



for SGI IRIX

Installation guide



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Chapter 1

Introduction

1.1 About this manual

This manual describes the complete installation of all software packages which are required to operate a Bruker spectrometer controlled by an SGI workstation, running IRIX 6.3 or 6.5. It focuses in particular on the scratch installation of IRIX and the installation of the NMR Suite. This basic setup, however, might not fit with your personal preferences and you might want to adjust the system for your environment. You probably want to install several users on the system, connect the SGI to the laboratory network etc. The most common procedures are described in this manual. Finally, a large part of this manual is dedicated to trouble shooting. What can you do if a user or the superuser forgets his/her password? Which steps can you take if the connection between the SGI and the spectrometer is lost? Where can you get patches for XWIN-NMR and IRIX and how do you install them? These and several other questions will be dealt with. If you have any comments or suggestions, or if you find any errors in this manual, please do not hesitate to contact us at:

`nmr-software-support@bruker.de`

1.2 Conventions

The following conventions will be used throughout this manual:

<code>courier</code>	Commands to be entered in a UNIX shell
<i>courier italics</i>	Response from the workstation
courier bold	An answer to a question from the system
<i>times italics</i>	A file or directory
helvetica	The contents of a file
<u>underlined</u>	XWIN-NMR commands

1.3 Which NMR Suite version for which IRIX version?

The following list shows a list of IRIX version supported by Bruker and the NMR Suite version which run on them. Note that the NMR Suite version is determined by the version of XWIN-NMR.

- IRIX 5.2: XWIN-NMR 1.0 - 2.5
- IRIX 5.3: XWIN-NMR 1.0 - 2.5
- IRIX 6.2: XWIN-NMR 1.3 - 2.5
- IRIX 6.3: XWIN-NMR 2.0 - 2.5
- IRIX 6.5: XWIN-NMR 2.5

!

FOR IRIX 6.5 YOU NEED XWIN-NMR 2.5 OR NEWER

1.4 IRIX 6.5 already contains NFS and the C-compiler utilities

All previous version of IRIX did not contain NFS and the C-compiler (Development options) as a part of the standard operating system. Because spectrometer operation requires those packages an extra CD “NFS and Development Options” had to be purchased and installed. IRIX 6.5, however, already contains these packages as a part of the standard operating system. Therefore the extra “NFS and Development Options” CD has become obsolete.

Chapter 2

Installing IRIX 6.3 on an O2

2.1 About the installation

This chapter describes the scratch installation of IRIX 6.3 as well as the installation of IRIX patches. IRIX will be already installed when your SGI is delivered from Bruker or SGI. However, if you connect a new system disk or if you want to change the filesystem, you need to install IRIX from scratch.

The IRIX 6.3 operating system is delivered on two CD's:

- IRIX 6.3 for SGI including R10000
- IRIX 6.3 Applications

Note that IRIX 6.3 is dedicated to O2, earlier versions do not run on O2 and IRIX 6.3 does not run on other SGI workstations.

The installation is performed by the `inst` program. The following abbreviations can be use within `inst`:

f=from
k=keep
i=install
r=remove
g=go
q=quit

2.2 Backup of important system files

If you have already configured your SGI and you want to install a new system disk or upgrade IRIX on the same system disk, you probably want to keep your original host, user and network configuration. Therefore, it is important to keep a backup of the configuration files mentioned below. Some files can simply be copied from the backup medium when you have finished the IRIX installation. Other files should not be copied back but only used for comparison. An example for the latter is your old file */etc/passwd*. Use it to find out the previously used User Ids and Usernames when installing the accounts.

Host specific files which can be copied from the backup medium:

- */usr/lib/SoftWindows/FLEXlm/license.dat*
- */usr/local/flexlm/Bruker/licenses/license.dat*
- */etc/fstab*
- */etc/exports*
- */etc/printcap*

Network specific files which can be copied from the backup medium or from another host in the network:

- */etc/resolv.conf*
- */etc/gated.conf*

Files which should NOT be copied back but used for comparison only:

- */etc/passwd*
- */etc/hosts*
- */etc/sys_id*
- */etc/services*
- */etc/config/netif.options*
- */etc/config/ifconfig-1.options*

The information in this last group of files should be restored by re-installing all user accounts (see 6.1) and the network configuration (see 6.4). The spectrometer internal network can be installed and configured by re-installing the DISKLESS packages from the XWIN-NMR CD (see 5.2).

If you have a tape drive, you can backup the file mentioned above in the following way. Make a backup tape after the workstation is completely set up, including the network, printer(s), user accounts and licenses:

1. Insert a tape into the tape drive
2. Open a UNIX shell


```
3.cd /etc

4.tar cv /etc/fstab \
    /etc/exports \
    /etc/printcap \
    /etc/resolv.conf \
    /etc/gated.conf \
    /usr/lib/SoftWindows/FLEXlm/license.dat \
    /usr/local/flexlm/Bruker/licenses/license.dat

5.tar rv passwd hosts sys_id services

6.cd config

7.tar rv netif.options ifconfig-1.options
```

After a scratch install of IRIX you can set up the workstation again in the following way:

1. Open a UNIX shell
2. Go to your home directory; type `cd`
3. `tar xv`
 - > This will copy back some files archived above into their correct destination directory. Other files will be placed in your home directory for comparison.
4. Set up the network as described in 6.4
 - > get the hostname, IP address, netmask from the files `sys_id`, `hosts`, `netif.options`, `ifconfig-1.options` in your home directory
5. Install all user accounts as described in 6.1
 - > get the Usernames and IDs from the file `passwd` in your home directory

2.3 Scratch installation of IRIX 6.3

A scratch installation is done in monitor mode, usually from a local CD drive¹. If you want to install a new filesystem, you can do this as part of the IRIX installation. Proceed as follows:

1. Shutdown the workstation:
 - click *System* -> *Shut Down System*
 - enter the root password if it is requested
 - click *OK*
 - wait for the system to shut down
2. In the window 'Okay to power off the system now':
 - click on *restart* or hit any key
3. In the window 'Starting up the system':
 - hit the **Esc** key or click *Stop for Maintenance*
4. Click *Install System Software*
5. In the window 'Install System Software':
 - click *Local CDROM*
 - click *Install*
6. When the window 'Insert the installation CDROM now' appears
 - insert the CD "IRIX 6.3 for O2 including R10000"
 - wait about 5 seconds for the CD to load
 - click *Continue*
 - wait until the installation tools have been copied to disk
7. The program `inst` will start automatically, the prompt will change to `Inst>`
If you want to make a new file system continue with **a**, otherwise with **b**
 - a) Create a new filesystem
If you want to make a new filesystem you can do that now:
CAUTION: ALL CURRENTLY STORED DATA WILL BE DELETED
 - Enter the following command:

```
Inst> admin mkfs
```

1. For remote Miniroot installations see: Toolchest: Help - Online books - Software Installation - Starting an Installation

- Answer the following questions:

Are you sure you want to clean your disks? **y**

Make new filesystem on /dev/dsk/dks0d1s0? **yes**

Do you want an EFS or an XFS filesystem? **xfs**

Wait until the filesystem has been made.

- Hit the space bar a few times, wait until you see the *Inst>* prompt again.

b) The installation of IRIX:

- Enter the following command:

```
Inst> from /CDROM/dist
```

- Hit the space bar a few times, wait until you see the line:

```
install software from: {/CDROM/dist}
```

do NOT ANSWER this question yet!

eject the CD and insert the CD “IRIX 6.3 Applications”

now press ENTER which answers the above question.

- Hit the space bar a few times, wait until you see the line:

```
install software from: {/CDROM/dist}
```

Answer this question with **done**

- Select the following IRIX packages for installation (i) or removal (r):

```
Inst> i default
```

```
Inst> i eoe.sw.ipgate
```

```
Inst> i eoe.sw.ppp
```

```
Inst> i eoe.sw.svr4net
```

```
Inst> i eoe.sw.uucp
```

```
Inst> i isdn_eoe
```

```
Inst> i print
```

```
Inst> i x_eoe.man.Xgifts
```

```
Inst> i x_eoe.sw.Xgifts
```

```
Inst> r demos
```

- Eject the CD and insert the CD “IRIX 6.3 for SGI including R10000”
- Now start the installation:

```
Inst> go
```

The installation will take about 20 minutes. If it is successful, you will get the message:

*Please insert the CD "IRIX 6.3 APPLICATION ..."
Type Control-C to interrupt*

- Eject the CD and insert the CD "IRIX 6.3 Applications". The installation will continue automatically and take another 20 minutes.
- c) When the installation is finished you will get the *Inst>* prompt again. Quit the installation program, type:

Inst> quit

Quitting the *inst* program takes a few minutes, you will see the message *Requickstarting ELF files ...*

- Answer the question "Restart? [y,n]" with **y**

The computer will now boot automatically.

8. After the workstation has booted
 - a) Log in as root
 - b) Open a UNIX shell
 - c) Type `passwd` and enter a password for root
 - d) Eject the CD
 - e) Proceed with further installations, like NFS (chapter 4), XWIN-NMR (chapter 5.2), user accounts (chapter 6.1) and network setup (chapter 6.4).

2.4 Update install

An Update Install can mean different things:

1. Install additional IRIX packages
2. Re-install the same version of IRIX
3. Upgrade to a newer version of IRIX

In all three cases, a version of IRIX is already installed. For special applications you might need additional IRIX packages which were not part of the standard installation. If one or several system files are corrupt it might be useful to re-install the same version of IRIX.

2.4.1 Install additional packages

As an example the installation of the *LPR spooler* is described. You need the *LPR spooler* if you want to use your SGI for network printing.

1. Insert the CD “IRIX 6.3 for SGI including R10000”
2. Open a UNIX shell
3. Type `su` to become superuser
4. Type `inst`

The program `inst` is started and the prompt changes to *Inst>*

Enter the following command:

```
Inst> from /CDROM/dist
```

Hit the space bar a few times, wait until you see the line:

```
install software from: {/CDROM/dist}
```

Answer this question with **done**

```
Inst> keep all
```

```
Inst> i *.*.bsdlpr
```

```
Inst> go
```

```
Inst> quit
```

Quitting the `inst` program takes a few minutes, you will see the message:

Requickstarting ELF files...

2.4.2 Re-install the same version of IRIX

Problems in UNIX, XWIN-NMR or in the network can be caused by somehow corrupted files of the operating system. Files might be damaged, missing or have the wrong permissions.

These problems can be solved by running the so called “Install Same” procedure which re-installs all packages that are already installed:

1. Insert the CD “IRIX 6.3 for O2 including R10000”
2. Open a UNIX shell
3. Type `su` to become superuser
4. Type `inst`

The program `inst` is started and the prompt changes to `Inst>`

Enter the following command:

```
Inst> from /CDROM/dist
```

Hit the space bar a few times, wait until you see the line:

```
install software from: {/CDROM/dist}
```

Answer this question with **done**

```
Inst> i S
```

```
Inst> go
```

Insert the CD “IRIX 6.3 Applications”, enter the command:

```
Inst> from /CDROM/dist
```

Hit the space bar a few times, wait until you see the line:

```
install software from: {/CDROM/dist}
```

Answer this question with **done**

```
Inst> i S
```

```
Inst> go
```

```
Inst> quit
```

Quitting the `inst` program takes a few minutes, you will see the message:

```
Requickstarting ELF files ..
```

2.5 IRIX patches

2.5.1 Where do you get IRIX patches?

IRIX patches are parts of IRIX in which errors have been corrected. Different patches are available for different versions of IRIX. They can be downloaded from the SGI WWW pages: `www.sgi.com` and `www.sgi.de`. Note that you first have to get a (free) license from SGI in order to download patches.

Patches for IRIX are also delivered by Bruker on the XWIN-NMR CD.

Patches for IRIX 6.3 reside in the directory:

```
/CDROM/unix/patches6.3
```

This directory contains several patch numbers, each number is a directory which contains the actual patch files and a corresponding readme file, e.g. patch 1881:

```
/CDROM/unix/patches6.3/1881/patch/README.patch.1881  
/CDROM/unix/patches6.3/1881/patch/patchSG0001881.eoe_sw  
/CDROM/unix/patches6.3/1881/patch/patchSG0001881.nfs_sw  
/CDROM/unix/patches6.3/1881/patch/patchSG0001881.idb
```

The README file describes which problems are corrected with the patch. Bruker recommends to install all patch numbers in increasing order, beginning with the lowest number. Note that the IRIX patches on the XWIN-NMR CD are not necessarily the latest available patches.

If you want to find out which patches are already installed type:

```
versions -b patch\*
```

2.5.2 How do you install IRIX patches?

2.5.2.1 Install IRIX patches from the XWIN-NMR <= 2.1 CD

1. Insert the XWIN-NMR CD into the CD drive
2. Open a UNIX shell
 - a) Go to the directory which contains the patches:
type: `cd /CDROM/unix/patches6.3`
 - b) Type: `ls`
you will see a list of patch numbers, e.g. *num1*, *num2*, etc.

