

Solaris Installation for NMR Host Computers

*Varian NMR Spectrometer Systems
With VnmrJ or VNMR Software*

Pub. No. 01-999223-00, Rev. A1202



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Varian NMR spectrometer systems

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Chapter 1. Solaris 9 Installation

Sections in this chapter:

- 1.1 “Solaris 9 Compatibility” [this page](#)
- 1.2 “Solaris 9 Quick Installation” [page 8](#)
- 1.3 “Booting from the Solaris 9 CDs or DVDs” [page 8](#)
- 1.4 “Solaris 9 Detailed Installation” [page 10](#)
- 1.5 “Additional Solaris 9 Software” [page 16](#)
- 1.6 “Sun Management Center 3.0 Platform 4 Update” [page 17](#)
- 1.7 “Adding the VNMR Icon to the CDE Tool Bar” [page 17](#)

This chapter describes how to install Solaris 9 software on a Sun computer to be used as an NMR spectrometer host.

Be sure the Solaris 9 version you plan to install is compatible with your Sun computer. For example, the May 2002 version of Solaris 9 is available for the Ultra 10, Ultra 60, Blade 100, and Blade 2000 workstations.

CAUTION: If Solaris 9 is preinstalled on your computer, do not use the preinstalled software. In order for VnmrJ or VNMR 6.1C to properly operate, you MUST install Solaris 9.

Start with *Solaris Quick Installation* in the next section to start the Interactive Solaris Installation program. Then, if you have any questions about a particular Solaris installation window, refer to the corresponding step in the section *Solaris Detailed Installation*, which starts on [page 10](#).

CAUTION: Do not use these instructions to load any other versions of Solaris except version 9 or load any other versions of VnmrJ or VNMR, unless so instructed in writing by Varian (not by Sun Microsystems, Inc.). Varian's software engineers and applications scientists have tested the compatibility of the Solaris, VnmrJ, and VNMR versions used in this manual and found it to be safe and fully operational for the supported Varian NMR spectrometer systems.

1.1 Solaris 9 Compatibility

Solaris 9 is compatible with VnmrJ and VNMR 6.1C. For systems with VNMR 6.1C, be sure to follow the instructions in section [1.7 “Adding the VNMR Icon to the CDE Tool Bar” page 17](#). Solaris 9 is supported only on ^{UNITY}INOVA and MERCURY-series systems.

Solaris 9 is a 64-bit operating system that generally retains compatibility and functionality for the existing 32-bit environment. Systems that can only run the 32-bit mode, including

sun4c, sun4d, and sun4m platforms, do not require the flash PROM update. For these systems, do not select 64-bit mode.

Be sure the Solaris 9 version you plan to install is compatible with your Sun computer. For example, the May 2002 version of Solaris 9 is available for the Ultra 10, Ultra 60, Blade 100, and Blade 2000 workstations.

Ultra 1 and Ultra 2 computers require a flash PROM update before they can run the 64-bit mode of the Solaris 9 operating environment. The flash PROM update is described in the Sun manual *Solaris 9 Sun Hardware Platform Guide*.

1.2 Solaris 9 Quick Installation

1. The Solaris installation program asks several questions about your network and system setup. Having this information before beginning the installation can save time later on.

Table 1 lists the topics of the required information. Fill in the table before starting the installation. Consult a system/network administrator if necessary.

If you need more information on a particular topic, refer to the “[Collecting System and Network Information for Solaris](#),” page 43.

2. Power up the computer and peripherals if not already done.
3. Get to the ok prompt:
 - On a running system, log in as `root` and enter:

```
# init 0
```
 - On a new system, press **Stop-A** (L1-A on some keyboards) to stop the default boot routine.Wait for the ok prompt. If a > prompt appears, enter `n`.
4. Choose the installation media. You have two choices for installing Solaris 9:
 - The Solaris 9 Operating Environment DVD (if your system has a DVD-ROM drive). Insert the DVD and follow the instructions.
 - CD-ROMs 1 and 2

1.3 Booting from the Solaris 9 CDs or DVDs

You can install Solaris 9 from two CD-ROMs or a DVD-ROM. This section describes the Initial Installation procedure for installing Solaris 9 using the following CD-ROMs:

- “Solaris 9 Software, 1 of 2”
- “Solaris 9 Software, 2 of 2”

Boot Failure from DVD

If you install Solaris 9 from the DVD-ROM, be aware that if your system has a Toshiba SD-M1401 DVD-ROM with firmware revision 1007, it will be unable to boot from the Solaris 9 DVD. You will see the following error message:

```
Boot from DVD media fails on systems with Toshiba SD-M 1401
DVD-ROM
```

Table 1. Solaris 9 Preinstallation Worksheet

| Category | Comments | Your Configuration |
|-----------------------------|--|--------------------|
| Host Name | Choose a host name; for example, mercury300, inova750 DO NOT USE: inova, inovaauto, gemcon, or wormhole | |
| Primary Network Interface | For systems with a second Ethernet board, choose the one that will interface with the building or LAN network (not the NMR console). Use: <code>le0</code> for 10baseT Ethernet boards; <code>hme0</code> for Ultras or 10/100baseT Ethernet boards, and <code>eri0</code> for Blades. | |
| IP Address | Your network IP number for networked systems, or use 10.0.0.1 for non-networked spectrometers with no second Ethernet board | |
| Default Route | Choose Find One or Specify One If you choose Find One, the system finds the default route information for you. | |
| Name Service | Choose NIS+ or NIS if the system is known to the name server, Choose Other if the site is using DNS, DCE, or similar. Choose None for no name service. | |
| Domain Name | Your network domain name; for example: <code>our.domain</code> | |
| Name Server | Choose Find One or Specify One If you choose Find One, the system finds name server information for you. If you choose Specify One, you will be asked for the following: Name Server Hostname – for example, <code>ourserver</code> Name Server IP Address – for example, <code>195.5.2.25</code> Subnet Mask – for example: <code>255.255.255.0</code> | |
| Proxy Server | Give name, e.g., <code>proxy.domain.com</code> | |
| Client Services Allocations | Used for allocating file systems for disk-less clients. VnmrJ or VNMR does not require client services to be set up. | |
| Disk Layout | Disk layout sizes vary according to disk size. The installation procedure suggests proper sizes. The recommended layout would include <code>/</code> and <code>swap</code> , with <code>/export/home</code> as either a directory or slice. Entire Distribution plus OEM package requires up to 2.2 GB. VnmrJ or VNMR requires from 175 to 300 MB. | |

To solve this problem, apply patch 111649-03, or a later version, to update the Toshiba SD-M1401 DVD-ROM drive's firmware. The patch is included on the Solaris 9 Supplement CD-ROM. See the README file for detailed instructions on loading the patch.

Bootup from the CD-ROM

1. Insert the CD-ROM labeled "Solaris 9 Software, 1 of 2" or the DVD and boot the system:

```
OK> boot cdrom
```

2. Use the information written in [Table 1](#) to fill in the Solaris installation windows.

If you have questions about a particular Solaris installation window, refer to the step in the section "[Solaris 9 Detailed Installation,](#)" [this page](#) that corresponds to that window.

1.4 Solaris 9 Detailed Installation

The following procedures correspond to the Solaris 9 installation windows as they appear.

- “Language and Locale,” page 10
- “Identify This System,” page 10
- “Time Zone Information,” page 11
- “Configuring Solaris for Installation,” page 12
- “Interactive Installation,” page 12

Language and Locale

1. **Select Language and Locale** – Select **English** from the Languages list. Choose one of the following selections from the Locales List:
 - English (C – 7-bit ASCII)
 - USA–English (8859-1)
 - USA–English (ISO-8859-15)There is a pause.
2. **The Solaris Installation Program** – Read the information and click **Continue**.

Identify This System

This group of windows is used to identify the system. When a Confirm Information window appears, check the listed information with what you wrote in [Table 1](#).

1. **Identify This System** – Select **Continue** to begin identifying the system.
2. **Network Connectivity** – Choose **Yes** or **No** according to the following:
 - Choose **Yes** for ^{UNITY}INOVA or MERCURY-series systems.
3. **DHCP** – Specify whether your system should use or should not use DHCP for network interface configuration.
4. **Primary Network Interface** – Select the primary network interface from the list. Choose an interface (in order of preference): `eri0`, `hme0`, `le0`.
5. **Host Name** – Enter the host name of the computer. Refer to [Table 1](#).

The host name identifies the system on the network. We recommend choosing a host name that is all lower case. **DO NOT USE** `inova`, `inovaauto`, `gemcon`, or `wormhole` as a host name, these are reserved for the console. Use host names like `mercury300` or `inova750`.

The host name must be unique within the domain in which it resides, and the name must be at least two characters, containing letters, digits, and minus signs (-).
6. **IP Address** – Enter the Internet Protocol address for your system. Refer to [Table 1](#).

The IP address must follow the site’s address conventions. IP addresses contain four sets of numbers separated by periods (e.g., 129.200.9.1).

 - For systems with two Ethernet interfaces (e.g., one built-in and one add-on board), use an IP address provided by your network administrator.
 - For systems with one Ethernet interface *that only will be connected to the NMR console*, use 10.0.0.1 for the IP address.

