

**Agilent**  
**VnmrJ 3.2 for INOVA and**  
**MERCURY*plus***

**Installation and**  
**Administration User Guide**



**Agilent Technologies**

# Notices

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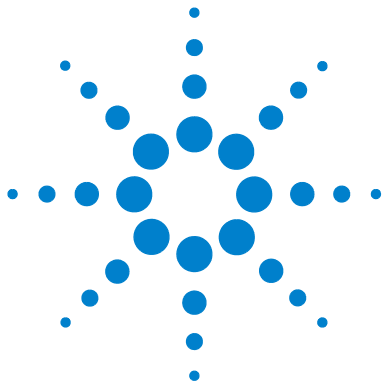
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# 1 Installation

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This chapter provides information on VnmrJ 3.2 installation requirements, installation procedures, installation options, software patches, and VnmrJ 2.2D restoration procedures.

## NOTE

After installation is complete, documentation is available in the Help menu.



## VnmrJ 3.2 Installation Requirements

- RHEL (Red Hat Enterprise Linux) 5.1/5.3/6.1 is installed on the host workstation.  
For more information, see the *VnmrJ 3.2 Linux Installation Guide*.
- Network connections between the host computer and the spectrometer have been configured.  
For more information, see “*Configuring Network Settings*” in the *VnmrJ 3.2 Linux Installation Guide*.
- The spectrometer is connected and powered on.
- Available VnmrJ 3.2 for INOVA and MERCURY*plus* Installation DVD
- Available RHEL 5.1, 5.3, 6.1 Installation DVD or RHEL 6.1 Kickstart DVD

### Compatibility

VnmrJ 3.2 is compatible with RHEL versions 5.1, 5.3, and 6.1. Currently shipping Agilent VnmrJ computers ship with RHEL 6.1 pre-installed and the RHEL 6.1 Kick start DVD.

## VnmrJ 3.2 Installation

When the VnmrJ 3.2 DVD is first loaded, the installation checks RHEL to ensure that required RHEL software packages are installed to run VnmrJ 3.2.

If additional RHEL software packages are required, a message displays indicating that the RHEL Installation DVD is needed, see [Step 4](#). If the computer was pre-configured using the RHEL 6.1 Kickstart Installation DVD, all required software packages have been supplied, go to [Step 5](#).

### NOTE

VnmrJ 3.2 automatically sets up “vnmr1” as the administrator account.

### New VnmrJ installations

- After installation is complete, use standard Linux tools to configure a password for the administrator.

### VnmrJ upgrade installations

- Run Update Users in VnmrJ Admin after installation has completed, see [Step 6](#).
- After Update Users is run the previous administrator login is available.

## Installing VnmrJ 3.2 software

### NOTE

User must be logged in as root; indicated below with “#” prompts.

- 1 Insert the VnmrJ 3.2 DVD.

A window will appear after the DVD has been mounted by the system. The title bar displays the DVD name to use in the next step.

- 2 Change to the DVD directory:  

```
# cd /media/DVD_Name
```

for example:

```
# cd /media/VnmrJ_3.2A
```

**3** Enter the following to begin installation:

```
# sh ./load.nmr
```

### NOTE

Begin installation using the terminal window. Double-clicking the **load.nmr** icon will fail.

In RHEL 5.x and 6.1, loading programs or scripts directly from the CD/DVD is not permitted.

---

If no additional RHEL software packages are required, go to [Step 5](#).

If additional RHEL software packages are required, a message box displays indicating that the RHEL Installation DVD is required, go to [Step 4](#).

**4** Installing required RHEL software packages (as needed):

**a** Eject the VnmrJ 3.2 DVD:

```
# cd /  
# eject
```

**b** Insert the RHEL Installation DVD and enter:

```
# cd /tmp/agilent_preinstall
```

**c** Wait for the DVD to be auto-mounted and enter:

```
# ./installpkgs
```

Installing RHEL software packages may take a few minutes.

**d** When prompted, click **Enter**.

**e** Eject the RHEL Installation DVD:

```
# eject
```

**f** Restart the VnmrJ installation from [Step 1](#).

**5** The VnmrJ 3.2 Installation window appears.

**a** Select the System tab associated with the installation at the top of the installation window: INOVA or *MERCURYplus*.

**b** Select the standard and password-protected VnmrJ 3.2 options, described in the two tables below. When a password-protected option is selected, a field appears to enter the case-sensitive password.