3. Open a second UNIX shell

- a) Go to the directory which contains the patches; type:
`cd /CDROM/unix/patches6.3`
- b) Type: `inst`

The `inst` program is started, the prompt changes to *Inst>*

- Install the patch with the smallest number; *num1*:

```
Inst> f num1/patch  
Inst> i A  
Inst> go
```

- Install the patch with the second smallest number; *num2*

```
Inst> f num2/patch  
Inst> i A
```

```
Inst> go
```

- Install the third smallest patch number *num3*:

```
Inst> f num3/patch
```

etc.

When you have installed all patch numbers leave the `inst` program:

```
Inst> quit
```

4. Reboot the computer, type: `reboot`

2.5.2.2 Install IRIX patches from the XWIN-NMR >= 2.5 CD

Patches for IRIX 5.3 and 6.3 are contained on the CDROM XWIN-NMR 2.5 for SGI. Furthermore an installation program is available to install or update patches. Install IRIX patches as follows:

1. Insert the XWIN-NMR CD into the CD drive
2. Open a UNIX shell
 - a) Go to the directory which contains the patches:

```
type: cd /CDROM/unix/patches6.3
```
 - b) Type: `./install_allpatches`

2.5.3 How do you delete IRIX patches?

Sometimes an IRIX patch solves one problem but causes another one. Therefore it might be necessary to remove a patch. Suppose you want to remove patch 2199:

1. Open a UNIX shell
2. Become superuser, type `su`
3. Type `inst -f none`
4. The program `inst` is started and the prompt changes to `Inst>`

```
Inst> l patch*
Inst> r patchSG0002199.*
Inst> go
Inst> quit
```

If you want to remove all IRIX patches you enter:

```
Inst> r patch*  
Inst> go  
Inst> quit
```

Chapter 3

Installing IRIX 6.5

3.1 About the installation

This chapter describes the scratch installation of IRIX 6.5 as well as the installation of IRIX patches. IRIX will be already installed when your SGI is delivered from Bruker or SGI. However, if you connect a new system disk or if you want to change the filesystem, you need to install IRIX from scratch.

The IRIX 6.5 operating system is delivered on six CD's "IRIX 6.5" :

Note that IRIX 6.5 runs on SGI Indy and O2, whereas IRIX 6.3 only runs on O2.

The installation is performed by the `inst` program. The following abbreviations can be use within `inst`:

- o=open
- f=from
- k=keep
- i=install
- r=remove
- g=go
- q=quit

3.2 Backup of important system files

If you have already configured your SGI and you want to install a new system disk or upgrade IRIX on the same system disk, you probably want to keep your original host, user and network configuration. Therefore, it is important to keep a backup of the configuration files mentioned below. Some files can simply be copied from the backup medium when you have finished the IRIX installation. Other files should not be copied back but only used for comparison. An example for the latter is your old file */etc/passwd*. Use it to find out the previously used User Ids and Usernames when installing the accounts.

Host specific files which can be copied from the backup medium:

- */usr/lib/SoftWindows/FLEXlm/license.dat*
- */usr/local/flexlm/Bruker/licenses/license.dat*
- */etc/fstab*
- */etc/exports*
- */etc/printcap*

Network specific files which can be copied from the backup medium or from another host in the network:

- */etc/resolv.conf*
- */etc/gated.conf*

Files which should NOT be copied back but used for comparison only:

- */etc/passwd*
- */etc/hosts*
- */etc/sys_id*
- */etc/services*
- */etc/config/netif.options*
- */etc/config/ifconfig-1.options*

The information in this last group of files should be restored by re-installing all user accounts (see chapter 6.1) and the network configuration (see chapter 6.4). The spectrometer internal network can be installed and configured by re-installing the DISKLESS packages from the XWIN-NMR CD (see chapter 5.2).

If you have a tape drive, you can backup the file mentioned above in the following way. Make a backup tape after the workstation is completely set up, including the network, printer(s), user accounts and licenses:

1. Insert a tape into the tape drive
2. Open a UNIX shell

```
3.cd /etc
4.tar cv /etc/fstab \
    /etc/exports \
    /etc/printcap \
    /etc/resolv.conf \
    /etc/gated.conf \
    /usr/lib/SoftWindows/FLEXlm/license.dat \
    /usr/local/flexlm/Bruker/licenses/license.dat
5.tar rv passwd hosts sys_id services
6.cd config
7.tar rv netif.options ifconfig-1.options
```

After a scratch install of IRIX you can set up the workstation again in the following way:

1. Open a UNIX shell
2. Go to your home directory; type `cd`
3. `tar xv`
 - > This will copy back some files archived above into their correct destination directory. Other files will be placed in your home directory for comparison.
4. Set up the network as described in chapter 6.4
 - > get the hostname, IP address, netmask from the files `sys_id`, `hosts`, `netif.options`, `ifconfig-1.options` in your home directory
5. Install all user accounts as described in chapter 6.1
 - > get the Usernames and IDs from the file `passwd` in your home directory

3.3 Scratch installation of IRIX 6.5

A scratch installation is done in monitor mode, usually from a local CD drive¹. If you want to install a new filesystem, you can do this as part of the IRIX installation. Proceed as follows:

1. Shutdown the workstation:

- click *System -> Shut Down System*
 - enter the root password if it is requested
 - click *OK*
 - wait for the system to shut down
2. In the window 'Okay to power off the system now':
 - click on *Restart* or hit any key
 3. In the window 'Starting up the system':
 - hit the **Esc** key or click *Stop for Maintenance*
 4. Click *Install System Software*
 5. In the window 'Install System Software':
 - click *Local CD-ROM*
 - click *Install*
 6. When the window 'Insert the installation CD-ROM now' appears:
 - insert the CD "IRIX 6.5 Installation tools"
 - wait about 5 seconds for the CD to load
 - click *Continue*
 - wait until the installation tools have been copied to disk
 7. The program `inst` will start automatically, the prompt will change to `Inst>`
If you want to make a new file system continue with step a, otherwise continue with step 8.
 - a) Create a new filesystem
If you want to make a new filesystem you can do that now:
CAUTION: ALL CURRENTLY STORED DATA WILL BE DELETED
 - Enter the following command:

```
Inst> admin mkfs
```

1. For remote Miniroot installations see: Toolchest: Help - Online books - Software Installation - Starting an Installation

- Answer the following questions:

Are you sure you want to clean your disks? **y**

Make new filesystem on /dev/dsk/dks0d1s0? **yes**

Wait until you see the *Inst>* prompt again

8. The installation of IRIX:

- a) Enter the following command:

Inst> open /CDROM/dist

You might get a page of information; answer the question at the end:

more? (h=help) **q**

You will probably get the following question; answer it as follows:

Do you wish to run the optional installation startup script?

Followed by several options. Choose the second option:

Please enter a choice [1]: **2**

- b) Wait until you see the following line:

install software from: {/CDROM/dist}

Do NOT ANSWER this question yet!

- First insert the CD “IRIX 6.5 Foundation 1”
- Then press ENTER to answer the above question

- c) Wait until you see the following line:

install software from: {/CDROM/dist}

Do NOT ANSWER this question yet!

- First insert the CD “IRIX 6.5 Foundation 2”
- Then press ENTER to answer the above question

- d) Wait until you see the following line:

install software from: {/CDROM/dist}

Do NOT ANSWER this question yet!

- First insert the CD “IRIX 6.5 Applications”
- Then press ENTER to answer the above question

You will get a page of information. Answer the question at end:

more? (h=help) **q**

e) Repeat the procedure described in step c for the CD's:

- IRIX 6.5 Development Libraries
- IRIX 6.5 Development Foundation

f) Wait until you see the following line:

```
install software from: {/CDROM/dist/dist6.5}
```

Do NOT ANSWER this question yet!

- First insert the CD "IRIX 6.5 ONC3/NFS Version 3"
- Then press ENTER which answers the above question

g) Wait until you see the following line:

```
install software from: {/CDROM/dist/dist6.5}
```

Answer this question with **done**

h) Select the following IRIX packages for installation (i) or removal (r):

```
inst> i default  
inst> i eoe.sw.ipgate  
inst> i eoe.sw.ppp  
inst> i eoe.sw.svr4net  
inst> i eoe.sw.uucp  
inst> i isdn_eoe  
inst> i nfs.sw.dskless_server  
inst> i print  
inst> i x_eoe.man.Xgifts  
inst> i x_eoe.sw.Xgifts  
inst> r demos  
inst> r CaseVision  
inst> r SpeedShop  
inst> r WorkShop  
inst> r WorkShopMPF  
inst> r ftn77_dev  
inst> r ftn90_dev  
inst> r ftn_dev  
inst> r langtools  
inst> r modules  
inst> r ViewKit_dev  
inst> r cms_dev  
inst> r complib_dev
```



```
inst> r complib_eoe
inst> r dev.books
inst> r dmedia_dev
inst> r dvdr
inst> r gl_dev
inst> r ifl_dev
inst> r inst_dev
inst> r java_dev
inst> r license_dev
inst> r motif_books
inst> r motif_dev
inst> r netscape_dev
inst> r webviewer_dev
inst> r x_dev
inst> go
```

- i) Wait a few minutes until you see the line:

```
Please insert the CD "IRIX 6.5 ..."
Type control-C to interrupt
```

Insert the requested CD; the installation will automatically continue.

- j) Repeat step i for each CD which is requested by the program.

The installation of some CD's will take several minutes. Occasionally you might see the message:

```
Error/Interrupt Menu
```

followed by several options and finally by the prompt *Interrupt>* . This is no problem, just insert the requested CD and enter:

```
Interrupt> 1
```

to continue (retry) the installation.

- k) When the installation is finished you will see the *Inst>* prompt again. Quit the installation program, type:

```
Inst> quit
```

Quitting the *inst* program takes a several minutes, you will see the message *Requickstarting ELF files ...*

- Wait until you see the following line, answer the question:

```
Ready to restart the system
```

```
Restart? {(y)es, (n)o, (sh)ell, (h)elp):y
```

-> The computer will now boot automatically.

9. After the workstation has booted
 - a) Log in as root
 - b) Open a UNIX shell
 - c) Type `passwd` and enter a password for root
 - d) Eject the CD
 - e) Proceed with further installations, like XWIN-NMR (5.2), user accounts (6.1) and network setup (6.4).

3.4 Update install

An Update Install can mean different things:

1. Install additional IRIX packages
2. Re-install the same version of IRIX
3. Upgrade to a newer version of IRIX

In all three cases, a version of IRIX is already installed. For special applications you might need additional IRIX packages which were not part of the standard installation. If one or several system files are corrupt it might be useful to re-install the same version of IRIX.

3.4.1 Install additional packages

As an example the installation of the *Disk Quotas* package is described.

1. Insert the CD "IRIX 6.5 Foundation 1"
2. Open a UNIX shell
3. Type `su` to become superuser
4. Type `inst`

The program `inst` is started and the prompt changes to `Inst>`

Enter the following command:

```
Inst> from /CDROM/dist
```

```
Inst> keep all
Inst> i eoe.sw.quotas
Inst> go
Inst> quit
```

Quitting the `inst` program takes a few minutes, you will see the message:
Requickstarting ELF files...

3.4.2 Re-install the same version of IRIX

Problems in UNIX, XWIN-NMR or in the network can be caused by somehow corrupted files of the operating system. Files might be damaged, missing or have the wrong permissions.

These problems can be solved by running the so called “Install Same” procedure which re-installs all packages that are already installed:

1. Open a UNIX shell
2. Type `su` to become superuser
3. Type `inst`

The program `inst` is started and the prompt changes to *Inst>*

4. Perform step 8a to 8g as described in 3.3
5. Enter the following commands after the *Inst>* prompt:

```
Inst> keep all
Inst> i S
Inst> go
```

6. Perform the steps 8i to 8k as described in chapter 3.3.

3.4.3 Upgrade from an older IRIX version

Upgrading to IRIX 6.5 from an older version is done in the following way:

1. Perform step 1 to 6 as described in chapter 3.3.
2. The program `inst` will start automatically, the prompt will change to *Inst>*

Please enter:

```
inst> r *
```

3. Perform step 8 and 9 as described in chapter 3.3.

3.5 IRIX patches

3.5.1 Where do you get IRIX patches?

IRIX patches are parts of IRIX in which errors have been corrected. Different patches are available for different versions of IRIX. They can be downloaded from the SGI WWW pages: `www.sgi.com` and `www.sgi.de`. Note that you first have to get a (free) license from SGI in order to download patches. Some IRIX 6.5 patches are already delivered on the IRIX CD's (on IRIX 6.5 Installation tools). They are automatically installed as a part of the installation of IRIX 6.5. IRIX patches are also delivered on the NMR Suite CD. However, at the time the NMR Suite 2.5 was released no IRIX 6.5 patches were available. Therefore the NMR Suite 2.5 CD only contains patches for IRIX 5.3 and 6.3.