- For systems with one Ethernet interface *that will be connected to a network*, use an IP address provided by your network administrator.
7. **Subnets** – Specify whether your system is or is not part of a subnet.
This screen appears only when a second Ethernet board is installed and enabled.
 8. **Netmask** – for example: 255 . 255 . 255 . 0
 9. **IPv6** – Specify whether the next generation Internet Protocol should or should not be enabled on your system. There is a pause.
 10. **Default Route** – Specify how to set the default route. Choose **Find one** or **Specify one**.
 11. **Confirm Information** – Verify that the information in the window is correct.
 12. **Configure Security Policy** – Select **Yes** or **No** to configure Kerberos Security. At the time of this manual's publication, Varian has not verified the compatibility of the Kerberos Security software with VnmrJ or VNMR.
 13. **Confirm Information** – Verify that the information in the Kerberos window is correct.

The following windows are used to identify the name service and network used by your computer. When a Confirm Information window appears, check the listed information with what you wrote in [Table 1](#).

1. **Name Service** – Select a name service. Refer to [Table 1](#).
 - Select **NIS+** or **NIS** if the system is known to a name service.
 - Select **DNS** if the site is using DNS or a similar name service.
 - Select **LDAP** if the site is using LDAP or a similar name service.
 - Select None if the site is not using a name service.
2. **Domain Name** – Enter the domain name in which the system resides. Refer to [Table 1](#).
3. **Name Server** – Choose **Find one** or **Specify one**. Refer to [Table 1](#).
 - If you choose Find one, the system finds name server information for you.
 - If you choose Specify one, you will be asked for the following:
 - Name Server Hostname – for example, ourserver
 - Name Server IP Address – for example, 195 . 5 . 2 . 25
4. **Confirm Information** – Compare the information listed in this window with the information written in [Table 1](#).

Time Zone Information

This group of windows is used to set the default time zone of your system. When a Confirm Information window appears, check the listed information.

- **Time Zone** – Enter the time zone information, geographic region, date, and time for your location.

When a Confirm Information window appears, check the listed information.

Configuring Solaris for Installation

After the system is identified, the interactive installation program displays the next group of screens, which ask for the following information:

- Upgrade or initial installation
- System type
- Software group
- Disks
- Preserve data
- Automatically layout file system
- Mount remote file systems

Interactive Installation

1. **Solaris Interactive Installation** – The **Initial** option overwrites the system disks when the new Solaris software is installed. You can accept the defaults or customize how Solaris is installed:
 - Select the type of Solaris to install.
 - Select disks to hold software you've selected.
 - Specify how file systems are laid out on disks.Select the way to install the Solaris software:
 - **Standard** installs your system from a Standard Solaris Distribution.
 - **Flash** installs your system from one or more Flash archives.
2. **Select Geographic Regions** – Select the geographic regions for which support should be installed, then click **Continue**.
3. **Select 64 Bit** – Select 64-bit if you want to include the Solaris 64-bit packages on this system.
4. **Select Software** – Choose **Entire Distribution plus OEM**.
We do not recommend customizing the software packages.
5. **Select Disks** – Select the disks on which to install Solaris:
 - a. Select disks from the Available Disks side.
 - b. Click **Add** to move the disks to the Selected Disks side.
6. **Preserve Data?** – If you want to preserve a file system, keep it from being overwritten, click the **Preserve** button.
In the Preserve screen, click the box next to the disk slices you would like to preserve (e.g., /data).
7. **Automatically Layout file Systems?** – Click **Auto Layout**.
We suggest selecting the following file systems to automatically layout:
 - /
 - swapWith only `root (/)` and `swap` selected, the other file systems in the list are collapsed into `root`. While this makes the space requirements for the `root` partition (or slice) bigger, you will not be constrained by fixed-sized slices; you will

have more of the disk to work with. Also, this configuration can save up to 300 MB of disk space.

For an alternate file system layout see [Table 2](#).

Table 2. Alternate Layout for Solaris 9 Disk Slice Sizes for VnmrJ or VNMR

| <i>Slice</i> | <i>Mount Point</i> | <i>Size</i> | <i>Description</i> |
|--------------|--------------------------|---------------------------|--|
| 0 | / | 1019 MB , at least | Contains /, /opt, /usr, /var Add 200-400 MB if options are loaded, heavy printing, use is expected as with an SMS, log files can be large. |
| 2 | overlap | Entire disk | Spans the entire disk. |
| 3 | swap | 513 MB | Space for virtual memory. |
| 7 | /export/home or /data | Remainder | /export/home contains VNMR and VnmrJ user accounts. Give it as much disk space as possible. |

If the disk has enough space, the /export/home directory is created and placed in its own partition. If the disk does not have enough space, you must create /export/home later.

Alternatively, you can choose a different file system layout. Be sure, however, to always have at least the root (/) and swap file systems. Items that are selected are set up in separate partitions. Items that are not selected are collapsed into the parent file system (they become a directory); this decreases the number of file systems but increases the size of the parent file systems. For example, we usually select /usr but not /usr/openwin. This way, /usr/openwin becomes contained by /usr.

- File System and Disk Layout** – Look at the File System column. At least the root (/) and swap file systems must be present. The /export/home file system might also be present; if not, you can create a /export/home directory (using `mkdir`) later. Click **Continue** and go to the next step.

[Figure 1](#) shows some example disk layouts as they appear in the Customize Disks window, which is opened by clicking **Customize** in File System and Disk Layout.

If you chose to create more file systems than just root (/) and swap, compare the sizes listed under Size with the values listed in [Table 3](#).

- If the sizes in the window are the same or bigger than [Table 3](#), click **Continue**. Note that if a /export/home file system does not exist, you must create a directory called /export/home for VnmrJ or VNMR to use.
- If the sizes in the window are smaller than [Table 3](#), click **Customize**.

Customize Disks – Alter the size fields on the listed disks to match the sizes in [Table 3](#). Refer to [Figure 1](#) for an example disk layout for a system with an external and internal hard disk.

The first external disk is identified by **Disk: c0t0d0** and the first internal disk is identified by **Disk: c0t1d0**. Typically, the system writes as many file systems as possible on the internal disk and places the rest on the external disk.

Your goal should be to match the sizes shown in [Table 3](#) while trying to give as much space as possible to /export/home.

On a two-disk system, you might see /export/home0 on the external disk and /export/home on the internal disk. If /export/home0 is bigger than

18 GB internal (c0t1d0) with minimum slices

| Disk: c0t1d0 17269 MB | | |
|-----------------------|--------------|-------|
| 0 | / | 1819 |
| 1 | swap | 512 |
| 2 | overlap | 17269 |
| 3 | | |
| 4 | /export/home | 15938 |
| 5 | | |
| 6 | | |
| 7 | | |

Capacity: 17269 MB
Allocated 17269 MB
Free: 0 MB

Boot Device: c0t3d0s0

With this layout, the directory /export/home must be created with the `mkdir` command before VnmrJ or VNMR can be installed.

15.6 GB external (c0t0d0) and 12 GB internal (c0t1d0) with minimum slices

| Disk: c0t0d0 13040 MB | | | Disk: c0t1d0 10020 MB | | |
|-----------------------|--------------|----------|-----------------------|---------|-------|
| 0 | | | 0 | / | 1819 |
| 1 | | | 1 | swap | 512 |
| 2 | overlap | 13040 | 2 | overlap | 10020 |
| 3 | | | 3 | | |
| 4 | | | 4 | | |
| 5 | | | 5 | | |
| 6 | | | 6 | data | 7689 |
| 7 | /export/home | 13040 MB | 7 | | |

Capacity: 13040 MB
Allocated 13040 MB
Free: 0 MB

Boot Device: c0t3d0s0

Capacity: 10020 MB
Allocated 10020 MB
Free: 0 MB

With this layout, /export/home is automatically created in a slice on the external hard disk (c0t0d0)

Figure 1. Example Disk Layouts for Solaris 9

Table 3. Solaris 9 Disk Slice Sizes for VnmrJ or VNMR

| <i>Slice</i> | <i>Mount Point</i> | <i>Suggested Value</i> | <i>Description</i> |
|--------------|--------------------------|---|---|
| 0 | / | 137 MB , at least | Contains directories and files essential for system operation; e.g., kernel, device drivers, boot programs. |
| 1 | /var | 62 MB , at least | Contains systems files that are likely to change over the life of the system, e.g., compilations, mail files, uucp files, print spool files. Print files and end log files can get large. We recommend 200 MB or more. |
| 2 | overlap | | Spans the entire disk. |
| 3 | swap | 2 x RAM or at least 512 MB , whichever is more. | Space for virtual memory. Must be at least twice the amount of installed RAM or 100 MB, whichever is more. For example, for 32 MB of RAM use at least 100 MB for swap, or for 64 MB of RAM use 128 MB of swap (which is twice the RAM). Note that swap space can be added after Solaris is installed without repartitioning the disk. |
| 4 | | | |
| 5 | /opt | 25 MB , at least | Contains mount points for third-party, unbundled software, and patches. If you plan to install other software, make this larger accordingly. |
| 6 | /usr | 1546 MB | Contains many of the standard UNIX programs, including OpenWindows and CDE files and programs. |
| 7 | /export/home or /data | Remainder | /export/home contains VNMR and VnmrJ user accounts. Give it as much disk space as possible. |

/export/home, change /export/home on the internal disk to /data, and then change /export/home0 on the external disk to /export/home. That way, the entire external disk is available for /export/home, where VnmrJ or VNMR is installed (see [Figure 1](#)).