**Table 1** Standard VnmrJ 3.2 options

Option	Description
VNMR	Loads the standard VnmrJ 3.2 and VNMR software.
Biopack	Loads Biomolecular NMR software (INOVA-only).
BIR_Shapes	Loads the B1 Independent Rotations (BIR4) pulse shapes (INOVA-only).
Chinese	Loads the Chinese language support.
Fiddle_example	Loads an example dataset for Fiddle Reference deconvolution.
Imaging_or_Triax	Loads Imaging or Triple-Axis gradient software (INOVA-only).
Japanese	Loads the Japanese language support.
JChemPaint	Loads the integrated JChemPaint molecular editing software.
Jmol	Loads the integrated Jmol molecular viewing software.
Secure_Environments	Option enhanced with security features, validation features, audit trails, and other tools to help facilitate compliance with regulations associated with electronic record authenticity.
userlib	Loads the user-contributed library.

**NOTE**

VnmrJ password-protected options can be installed by the administrator after VnmrJ 3.2 installation. To access and install these options, enter `vnmrjOptions` in the VnmrJ command line.

**Table 2** VnmrJ 3.2 password-protected options

Option	Description
Projection_Reconstruction_for_Biopack	Loads the Projection_Reconstruction_for_Biopack software (Inova-only).
Diffusion	Loads the Diffusion software.
DOSY_for_VnmrJ_3.x	Loads High-Resolution Diffusion-Ordered Spectroscopy for VnmrJ 3.2 software.
LC-NMR	Loads Liquid Chromatography NMR software (Inova-only).
VnmrJ_NMRPipe	Loads the VnmrJ NMR Pipe software (Inova-only).
STARS	Loads the Spectrum Analysis of Rotating Solids software (Inova-only).

**c** At the bottom of the Installation window, the following fields display default values and may be modified: **VnmrJ home directory**, **User name**, and **Group name**.

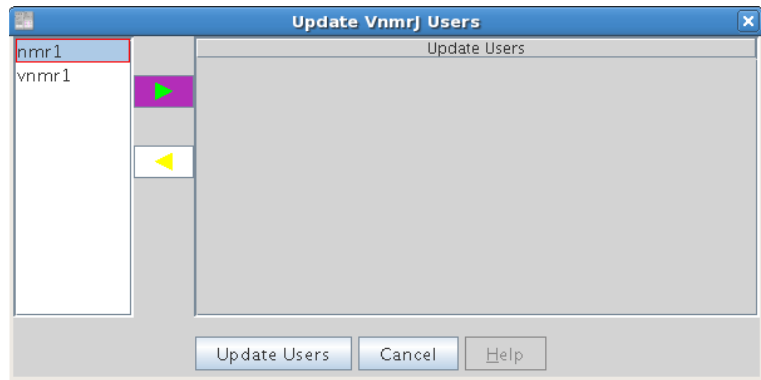
**d** Click **Install**. A second window will pop-up and display the installation progress.

After installation has completed, VnmrJ Admin will open. Use VnmrJ Admin to update existing VnmrJ user accounts—go to [Step 6](#).

If there are no existing VnmrJ user accounts, go to [Step 10](#).

**6** Go to **Configure > Users > Update Users**.

The Update VnmrJ Users window displays with user accounts listed on the left side of the window.



- 7 Select the accounts to be updated.  
Hold the Control and Shift keys to select multiple accounts with the same interface.
- 8 Click the highlighted, green arrow to move the accounts to Update Users.
- 9 Click **Update Users**.
- 10 Exit from VnmrJ Admin, **Management > Exit**.
- 11 Click **Done** on the progress pop-up to complete the installation.  
Continue to [“Configuring acquisitions communication”](#).

## Configuring acquisitions communication

This section describes how to use the `setacq` command to establish communication between the host computer and the NMR console.

### NOTE

User must be logged in as root; indicated below with “# ” prompts.

1 Enter the following in a terminal window:

```
# /vnmr/bin/setacq
```

2 Enter **yes** to blink the eth1 port, and check to make sure that the console is plugged into the eth1 port. The blinking times out in 20 seconds.

3 When prompted, reboot the console.

4 After rebooting the console, click **Enter**.

The console software will download.

5 If this is the first time VnmrJ has been installed on the computer, the `acqproc` user must be created.

To create the `acqproc` user enter the following in a terminal window:

```
# /vnmr/bin/makesuacqproc
```

6 Reboot the computer, if prompted.

## Starting and stopping console communication

Console communication programs, known as the `proc`-family, direct communication between the host computer and the console.

To start or stop console communication programs, enter the following in a terminal window:

```
# su acqproc
```

## Configuring system settings

After VnmrJ 3.2 is installed, configure the system by using the VnmrJ 3.2 System Settings window.

- 1 Log in as the administrator.
- 2 Start **VnmrJ** by double-clicking on the VnmrJ desktop icon or by entering `vnmrj` in a terminal window.
- 3 Click **Edit > System settings**.