3.5.2 How do you delete IRIX patches?

Sometimes an IRIX patch solves one problem but causes another one. Therefore it might be necessary to remove a patch. Suppose you want to remove patch 3140:

1. Open a UNIX shell
2. Become superuser, type `su`
3. Type `inst -f none`
4. The program `inst` is started and the prompt changes to `Inst>`

```
Inst> l patch*
Inst> r patchSG0003140.*
Inst> go
Inst> quit
```

If you want to remove all IRIX patches you enter:

```
Inst> r patch*
Inst> go
Inst> quit
```

Chapter 4

NFS and Development Options for IRIX 6.3

If your SGI workstation controls a Bruker spectrometer, you need two additional packages which are not on the IRIX 6.3 CD's. These are:

- NFS (Network File System)
- Development Options (C-compiler)

You need NFS for the spectrometer internal network. The C-compiler is required for compilation of XWIN-NMR AU programs.

FOR IRIX 6.5 NSF AND C-COMPILER ARE ON THE IRIX CD's

FOR IRIX 6.3 NSF AND C-COMPILER ARE NOT ON THE IRIX CD's

For IRIX 6.3 there are two possibilities:

1. Install the packages from the Bruker CD:
 - Development Options/NFS for IRIX 6.3
2. Install the packages from two SGI CD's:
 - IRIS Development Option 7.1 for IRIX 6.3
 - ONC3/NFS Version 2, for IRIX 6.2, 6.3 and 6.4

If your SGI was delivered by Bruker, the Bruker made CD "Development Options/NFS for IRIX 6.3" should be included in the shipment.

IMPORTANT:

If you have IRIX 6.3 you must install “Development Options/NFS for IRIX 6.3”.

XWIN-NMR 1.3 and older used the CC compiler for the compilation of AU programs. XWIN-NMR 2.0 and newer use the GCC compiler which is automatically installed when you install XWIN-NMR.

IMPORTANT: even though XWIN-NMR 2.0 or newer use GCC you must still install the CC compiler as described below.¹

Both, the Bruker and SGI CD, are installed in multi-user mode (computer is up).

4.1 The Bruker CD ‘Development Options/NFS’

The Bruker CD contains both NFS and the C-compiler. To install this CD the IRIX 6.3 operating system must already be installed and the SGI must be booted.

1. Insert the CD labeled “Development Options/NFS for IRIX 6.3”

2. Open a UNIX shell

a) Type `/CDROM/startme`

The startup of the installation program takes several minutes...

You can choose between:

- The graphical tool (Desktop-Software Manager)
- The non-graphical program (“inst”)

b) Enter 2, the program `inst` is started and the prompt changes to `Inst>`.

Select the following IRIX packages for installation (i) or removal (r):

```
Inst> r CaseVision
Inst> r SpeedShop
Inst> r WorkShop
Inst> r dmedia_dev
Inst> r dvdr
Inst> r gl_dev
```

1. The CC packages provides the linker which is not included in the GCC package.

```
Inst> r ifl_dev
Inst> r license_dev
Inst> r motif_books
Inst> r webviewer_dev
Inst> i nfs.sw.dskless_server
```

c) Start the installation now:

```
Inst> go
```

d) Leave the installation program

```
Inst> quit
```

Quitting the `inst` program takes a few minutes, you will see the message:
Requickstarting ELF files ...

e) Eject the CD

4.2 The SGI CD's: 'IRIS Development Option' and 'ONC3/NFS'

The C-compiler and NFS reside on separate CD's.

1. Open a UNIX shell
2. Insert the CD "IRIS Development Option 7.1 for IRIX 6.3"
3. Type `su` to become superuser
4. Type `inst`

The program `inst` is started and the prompt changes to `Inst>`

```
Inst> from /CDROM/dist
Inst> r CaseVision
Inst> r SpeedShop
Inst> r WorkShop
Inst> r dmedia_dev
Inst> r dvdr
Inst> r gl_dev
Inst> r ifl_dev
Inst> r license_dev
Inst> r motif_books
Inst> r webviewer_dev
Inst> go
```

```
Inst> quit
```

Quitting the `inst` program takes a few minutes, you will see the message:
Requickstarting ELF files ...

5. Eject the CDROM

6. Insert the CDROM “ONC3/NFS 6.3 Version 2, for IRIX 6.2, 6.3 and 6.4”

7. Type `inst`

The program `inst` is started and the prompt changes to *Inst>*

```
Inst> from /CDROM/dist
Inst> i nfs.sw.dskless_server
Inst> go
Inst> quit
```

Quitting the `inst` program takes a few minutes, you will see the message:
Requickstarting ELF files ...

8. Eject the CD

Chapter 5

Installation of XWIN-NMR

5.1 The nmr-superuser

When you install XWIN-NMR 2.0 or newer, you will be asked for the nmr-superuser. This can be any user who has a login account, including root. Instead of being asked for the root password, you will be asked for the nmr-superuser password when running certain commands like `cf`, `expinstall` etc. If you want an nmr-superuser different from root, we recommend to install a special user e.g. `nmrsu`. Install this user (see 6.1) before you install XWIN-NMR. This user is then entered as nmr-superuser during the installation of XWIN-NMR.

5.2 The installation of XWIN-NMR 2.5

!

FOR IRIX 6.5 YOU NEED XWIN-NMR 2.5 OR NEWER

1. Insert the XWIN-NMR CD into the CD drive
2. Open a UNIX shell
3. Type `su` to become superuser

4. Type `/CDROM/startme`

The XWIN-NMR installation window will appear. We recommend to select at least the following packages:

- XWIN-NMR (for acquisition and processing)
- XWIN-PLOT (for wysiwyg printing/plotting)
- ICON-NMR (for routine spectroscopy and automation) ¹
- DISKLESS (for spectrometer operation)
- ACROREAD (for XWIN-NMR online help)
- FLEXLM (for the XWIN-NMR license)
- NMR-CHECK (for spectrometer hardware tests and remote service) ¹

A red radio button indicates that a package is selected.

If you select XWIN-NMR standard installation, XWIN-NMR will be installed in the directory `/u`. If you select XWIN-NMR user-defined installation, a new window will open in which you can change the XWIN-NMR installation directory. Note that you need both GCC and Perl for running XWIN-NMR AU programs.

5. Click on the *start* button

The installation program asks you several questions, e.g. which user is the nmr-superuser (see 5.1). Normally, you can answer all other questions by clicking **yes**, **ok**, **seen** or **install**, or by hitting **Enter**. When the installation is finished you will again get several questions or information windows. Normally, you can answer all question by clicking **yes**, **ok**, **seen**, or by hitting the **Enter** key.

5.3 Perl and GCC

In previous version of the NMR Suite the packages Perl and GCC could be selected or deselected during a user-defined installation. With NMR Suite 2.5 they are automatically installed in the directory `<var>/gnu` and `<var>/perl` where `<var>` is the directory where XWIN-NMR is installed (default `/u`). Perl and GCC are needed for compiling XWIN-NMR AU programs.

1. This package is only needed if your workstation is connected to a spectrometer

5.4 Configuration flags

After the installation of IRIX and XWIN-NMR, you must check the configuration flags by typing `chkconfig` in a UNIX shell. All flags are either `on` or `off`.

The following flags must be `on`:

- `lockd`
- `network`
- `nfs`
- `verbose`
- `vswap`
- `windowssystem`
- `xdm`

The following flags must be `off`:

- `autoconfig_ipaddress`
- `routed`
- `yp`
- `ypserv`
- `ypmaster`

If some of these flags are set differently, you must correct them, e.g.:

```
chkconfig vswap on
chkconfig ypmaster off
```

CAUTION: If your SGI is connected to the spectrometer but NOT to the laboratory network, SWITCH OFF the *gated* daemon (type `chkconfig gated off`), otherwise the connection to the spectrometer is lost a few minutes after the SGI was rebooted.

5.5 The XWIN-NMR license

If your SGI is connected to a spectrometer, XWIN-NMR will always start, even if you do not have a license. The fact that a connection to the spectrometer CCU could be established serves as a license in such a case. Nevertheless, we recommend to order an official license if you do not have one. On a standalone workstation, XWIN-NMR does not start without an official license. Please use the order forms, which are part of the XWIN-NMR release letter, to obtain a license. Your

request must at least contain the following information:

- order number
- hostid of your SGI
- program for which you want to get a license
- type of license
- number of licenses

1. Order number:

This can be the order number of your spectrometer, of your SGI workstation or of your XWIN-NMR license.

2. Hostid:

On SGI Indy or O2, type: `sysinfo`

On other SGI's, type: `(echo "obase=16";sysinfo -s) | bc`¹

3. Program:

The following programs need a license: XWIN-NMR, XWIN-PLOT, NMR-SIM, NMR-CHECK, AURELIA, AMIX, SBASE, PARAVISION, MAXENT. A license for XWIN-NMR 2.0 or later (FEATURE XWINNMR2) automatically includes a license for XWIN-NMR, XWIN-PLOT, NMR-SIM and NMR-CHECK.

4. Type of license:

The following license types are available:

- **node locked**

Only valid on one host. You can run any number of XWIN-NMR sessions in parallel, but only on this one host.

- **floating**

Valid within a network. You can run exactly as many sessions of XWIN-NMR as you have licenses.

- **demo**

A **node locked** license which is valid for 3 months.

1. This command also works on Indy and SGI but `sysinfo` is shorter.

All Bruker spectrometers are delivered with a node locked license. A demo license is free of charge.

5. The number of licenses:

If you order floating licenses, you must specify the number of licenses

A license for XWIN-NMR consists of 4 feature lines which will be sent to you by fax or Email. Setup your license as follows:

1. Open a UNIX shell
2. Become superuser; type su
3. cd /usr/local/flexlm/Bruker/licenses
4. Edit the file *license.dat*
append the 4 feature lines below the line
DAEMON ...
5. Reboot the workstation: /etc/reboot

5.6 Installation of XWIN-NMR 2.5 patches

The XWIN-NMR patches are parts of XWIN-NMR which contain bug fixes. They are available on the Bruker FTP server. We recommend to install new patches whenever the patchlevel on your system is older than the one on the FTP server. Note that you might have to connect your workstation to the network in order to get the patches.

Perform the following steps:

1. Open a UNIX shell
2. Type patchlevel
This will show you the patchlevel on your system.
3. Log in on a computer which is connected to the internet
4. Type ftp ftp.bruker.de

Name: ftp

Password: enter your own full Email address

```
ftp> cd /pub/nmr/xwinnmr/patches/xwinnmr2.5/sgi
ftp> bin
```

```
ftp> ls
      (you will see a file allpatches2.5-X.tar.gz where X is the patchlevel)
ftp> get allpatches2.5-X.tar.gz
ftp> get patches.readme
ftp> bye
```

5. Install the patches according to the file *patches.readme*

You can also get XWIN-NMR patches from the American FTP server:

```
ftp.bruker.com:/pub/nmr/mirror.bruker.de/xwinnmr
```

Check our WWW pages for known bugs and the latest patches available:

```
www.bruker.de -> Analytical -> NMR -> Software -> Bugs
```

Chapter 6

System Administration

6.1 Add a new user account

If the new user already exists on other hosts in the network, make sure that you use the same User id and Group ID on all hosts in the network. Perform the following steps:

1. Click *System* -> *System Manager* -> *Security and Access Control* -> *User Manager* -> *Add*
2. Enter the root password if it is requested
3. Click **Next**
4. Enter the new Login Name, then click **Next**
5. Enter the Full Name -> click **Next** -> click **Next**
6. Click on *Add a password* -> click **Next**
7. Enter the same password in the two password fields -> click **Next**
8. Enter the User ID -> click **Next**
9. Accept the indicated *Primary Group* or specify a different one -> click **Next**

10. Accept the indicated *Home Directory* or enter a different one -> click **Next**

11. Accept the indicated *IRIX shell* or select a different one -> click **Next**

12. Click **OK** to accept the new user

13. Close all open windows by clicking **OK** and *File* -> *Close*

If you want to change the properties of an existing user:

1. Click *System* -> *System Manager* -> *Security and Access Control* ->

User Manager -> click on a specific user -> click *Edit*

2. Close all windows by clicking **OK** and *File* -> *Close*

- If you changed the User ID:

```
type: find / -user old_uid -exec chown new_uid {} \;
```

- If you changed the Group ID:

```
type: find / -user old_gid -exec chgrp new_gid {} \;
```

6.2 Change the hostname of the SGI

To see the current hostname, enter one of the following commands:

- `hostname`
- `uname -a`

If you want to change the hostname, perform the following steps:

1) Log in as root

2) Edit the files:

/etc/sys_id

/etc/hosts

/usr/local/flexlm/Bruker/licenses/license.dat

and replace the current hostname by the new one.