9. **Mount Remote File Systems?** – Click the **Remote Mounts** button to set up mounts to remote file systems.

This window enables you to specify and verify remote file systems to mount from a server. While you can always add remote mounts later, adding them now might be more convenient.

10. **Profile** – Check the information in the window. Click **Begin Installation** if the information is acceptable. Click **Change** if you need to change anything.

11. **Reboot After Installation?** – Select **Auto Reboot**. The system automatically reboots after Solaris is installed.

The system automatically reboots after Solaris is installed. Then, you are asked for a root password. For more information about creating a root password, refer to “[Choosing a User Password,](#)” page 46.

12. After the system has rebooted, you are prompted to activate the power saving shutdown (Autoshutdown). Select **No**.

A prompt for the second CD appears. Insert the “Solaris 9 Software, 2 of 2” CD and follow the instructions.

At this stage if you are ready to install VnmrJ or VNMR. Refer to the *Software Installation* manual that shipped with your spectrometer.

1.5 Additional Solaris 9 Software

After you have installed Solaris 9, there are five additional CDs that you can install.

- **Solaris 9 Languages** contains messages files and other software in languages other than English. The appropriate contents are installed from this CD if you configure your system to a nonEnglish locale. If you used the Solaris 9 Installation CD, any software needed from the Solaris 9 Languages CD was automatically installed.
- Two CDs labeled **Solaris 9 Documentation** contain documentation sets in PDF and HTML formats for different language groupings. The sets provide manuals for users, administrators, and developers. You can also read the manuals directly from the CD. If you used the Solaris 9 Installation CD, any software needed from the Solaris Documentation CDs was automatically installed.
- **Solaris 9 Software Supplement** contains additional software for use on Sun hardware products. This CD might also contain patches needed by some systems, such as a firmware patch that enables some older DVD drives to boot this Solaris release from DVD media. For most software on this CD, read the chapter “Installing Software from the Solaris 9 Software Supplement CD” in the *Solaris 9 Hardware Platform Guide*.
- **Solaris Software Companion** contains a collection of Linux applications and other Free and Open Source software for the Solaris 9 operating environment. For more information, visit the site <http://www.sun.com/software/solaris/freeware>. The contents of this CD are not included in the Solaris 9 Operating Environment DVD.

1.6 Sun Management Center 3.0 Platform 4 Update

Also available are three CDs for installing Sun Management Center 3.0, which is designed to simplify the task of monitoring and managing Sun components by providing a single point of management.

1.7 Adding the VNMR Icon to the CDE Tool Bar

After you have installed VNMR 6.1C and if your system is running Solaris 9, you must edit the `makeuser` script in the `/vnmr/bin` directory to get the VNMR icon to appear in the CDE tool bar, as shown in [Figure 2](#).



Figure 2. VNMR Icon in CDE Tool Bar

1. Open a Solaris terminal window or host window.
2. Change directories to `/vnmr/bin`:

```
vnmr1> cd /vnmr/bin
```
3. To edit the `makeuser` script, enter `vi makeuser`
4. Scroll through the `makeuser` script and look for the following line:

```
5.7 | 5.8 )
```
5. Change the line so that it reads

```
5.7 | 5.8 | 5.9 )
```
6. Save your change by pressing the **Esc** key and typing

```
:wq!
```
7. Run the `makeuser` command as described in the *Software Installation* manual.

Chapter 2. Solaris 8 Installation

Sections in this chapter:

- 2.1 “Solaris 8 Compatibility” this page
- 2.2 “Solaris 8 Quick Installation” page 20
- 2.3 “Solaris 8 Detailed Installation” page 21

This chapter describes how to install Solaris 8 software on a Sun computer to be used as an NMR spectrometer host.

CAUTION: If Solaris 8 is preinstalled on your computer, do not use the preinstalled software. In order for VnmrJ or VNMR to properly operate, you MUST manually load Solaris 8.

Start with *Solaris Quick Installation* in the next section to start the Interactive Solaris Installation program. Then, if you have any questions about a particular Solaris installation window, refer to the corresponding step in the section *Solaris 8 Detailed Installation*, which starts on page 21.

CAUTION: Do not use these instructions to load any other versions of Solaris except version 8 or load any other versions of VnmrJ and VNMR, unless so instructed in writing by Varian (not by Sun Microsystems, Inc.). Varian's software engineers and applications scientists have tested the compatibility of the Solaris, VnmrJ, or VNMR versions used in this manual and found it to be safe and fully operational for the supported Varian NMR spectrometer systems.

2.1 Solaris 8 Compatibility

Solaris 8 is compatible with VnmrJ and VNMR 6.1C (with appropriate patches). Solaris 8 is supported on ^{UNITY}INOVA, MERCURY-series, UNITYplus, UNITY, VXR-S, and GEMINI 2000 systems.

Solaris 8 is a 64-bit operating system that retains compatibility and functionality for the existing 32-bit environment.

Ultra 1 and Ultra 2 computers require the flash PROM update before they can run the 64-bit mode of the Solaris 8 operating environment. The flash PROM update is described in the Sun manual *Solaris 8 Sun Hardware Platform Guide*.

Systems that can only run the 32-bit mode, including sun4c, sun4d, and sun4m platforms, do not require the flash PROM update. For these systems, do not select 64-bit mode.

2.2 Solaris 8 Quick Installation

1. The Solaris installation program asks several questions about your network and system setup. Having this information before beginning the installation can save time later on.

Table 4 lists the topics of the required information. Fill in the table before starting the installation. Consult a system/network administrator if necessary.

If you need more information on a particular topic, refer to “Collecting System and Network Information for Solaris,” page 43.

Table 4. Solaris 8 Preinstallation Worksheet

| <i>Category</i> | <i>Comments</i> | <i>Your Configuration</i> |
|---|--|---------------------------|
| Host Name | Choose a host name; for example, <code>inova750</code> . Do not use: <code>inova</code> , <code>inovaauto</code> , <code>gemcon</code> , or <code>wormhole</code> . | |
| Primary Network Interface | For systems with a second Ethernet board, choose the one that will interface with the building or LAN network (not the NMR console). Use: <code>le0</code> for 10baseT Ethernet boards; <code>hme0</code> for Ultras or 10/100baseT Ethernet boards, and <code>eri0</code> for Blades. | |
| IP Address | Your network IP number for networked systems, or use 10.0.0.1 for non-networked spectrometers with no second Ethernet board | |
| Name Service | Choose NIS+ or NIS if the system is known to the name server, Choose Other if the site is using DNS, DCE, or similar. Choose None for no name service. | |
| Domain Name | Your network domain name; for example: <code>our.domain</code> | |
| Name Server | Choose Find One or Specify One If you choose Find One, the system finds name server information for you. If you choose Specify One, you will be asked for the following: Name Server Hostname – for example, <code>ourserver</code> Name Server IP Address – for example, <code>195.5.2.25</code> Subnet Mask – for example: <code>255.255.255.0</code> | |
| Proxy Server (Solaris 8, 1/01 or later) | Give name, e.g., <code>proxy.domain.com</code> | |
| Client Services Allocations | Used for allocating file systems for disk-less clients. VnmrJ or VNMR does not require client services to be set up. | |
| Disk Layout | Disk layout sizes vary according to disk size. The installation procedure suggests proper sizes. The recommended layout would include <code>/</code> and <code>swap</code> , with <code>/export/home</code> as either a directory or slice. | |

2. Power up the computer and peripherals if not already done.
3. Get to the ok prompt:
 - On a running system, log in as `root` and enter:
`# init 0`
 - On a new system, press **Stop-A** (L1-A on some keyboards) to stop the default boot routine.

Wait for the ok prompt. If the > prompt appears, enter **n**.

4. Installing Solaris 8 involves loading both CD-ROMs 1 and 2. **Do not use the Solaris 8 Installation disk! Insert the CD-ROM labeled “Solaris 8 Software, 1 of 2”** and boot up from the CD-ROM:
OK> `boot cdrom`
5. Use the information written in [Table 4](#) to fill in the Solaris installation windows.

2.3 Solaris 8 Detailed Installation

The following procedures correspond to the Solaris 8 installation windows as they appear.

- “[Language and Locale](#),” [page 21](#)
- “[Identify This System](#),” [page 21](#)
- “[Time Zone Information](#),” [page 22](#)
- “[Configuring Solaris for Installation](#),” [page 23](#)

Language and Locale

1. **Select Language and Locale** – Select **English** from the Languages list. Choose one of the following selections from the Locales List:
 - English (C – 7-bit ASCII)
 - USA–English (8859-1)
 - USA–English (ISO-8859-15)
 There is a pause.
2. **The Solaris Installation Program** – Read the information and click **Continue**.

Identify This System

This group of windows is used to identify the system. When a Confirm Information window appears, check the listed information with what you wrote in [Table 4](#).