The System Settings window has two tabs: **System** and **Display/Plot**.

- 4 Configure system settings for the spectrometer system.

**Table 3** System setting

Tab	Fields
System	<ul style="list-style-type: none"> <li>• Application mode—Spectroscopy, LC-NMR.</li> <li>• Gradient amplifier-on/off selection for each installed gradient axis.</li> <li>• Hardware Z1 shimming-none for no Z1 shimming, Delay for Z1 shimming enabled during delay time, or Presat for Z1 shimming enabled during delay time preceding presat.</li> <li>• Probe protection-check to enable.</li> <li>• VT cutoff (0-50)-specify VT cutoff temperature; 25 °C recommended.</li> <li>• Operator Login Window Position-select appropriate setting.</li> </ul>
Display/plot	<ul style="list-style-type: none"> <li>• Set display from plotter aspect ratio (<code>wysisyg</code>)-select to enable.</li> <li>• Spectrum updating during phasing (0-100)-set the percentage of the display that is updated during interactive phasing. 100 is recommended.</li> <li>• Max # of pens-number of plotter pens to use.</li> <li>• Show Tooltips-select to enable.</li> <li>• Max # of items to show in Locator-set the number of locator items to show. A Setting greater than 2000 starts to diminish the performance.</li> <li>• Display only matching items in locator-select to enable.</li> <li>• Process data on drag-and drop from locator-select to enable.</li> </ul>

## System configuration

Use the System Configuration window to configure the NMR spectrometer hardware.

- 1 Log in to the system as the administrator.
- 2 Launch VnmrJ.
- 3 Click **System config** button in the System Settings window to open the Spectrometer Configuration window.
- 4 Click **Use Console data** to update the fields.
- 5 Confirm configuration values are correct for each RF channel.

For more information on INOVA and MERCURY*plus* configuration values, see [Table 4](#), [Table 5](#), and [Table 6](#).

- 6 Click **OK** to save system settings or **Cancel** to make no changes and close the System Settings window.
- 7 Exit and restart VnmrJ 3.2.

**Table 4** General configuration

Label	Choices	Explanation
System	Spectrometer, Data station	Sets whether the function of the workstation is to control a spectrometer or to operate as a separate data station. If Data Station is selected, VnmrJ 3.2 does not allow acquisitions (the go command, its aliases, and related commands do not work).
Proton frequency	85, 100, 200, 300, 400, 500, 600, 700, 750, 800, 900, 3T, 4T	Sets <sup>1</sup> H frequency for spectrometer-type systems.
VT controller	Not present, present	Sets whether a VT controller is present.
X axis gradient, Y axis gradient, Z axis gradient	Not present, Gradient coordinate Rotator Performa I, Performa IV, Performa XYZ, Homospoil	Sets value of the spatial axis. If the system has a waveform generator option with a gradient control unit, check if the gradient values are correct next to the labels X Axis, Y Axis, and Z Axis. If the waveform generator is present for an axis, set the value to WFG+GCU. If the PFG option is installed, set the value to Performa I, Performa II, Performa III, or Performa IV; otherwise, set the value for the axis to None. Up to three gradients can be present, one for each spatial axis.

**Table 4** General configuration (continued)

Label	Choices	Explanation
System gradient coil	None, Nano, Performa_1, Performa_2, Performa_XYZ	Selects the gradient coil configuration file that defines the current installed gradient coil ( <code>sysgcoil</code> ).
Number of RF channels	1, 2, 3, 4, 5	Sets number of rf channels available (the lock channel is not included). Systems normally have 2, 3, or 4 rf channels: The first channel is for direct observation. The second channel allows decoupling or pulsing when decoupling. An optional third channel allows decoupling of a second nucleus. An optional fourth channel allows decoupling of a third nucleus. The minimum value you can select is 2. <i>Do not change this value to eliminate the use of a channel.</i> For information on how to disable a channel, refer to the descriptions of the parameters <code>dn2</code> and <code>dn3</code> in the <i>VnmrJ 3.2 Command and Parameter Reference</i> .
MAS Controller	Present, Not Present	Sets whether the MAS Controller is present.
Sample changer	None, Carousel, SMS 50 Sample, SMS 100 Sample, VAST,	Sets the type of optional sample changer. Select <b>None</b> if no sample changer is present or to disable an attached sample changer. Refer to <a href="#">Chapter 5</a> , "Automated Hardware", for more information.
Sample changer port	None, Com1, Ethernet	Sets communications port used for the sample changer. Select <b>Not Used</b> if no sample changer is present.
Agilent 28 Thin Shims	Agilent.14.Shims, Agilent.15.Shims, Oxford.15.Shims, Agilent 18.Shims, Agilent 20.Shims, Agilent 23.Shims, Agilent 26.Shims, Agilent 28.Shims, Agilent 29.Shims, Agilent 35.Shims, Agilent 40 Shims, Ultra 18 Shims, Ultra 39 Shims	Sets type of shims on the system.
Number of receivers	1, 2, or 4	Sets the number of receivers available in the system.