3) Reboot the computer; type `/etc/reboot`

6.3 Increase the system security

There are several ways to increase the security on your workstation. Two of them are mentioned below.

1. Make sure that all users have a password:
 - a) Open a UNIX shell
 - b) Become superuser: type `su`
 - c) Type: `passwd -s -a`
This gives you a list of all users showing which users have a password (PS), are locked (LK) or do not have a password (NP). If a user is locked, you cannot log in as this user, not with any password.
 - d) Create a password for all normal users, e.g.:
type: `passwd guest`
 - e) Lock all special users, like lp, diag, sysadm:
type: `passwd -l lp`
2. Select security features. You can set each security feature according to your personal preferences or use the following default values:
 - a) Click *system* -> *System manager* -> *Security and access control* -> *Improve system security*
 - b) Enter the root password if it is requested
 - c) Click **Next**
 - d) Click **Next**
 - e) In the field *Active User Accounts* select 'root'
 - f) Click on **Disable Java** and **Disable Java Script**, then click **ACCEPT**
 - g) Click **Next**
 - h) Disable logins to NIS accounts: click **Yes**, then click **Next**
 - i) Use shadow password file: click **No**, then click **Next**
 - j) Require passwords at login: click **No**, then click **Next**
 - k) Disable the Visual Login Screen: click **No**, then click **Next**
 - l) Disable privileged users: click **No**, then click **Next**

- m) Protect new users files: click **Yes**, then click **Next**
- n) Disable remote display: click **No**, then click **Next**
- o) Disable IP forwarding: click **No**, then click **Next**
- p) Click **OK**
- q) Click **OK** and *File -> Close* to close remaining windows

6.4 Connect the SGI to the laboratory network

This is a condensed description of how to setup an SGI for networking. For a detailed description, please see the manual “The interaction between XWIN-NMR and UNIX” which you will find in the XWIN-NMR online help: click *Help -> Other topics -> XWIN-NMR and UNIX*

6.4.1 Set up the network connection

An SGI which is connected to a spectrometer has 2 ethernet boards (interfaces). Interface **ec1** is usually used for the connection to the spectrometer. The configuration of this internal network is automatically done during the installation of the DISKLESS package from the XWIN-NMR CD.

Interface **ec0** can be used to connect the SGI to the laboratory network. Before you make the physical connection to the network, take the following steps:

1. Choose a hostname, e.g. **rose**
2. Determine the netmask of the (sub)network. This must be the same as the netmask on all other hosts in the (sub)network, e.g. **0xffff0000** or **0xffffffff00**.
3. Determine the IP address for the new host. The IP address always looks like **a.b.c.d** and contains a network part (the same on all hosts) and a host part (different on each host):

netmask	IP address	network part	host part
0xff000000	a.b.c.d	a	b.c.d
0xffff0000	a.b.c.d	a.b	c.d
0xffffffff00	a.b.c.d	a.b.c	d

4. Make sure the network part of the IP address is the same as on other hosts in the (sub)network and the host part is unique for the new host.
5. Click *System* -> *System Manager* -> *Network and connectivity* -> *Set Up and Start Networking*
6. Enter the root password if it is requested, then click **Next**
7. Click on the field *Interface Name* and select **Ethernet ec0**, then click **Next**
8. Enter the hostname and IP address
9. Switch off *Use default netmask* (the red tic mark must disappear)
10. Enter the netmask of your (sub)network, click **Next**, then click **OK**
The network will be configured now, this might take several minutes.
11. Close all open windows by clicking **OK** and *File* -> *close*

6.4.2 Setup hostname administration

After the basic network configuration you must make the hostnames of other computers in the network known to your SGI. There are two ways of doing this:

1. Local host administration in the file */etc/hosts*:
 - a) Log in as root
 - b) Edit the file */etc/hosts*, for each host enter a line like:
156.87.14.22 sunflower
156.87.14.23 tulip
etc.

where 156.87.14.22 and 156.87.14.23 are the IP addresses and sunflower and tulip the hostnames of two other computers in the network.

2. Remote host administration on a nameserver:
 - a) Log in as root
 - b) Edit the file */etc/resolv.conf* and enter lines like:
domain netx.lab.com
hostresorder local bind
nameserver 156.87.14.10

where netx.lab.com is the domainname of the network and 156.87.14.10

the IP address of the nameserver.

The second line is optional. It specifies that network commands like `telnet` should first check the local file `/etc/hosts` and then, if the host was not found, contact the nameserver (`bind`).

- c) The network administrator must enter your new host on the nameserver.

Now you can communicate with other hosts in the network, e.g. log in to the host called `sunflower`:

1. Open a UNIX shell
2. `telnet sunflower`

6.4.3 Setup permissions for `rcp`, `rlogin` and `rcp`

The commands `rcp`, `rlogin` and `rsh` require special access permissions. There are two ways of doing this.

1. The system administrator can setup up these permission for all users:

- a) Open a UNIX shell
- b) Become superuser, type `su`
- c) `cd /etc`
- d) Edit the file `hosts.equiv`

Make two entries for every remote host from which access is allowed, e.g.:

```
sunflower
sunflower.netx.lab.com
```

2. As a normal user, you can allow remote access from a remote host for yourself:

- a) Open a UNIX shell
- b) Go to your home directory; type `cd`
- c) Edit the file `.rhosts`

Make two entries for every remote host from which access is allowed, e.g.:

```
sunflower
sunflower.netx.lab.com
```

- d) `chmod 644 .rhosts`

In both examples `sunflower` is the hostname and `netx.lab.com` is the domainname of the remote host.

To allow `rcp`, `rsh` and `rlogin` network wide in all directions, you must setup the file `/etc/hosts.equiv` or `.rhosts` on each host.

6.4.4 Setup automatic routing

There are 2 different ways to setup network routing:

- use the routing daemons *gated* or *routed*
- use a static route: the command `'route add'`

Bruker recommends to use the *gated* daemon. The example below describes how to set up *gated*.

1. Login as root

1. `cd /etc`

2. Edit the file *gated.conf* and enter:

```
RIP yes
HELLO no
EGP no
traceflags internal external route
noannounce 149.236.99 intf all proto rip hello
donotlisten 149.236.99 intf all proto rip hello
```

IMPORTANT: the file *gated.conf* must contain the lines (noannounce and donotlisten 149.236.99) if your SGI is connected to a spectrometer.¹

3. `chkconfig gated on`

4. `chkconfig routed off`

5. Reboot the computer; type `/etc/reboot`

6. Type `netstat -rn` to view the routing table

CAUTION: If your SGI is connected to the spectrometer but NOT to the laboratory network, SWITCH OFF the *gated* daemon (type `chkconfig gated off`), otherwise the connection to the spectrometer is lost a few minutes after reboot.

1. Otherwise everyone on the network can log in as root on the CCU of your spectrometer.

6.5 Time and time synchronization

6.5.1 Set the time zone

First, find out what time zone you are in. A complete list of all time zones is available as SGI online help:

click *Help* -> *Online Books* -> *SGI Admin* -> *System Configuration and Operation* -> *Configure the IRIX Operating system* -> *Find: time zone*

Set the timezone by performing the following steps:

1. Open a UNIX shell
2. Type `su` to become superuser
3. Edit the file `/etc/TIMEZONE`

Enter the value of the environment variable `TZ`, e.g.:

if you are at the US east coast:

`TZ=EST5EDT4`

if you are in Germany:

`TZ=MET-1MDT-2`

where:

- `EST` and `MET` are the normal time zones
- `EDT` and `MDT` are the alternate time zones (daylight saving)
- the numbers specify the time difference to Greenwich mean time (GMT)

The IRIX manual page of `timezone` tells you to put the values of `TZ` in double quotes (`""`). However, the double quotes are not really necessary and certain XWIN-NMR applications do not work properly when `TZ` is in double quotes.

6.5.2 Set the current time and date

In many laboratories SGI workstations are part of a network and the time and date are periodically provided by time servers. However, if you have a standalone workstation or you want to be independent of a time server, then set the time and date as follows:

1. Open a UNIX shell

2. Type `su` to become superuser
3. Type `chkconfig timed off`
4. Type `chkconfig timeslave off`
5. Check the current time and date: type `date`
6. Set the time and date with the command
`date mmddhhmmyy`
e.g. if it is 2:30 p.m. on the 17th of March 1997
`date 0317143097`
7. Check the new date and time: type `date`

If your SGI is switched off, a battery insures that date and time will stay correct.

6.5.3 Time Synchronization

The Silicon Graphics IRIX operating systems provides two methods for network time synchronization, using the daemons `timed` or `timeslave`.

6.5.3.1 The 'timed' daemon

When you use `timed`, the average time on the network is calculated and set regularly on each host. The master `timed` collects time differences between all hosts where `timed` is active. It computes the average time and send this back to each host which will slow down or speed up its clock to bring it to the average network time. The master `timed` (master host) is automatically elected by slave `timed`'s. Note that all hosts are equivalent, any hosts can be elected as master unless `timed` was started without the `-M` option or specified as `untrusted` (see: `man timed`).

Perform the following steps:

1. `Echo -P /var/tmp/.timetrim > /etc/config/timed.options`
2. `/etc/chkconfig timed on`
3. `/etc/chkconfig timeslave off`
4. `/etc/reboot`

Note that changing the time using the command `date` on any host immediately

changes the time on all hosts where `timed` is active. You can see which host is currently elected as master by typing `/usr/etc/timedc msite`.

6.5.3.2 The ‘timeslave’ daemon

When you use `timeslave`, then the time on the local host is set to the time of its master. You have to specify on the local host, which host in the network is its master. The time on the master host might be determined locally, with `timed` or also with `timeslave`. In the latter case the master gets its time from a higher master.

Perform the following steps:

1. `Echo hostname_server > /etc/config/timeslave.options`
2. `/etc/chkconfig timed off`
3. `/etc/chkconfig timeslave on`
4. `/etc/reboot`

6.6 Change the monitor refresh rate

If the display on your monitor is blurred or unsharp, you can change the refresh rate and see whether that gives an improvement.

1. Open a UNIX shell
2. Become superuser, type `su`
3. Type `cd /usr/gfx`
4. Type `./gfxinfo`
-> this will show you the current display resolution and refresh rate
5. Type `./setmon 75`

Answer the following question:

Make new format the power-on default? <n> y

The refresh rate will be set to 75 Hz.

6.7 Change the cursor, editor, login icon, background etc.

6.7.1 Change the SGI cursor

You can change the cursor colour and shape in the following way:

1. Login as normal user
2. Go to your home directory: type `cd`
3. Edit the file `.Xresources` or `.Xdefaults` and enter lines like:

```
*pointerColor: blue
*pointerColorBackground: black
*pointerColorForeground: green
winterm*pointerShape: hand1
xterm*pointerShape: circle
```

The first two entries apply to the entire screen except for those applications for which a different cursor colour is specified. the fourth entry to Winterm UNIX shells and the last one to Xterm UNIX shells. ColorBackground refers to the colour of the cursor contour.

The following shapes are available:

arrow, center_ptr, circle, crosshair, dot, dotbox, exchange, fleur, gumby, hand1, hand2, heart, left_ptr, mouse, pencil, pirate, spider, spraycan, star, trek, watch

A list of available colours appears when you enter the command `colorview`.

You can change the colour and shape of the cursor but not the size.

6.7.2 Put an image or picture on the login screen

Create a file with a picture of yourself and copy this file to your home directory. This can be a tiff, giff, or SGI RGB image file. Other file formats have not been tested by Bruker.

1. Open a UNIX shell
2. Go to your home directory; type `cd`
3. `mkdir .icons`

4. `mv picture .icons/login.icon`

5. Log out to see the effect

Alternatively, the system administrator can copy picture files of all users into the directory `/usr/lib/faces` or `/usr/local/lib/faces`.

If your picture file does not have the correct format, the picture will not appear on the login screen. You can use the command `convert` to change the format of your picture file. The command `convert` is part of the ImageMagick package which is available on our FTP server ftp.brucker.de in the directory `/pub/nmr/binaries.indy`.

6.7.3 Change the background

Each user can select his/her own desktop background. A standard set of background patterns/colours is delivered with the IRIX operating system.

1. Click on *Desktop -> Customize -> Background*
-> a list of backgrounds will appear
2. Click on one of the backgrounds in this list
3. Click **apply**

If you prefer a background which is not part of the standard set you can also use your own image files.