1. **Identify This System** – Click **Continue** to begin identifying the system.
2. **Network Connectivity** – Choose **Yes** or **No** according to the following:
Choose **Yes**.
This screen appears only when a second Ethernet board is installed and enabled.
3. **DHCP** – Specify whether your system should use or should not use DHCP for network interface configuration.
4. **Primary Network Interface** – Select the primary network interface from the list. Choose an interface (in order of preference): `eri0`, `hme0`, or `le0`.
5. **Host Name** – Enter the host name of the computer. Refer to [Table 4](#).
The host name identifies the system on the network. We recommend choosing a host name that is all lower case. Do not use `inova`, `inovaauto`, `gemcon`, or `wormhole` as a host name, these are reserved for the console. Use host names like `inova750`.
The host name must be unique within the domain in which it resides, and the name must be at least two characters, containing letters, digits, and minus signs (-).
6. **IP Address** – Enter the Internet Protocol address for your system. Refer to [Table 4](#).

The IP address must follow the site's address conventions. IP addresses contain four sets of numbers separated by periods (e.g., 129.200.9.1).

- For systems with two Ethernet interfaces (e.g., one built-in and one add-on board), use an IP address provided by your network administrator.
 - For systems with one Ethernet interface *that only will be connected to the NMR console*, use 10.0.0.1 for the IP address.
 - For systems with one Ethernet interface *that will be connected to a network*, use an IP address provided by your network administrator.
7. **IPv6** – Specify whether the next generation Internet Protocol should or should not be enabled on your system.
 8. **Confirm Information** – Verify that the information in the window is correct.
 9. **Configure Security Policy** – Select **Yes** or **No** to configure Kerberos Security. At the time of this manual's publication, Varian has not verified the compatibility of the Kerberos Security software with VnmrJ or VNMR.
 10. **Confirm Information** – Verify that the information in the Kerberos window is correct.

The following windows are used to identify the name service and network used by your computer. When a Confirm Information window appears, check the listed information with what you wrote in [Table 4](#).

1. **Name Service** – Select a name service. Refer to [Table 4](#).
 - Select **NIS+** or **NIS** if the system is known to a name service.
 - Select **DNS** if the site is using DNS or a similar name service.
 - Select **LDAP** if the site is using LDAP or a similar name service.
 - Select None if the site is not using a name service.
2. **Domain Name** – Enter the domain name in which the system resides. Refer to [Table 4](#).
3. **Name Server** – Choose **Find one** or **Specify one**. Refer to [Table 4](#).
 - If you choose Find one, the system finds name server information for you.
 - If you choose Specify one, you will be asked for the following:
 - Name Server Hostname – for example, ourserver
 - Name Server IP Address – for example, 195 . 5 . 2 . 25
4. **Subnets** – Specify whether your system is or is not part of a subnet.
5. **Netmask** – for example: 255 . 255 . 255 . 0
6. **Confirm Information** – Compare the information listed in this window with the information written in [Table 4](#). There is a long pause.

Time Zone Information

This group of windows is used to set the default time zone of your system. When a Confirm Information window appears, check the listed information.

- **Time Zone** – Enter the time zone information, geographic region, date, and time for your location.

When a Confirm Information window appears, check the listed information. There is a pause.

Configuring Solaris for Installation

After the system is identified, the interactive installation program displays the next group of screens, which ask for the following information:

- Upgrade or initial installation
 - System type
 - Software group
 - Disks
 - Preserve data
 - Automatically lay out file system
 - Mount remote file systems
1. **Solaris Interactive Installation** – Choose **Initial**.
Read the information on the next screen and click **Continue**.
 2. **Select Geographic Regions** – Select the geographic regions for which support should be installed, then click **Continue**.
 3. **Select Software** – Choose **Entire Distribution plus OEM**.
We do not recommend customizing the software packages.
 4. **Select Disks** – Select the disks on which to install Solaris:
 - a. Select disks from the Available Disks side.
 - b. Click **Add** to move the disks to the Selected Disks side.
 5. **Preserve Data** – If you want to preserve a file system, keep it from being overwritten, click the **Preserve** button.
In the Preserve screen, click the box next to the disk slices you would like to preserve (e.g., /data).
 6. **Automatically Layout file Systems** – Click **Auto Layout**.

We suggest selecting the following file systems to automatically layout:

- /
 - swap
-

With only `root (/)` and `swap` selected, the other file systems in the list are collapsed into `root`. While this makes the space requirements for the `root` slice bigger, you will not be constrained by fixed-sized slices; you will have more of the disk to work with. Also, this configuration can save up to 300 MB of disk space.

If the disk has enough space, `/export/home` is created and placed in its own slice. If not, you must create a `/export/home` directory later.

Alternatively, you can choose a different file system layout. Be sure, however, to always have at least `root (/)` and `swap` file systems. Items that are selected are set up in separate partitions (slices). Items that are not selected are collapsed into the parent file system (they become a directory); this decreases the number of file systems but increases the size of the parent file systems. For example, we usually

select `/usr` but not `/usr/openwin`. This way, `/usr/openwin` becomes contained by `/usr`.

7. **File System and Disk Layout** – Look at the File System column. At least the `root (/)` and `swap` file systems must be present. The `/export/home` file system might also be present; if not, you can create a `/export/home` director (using `mkdir`) later. Click **Continue** and go to the next step.

Figure 3 shows some example disk layouts as they appear in the Customize Disks window, which is opened by clicking **Customize** in the File System and Disk Layout window.

If you chose to create more file systems than just `root (/)` and `swap`, compare the sizes listed under Size with the values listed in **Table 5**.

Table 5. Solaris 8 Disk Slice Sizes for VnmrJ or VNMR.

| <i>Slice</i> | <i>Mount Point</i> | <i>Suggested Value</i> | <i>Description</i> |
|--------------|--------------------------|---|---|
| 0 | / | 400 MB , at least | Contains directories and files essential for system operation; e.g., kernel, device drivers, boot programs. |
| 1 | /var | 60 MB , at least | Contains systems files that are likely to change over the life of the system, e.g., compilations, mail files, uucp files, print spool files. |
| 2 | overlap | | Spans the entire disk. |
| 3 | swap | 2 x RAM or at least 100 MB , whichever is more. | Space for virtual memory. Must be at least twice the amount of installed RAM or 100 MB, whichever is more. For example, for 32 MB of RAM use at least 100 MB for swap, or for 64 MB of RAM use 128 MB of swap (which is twice the RAM). Note that swap space can be added after Solaris is installed without repartitioning the disk. |
| 4 | | | |
| 5 | /opt | 25 MB , at least | Contains mount points for third-party, unbundled software, and patches. If you plan to install other software, make this larger accordingly. |
| 6 | /usr | 827 MB | Contains many of the standard UNIX programs, including OpenWindows and CDE files and programs. |
| 7 | /export/home or /data | Remainder | /export/home contains VNMR and VnmrJ user accounts. Give it as much disk space as possible. |

- If the sizes in the window are the same or bigger than **Table 5**, click **Continue**. Note that if a `/export/home` file system does not exist, you must create a directory called `/export/home` for VnmrJ or VNMR to use.
- If the sizes in the window are smaller than **Table 5**, click **Customize**.

Customize Disks – Alter the size fields on the listed disks to match the sizes in **Table 5**. Refer to **Figure 3** for an example disk layout for a system with an external and internal hard disk.

The first external disk is identified by **Disk: c0t0d0** and the first internal disk is identified by **Disk: c0t1d0**. Typically, the systems places as many

18 GB internal (c0t1d0) with minimum slices

| Disk: c0t1d0 17269 MB | | |
|-----------------------|--------------|-------|
| 0 | / | 1819 |
| 1 | swap | 512 |
| 2 | overlap | 17269 |
| 3 | | |
| 4 | /export/home | 15938 |
| 5 | | |
| 6 | | |
| 7 | | |

Capacity: 17269 MB
Allocated 17269 MB
Free: 0 MB

Boot Device: c0t3d0s0

With this layout, the directory /export/home must be created with the `mkdir` command before VnmrJ or VNMR can be installed.

15.6 GB external (c0t0d0) and 12 GB internal (c0t1d0) with minimum slices

| Disk: c0t0d0 13040 MB | | | Disk: c0t1d0 10020 MB | | |
|-----------------------|--------------|----------|-----------------------|---------|-------|
| 0 | | | 0 | / | 1819 |
| 1 | | | 1 | swap | 512 |
| 2 | overlap | 13040 | 2 | overlap | 10020 |
| 3 | | | 3 | | |
| 4 | | | 4 | | |
| 5 | | | 5 | | |
| 6 | | | 6 | data | 7689 |
| 7 | /export/home | 13040 MB | 7 | | |

Capacity: 13040 MB
Allocated 13040 MB
Free: 0 MB

Boot Device: c0t3d0s0

Capacity: 10020 MB
Allocated 10020 MB
Free: 0 MB

With this layout, /export/home is automatically created in a slice on the external hard disk (c0t0d0)

Figure 3. Example Disk Layouts for Solaris 8

files systems as possible on the internal disk and places the rest on the external disk.

Your goal should be to match the sizes shown in [Table 5](#) while trying to give as much space as possible to `/export/home`.

On a two-disk system, you might see `/export/home0` on the external disk and `/export/home` on the internal disk. If `/export/home0` is bigger than `/export/home`, change `/export/home` on the internal disk to `/data`, and then change `/export/home0` on the external disk to `/export/home`. That way, the entire external disk is available for `/export/home`, where VnmrJ or VNMR is installed (see [Figure 3](#)).

8. **Mount Remote File Systems** – Click the **Remote Mounts** button to set up mounts to remote file systems.

