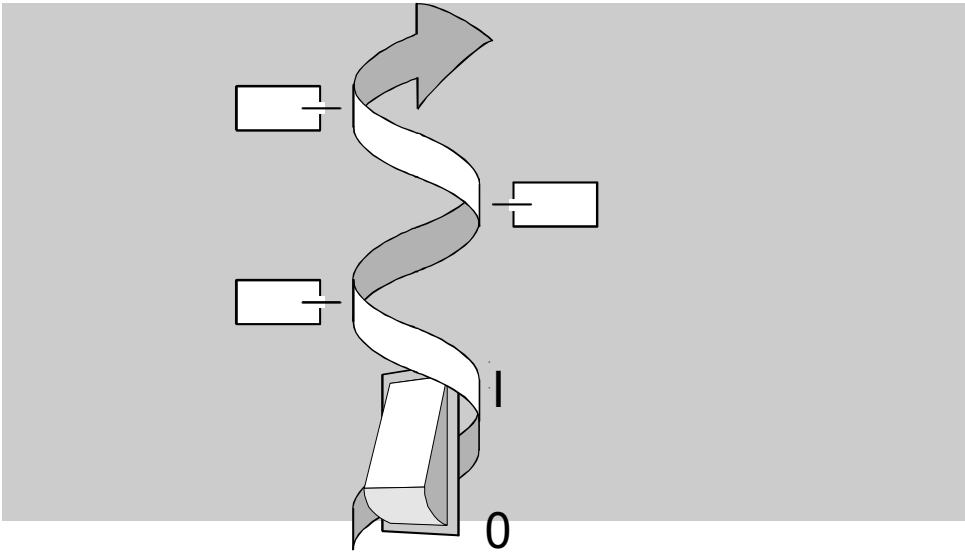
► Answer the question *Exchanging disk done?* with *yes*.

If you enter *no*, the installation procedure is aborted.

When the defective device has been replaced, a hardware analysis of the new magnetic disk is carried out in a background process. This procedure is accompanied by appropriate messages on the screen. Mirror alignment is then carried out in the background. Depending on the volume of data and number of magnetic disks involved, it may take a long time (up to one hour) until complete mirror disk mode is reached again. During the whole installation period users have access to all files.

If you are working in RAID mode, you must configure the replacement magnetic disk with the *RAIDmaster Storage Manager* (see the manual “RAIDmaster - Introductory Guide for System Administrators”).

Diagnostics system



Diagnostics system of the RM300 E /RM400 E

The diagnostics system of the RM300 E / RM400 E

The RM300 E / RM400 E has an extended diagnostics and managment system which displays a variety of information on the server management hardware.

The server management hardware is located on the basic board of the RM300 E / RM400 E and is based on the i960 processor of the PCI bridge. This component monitors the hardware status of the entire system unit and distributes this information as an object of the Management Information Base.

The server management hardware monitors the following values:

– temperature outside the system unit (incoming air)

– temperature inside the system unit

– temperature in the power supply unit (TEMP_FAILURE_SIGNAL)

– temperature of each installed CPU

– speed of the installed fans (FUN_FAIL_DETECTION) and the fan speed controllers

and checks the following components:

– the operating voltage of the power supply unit

– the identification number and the version of the system board

– the front door (open or closed).

More diagnostics information on components of the entire E system is provided by the Reliant UNIX 5.44 operating system, which checks the following:

– connection of a peripheral cabinet to the system unit

– the CPU configuration

– the RAM configuration

– the system error status

– the status of the uninterruptible power supply.

The SAF-TE (**S**CSI **A**ccessed **F**ault **T**olerant **E**nclosures) standard is used for managing the hard disk drives and peripheral cabinets. The peripheral cabinets can only be connected to the system unit with a SCSI cable and supply all status information on the cabinets to the server management software using the SAF-TE.

The following values are monitored by the SAF-TE modules and passed on as objects of the Management Information Base:

– temperature outside the system unit (incoming air)

– temperature inside the system unit

– speed of the installed fans (FUN_FAIL_DETECTION) and the fan speed controllers

and checks the following components:

– the operating voltage of the power supply unit

– the front door (open or closed).

Use of the diagnostics system of the RM300 E / RM400 E explains the high noise level at power up. This is caused by the maximum speed of the fans being checked.

When the test is completed, the fan speed is reduced to the operating speed and the noise level is reduced to the specified values.

Index

Siemens AG
User Documentation OEC ES EP 5
81730 München
Germany

Fax: (089) 636-48717

Internet: man2@mch.sni.de

Comments
Suggestions
Corrections

Submitted by

Comments on RM300 E / RM400 E Software for Configuration/Installation

Siemens AG
User Documentation OEC ES EP 5
81730 München
Germany

Fax: (089) 636-48717

Internet: man2@mch.sni.de

Comments
Suggestions
Corrections

Submitted by

Comments on RM300 E / RM400 E Software for Configuration/Installation

Siemens AG
Training Center, Consulting Service
81730 Munich
Germany

Fax: (++49) 89636-52003

Courses
Consulting
Self-tuition media

The Siemens Training Center offers consulting for in-service training, courses and self-tuition media on almost all aspects of information technology, either on your premises or at a Training Center near you. Write to us for information and course programs.

Submitted by

send me information/course programs on the following topics

Siemens AG
Training Center, Consulting Service
81730 Munich
Germany

Fax: (++49) 89636-52003

Courses
Consulting
Self-tuition media

The Siemens Training Center offers consulting for in-service training, courses and self-tuition media on almost all aspects of information technology, either on your premises or at a Training Center near you. Write to us for information and course programs.

Submitted by

send me information/course programs on the following topics