1. Open a UNIX shell
2. Go to your home directory; type `cd`
3. Edit the file `.backgrounds` and enter lines like:

```
background "im1"
command "-execute /usr/bin/X11/display -win root /usr/people/<user>/im1.jpg "
default "-execute /usr/bin/X11/display -win root /usr/people/<user>/im1.jpg "
exeok " /usr/bin/X11/display"
readok "/usr/people/<user>/im1.jpg"
```

```
background "im2"
command "-execute /usr/bin/X11/display -win root /usr/people/<user>/im2.jpg "
default "-execute /usr/bin/X11/display -win root /usr/people/<user>/im2.jpg "
exeok " /usr/bin/X11/display"
```

```
readok "/usr/people/<user>/im2.jpg"
```

6.7.4 Change the SGI default editor

Each user can select his/her own editor which will be used whenever a text file is opened by IRIX.

1. Click on *Desktop* -> *Customize* -> *Desktop*
2. Click in the field *Default Editor*, then click on the editor of your preference. If your preferred editor you prefer is not available, click on **other** and enter the name of the editor.

Important: the editor which is used by IRIX is independent from the editor used by XWIN-NMR. XWIN-NMR uses the editor which is specified with the XWIN-NMR command setres.

6.8 Installation of Email

Email is a fast and cheap medium for exchange of information. In order to send and receive Email you need:

- a mail transport agent (mta) e.g. **Sendmail** or **Smail**
- a mail user agent (mua) e.g. **Elm** or **Mediamail**

Sendmail is the standard program for transferring Email between UNIX computers. **Smail** is an easy-to-install stripped version of **Sendmail**. **Elm** is a text-based user interface which can only transfer ascii files. Binary files can only be sent with **elm** if they are converted to ascii first.

Mediamail¹ is a graphical user interface which can transfer both text files and binary files. It is part of a default IRIX installation. Binary files like executables, images and sounds can be sent as attachments. **Elm** and **Smail** are not installed by default. You can get them from our ftp server *ftp.bruker.de*².

-
1. MediaMail is SGI's graphical version of **Zmail** (**Zmail** runs on various platforms)
 2. Check the directory */pub/nmr/binaries.indy*

6.8.1 A simple way to install email on an SGI

Suppose you are user **joe** and you want to send and receive Email on an SGI computer called **sparrow**:

1. Log in on a computer which is connected to the internet
2. Get the **smail** program from the FTP server


```
type ftp ftp.brucker.de
Name: ftp
Password: enter your own full Email address
ftp> cd /pub/nmr/binaries.indy
ftp> bin
ftp> mget smail* (answer each question with y)
ftp> bye
```
3. Copy the files **smail*** to host **sparrow** using **rcp** or **ftp** ¹
4. Log in as root on the host **sparrow**:
 - a) Go to the directory where you stored the files **smail***
 - b) Type `more smail*.readme`
-> install **smail** as described
 - c) Type `cd /usr/local/lib/smail`
 - d) Create the file **config** and enter 4 lines like:

```
domains=lab1.uni.com
smart_path=mailserv.lab1.uni.com
smart_transport=smtp
visible_name=lab1.uni.com
```

This is just an example, enter your network information:

- **domains**: the domainname(s) of **sparrow**
- **smart_path**: hostname.domainname of the mail server
- **smart_transport**: the mail protocol (usually **smtp**)
- **visible_name**: hostname appearing in outgoing mail

1. You can skip this step if you are already logged in on **sparrow**, i.e. **sparrow** is connected to the internet

5. Reboot your host **sparrow**; type `/etc/reboot`

Now you can send and received Email using **mediamail**:

1. Log in on host **sparrow** e.g. as user **joe**:
2. Start **mediamail** in one of the following two ways:
 - Type `zmail -gui`
 - Click *Find* -> *Applications* -> *MediaMail*
3. To send a mail:
 - a) Click *Compose* -> *Compose new*
 - b) Enter the recipients Email address after *To*:
 - c) Enter your Email text in the main text field
 - d) Click **Send**
4. To read incoming mails: select a message and click **Read**
5. For help on other **mediamail** functions click **Help**

User **joe** will receive all mails which are sent to the address:

joe@sparrow.lab1.uni.com

An Email address consist of 3 parts: a username, the @ sign and the hostname of the target computer. Usually Email is not sent directly to a users host but to a central mail server. The Email address for **joe** would then be:

joe@lab1.uni.com

where *lab1.uni.com* is the hostname of the mail server¹

All Email for **joe** is forwarded to his host **sparrow**, if the file `/usr/lib/aliases` on the mail server contains the line:

`joe: joe@sparrow.lab1.uni.com`

If you want to use **elm** instead of **mediamail** you must get the **elm** package from the Bruker FTP server as described above for **smail**.

1. In this example the mail server must be known by the name **lab1.uni.com**, which in this case is also the domainname of the network

For help on elm type: 'man -M /usr/local/man elm' in a UNIX shell or read the files /usr/local/lib/elm-help.*

If you want to send binary files with elm:

1. Check the type of your file, type: `file fila` ¹

If *fila* is ascii you can include *fila* in your mail, if *fila* is binary you must continue with step 2

2. Compress the file: `gzip fila`

-> this will create the file *fila.gz*

3. `uuencode fila.gz fila.gz > fila.gz.as` ²

4. Include the file *fila.gz.as* in your mail

The recipient must:

1. Cut out the encrypted text including the lines:

```
begin xxx fila.gz
end
```

2. Store this text into a file e.g. named *fila.gz.as*

3. `uudecode fila.gz.as`

-> this will create the file *fila.gz*

4. `gunzip fila.gz`

-> this will re-create the original binary file *fila*

6.9 Add hardware devices like disk, tape, MO

Before you buy additional hardware devices, like CDROM, hard disks, tape drives etc. , make suer that the device is compatible with your computer hardware. If you

-
1. If the output of the command `file` contains the word *text*, the file is ascii. Otherwise it is binary.
 2. The second argument is the name of the binary file created by `uudecode`. This can be any name.

are not sure, contact your local Bruker representative.

6.9.1 Add an additional hard disk

The SGI-O2 contains 2 SCSI controllers:

- SCSI controller 0 for internal devices
- SCSI controller 1 for external devices

Each SCSI controller can connect up to 7 devices, each device has a different SCSI-ID (unit number). Internal hard disks, connected to SCSI controller 0, always have unit number 1 or 2, depending on which slot they reside in. This unit number is automatically set after inserting the disk. For external hard disks however, you have to choose a free unit number and set this manually. This is done with a switch located on the disk unit.

An O2, as delivered by Bruker, has 2 devices connected to SCSI controller 0, the system hard disk (unit 1) and the CDROM drive (unit 4). One slot is free to add an extra internal hard disk: unit 2. More hard disks can be added as external devices, connected to SCSI controller 1.

Before you connect an extra disk, first check the controller and unit number of already existing devices:

```
type hinv | grep -i SCSI
```

In this example we will add an extra internal disk (controller 0) which automatically gets unit number 2. The disk will be configured as an option disk, which means it contains only one partition (one filesystem). The new filesystem will be mounted on the directory `/v`.

Proceed as follows:

1. Shutdown the computer; type `/etc/shutdown`
2. Connect the disk drive to the workstation
3. Boot up the computer
4. Login as root
5. Open a UNIX shell
6. Type `fx -x`

Answer the following questions:

```
fx: "device-name" = (dksc) hit Enter
fx: ctlr# = (0) enter the SCSI controller number, here 0
fx: drive# = (1) enter the SCSI id (unit number), here 2
fx: lun# = (0) Enter
```

If the disk does not contain an sgi volume label, you see the message ¹:

```
fx: Warning:  no sgilabel on disk
fx: Warning:  can't read sgilabel on disk
creating new sgilabel
```

The fx program automatically creates an sgi volume label, then the prompt will change to *fx>*. Start the configuration of the filesystem by typing:

```
fx> r/o
```

The program responds with two questions, which you must answer as follows:

```
type of data partition=(xfs) Enter
create usr log partition? = (yes) no
```

If your disk contains any data you will get the question:

```
Warning: you will need to re-install all software and
restore user data from backups after changing the parti-
tion layout. Changing partitions will cause all data on
the drive to be lost. Be sure you have the drive backed
up if it contains any user data. Continue?
```

Answer the question with **y**

Write the sgi volume label on the disk by entering:

```
fx> l/sy
```

(note that this is the letter l, not the number 1)

Now leave the fx program by entering:

```
fx> exit
```

7. `mkfs /dev/dsk/dks0d2s7`

8. `mkdir /v`

1. If you get the questions: *Show differences? Use existing volume header?*, answer them with **no**.

9. `mount /dev/dsk/dks0d2s7 /v`

In order for the filesystem to be mounted automatically when the SGI boots, you must make an entry in the file `/etc/fstab`.

10. Edit the file `/etc/fstab` and add the line:

```
/dev/dsk/dks0d2s7 /v xfs rw,raw=/dev/rdisk/dks0d2s7 0 0
```

In the steps above, 0 is the controller number, 2 the disk number and 7 stands for a partition layout where one partition covers the whole disk.

6.9.2 Add an HP DAT drive

Some DAT tape drives can be connected to an SGI and will be recognized automatically. However, if you add an HP (Hewlett-Packard) or Archive (Python 25501), you must perform the following steps:

1. Shutdown the computer; type `/etc/shutdown`
2. Connect the DAT drive
3. Boot up the computer
4. Login as root
5. Open a UNIX shell
6. Edit the file `/var/sysgen/master.d/scsi`

Enter the following text ¹after the entry for the ARCHIVE Python drive:

```
{ DATTAPE, TPDAT, 7, 12, "ARCHIVE", "Python 25501" /*DDS1*/, 0, 0, {0},
MTCAN_BSF|MTCAN_BSR|MTCAN_APPEND|MTCAN_SETMK|MTCAN_PART|
MTCAN_PREV|MTCAN_SYNC|MTCAN_SPEOD|MTCAN_CHKRDY|MTCAN_VAR|
MTCAN_SETSZ|MTCAN_SILI|MTCAN_AUDIO|MTCAN_SEEK|MTCAN_CHTYPEANY,
40, 4*60, 4*60, 5*60, 512, 512*512, 0, (u_char *)0 },
```

```
{ DATTAPE, TPDAT, 7, 12, "ARCHIVE", "Python 25601" /*DDS1*/, 0, 0, {0},
MTCAN_BSF|MTCAN_BSR|MTCAN_APPEND|MTCAN_SETMK|MTCAN_PART|
MTCAN_PREV|MTCAN_SYNC|MTCAN_SPEOD|MTCAN_CHKRDY|MTCAN_VAR|
```

1. You can copy and paste this text from this document or from the ascii file:
`/<var>/prog/bin/install.net/manual.63`.

```

MTCAN_SETSZ|MTCAN_SILI|MTCAN_AUDIO|MTCAN_SEEK|MTCAN_CHTYPEANY,
40, 4*60, 4*60, 5*60, 512, 512*512, 0, (u_char *)0 },

```

```

{ DATTAPE, TPDAT, 7, 12, "ARCHIVE", "Python 26601" /*DDS1*/, 0, 0, {0},
MTCAN_BSF|MTCAN_BSR|MTCAN_APPEND|MTCAN_SETMK|MTCAN_PART|
MTCAN_PREV|MTCAN_SYNC|MTCAN_SPEOD|MTCAN_CHKRDY|MTCAN_VAR|
MTCAN_SETSZ|MTCAN_SILI|MTCAN_AUDIO|MTCAN_SEEK|MTCAN_CHTYPEANY,
40, 4*60, 4*60, 5*60, 512, 512*512, 0, (u_char *)0 },

```

```

/* HP-HP35470A DAT DRIVE (2000 MBytes, no compression) */
{ DATTAPE, TPDAT, 2, 8, "HP", "HP35470A", 0, 0, {0},
MTCAN_BSF|MTCAN_BSR|MTCAN_APPEND|MTCAN_SETMK|MTCAN_PART|
MTCAN_PREV|MTCAN_SYNC|MTCAN_SPEOD|MTCAN_CHKRDY|MTCAN_VAR|
MTCAN_SETSZ|MTCAN_SILI|MTCAN_SEEK|MTCAN_CHTYPEANY,
40, 4*60, 4*60, 5*60, 512, 64*512, 0, (u_char *)0 },

```

```

/* HP-HP35480A DAT DRIVE (4000 MBytes with compression) */
{ DATTAPE, TPDAT, 2, 8, "HP", "HP35480A", 0, 0, {0},
MTCAN_BSF|MTCAN_BSR|MTCAN_APPEND|MTCAN_SETMK|MTCAN_PART|
MTCAN_PREV|MTCAN_SYNC|MTCAN_SPEOD|MTCAN_CHKRDY|MTCAN_VAR|
MTCAN_SETSZ|MTCAN_SILI|MTCAN_AUDIO|MTCAN_SEEK|MTCAN_CHTYPEANY,
40, 4*60, 4*60, 5*60, 1024, 128*512, 0, (u_char *)0 },

```

```

{ DATTAPE, TPDAT, 2, 6, "HP", "C1533A", 0, 0, {0, 3, 3, 3},
MTCAN_BSF|MTCAN_BSR|MTCAN_APPEND|MTCAN_SETMK|MTCAN_PART|
MTCAN_PREV|MTCAN_SYNC|MTCAN_SPEOD|MTCAN_CHKRDY|MTCAN_VAR|
MTCAN_SETSZ|MTCAN_SILI|MTCAN_SEEK|MTCAN_CHTYPEANY,
40, 4*60, 4*60, 5*60, 512, 64*512, 0, (u_char *)0 },

```

7. Type `autoconfig -v`

8. Type `/etc/reboot`

9. Login as root

10. Open a UNIX shell

11. Type `rm /dev/*tape*`

12. Type `cd /dev`

13. Type `./MAKEDEV`

14. Type `/etc/reboot`

6.9.3 Add a magneto-optical drive

The description below can be used for SGI workstations running IRIX 6.3 or later.