This window enables you to specify and verify remote file systems to mount from a server. While you can always add remote mounts later, adding them now might be more convenient.

9. **Profile** – Check the information in the window. Click **Begin Installation** if the information is acceptable. Click **Change** if you need to change anything.
10. Select **Auto Reboot**. The system automatically reboots after Solaris is installed.
The system automatically reboots after Solaris is installed. Then, you are asked for a `root` password. For more information about creating a `root` password, refer to the [“Choosing a Root Password,”](#) page 46.
11. After the system has rebooted, a prompt for the second CD appears. Insert the “Solaris 8 Software, 2 of 2” CD and follow the instructions.

Chapter 3. Solaris 7 Installation

Sections in this chapter:

- 3.1 “Solaris 7 Compatibility” [this page](#)
- 3.2 “Solaris 7 Quick Installation” [page 27](#)
- 3.3 “Solaris 7 Detailed Installation” [page 29](#)

This chapter describes how to install Solaris 7 software on a Sun computer to be used as an NMR spectrometer host.

Start with *Solaris Quick Installation* in the next section to start the Interactive Solaris Installation program. Then, if you have any questions about a particular Solaris installation window, refer to the corresponding step in the section *Solaris 7 Detailed Installation*, which starts on [page 29](#).

CAUTION: Do not use these instructions to load any other versions of Solaris except version 7 or load any other versions of VnmrJ and VNMR, unless so instructed in writing by Varian (not by Sun Microsystems, Inc.). Varian's software engineers and applications scientists have tested the compatibility of the Solaris, VnmrJ, and VNMR versions used in this manual and found it to be safe and fully operational for the supported Varian NMR spectrometer systems.

3.1 Solaris 7 Compatibility

Solaris 7 is compatible with VNMR 6.1C, but not VnmrJ. Solaris 7 is supported on UNITY^{INNOVA} and MERCURY-series, UNITY^{plus}, UNITY, VXR-S, and GEMINI 2000 systems.

Solaris 7 is a 64-bit operating system that retains compatibility and functionality for the existing 32-bit environment.

Ultra 1 and Ultra 2 computers require the flash PROM update before they can run the 64-bit mode of the Solaris 7 operating environment. The flash PROM update is described in the Sun manual *Solaris 7 Sun Hardware Platform Guide*.

System that can only run the 32-bit mode, including sun4c, sun4d, and sun4m platforms, do not require the flash PROM update. For these system, do not select 64-bit mode.

3.2 Solaris 7 Quick Installation

1. The Solaris installation program asks several questions about your network and system setup. Having this information before beginning the installation can save time later on.

Table 6 lists the topics of the required information. Fill in the table before starting the installation. Consult a system/network administrator if necessary.

If you need more information on a particular topic, refer to “Collecting System and Network Information for Solaris,” page 43.

Table 6. Solaris 7 Preinstallation Worksheet

| <i>Category</i> | <i>Comments</i> | <i>Your Configuration</i> |
|-----------------------------|---|---------------------------|
| Host Name | Choose a host name; for example, mercury300, inova750 Do not use: inova, inovaauto, gemcon, or wormhole | |
| Primary Network Interface | For systems with a second Ethernet board, choose the one that will interface with the building or LAN network (not the NMR console). Use: 1e0 for 10baseT Ethernet boards; hme0 for Ultras or 10/100baseT Ethernet boards. | |
| IP Address | Your network IP number for networked systems, or use 10.0.0.1 for non-networked spectrometers with no second Ethernet board | |
| Name Service | Choose NIS+ or NIS if the system is known to the name server, Choose Other if the site is using DNS, DCE, or similar. Choose None for no name service. | |
| Domain Name | Your network domain name; for example: our.domain | |
| Name Server | Choose Find One or Specify One If you choose Find One, the system finds name server information for you. If you choose Specify One, you will be asked for the following: Name Server Hostname – for example, ourserver Name Server IP Address – for example, 195.5.2.25 Subnet Mask – for example: 255.255.255.0 | |
| Client Services Allocations | Used for allocating file systems for disk-less clients. VNMR does not require client services to be set up | |
| Disk Layout | Disk layout sizes vary according to disk size. The installation procedure suggests proper sizes. The recommended layout would include / and swap, with /export/home as either a directory or slice. | |

2. Power up the computer and peripherals if not already done.
3. Get to the ok prompt:
 - On a running system, log in as root and enter:
init 0
 - On a new system, press **Stop-A** (L1-A on some keyboards) to stop the default boot routine.

Wait for the ok prompt. If the > prompt appears, enter **n**.
4. Insert the CD-ROM labeled “Solaris 7 Software” and boot up from the CD-ROM:
OK> **boot cdrom**
5. Use the information written in **Table 6** to fill in the Solaris installation windows.
If you have questions about a particular Solaris installation window, refer to the step in the “Solaris 7 Detailed Installation,” [this page](#) that corresponds to that window.

3.3 Solaris 7 Detailed Installation

The following procedures correspond to the Solaris 2.6 installation windows as they appear.

- “Language and Locale,” [this page](#)
- “Identify This System,” [this page](#)
- “Name Service and Network Information,” [page 30](#)
- “Time Zone Information,” [page 30](#)
- “Configuring Solaris for Installation,” [page 30](#)

Language and Locale

1. **Select Language and Locale** – Select **English** from the Languages list. Select USA–English (ASCII only) or USA–English (ISO-8859-1) from the Locales list.
2. **The Solaris Installation Program** – Read the information and click **Continue**.

Identify This System

This group of windows is used to identify the system. When a Confirm Information window appears, check the listed information with what you wrote in [Table 6](#).

1. **Identify This System** – Click **Continue** to begin identifying the system.
2. **Host Name** – Enter the host name of the computer. Refer to [Table 6](#).
 The host name identifies the system on the network. We recommend choosing a host name that is all lower case. Do not use *inova*, *inovaauto*, *gemcon*, or *wormhole* as a host name, these are reserved for the console. Use host names like *mercury300* or *inova750*.
 The host name must be unique within the domain in which it resides, and the name must be at least two characters, containing letters, digits, and minus signs (–).
3. **Network Connectivity** – Choose Yes or No according to the following:
 - Choose **Yes** if your system is a ^{UNITY}*INOVA*, *MERCURY*-series, or *GEMINI 2000*.
 - Choose **Yes** if your system is a *UNITYplus*, *UNITY*, or *VXR-S* system that **will be** connected to a network.
 - Choose **No** if your system is a *UNITYplus*, *UNITY*, or *VXR-S* system that will **not** be connected to a network, and then skip to the *Time Zone Information* section below.
4. **Primary Network Interface** – Select the primary network interface from the list. Select *hme0* if it is listed; otherwise, select *le0*.
 This screen appears only when a second Ethernet board is installed and enabled.
5. **IP Address** – Enter the IP address of the computer. Refer to [Table 6](#).
 The IP address must follow the site’s address conventions. IP addresses contain four sets of numbers separated by periods (e.g., 129.200.9.1).
 - For systems with two Ethernet interfaces (e.g., one built-in and one add-on board), use an IP address provided by your network administrator.
 - For systems with one Ethernet interface *that only will be connected to the NMR console*, use 10.0.0.1 for the IP address.

- For systems with one Ethernet interface *that will be connected to a network*, use an IP address provided by your network administrator.
6. **Confirm Information** – Compare the information listed in this window with the information written in **Table 6**.

Name Service and Network Information

This group of windows is used to identify the name service and network used by your computer. When a Confirm Information window appears, check the listed information with what you wrote in **Table 6**.

1. **Name Service** – Select a name service. Refer to **Table 6**.
 - Select NIS+ or NIS if the system is known to a name service.
 - Select Other if the site is using DNS, DCE, or a similar name service.
 - Select None if the site is not using a name service.
2. **Domain Name** – Enter the domain name in which the system resides. Refer to **Table 6**.
3. **Name Server** – Choose Find One or Specify One. Refer to **Table 6**.
 - If you choose Find One, the system finds name server information for you.
 - If choose Specify One, you will be asked for the following information:
 - Name Server Hostname – for example, ourserver
 - Name Server IP Address – for example, 195 . 5 . 2 . 25
 - Subnet Mask – for example: 255 . 255 . 255 . 0

Time Zone Information

This group of windows is used to set the default time zone of your system. When a Confirm Information window appears, check the listed information.

- **Time Zone** – Enter the time zone information, geographic region, date, and time for your location.

Configuring Solaris for Installation

After the system is identified, the interactive installation program displays the next group of screens, which ask about the following:

- Upgrade or initial installation
 - System type
 - Software group
 - Disks
 - Preserve data
 - Automatically lay out file system?
 - Remote file systems
1. **Solaris Interactive Installation** – Choose **Initial**.
Read the information on the next screen and click **Continue**.

2. **Allocate Client Service** – client services are not used by VNMR, so you can click **Continue**.

However, your network administrator might want to allocate space for diskless clients and/or autoclient systems. We provide no further detail on these settings.

3. **Select Software** – Choose **Entire Distribution plus OEM**.

We do not recommend customizing the software packages.

4. **Select Disks** – Select the disks on which to install Solaris:

- a. Select disks from the Available Disks side.
- b. Click Add to move the disks to the Selected Disks side.