IMPORTANT:

- Magneto-optical drives are NOT supported for versions of IRIX older than 6.3.
- Magneto optical drives connected to an SGI cannot read MO-disks which have been created on an X32.

Before you connect the drive, first check the controller and unit number of already existing devices:

```
type hinv | grep -i SCSI
```

Suppose that SCSI-ID (unit number) 3 of controller 1 is unused. We will use it for the magneto-optical drive.

1. Shutdown and switch off the SGI workstation
2. Connect the magneto-optical drive
 - > attach an SCSI-terminator if this drive is the only or last device connected to this SCSI port
3. Set the SCSI-ID on the drive to 3 (with the switch on the back of the drive)
4. Switch on the SGI, it will boot automatically.
5. Login as root
6. Insert an empty disk cartridge
7. Open a UNIX shell
8. Type `fx -x "dksc(1,3)"`

where 1 is the controller number and 3 the SCSI-ID

You see several messages ¹, one of which is:

```
creating new sgilabel
```

The `fx` program automatically creates an sgi volume label, then the prompt

1. If you get the questions: *Show differences? Use existing volume header?* answer them with **no**.

will change to *fx*>. Start the configuration of the filesystem by typing:

```
fx> r/o
```

Answer the following questions:

```
type of data partition = (xfs) xfs
```

```
create usr log partition? = (yes) yes
```

```
Warning: you will need to re-install all software and  
restore user data from backups after changing the parti-  
tion layout. Changing partitions will cause all data on  
the drive to be lost. Be sure you have the drive backed  
up if it contains any user data. Continue? yes
```

```
9.mkfs /dev/rdisk/dks1d3s7
```

```
10.mkdir /modisk
```

```
11.chmod 777 /modisk
```

```
12.mount /dev/dsk/dks1d3s7 /modisk
```

Before ejecting an MO-disk, you must unmount it. Otherwise the filesystem might become corrupt and your data will be destroyed. To unmount, do the following:

1. Become superuser: type `su`
2. `umount /modisk`
3. Push the eject button on the drive

The disadvantage of this method is obvious: you must be superuser to change the magneto-optical disk. If you want to do this as normal user, without the risk of losing data, do the following:

1. Get the files *mountmo* and *umountmo* from our ftp server:
-> `ftp.brucker.de:/pub/nmr/binaries.indy`
2. Become superuser: type `su`
3. Copy *mountmo* and *umountmo* into the directory `/usr/bin`
4. Type `chmod 4755 /usr/bin/*mountmo`
5. Edit the file `/etc/fstab` and enter the line:
`/dev/dsk/dks1d3s7 /modisk xfs rw,soft,intr,timeo=60,bg,retry=100 0 0`

Now you can change magneto-optical disks as normal user:

1. Login as normal user
1. Type `umountmo -e`
-> the MO-disk will be unmounted and ejected
2. Insert a new MO-disk
3. Type `mountmo`

This procedure has been tested at Bruker for Pinnacle Micro Vertex 2.6 and Ricoh drives.

The Pinnacle Micro Vertex 2.6 drive only works with IRIX 6.3, if it uses the firmware version 2.21 or later. You can get this firmware from:

<http://www.pinnaclemicro.com>

Since the magneto-optical drive does not work under IRIX 6.3 until this firmware has been loaded, you must first connect it to another computer, e.g. a PC and load the firmware from there. After that you can use it with your O2.

Chapter 7

Trouble shooting

7.1 General steps that you can try to locate or solve problems

7.1.1 Check the WWW for FAQ's, known bugs or known problems

The Bruker WWW pages contain a large amount of information about known errors and problems:

1. Start your WWW browser
2. Go to the Bruker home page: `www.bruker.de`
3. Click *Analytical* -> *NMR* -> *Software*
4. Click on **FAQ** or **Bugs**

Note that you need an account to enter these pages. If you do not have one, click on **WWW account** and fill out the form to get a free account.

7.1.2 SGI help

1. Manual Pages: help on UNIX commands
 - Click *Help* -> *Man Pages* or type `xman`
-> a list of UNIX commands appears; click on a command to get help

- type `man <command>`, e.g. `man find`
- 2. How do I ... : particular tasks¹
 - Click *Help* -> *How do I...* and select a question, e.g.: ‘Organize Windows’
- 3. On-line Books: general information
 - Click *Help* -> *Online Books* or type `insight`
-> select a book and/or search for keywords
- 4. SGI Frequently Asked Questions
 - Start your web browser and enter the following WWW address²:
`www.sgi.com/Archive/FAQs`

7.1.3 Switch on the history function in XWIN-NMR

The history function keeps track of all the commands you have entered in XWIN-NMR and of all error messages. This can be very useful if you discuss a problem with your Bruker service or support person.

1. Start `xwinnmr`
2. Click *Display* -> *Status & history* -> *Enable ‘history’ file*

The XWIN-NMR history is stored in the file:

`/<var>/prog/curdir/<user>/history`

where `<var>` is the directory where XWIN-NMR is installed and `<user>` the user who started XWIN-NMR. The history file is automatically re-initialized (overwritten) when XWIN-NMR is started.

7.1.4 Clean up your disk

If the root partition of your disk is full, every command will fail that requires a certain amount of disk space on it. If another partition is full, the system cannot store data on that partition, e.g. you will not be able to acquire or process XWIN-NMR data. Proceed as follows:

-
1. *How do I...* is available for IRIX >= 6.3
 2. or get the file `/pub/sgi/faq/sgi-faq.tar.gz` from the FTP server `viz.tamu.edu`

1. Open a UNIX shell
 - a) become superuser; type `su`
 - b) type `df`
2. If the partition '/' is (almost) 100% full:
 - a) `find / -name core -exec rm {} \;`
 - b) `rm /usr/adm/crash/*unix*`
 - c) `rm /usr/adm/crash/*core*`
3. If another partition, e.g. /x, is (almost) 100% full:
 - a) `find /x -name core -exec rm {} \;`
 - b) remove processed data in XWIN-NMR with delp
 - c) back up raw data and then remove them with dela
 - d) use the del command to remove a dataset with all experiments /raw data

7.1.5 Reboot the SGI

Rebooting the SGI workstation is a quick and efficient way to kill and restart any hanging processes. Perform the following steps:

1. Check who is logged in; type `who`
-> warn all users who are logged in that you are going to shutdown the system
2. Shutdown the computer; type `/etc/shutdown`
3. When the computer is down, switch it off; push the power button
4. Switch the computer on, it will boot automatically

7.1.6 Reboot the SGI and the CCU with 'reviveccu'

If you have any kind of communication problem between the SGI workstation and the spectrometer CCU, it is always a good idea to reboot both.

1. Check who is logged in; type `who`
-> warn all users who are logged in that you are going to shutdown the system
2. Type `reviveccu`
-> follow the instructions:

- a) You will be asked to switch off the acquisition rack
- b) `reviveccu` will automatically reboot the SGI
- c) Switch on the acquisition rack after the SGI has rebooted

7.2 Various problems in XWIN-NMR or UNIX

7.2.1 The XWIN-NMR window is frozen

Perform the following steps and check after each step whether XWIN-NMR is responding again:

1. Press the Escape key: **Esc**
2. Move the cursor into the UNIX shell where XWIN-NMR was started
3. Type `^\` (control backslash)
 - > the question “do you want to restart the graphic server” appears
 - type **y** if an acquisition is running which should not be stopped
 - type **n** if no acquisition is running, continue with step 4
4. If you answered the question in step 3 with **n**
 - a) Type `shrmrm`
 - b) Type `uxproc`
 - c) Kill any hanging XWIN-NMR processes with:
 - d) `kill PID` (if this does not work, try `kill -9 PID`)
 - e) Type `xwinnmr` to restart XWIN-NMR

If steps 1 to 4 do not solve the problem then perform the steps described in 7.2.2.

7.2.2 The entire screen is frozen

If you have lost mouse control on the entire screen, there are several things you can do. The following steps are increasingly drastic; perform the next higher step only if the previous one didn't help.

1. Press the Escape key: **Esc**

2. Press the five keys: 'Shift-Ctrl-Alt-F12-/' simultaneously
where '/' is the key on the numeric pad, left of the Num Lock key
-> this will log you out
3. If the system is connected to the network, log in as root via another host and
type `/etc/reboot`
-> this will reboot the workstation
4. Push the power button
-> this will do a proper shutdown
5. Push the small hidden reset button
-> this will briefly cut off the power

Important: before you reboot or shutdown the system, first check who is logged in if this is still possible: type `who`. Warn all users who are logged in that you are going to shutdown the system.

7.2.3 Programs like `shrmr`, `reviveccu` and `touser` are not found

These programs are delivered with XWIN-NMR and are executed by the superuser from a UNIX shell. However, if you become superuser with the command `su`, the programs may not be found. You can solve this problem in two different ways:

1. Become superuser with the command '`su - root`'
2. Log out and log in as root
3. Now the programs `shrmr`, `reviveccu`, `touser` etc. can be typed in from any directory and will always be found.

7.2.4 You cannot log in as normal user

There are several possible reasons why you cannot login as normal user. First find out if other normal users can log in. If they can, the problem is user specific:

1. Your password is wrong (see 7.4.1)
2. One of your personal setup files is corrupt. Check the files:
 - `/usr/people/<user>/.desktop-<hostname>/log`
 - `/usr/lib/X11/xdm/xdm-errors`

- `/var/adm/SYSLOG`
and look for a possible reason.

7.3 Print and plot problems

7.3.1 Problems specific for plotting with plot/view

1. Did you enter the correct plotter type? type `edo`
2. Are the plot parameters correct? type `edg`
3. Is a plotter specified in `setres`?
-> yes? Then this plotter will always be used, regardless of the plotter in `edo`.

7.3.2 Problems specific for plotting with XWIN-PLOT

1. Make sure the printer is installed, preferably with `cfpp` in XWIN-NMR.
2. In XWIN-PLOT; click *File -> Print -> Setup*
 - a) Select the correct Printer Type:
 - If you have a postscript printer: select PostScript
 - If you have a non-postscript printer: select the type of your printer
 - b) Select the correct Paper Size
 - c) Enter the correct Print Command. A full print command would be:
`lp -dprintername -c -s -oraw -nl %s`
 - The arguments `-c` and `%s` are obligatory
 - The argument `-dprintername` is only required if no default printer is defined or if you do not want to print to the default printer (type `lpstat -t` in a UNIX shell to find out if a default printer exists)
 - The other arguments are optional (type `man lp` in a UNIX shell)

Note that XWIN-PLOT ignores the printer specified with `edo` or `setres`.

If nothing is printed:

1. In XWIN-PLOT; click *File -> Print -> To File...* and enter a filename in the field *Selection*

2. Open a UNIX shell and enter the print command which is also used in XWIN-PLOT specifying the filename you entered in step 1 instead of '%s'.
 - If this does not work either, type `lpstat -t` in a UNIX shell and look for possible problems (see 7.3.3).
 - If this works, click *File* -> *Print* -> *Setup*, enter '/usr/bin/lp' instead of 'lp' in the *Print Command* field and check all other settings in *Setup*.

If the print-out is wrong or corrupt:

1. Check the *Printer Type* (see step 2a above)
2. Check other 'Setup' settings like 'Output Format' and 'Paper Size'.

7.3.3 General print and plot problems

1. Check the plot status in a UNIX shell
 - a) Open a UNIX shell
 - b) Become superuser; type `su`
 - c) Type `lpstat -t`
 - d) Is a previous plot hanging? Then type `cancel <request-number>`
 - e) Is the printer disabled? Then type `/usr/bin/enable printername`
 - f) Is the scheduler not running? Then type `/usr/lib/lpsched`
2. Switch the printer off and on again
3. Check how many *lp* processes are running; type `ps -fulp`

The output should show only one *lp* process `/usr/lib/lpsched`. If other *lp* processes show up:

 - a) Become superuser: type `su`
 - b) Type `/usr/lib/lpshut`
 - c) Type `ps -fulp`
 - d) Kill remaining *lpsched* processes: type `kill PID1 PID2 PID3 ...`
where `PID1, PID2` etc. are the PID numbers of the *lp* processes
 - e) Type `/usr/lib/lpsched`
4. Check if the printer cable is properly connected

5. Remove and re-install the printer in XWIN-NMR

- a) Type `cfpp` -> printer-plotter installation -> remove printer-plotter

If you get an error message that XWIN-NMR cannot remove the printer:

- Open a UNIX shell
- Become superuser; type `su`
- Type `/usr/lib/lpshut`
- Type `/usr/lib/lpadmin -xprintername`
(*printername* is, for instance, *hplj4l*)
- Type `/usr/lib/lpsched`

- b) Now re-install the printer in XWIN-NMR

type `cfpp` -> printer-plotter installation -> install new printer-plotter

7.4 Password problems

The following types of passwords exist on an SGI workstation:

- normal user passwords
- nmr-superuser password
- root password
- prom password

The nmr-superuser is only used in connection with XWIN-NMR 2.0 or newer. It can be any normal user or root. The PROM password is normally not installed, but if it is, then you will be asked for it when you want to enter the Command Monitor Mode ¹. If you have forgotten a password you can get around this problem in the following way.

7.4.1 Remove a normal user or nmr-superuser password

If a normal user or the nmr-superuser have forgotten the password, the superuser can remove it. Suppose the user guest has forgotten his password:

1. The Command Monitor mode can be entered by hitting the ESC key when the workstation starts booting.

1. Log in as root
2. Type `passwd -d guest`

The user `guest` can log in now without a password and define a new password with the command `passwd`

7.4.2 Remove the root password

If you are the system administrator and you have forgotten the root password, you can change it as follows:

1. Push the power button (to shutdown and switch off the SGI)
2. Push the power button again (to switch on the SGI)
3. In the window 'Starting up the System':
 - Click *Stop for Maintenance*
4. Click *Install System Software*
5. In the window 'Install System Software':
 - Click *Local CDROM*
 - Click *Install*
6. When the window 'Insert the installation CDROM' appears
 - Insert the CD "IRIX 6.3 for SGI including R10000"
 - Wait about 5 seconds for the CD to load
 - Click *Continue*
 - Wait until the installation tools have been copied to disk
7. The program `inst` will start automatically, the prompt will change to `Inst>`
`Inst> admin shroot`
The prompt will change again to `#`:
`# passwd`
Enter a new password for root.
`# exit`
`Inst> quit`

8. Answer the question “Restart? [y,n]“ with **y**
The computer will now boot.

7.4.3 The PROM password

Bruker delivers all SGI workstations without a PROM password. You can, however, install a PROM password, which is then asked for when you want to enter the *Command Monitor Mode*. If you have forgotten the PROM password you can delete it if the workstation is booted and you can log in as root:

- log in as root
- open a UNIX shell
- type `nvrnm passwd_key ""`

note that the second argument of `nvrnm` is two times double quote.

If the SGI does not boot or you do not know the root password, the PROM password can only be removed via the hardware. Contact your local Bruker office in such a case.

7.5 General network problems

1. If `rcp` and `rlogin` return *permission denied*
-> the files `.rhosts` and `/etc/hosts.equiv` on the remote host have not been setup correctly (see 6.4.3)
2. If `telnet host_a` returns *unknown host*:
There are 2 possibilities:
 - a) There is no name server installed and `host_a` is not in `/etc/hosts`
 - b) There is a name server installed but:
 - `/etc/resolv.conf` does not exist on the local host
 - `/etc/resolv.conf` is wrong
 - `host_a` is not administered on the nameserver
3. If `telnet a.b.c.d` (IP address) returns *unknown host*
There are 2 possibilities:
 - a) There is no host with IP address `a.b.c.d`

- b) The host with this IP address is in a different subnet and there is no route to this host
- 4. If `telnet host_a` returns *Trying host_a ...* and nothing happens
There are 3 possibilities:
 - a) `host_a` is not booted
 - b) `host_a` is physically not connected to the network
 - c) the networking on `host_a` is turned off
- 5. If a file is not executable after FTP transfer:
Set the x-permission: `chmod a+x filename`
(Note that FTP always removes the x-permission)
- 6. If a binary file is corrupted after FTP transfer:
Repeat the transfer in binary mode: type `bin` in FTP before you get the file
- 7. If `'mount host_b:/dira /dirb'` returns
mount: access denied for host_b:/dira
dira on `host_b` is not exported. Login on `host_b`, make the entry `dira` in the file `/etc/exports` and type `exportfs -a`. Now try the mount command on the remote host again.

7.6 Communication problems between SGI and CCU

If the acquisition (zg, gs, wobb) and/or the configuration (cf) fail, you might have a communication problem between the SGI and the spectrometer CCU. Typically you will get error messages from XWIN-NMR like:

```
Connect to spect: unable to connect to remote host
Connection to spect. aqport0, failed
Acquisition hardware not present or defect
```

Check the communication between the SGI and the CCU in the following way:

- a) Open a UNIX shell
- b) Type `telnet spect`
Depending on whether `'telnet spect'` works (you get a login prompt) or not, continue with paragraph 7.6.1 or 7.6.2.

7.6.1 Communication problems but ‘telnet spect’ works

If ‘telnet spect’ works, the CCU has booted. This means that the spectrometer network software is installed and running. The communication problems obviously have other causes. Two of the most common causes are mentioned below.

In each of the following steps you must be logged in on the SGI as root and type the indicated commands in a UNIX shell.

1. Check if the process *startd* is running on the CCU:

a) Type `telnet spect` and log in on the CCU as root

b) Type `ps -ef | grep startd`

Does this command show you 2 processes */etc/startd* ?

YES? Then *startd* is running, type `exit`, go to step 2

NO? Then you found the problem, go to step 1c.

c) Type `/etc/startd`

Trying to start *startd* in this way might show you the reason why *startd* was not started automatically. You might have a hardware problem and starting the *startd* manually indicates which board has a failure. Run the corresponding hardware test (see 7.7.1).

2. Check if the spectrometer has an alias name which is not specified in */etc/hosts*:

a) Type `cd /<var>/conf/instr`

<var> is the directory where XWIN-NMR is installed (default is */u*)

b) Type `more curinst`

What is the output of this command?

- `spect`? Then the spectrometer does not have an alias name
- different from `spect`, e.g. `drx`? Then do the following:

type `grep spect /etc/hosts`

What is the output of this command?

`149.236.99.99 spect drx`? Then the alias name is specified

`149.236.99.99 spect`? Then you found the problem, go to c)

c) Edit the file */etc/hosts*:

append the alias name, e.g. `drx` after `spect`

If these two steps did not solve your problem, switch on the XWIN-NMR history

(see 7.1.3) to track all error messages and contact your local Bruker office.

7.6.2 Communication problems and 'telnet spect' does not work

If 'telnet spect' does not work the CCU has probably not booted up completely. This can have several causes. In each of the following steps you must be logged in on the SGI as root and type the indicated commands in a UNIX shell. After each step, type 'telnet spect' and see if you get a login prompt.

7.6.2.1 Software related problems

1. Reboot the SGI and CCU using `reviveccu`:

type `reviveccu`

-> follow the instructions:

- a) you will be asked to switch off the acquisition rack
- b) `reviveccu` will automatically reboot the SGI
- c) switch on the acquisition rack after the SGI has rebooted

2. If the SGI is not connected to the external (laboratory) network you must switch the *gated* daemon off:

- a) Type `su` to become superuser
- b) Type `chkconfig gated off`
- c) Type `reviveccu`

If you don't turn off *gated* the CCU will be removed from the routing table about 5 minutes after rebooting the SGI. From that moment on the CCU will be unreachable.

3. Check if the network domainname is defined:

- a) type `domainname`

Does this command show any output?

YES? Then a domainname is defined, go to step 4.

NO? Then you found the problem, go to step 3b.

- b) Edit the file `/var/yp/ypdomain`

-> enter the domainname of your laboratory network

(if the SGI is not connected to the network, enter any name)

- c) Type `reviveccu`
- 4. Check if NFS is running:
 - a) Type `ps -ef | grep nfsd`
Does the output of this command show you 4 processes `/usr/etc/nfsd` ?
YES? Then NFS is running, continue with step 6
NO? Then you found the problem, continue with step 4b
 - b) Type `chkconfig nfs on`
 - c) Type `reviveccu`
 - d) Run step 4a again and if NFS is still not running continue with step 5
- 5. Check if NFS is installed:
 - a) Type `versions | grep nfs.sw`
Does the output of this command show you the package `nfs.sw`?
YES? Then NFS is installed, go to step 6
NO? Then you found the problem, go to step 5b
 - b) Install the SGI CD “ONC3/NFS 6.3 Version 2, for IRIX 6.2, 6.3 and 6.4” or the Bruker CD “NFS/Development Options for IRIX 6.3” (see 4)
- 6. Check if the process `bfsd` is running:
 - a) Type `ps -ef | grep bfsd`
Does the output of this command show you the process `/usr/diskless/bfsd` ?
YES? Then `bfsd` is running, continue with step 7
NO? Then you found the problem, continue with step 6b
 - b) Check the file `/etc/services` and correct it if it is wrong (see 7.6.3.1)
 - c) Type `reviveccu`
- 7. Check if the `/usr/diskless` partitions are exported:
 - a) Type `exportfs -v`
Does the output of this command show you the partitions:
`/usr/diskless/dl_usr` and `/usr/diskless/clients/spect` ?
YES? Then the partitions are exported, continue with step 8
NO? Then you found the problem, continue with step 7b
 - b) Check the file `/etc/exports` and correct it if it is wrong (see 7.6.3.1)

- c) Type `reviveccu`
- 8. Check if the spectrometer network is correctly configured:
 - a) Check the files `/etc/config/ifconfig-2.options` and `/etc/config/netif.options` and correct them if they are wrong (see 7.6.3.1)
 - b) Type `reviveccu`
- 9. Reconfigure the spectrometer network:
Type `/<var>/prog/bin/install.net/install.net`
where `<var>` is the directory where XWIN-NMR is installed (default `/u`). This command reconfigures the entire spectrometer network.
- 10. Reconfigure the spectrometer network by re-installing the DISKLESS package:
 - a) Insert the XWIN-NMR CD into the CD drive
 - b) Type `/CDROM/startme`
 - c) Wait for the installation window to open
 - select the Diskless package
 - deselect all other packages
 - click **START**
you will be asked to shutdown the CCU; just click **OK**
 - wait for the installation to finish
 - click **EXIT**

7.6.2.2 Hardware related problems

- 1. Check if the ethernet cable between SGI and CCU is properly connected.
-> Remove and re-connect the ethernet cable and the transceiver or minihub.
- 2. Check if the ethernet interface is broken.
 - a) Physically connect the CCU to the first ethernet interface (`ec0`)¹
 - b) Type `su` to become superuser

1. assuming that the CCU is currently connected to the second ethernet interface.