5. **Preserve Data?** – If you want to preserve a file system, keep it from being overwritten, click the **Preserve** button.

In the Preserve screen, click the box next to the disk slices you would like to preserve (e.g., /data).

6. **Automatically Layout file Systems?** – Click **Auto Layout**.

We suggest selecting the following file systems to automatically layout:

- /
- swap

With only `root (/)` and `swap` selected, the other file systems in the list are collapsed into `root`. While this makes the space requirements for the root slice bigger, you will not be constrained by fixed-sized slices; you will have more of the disk to work with. Also, this configuration can save up to 300 MB of disk space.

If the disk has enough space, `/export/home` is created and placed in its own slice. If not, you must create a `/export/home` directory later.

Alternatively, you can choose a different file system layout. Be sure, however, to always have at least `root (/)` and `swap` file systems. Items that are selected are set up in separate partitions (slices). Items that are not selected are collapsed into the parent file system (they become a directory); this decreases the number of file systems but increases the size of the parent file systems. For example, we usually select `/usr` but not `/usr/openwin`. This way, `/usr/openwin` becomes contained by `/usr`.

7. **File System and Disk Layout** – Look at the File System column. At least the `root (/)` and `swap` file systems must be present. The `/export/home` file system might also be present; if not, you can create a `/export/home` director (using `mkdir`) later. Click **Continue** and go to the next step.

Figure 4 shows some example disk layouts as they appear in the Customize Disks window, which is opened by clicking **Customize** in the File System and Disk Layout window.

If you chose to create more file systems than just `root (/)` and `swap`, compare the sizes listed under Size with the values listed in **Table 7**.

- If the sizes in the window are the same or bigger than **Table 7**, click **Continue**. Note that if a `/export/home` file system does not exist, you must create a directory called `/export/home` for VNMR to use.
- If the sizes in the window are smaller than **Table 7**, click **Customize**.

Customize Disks – Alter the size fields on the listed disks to match the sizes in **Table 7**. Refer to **Figure 4** for an example disk layout for a system with an external and internal hard disk.

18 GB internal (c0t1d0) with minimum slices

| Disk: c0t1d0 17269 MB | | |
|-----------------------|--------------|-------|
| 0 | / | 1819 |
| 1 | swap | 512 |
| 2 | overlap | 17269 |
| 3 | | |
| 4 | /export/home | 15938 |
| 5 | | |
| 6 | | |
| 7 | | |

Capacity: 17269 MB
Allocated 17269 MB
Free: 0 MB

Boot Device: c0t3d0s0

With this layout, the directory /export/home must be created with the `mkdir` command before VnmrJ can be installed.

15.6 GB external (c0t0d0) and 12 GB internal (c0t1d0) with minimum slices

| Disk: c0t0d0 13040 MB | | | Disk: c0t1d0 10020 MB | | |
|-----------------------|--------------|----------|-----------------------|---------|-------|
| 0 | | | 0 | / | 1819 |
| 1 | | | 1 | swap | 512 |
| 2 | overlap | 13040 | 2 | overlap | 10020 |
| 3 | | | 3 | | |
| 4 | | | 4 | | |
| 5 | | | 5 | | |
| 6 | | | 6 | data | 7689 |
| 7 | /export/home | 13040 MB | 7 | | |

Capacity: 13040 MB
Allocated 13040 MB
Free: 0 MB

Boot Device: c0t3d0s0

Capacity: 10020 MB
Allocated 10020 MB
Free: 0 MB

With this layout, /export/home is automatically created in a slice on the external hard disk (c0t0d0)

Figure 4. Example Disk Layouts for Solaris 7

Table 7. Solaris 7 Disk Slice Sizes for VNMR

| <i>Slice</i> | <i>Mount Point</i> | <i>Suggested Value</i> | <i>Description</i> |
|--------------|--------------------------|---|---|
| 0 | / | 40 MB , at least | Contains directories and files essential for system operation; e.g., kernel, device drivers, boot programs. |
| 1 | /var | 60 MB , at least | Contains systems files that are likely to change over the life of the system, e.g., compilations, mail files, uucp files, print spool files. |
| 2 | overlap | | Spans the entire disk. |
| 3 | swap | 2 x RAM or at least 100 MB , whichever is more. | Space for virtual memory. Must be at least twice the amount of installed RAM or 100 MB, whichever is more. For example, for 32 MB of RAM use at least 100 MB for swap, or for 64 MB of RAM use 128 MB of swap (which is twice the RAM). Note that swap space can be added after Solaris is installed without repartitioning the disk. |
| 4 | | | |
| 5 | /opt | 25 MB , at least | Contains mount points for third-party, unbundled software, and patches. If you plan to install other software, make this larger accordingly. |
| 6 | /usr | 536 MB | Contains many of the standard UNIX programs, including OpenWindows and CDE files and programs. |
| 7 | /export/home or /data | Remainder | /export/home contains VNMR and VNMR user accounts. Give it as much disk space as possible. |

The first external disk is identified by **Disk: c0t0d0** and the first internal disk is identified by **Disk: c0t3d0**. Typically, the system places as many file systems as possible on the internal disk and places the rest on the external disk. Your goal should be to match the sizes shown in [Table 7](#) while trying to give as much space as possible to /export/home.

On a two-disk system, you might see /export/home0 on the external disk and /export/home on the internal disk. If /export/home0 is bigger than /export/home, change /export/home on the internal disk to /data, and then change /export/home0 on the external disk to /export/home. That way, the entire external disk is available for /export/home, where VNMR is installed (see [Figure 4](#)).

8. **Mount Remote File Systems?** – Click the **Remote Mounts** button to set up mounts to remote file systems. This window allows you to specify and verify remote file systems to mount from a server. You can add remote mounts later.
9. **Profile** – Check the information in the window. Click **Begin Installation** if the information is acceptable. Click **Change** if you need to change anything.
10. Select **Auto Reboot**. The system automatically reboots after Solaris is installed.

The system automatically reboots after Solaris is installed. Then, you are asked for a root password. For more information about creating a root password, refer to “[Choosing a Root Password,](#)” page 46.

Chapter 4. Solaris Reference Information

Sections in this chapter:

- 4.1 “Mounting a CD-ROM” this page
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- 4.3 “Opening a Host or Terminal Window” page 39
- 4.4 “System Requirements” page 40
- 4.5 “Disabling and Reenabling a X453A Thinnet Coax Ethernet Board” page 41
- 4.6 “Collecting System and Network Information for Solaris” page 43
- 4.7 “Choosing a Root Password” page 46
- 4.8 “Choosing a User Password” page 46

This appendix contains reference information for Solaris that might be useful during the software installation.

4.1 Mounting a CD-ROM

VnmrJ and VNMR ships on a CD-ROM; therefore, you will need access to a CD-ROM drive. The CD-ROM drive can be local, attached to the computer on which you are installing the software, or remote, available over the network. In either case, make sure the CD-ROM drive is correctly connected and powered up. Insert the CD in the CD-ROM drive (if necessary use a CD caddy).

Volume Manager

If you are having trouble opening the CD-ROM (`/cdrom/cdrom0`), check to see if Volume Manager is running:

```
ps -ef | grep vold
```

If you see an entry containing `/usr/sbin/vold`, Volume Manager is running.

If Volume Manager is not running, start it by becoming `root` and entering:

```
/etc/init.d/volmgt start
```

Mounting a Local CD-ROM Drive

This procedure describes how to mount the local CD-ROM drive if it is not already mounted. The CD-ROM drive is local if it is attached to the computer on which you will be loading VnmrJ or VNMR.

1. Insert the CD-ROM into the drive.
2. Become root.

3. Check to see that the CD-ROM has been mounted by Solaris as follows:

```
# cd /
# ls cdrom
```

If the `/cdrom` directory does not exist, enter the following commands:

```
# mkdir /cdrom
# mount -r -F hsfs /dev/sr0 /cdrom
```

If the `/cdrom` directory does exist but shows no files when you enter `ls`, mount the CD-ROM as follows:

```
# mount -r -F hsfs /dev/sr0 /cdrom
```

You are now ready to install the VnmrJ or VNMR software. For more information use the UNIX command `man` on `mount`, `umount`.

Mounting a Remote CD-ROM Drive

If the CD-ROM drive is attached to a remote Sun computer, you must first mount the drive locally.

Below we refer to *remotehost* as the remote host that has the CD-ROM drive attached, and we refer to the *localhost* as the local host where the VnmrJ or VNMR software is to be loaded. The procedure that needs to be followed depends on whether the *remotehost* is running Solaris or SunOS.

If the Remote Host is Running Solaris

If the remote host is running Solaris, use this procedure. If the remote host is running SunOS, skip to the next procedure.

To mount the CD-ROM drive from the *remotehost*, you need the root password and a login ID with a password for the *remotehost*.

1. Insert the CD-ROM into the drive.
2. Login to the *remotehost* as a normal user (not root, Solaris does not permit remote login as root) enter the user's password, and then become root on the *remotehost*:

```
localhost.user1> rlogin remotehost -l user2
Password:
remotehost.user2> su
Password:
```
3. The volume manager may have already mounted the CD-ROM. To check, enter `df -k` and look for an entry that looks like this: `/cdrom/vnmr_61b`. This is the entry you will use in the following steps. Otherwise, create a mount point for the CD-ROM drive and mount it on the *remotehost*:

```
# mkdir /cdrom
# mount -r -F hsfs /dev/sr0 /cdrom
```

If you get the message that the device is busy, the CD-ROM drive is already mounted; you can proceed with the rest of this procedure. Solaris normally mounts local devices during bootup.

4. Check if the file `/etc/dfs/sharetab` exists:

```
# cd /etc/dfs
# ls
dfstab      fstypes     sharetab
```

5. Whether `sharetab` exists or not, enter the `share` command as shown below. This command enables anyone on the network to mount the CD-ROM. If you want to restrict the systems that can mount the CD-ROM replace `ro` with `ro=hostname1:hostname2:hostname3:...`

```
# share -F nfs -o ro /cdrom/cdrom0
```

At this point `sharetab` exists. It tells the *remotehost* that the CD-ROM can be remotely mounted. If `sharetab` existed in step 3, the next two commands do not need to be executed. Otherwise, execute the following two commands as root:

```
# /usr/lib/nfs/nfsd -a 16
# /usr/lib/nfs/mountd
```

6. Double check with the `dfmounts` command:

```
# dfmounts
RESOURCE  SERVER          PATHNAME          CLIENTS
-         remotehost     /cdrom/cdrom0    localhost
```

The name `/cdrom` might also appear under `PATHNAME`.

7. Get back to the *localhost* by entering `exit` twice.

The first `exit` will make you `user2` on *remotehost*, the second `exit` command will bring you back on *localhost*.

8. Mount the remote CD-ROM drive as follows:

a. Become root on the *localhost*.

b. Enter the following commands:

```
# cd /
# mkdir /cdrom
# mount remotehost:/cdrom/cdrom0 /cdrom
(or remotehost:/cdrom)
```

You are now ready to install the VnmrJ or VNMR software. For more information use the UNIX command *man* on *mount*, *umount*.

After VnmrJ or VNMR is loaded, you can disable the access with `unshare /cdrom` or by rebooting *remotehost*. For more information use the UNIX command *man* on `dfmounts`, `dfstab`, `mountd`, `nfsd`, `share`, `sharetab`, `unshare`.

If the Remote Host is Running SunOS 4.1.x

If the remote host is running SunOS 4.1.x, use this procedure. If the remote host is running Solaris, use to the previous procedure.

To mount the CD-ROM drive from the *remotehost*, you need the root password of the *remotehost*.

1. Login to the *remotehost* as root:


```
localhost.user1> rlogin remotehost -l root
Password:
```
2. If not already done, make a mount point for the CD-ROM drive and mount it on the *remotehost*:


```
# mkdir /cdrom
# mount -r -t hsfs /dev/sr0 /cdrom
```

If you get a message that the device is busy, ignore it and proceed with the next steps.

- Using a text editor such as `vi`, edit the file `/etc/exports`. Check if the line below exists, if it does not exist add it. Note if the file is a new file.

```
# vi /etc/exports
```

```
/cdrom -ro
```

Access to specific systems only can be set by entering the line as

```
/cdrom -ro,access=localhost
```

- The command below enables the mount of the CD-ROM.
- If the file `/etc/exports` in step 3 was a new file, you must also start two daemons or reboot the *remotehost*:

```
# /usr/etc/nfsd 8 &
```

```
# /usr/etc/rpc.mountd -n
```

- Get back to the *localhost* typing `exit` twice.

The first `exit` will make you user2 on *remotehost*, the second `exit` command will bring you back on *localhost*.

After `VnmrJ` or `VNMR` is loaded, you can disable the access with `exportfs -u /cdrom`. To permanently disable access, you must remove the line in `/etc/exports` (or remove the file `/etc/exports`). For more information use the UNIX command man on `exports`, `exportfs`, `mountd`, `nfsd`, `showmount`, `xtab`.

- Mount the remote CD-ROM drive as follows:

- Become root on the *localhost*.

- Enter the following commands:

```
# cd /
```

```
# mkdir /cdrom
```

```
# mount remotehost:/cdrom /cdrom
```

You are now ready to install the `VnmrJ` or `VNMR` software. For more information use the UNIX command man on `mount`, `umount`.

4.2 Shutting Down the Sun Computer

Using the recommended shutdown procedure is essential for preserving data and internal housekeeping information. The Solaris operating system does not necessarily write to the disk when a program tells it to. Rather, data is kept in cache memory until Solaris determines that a write to disk is needed. Data and status information could (and will) be lost if the `L1-A` or `STOP-A` key sequences are used or if the power switch is actuated. We recommend using the `init 0` command, `halt` command, or the `shutdown -y -g120 -i0` command, which, in 2 minutes, brings the computer to run level 0 where it is safe to turn off the power.

On Sun Ultra systems, the command `init 5` shuts down the systems power.

After you are sure you have saved the files you will need later, you are ready to shut down the system and prepare to install a new version of Solaris. The steps below offer a safe method for shutting down UNIX.

To shut down the system, you must be logged in as `root` from the `login:` prompt (and not from a shell or by entering the `su` command). If you are currently in VNMR, exit VNMR before shutting down UNIX.

1. If not already logged in as `root`, log in and enter the `root` password (if used):

```
login: root
password: root_password
```
2. Change to the `/etc` directory and remove the file `acqpresent`:

```
varian# cd /etc
varian# rm acqpresent
```
3. If you want to shut down immediately, enter the `shutdown` or `init 0` command:
 - Solaris – `init 0`
 - SunOS – `/etc/shutdown -h now`

If you want to set a wait period to allow other users to get off the system, enter the `shutdown` command as follows:

- Solaris – `/etc/shutdown -y -gsec -i0`
- SunOS – `/etc/shutdown -h hour:min`

Solaris—For example, the command `/etc/shutdown -y -g30 -i0` sends messages to users warning of a shutdown in 30 seconds.

SunOS—For example, the command `/etc/shutdown -h 15:30` sends messages to users warning of a shutdown and shuts down the system at 3:30 P.M.

At shutdown, the system forces any information on its way to the hard disk to be written out immediately, cleans up any processes that are running, and executes an orderly shutdown of the system. The process takes about 20 seconds. When the system is safely shut down, the monitor prompt “>” or “ok” appears.

4.3 Opening a Host or Terminal Window

This section describes how to open a host window (sometimes referred to as a UNIX shell), which you can use to enter UNIX commands. These windows are the Common Desktop Environment (CDE) version of a command tool.

To open a terminal console or host window, do the following steps:

1. Move the mouse to a blank area on the screen, not on a window.
2. Press and hold the right mouse button. The Workspace popup window appears.
3. While holding the right mouse button, slide the cursor to **Hosts**.
4. In the drop-down, menu, select **This Host** and release the right mouse button.
The window opens.

4.4 System Requirements

This section lists some Sun and software requirements.

Sun Requirements

Varian currently supports the Sun workstations shown in [Table 8](#). This table also lists the versions of the Solaris operating system that are currently compatible with VnmrJ or VNMR software. If you purchased a Sun workstation from a source other than Varian, or plan to use an existing Sun workstation, any of the Sun workstations listed here are acceptable.

Table 8. Sun Workstations, Sun Architecture, and Solaris Versions

| <i>Sun System</i> | <i>Sun Architecture</i> | <i>Solaris Version</i> |
|-------------------|-------------------------|------------------------|
| Blade 100 and 150 | Sun-4u | 9, 8 (10/00 or later) |
| Blade 150 | Sun-4u | 9, 8 (10/02 or later) |
| Ultra | Sun-4u | 9, 8, 7 |

The host workstations must have at least 128 megabytes (MB) of RAM, but 256 MB is recommended. Solaris and VnmrJ require a minimum total hard disk space of 4 GB.

Monitors can be any size, monochrome or color. Graphics can be “plain” or the PGX version (the GX version provides higher performance). Base level graphics work fine with VnmrJ. Higher performance graphics configurations (e.g., Creator, Elite) are also compatible with VnmrJ.

Solaris Software Group Space Requirements

NMR spectrometers require the Entire Distribution plus OEM Support software group. [Table 9](#) lists the space requirements of the Solaris 9 software groups. [Table 10](#) lists the space requirements of the Solaris 8 software groups. [Table 11](#) lists the space requirements of the Solaris 7 software groups.

Table 9. Solaris 9 Software Group Space Requirements

| <i>Software Group</i> | <i>Space (MB)</i> |
|------------------------------|-------------------|
| Entire distribution plus OEM | 2151 |
| Entire Distribution | 2114 |
| Developer system support | 1927 |
| End user system support | 1471 |
| Core system support | 716 |

Table 10. Solaris 8 Software Group Space Requirements

| <i>Software Group</i> | <i>Space (MB)</i> |
|------------------------------|-------------------|
| Entire distribution plus OEM | 1321 |
| Entire Distribution | 1296 |
| Developer system support | 1249 |
| End user system support | 936 |

Table 11. Solaris 7 Software Group Space Requirements

| <i>Software Group</i> | <i>32-Bit Support (Mbytes)</i> | <i>64-Bit Support (Mbytes)</i> |
|------------------------------|------------------------------------|------------------------------------|
| Entire distribution plus OEM | 801 | 909 |
| Entire Distribution | 787 | 895 |
| Developer system support | 716 | 837 |
| End user system support | 438 | 532 |

4.5 Disabling and Reenabling a X453A Thinnet Coax Ethernet Board

The X453A Thinnet Coax Ethernet board must be disabled before Solaris is installed and then reenabled after Solaris is installed. The appropriate steps in the Solaris installation procedures refer you to the procedures in this section.