- c) `sh /<var>/prog/bin/install.net/swap.net`
 where <var> is the directory where XWIN-NMR is installed.
 Answer the question "Do you want to swap ... " with **y**
- d) Type `reviveccu`
 follow the instructions.
3. Replace the ethernet cable, transceiver or minihub between the SGI and CCU to find out if either of these components is broken.
 4. If a new CCU was installed:
 - a) Type `arp -d spect`
 - b) Type `reviveccu`

7.6.3 Files which are needed for the spectrometer network

7.6.3.1 File entries made for the spectrometer network

- */etc/hosts*

```
149.236.99.1    ASP_ST2
149.236.99.99  spect
```
- */etc/bootparams*

```
spect root=ASP_ST2:/usr/diskless/clients/spect/root \
swap=ASP_ST2:/usr/diskless/clients/spect/swapfile \
dump=ASP_ST2:/usr/diskless/clients/spect/dump
```
- */etc/exports*

```
/usr/diskless/dl_usr -ro,anon=0
/usr/diskless/clients/spect -rw,anon=0,root=spect,nohide
```
- */etc/services*

```
bfs    2201/udp    # bootfileserv
```
- */etc/config/ifconfig-2.options*

```
netmask 0xfffff00    broadcast 149.236.99.255
```
- */etc/config/netif.options*

```
if1name=ec0
if1addr=$HOSTNAME
```

```

        if2name=ec1 (on O2)
        if2name=ec2 (on Indy)
        if2addr=ASP_ST2
    • /usr/diskless/clients/spect/root/etc/fstab
ASP_ST2:/usr/diskless/clients/spect/root / nfs rw,bg,hard,retry=3,timeo=20 0 0
ASP_ST2:/usr/diskless/dl_usr /usr nfs ro,bg,hard,retry=3,timeo=20 0 0
ASP_ST2:/usr/diskless/clients/spect/var /var nfs rw,bg,hard,retry=3,timeo=20 0 0

```

7.6.3.2 Files created for the spectrometer network

- */usr/diskless/clients/spect/swapfile*
This file can also be created manually with the command:

```
mkfile 8000000 /usr/diskless/clients/spect/swapfile
```
- */var/yp/ypdomain*
If this file is empty, the domainname **dummy** is entered during the installation of the DISKLESS package from the XWIN-NMR CD. If it is not empty, it is left unchanged. The CCU needs a domainname to be able to boot.
- */etc/rc2.d/S95bfsd*
This file is a symbolic link to the file */etc/init.d/bfsd*. From this file the *bfsd* daemon */usr/diskless/bfsd* is started. ¹
- */usr/diskless/clients/spect/root/dev*
This directory contains a large number of special files such as *tty00*, *tty01*, *tty02*, etc. These files are created during the installation of the DISKLESS package from the XWIN-NMR CD. They can also be created manually:
 - a) become superuser: type `su`
 - b) `cd /usr/diskless/clients/spect/root/dev`
 - c) `./MKDEV -m RS3330`

7.6.4 View the output of the CCU console

In order to view the output of the CCU you must connect serial port 2 of the SGI with *tty00* of the CCU (cable HZ10034 for O2, HZ04161 for Indy). The program

1. In XWIN-NMR 1.3 and earlier the pathname of this daemon is */u/prog/<version>/bfsd*

`cu` can be used to make the output of the CCU visible in a UNIX window on the SGI (`cu` has the same function as `kermit` on older systems). The program `cu` must be configured once before it can be used.

7.6.4.1 How do you configure the program ‘cu’

1. Type `versions | grep uucp`

The output of this command should show you the package `oe.sw.uucp` or `oe2.sw.uucp`. If it does not appear, install the package from the CD “IRIX 6.3 for SGI including R10000”. (see 2.4.1).

2. Edit the file `/etc/uucp/Devices` and search for the line:

Direct ttyd2 - 9600 direct

If this line begins with a character `#` and possibly a space, remove these characters; the line must begin with ‘Direct...’.

3. Edit the file `/etc/uucp/Dialers` and search for the line:

direct "" "" \M\c

If it does not exist or has a different syntax, enter it exactly as specified above.

4. Edit the file `/etc/inittab` and search for the line:

t2:23:off:/sbin/getty ttyd2 co_9600

If the third field of this line contains the word `respawn`, change that to `off`.

5. `/etc/reboot`

7.6.4.2 View/change the prom parameters

1. Open a UNIX shell

2. Type `cu -l ttyd2`

-> You will get the prompt *connected* and you can see the CCU output messages:

- a) Push the reset button of the CCU
- b) Press `Control-C` to interrupt the boot process

The CCU will be in monitor mode now, the prompt will change to `>>`, type:
`>> printenv`

You will get a list of environment variables, the most important are:

```
netaddr=149.236.99.99
netmask=0xffff0000
bootfile=bfs()/usr/diskless/clients/spect/root/
unix_r4600_std1
bootmode=c
```

These values must be shown as specified above². You can set the environment variables as follows:

```
>> setenv netaddr 149.236.99.99
>> setenv netmask 0xffff0000
```

To boot the CCU again, type:

```
>> u
```

c) To exit the cu program type:

```
>> ~.Enter (press the keys: tilde, dot, Enter)
```

7.6.4.3 View the boot process

When all environment parameters are correct, you can view the boot process and see where it hangs. This might give you an indication as to what the problem is.

1. Open a UNIX shell
2. Type `cu -l ttyd2`
-> you will get the prompt *connected* and you can see the CCU output
3. Push the reset button of the CCU

The CCU will try to boot now. The output of the boot process is listed below. The marks ‘---?---’ indicate positions where the boot process possibly hangs or goes into an endless loop:

```
Autoboot: Waiting to load
```

-
1. For CCU-4 and 5 the bootfile is *unix*, for CCU-6 and later it is *unix_r4600_std*.
 2. If the *netaddr* is different, the spectrometer network files must be adjusted. However, when you install the DISKLESS package the entries are set back to **149.236.99.99** and your CCU will not boot anymore. Therefore we strongly recommend not to change the *netaddr*.

```

bfs()/usr/diskless/clients/spect/root/
unix.r4600_stddebbe:/etc>vi inittab

#      Copyright (c) 1984 AT&T
(CTRL-C to abort)
loading
---1---
Obtaining /usr/diskless/clients/spect/root/
unix.r4600_std from server c85
851056+115728+824448 entry: 0x80021000
CPU: MIPS R4700 Processor Chip Revision: 1.0
FPU: MIPS R4700 Floating Point Unit [CP1] Revision: 1.0
RISC/os Release 4_52 mips Version UMIPS
Total real memory  = 16777216
Available memory   = 14356480
Root on nfs file : Swap on nfs file :
---2---
hostname: spect
domainname: dummy
---3---
Root fstype nfs
Available memory   = 12705792
Root on nfs file : Swap on nfs file :
The system is coming up. Please wait.
ASP_ST2:/usr/diskless/clients/spect/var mounted on /var
ASP_ST2:/usr/diskless/dl_usr mounted on /usr
Internet daemons: portmap inetd.
NFS daemons: nfsd biod lockd statd.
The system is ready.

```

Booting might hang, stop (and print an error message) or go into an endless loop at one of the positions 1, 2 or 3. This might be caused by one of the problems mentioned below. Check the indicated files and correct them if necessary or perform the indicated steps.

- a) If booting stops at position ---1--- one of the following problems exist:
 - the *bsfd* is not running; go to 7.6.2.1, step 6
 - the DISKLESS packages is not installed; see 7.6.2.1, step 10
 - the network is not set up correctly; check the files:
 /etc/config/netif.options and */etc/config/ifconfig-2.options*
- b) If booting stops at position ---2--- one of the following problems exist:

- the domainname is not defined; check `/var/yp/ypdomain`
 - the network is not set up correctly; check `/etc/hosts`, `/etc/bootparams`
 - the swapfile does not exist; check `/usr/diskless/clients/spect/swapfile`
- c) If booting stops at position ---3--- one of the following problems exist:
- NFS is not running; see 7.6.2.1, step 4
 - diskless partitions are not exported; see 7.6.2.1, step 7
 - the network is not set up correctly; check `/etc/hosts`
- d) If booting is very slow or hangs at an arbitrary point you might have a hardware problem (see chapter 7.6.2.2).
4. To exit the `cu` program type:
- ```
>> ~.Enter (press the keys: tilde, dot, Enter)
```

#### 7.6.4.4 Run CCU diagnostic tests

1. Open a UNIX shell
  2. Type `cu -l ttyd2`
    - > you will get the prompt *connected* and you can see the CCU output:
- a) Push the reset button of the CCU
- b) Press Control-C to interrupt the boot process
- The CCU will be in monitor mode now, the prompt will change to >>
- ```
>> setenv bootmode m
```
- c) Push the CCU reset button
- The CCU diagnostic tests will start automatically. If one or more diagnostic tests fail, the CCU could be broken. If they are all passed successfully, your CCU seems to be okay. The bootmode is automatically set back to its normal value `c`.
- d) To exit the `cu` program type:
- ```
>> ~.Enter (press the keys: tilde, dot, Enter)
```

## 7.7 Spectrometer hardware tests

The XWIN-NMR CD contains various programs to test the spectrometer hardware components.

### 7.7.1 Spectrometer internal boards

Test programs for spectrometer internal boards like RCU, TCU, FCU etc. are started on the CCU.

1. Type `telnet spect` and log in as root
2. Type `cd /u/systest/rcu`
3. Type `./rcutest` (to test the rcu)

After starting a test, type `h` to get help or type `auto` to run a complete test  
The tests for the other boards are started in the same way, just replace the names accordingly.

### 7.7.2 Spectrometer external components

Tests for spectrometer external components like HPPR, BSMS and HPCU are started on the SGI:

1. Open a UNIX shell
2. Enter the name of the test program:
  - for the Amplifier Control Board: type `acb`
  - for the BSMS Shim and Lock Unit: type `bsms`
  - for the Gradient Unit: type `grad`
  - for the High Power Control Unit: type `hpcu`
  - for the Preamplifier: type `hppr`
  - for the RX22 receiver: type `rx22`

### 7.7.3 The program NMR-CHECK

The major spectrometer components, both internal and external, can also be tested with the program `nmrcheck`. This program has mainly been developed for remote service but it is also a convenient tool for local spectrometer hardware tests. It is delivered as a separate package on the XWIN-NMR CD. To find out if NMR-CHECK is already installed simply type `nmrcheck` in a UNIX shell. If the command is not found, install NMR-CHECK from the XWIN-NMR CD (see 5.2).

If you have an ISDN connection in your laboratory and you want to allow remote service via ISDN you must install the ISDN packages from the CD "IRIX 6.3 for

SGI including R10000” (see 2.4.1). After NMR-CHECK has been successfully installed, proceed as follows:

1. Double click the NMR-CHECK icon on the desktop
2. The program asks for the nmr-superuser password, which was defined during the installation of XWIN-NMR, and a password for the temporary service account which can be freely chosen.
3. Click *Connect -> Spectrometer -> Local instrument -> Connect*  
a small green window will appear as soon as the connection has been established.
4. Click Diagnosis, then click on the spectrometer part you want to check

For more details read the NMR-CHECK on-line help or the NMR-CHECK manual.

---

## 7.8 SGI boot problems

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There are several reasons why your workstation will not boot to multi-user mode.

### 7.8.1 The boot process does not start

1. The CPU could be broken. Run the SGI diagnostic tests (see 7.8.4).
2. Sometimes, on an O2, a white screen without a cursor appears after switching the computer on. If that happens, push the small hidden reset button a few times until the O2 starts to boot normally.

### 7.8.2 The SGI does not boot to multi-user mode

The SGI tries to mount all partitions described in the file */etc/fstab*. A problem arises when a partition resides on a remote host and this host is not reachable. In such a case you can boot to single user mode and delete the entry from */etc/fstab*:

1. Push the power button (shutdown and switch off)
2. Push the power button again (switch on)
3. In the window ‘Starting up the System’ click *Stop for Maintenance*

4. Click *Enter Monitor Mode*  
-> The prompt will change to '>'
5. Enter `single`
6. Enter the root password if it is requested
7. Type `export TERM=iris-tp` <sup>1</sup>
8. Type `vi /etc/fstab`  
enter a # character at the beginning of the line in which the remote disk is specified (usually of the type `nfs`)
9. Type `init 2`

### 7.8.3 Booting the SGI is very slow

If booting the SGI takes more than a couple of minutes, the workstation probably tries to reach a nameserver which does not exist. Perform the following steps:

1. Wait until the SGI has booted
2. Login as root
3. `cd /etc`
4. `ls resolv.conf`
5. If the file *resolv.conf* exists:
  - a) `mv resolv.conf resolv.conf.save`
  - b) `/etc/reboot`

If the boot process is as slow as it was before or if the file *resolv.conf* does not exist, the problem has nothing to do with a nameserver. If booting is much faster now, you have found the problem; the file *resolv.conf* is wrong. Now there are two possibilities:

- a) Your network does not have a nameserver; remove the unneeded file with:

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1. If this command is not found, you probably use a c-shell: try `setenv TERM iris-tp` instead

```
rm /etc/resolv.conf.save
```

b) Your network has a nameserver but the IP address is wrong:

- `cd /etc`
- `mv resolv.conf.save resolv.conf`
- edit *resolv.conf* and enter the correct IP address of the nameserver
- `/etc/reboot`

#### 7.8.4 SGI workstation diagnostic tests

Diagnostic tests are used to test all hardware components of the SGI workstation. These include CPU, Memory, Mother board (SCSI, Parallel and Serial ports, Ethernet Controller) and Graphics. The entire test takes about half an hour.

1. Shutdown the workstation:
  - click *System -> Shut Down System*
  - enter the root password
  - click **OK**
  - wait for the system to shut down
2. In the window 'Okay to power off the system now ...':
  - click on **restart** or hit any key
3. In the window 'Starting up the System':
  - click *Stop for Maintenance*
4. Click *Run Diagnostics*

The test will start automatically and will take about 30 minutes. It will stop if an error occurs and is resumed by hitting **Enter**. The test can be interrupted by hitting the **Esc** key.





## Chapter 8

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