Disabling the X453A Thinnet Coax Ethernet Board

To temporarily disable the X453A thinnet coax second Ethernet board, use these steps:

1. At the ok prompt enter the following commands:

```
ok set-default sbus-probe-list
ok show-sbus
```

The system lists SBus slot assignments similar to the following:

```
SBus slot 5 ledma le SUNW, bpp espdam esp
SBus slot 4 aft-misc SUNW, CS4321 power management
SBus slot 1
SBus slot 2 le
SBus slot 3
Sbus slot 0
ok
```

The `le` represents the second Ethernet board. In the above example, it is installed in SBus slot 2. Write down the slot number of where your Ethernet board is installed.

2. Enter the following:

```
ok printenv sbus-probe-list
```

The system displays a series of digits.

```
sbus-probe-list=541230
```

3. Enter the following command, with `xxxx` representing the series of digits with the slot number containing the second Ethernet board omitted:

```
ok setenv sbus-probe-list xxxx
```

For example, entering the command with the list displayed in step 4 above, it would look like `setenv sbus-probe-list 54130`, with the number “2” omitted.

4. Enter the following to initiate the changes:

```
ok reset
```

5. Press the Stop–A (or L1–A) keys to stop the system after the Sun banner is displayed.

6. To verify that `le` is not shown next to the slot you omitted in step 6, enter:

```
ok show-sbus
```

To continue with our example, the following list would display:

```
SBus slot 5 ledma le SUNW, bpp espdam esp
SBus slot 4 aft-misc SUNW, CS4321 power management
SBus slot 1
SBus slot 2
SBus slot 3
SBus slot 0
ok
```

The system now ignores the second Ethernet board while Solaris is installed. After you install Solaris, you will reenble the second Ethernet board.

7. Boot up the Solaris CD-ROM and proceed with the Solaris installation.

To Reenable the X453A Thinnet Coax Second Ethernet Board

The steps in this section describe how to reenble the second Ethernet board. Follow the instructions in this section if you have a second Ethernet board installed and disabled it as described earlier in this manual.

1. Log in as `root` and enter the `root` password you just created:
2. At the root prompt “#,” enter:


```
# init 0
```
3. When the “ok” prompt appears, enter:


```
ok set-default sbus-probe-list
```
4. Enter the `printenv` command as follows:


```
ok printenv sbus-probe-list
```

The system displays the following with a series of digits that now include the slot number you previously eliminated:

```
sbus-probe-list 541230
```
5. Reset and reboot the Sun computer:


```
ok reset
```

Press the Stop-A (or L1-A) keys to stop the system after the Sun banner is displayed. You might have to switch back to the *new* mode.
6. Enter the `show-sbus` command and verify that the `le` entry is at the SBus slot you omitted earlier:


```
ok show-sbus
```

```
SBus slot 5 ledma le SUNW, bpp espdam esp
SBus slot 4 aft-misc SUNW, CS4321 power management
SBus slot 1
SBus slot 2 le
SBus slot 3
SBus slot 0
ok
```
7. Reboot the computer:


```
ok boot
```
8. When the system shows the login prompt, log in as `root`.

4.6 Collecting System and Network Information for Solaris

The installation program asks you to supply some system and network information before installation begins. You can save time by collecting this information now, before booting from the Solaris CD-ROM.

Use the preinstallation worksheet to record your system information. Each field on the worksheet is described in this section, describing what the field means and if VnmrJ or VNMR has special requirements in that particular area.

Stand-alone, Non-networked System—If your system is not connected to a network, you need to know or create only the host name, root password, and the time zone. If your system is on a network, you need additional information that is described in this section.

Upgrade From SunOS—If your system is already running UNIX (SunOS) and you are going to install Solaris, you must get the information from your current setup as described below. Also, check your setup with your system and network administrators. Be sure you have backed up any information you wish to keep.

Host Name

A computer on a network is often called a host. Its host name is the name that uniquely identifies the computer. When choosing a host name, make sure the name you select is unique within both your local area network and, if applicable, your name service domain.

In many networks, the choice of a host name is left up to the owner of the computer (subject to the requirement of uniqueness). A host name can be up to 64 uppercase or lowercase characters. It is strongly recommended that you use all lowercase characters in the host name because some networking software that might be used in other computers on the network could require lowercase host names. Choose a name that starts with a lowercase letter, followed by any combination of lowercase letters, numbers or hyphens. The name, however, cannot end with a hyphen.

Finding the Host Name

Enter `uname -n` from within a C Shell to display host name information for a Sun computer.

VNMR Requirements

VNMR for ^{UNITY}INOVA, MERCURY series, and GEMINI 2000 reserve the IP names `gemcon`, `inova`, `inovaauto`, and `wormhole`. Do not use these names for your host name if you are installing VNMR on one of these spectrometers. Names such as `mercury300` or `inova750`, however, can be used. We also recommend a name that is all lower-case.

Primary Network Interface

If your system has more than one Ethernet board installed, you must specify which Ethernet board (network adaptor) is the system's primary network interface.

VNMR Requirements

In order of preference, select `eri0`, `hme0` or `le0`.

IP Address

Your computer must have a unique Internet Protocol network address (IP address) if your computer is to be attached to a network.

Finding the IP Address

Ask your network or system administrator. Alternatively, you can use one of the following UNIX commands:

- If the software is being installed on a computer that is already connected to a network where NIS is present, use the command:

```
ypcat hosts | grep `uname -n`
```

Note the use of back quotes (`) to enclose the last command argument.

- If your system is not connected to a network or if NIS is not present, use:

```
grep `uname -n` /etc/hosts
```

VNMR Requirements

For NMR spectrometers with no second Ethernet board installed in the host computer, use 10.0.0.1 for the IP address. Otherwise, no special requirements for VNMR.

Name Service Type

The name service prompt allows choosing between NIS+, NIS, Other (DCE) or None.

Finding the Name Service Type

Ask your network administrator what name service the network uses.

VNMR Requirements

None.

Domain Name

The domain name is the name assigned to a group of computers that are administered together. All computers in the group (domain) are accessed by the same NIS or NIS+ maps.

Finding the Domain Name

Your network administrator should be able to provide the domain name. Or the domain name can be found by entering the command `domainname`.

VNMR Requirements

None.

Name Server Host Name and IP Address

If you select either NIS or NIS+ as the name service type, it is assumed that there is a different computer on the network that is the current NIS or NIS+ server. You can select how the name server will be found—allow the software to find one or specify one explicitly.

If you want to specify a name server, you must provide the host name and IP address of the server that provides the name service.

Finding the Name Server Information

On an existing computer, the server's name can be displayed by entering the command `ypwhich`. The server's IP address can be displayed by entering the command `ypcat hosts | grep `ypwhich``. Again, note the use of back quotes (```).

Also, during the Solaris installation, you can elect to have the system find the name server.

VNMR Requirements

None.

Enable IPv6

Consult your system administrator.

Proxy Server (Sun Blade 100 and Blade 1000)

Finding the Proxy Server Information

Use Netscape to find this information.

1. Open Netscape and select **Edit**, then **Preferences**.
2. In the Preferences window, select **Advanced**, then **Proxies**. If you know the proxy server address, enter it in either the Manual or Automatic configuration fields; otherwise consult your system administrator about network proxies.

Subnet Mask

If your system is part of a subnet, you must provide a the subnet mask number. The subnet mask is a number used to split Internet addresses into the network (Internet) and host parts.

Finding the Subnet Mask Number

If your site does not use multiple subnets, use the default number; otherwise, consult your network administrator. For a computer connected to a network, use the following command:

```
cat /etc/netmasks
```

VNMR Requirements

None.

Setting the Time Zone

Solaris software uses world time zones and automatically adjusts the system clock for daylight-savings time if appropriate. You can set the time zone by selecting geographic region, hours offset from GMT, or by selecting the name of a file in the directory `/usr/share/zoneinfo`.

4.7 Choosing a Root Password

A root password may contain any number of characters, but only the first eight characters of the password are significant. For example, if you enter `a1b2c3d4e5f6` as your root password, then `a1b2c3d4` could also be used to gain root access.

1. Enter your root password, and then enter the same password again to confirm it, as prompted. The system continues to reboot. After the message “The system is ready” appears, you are prompted to log in.
2. Type `root` at the `login:` prompt and press Return.
3. Enter your root password at the prompt. The root prompt (`#`) appears.

4.8 Choosing a User Password

Passwords help maintain system security. You can change a password with the UNIX command `passwd`. When choosing a password, consider the following:

- Select a password at least six characters long.
- Use letters or numbers or a combination of both, but do not use special characters such as `! @ # $ % ^ & * _ + | } { : ? > < \ /`. Many of these characters have special meaning to UNIX and could cause chaos if encountered in a password.
- Use either upper or lower case, but remember that since UNIX is case-sensitive, the password must be entered each time in the same case.
- Select a password that you can easily remember. If you forget your password, you cannot log into the system, and the system does not tell you, or even `root`, the password. The `root` account can, however, reset passwords.
- If extra system security is required, you might consider adding numbers or combining two dissimilar words with no space between the words.

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