## 1 Installation

**Table 4** General configuration (continued)

Label	Choices	Explanation
Max Spectral Width	500 kHz, 1 MHz, 2 MHz, 5 MHz	Set to 500 kHz for UNITYINOVA. Default is 500 KHz. Set to 2 or 5 MHz for systems with Wideband NMR Module accessory.
Rotor Synchronization	Not Present, Present	Set to Present if system has the optional solids rotor synchronization accessory; else set to Not Present. This accessory requires the Acquisition Controller board (p/n 969204-0x), Pulse Sequence Controller board (p/n 992560-0x), or Digital Acquisition Controller board (p/n 1- 902022-00).
IF Frequency	10.5 MHz, 20.0 MHz	Select the intermediate frequency (IF) of your system.
Lock frequency	1 Hz to 160 MHz, in 0.1 Hz steps (enter the number directly)	The value should be the same as found in the procedure in sec, which is the nominal $^2\text{H}$ observe frequency. To observe NMR signals, the value of Lock Frequency must be set correctly.
ProTune	Present, not present	Select <b>present</b> if ProTune hardware is installed and in use, see also “ <a href="#">Setting Up Automatic Probe Tuning</a> ” on page 75.

**Table 5** RF channels configuration

Label	Choices	Explanation
Type of RF	Direct Synthesis, H1 Only, H2 Decoupler	Sets type of RF generation on the current RF channel. Direct Synthesis uses the frequency directly from the frequency synthesizer with no mixing (also called RF type C). Fixed Frequency (H1 or H2) uses RF generated from fixed frequency sources (also called RF type A).
Synthesizer	None, PTS320, PTS500, PTS620, PTS1000	Sets the model of the PTS frequency synthesizer, if present, on the current rf channel. The model number is written on the front of the synthesizer. To make a selection for the Decoupler RF Channel with a fixed-frequency decoupler, select <b>PTS***</b> for RF channels 1 and 2 (and all others, if present), where *** is the number written on the front of the synthesizer.

**Table 5** RF channels configuration (continued)

Label	Choices	Explanation
Frequency Overrange	Not Present, 10000 Hz, 100000 Hz	Sets whether current channel has special version X46 of PTS frequency synthesizer in which the signal phase is stable over a larger range of frequencies than the standard synthesizer. If Frequency Overrange is present, look at the fifth character in the serial number and select correct overrange value as follows: H, select 100000 (0.1 resolution); J, select 100000 (1:0 resolution); K, set 10000 (0.1 resolution).
Maximum power	0 to 63 for 63-dB attenuator, or -16 to 63 for 79-dB attenuator (enter number directly)	Sets the maximum power (upper limit) to the current rf channel to prevent damage from high power rf. The decoupler channel is usually set to <b>45</b> or <b>50</b> to prevent damage to the probe.
Waveform Generator	Not Present, Present	Sets whether current rf channel has a waveform generator.
Type of linear amplifier	Full band, Low band, Broadband, Shared	Sets the type of amplifier on the current rf channel. Full Band indicates the channel uses a linear full-band amplifier. Low Band indicates that the channel uses a linear low-band amplifier. Broadband indicates that the channel goes to one amplifier for all frequencies. Shared means that the amplifier is fully declared with the third channel and that the fourth channel shares this amplifier with the third channel. Contact your field service engineer if you have any questions about what class amplifiers are in your system. Refer to the <code>ampType</code> parameter in the <i>VnmrJ 3.2 Command and Parameter Reference</i> .

## 1 Installation

**Table 6** *MERCURYplus/-Vx* Configuration

Parameters*	Values	Descriptions
System	Spectrometer, Data Station	Sets whether function of the workstation is to control a spectrometer or to operate as a separate data station. If Data Station is selected, VnmrJ does not allow acquisitions (the <code>go</code> command, its aliases, and related commands do not work).
System Type	4-Nucleus, Broadband	Sets whether the function of the workstation is to control a 4-Nucleus <i>MERCURYplus/-Vx</i> NMR spectrometer or a Broadband <i>MERCURYplus/-Vx</i> NMR spectrometer. Effective June 2000, the <i>MERCURY-VX</i> 300-MHz 4-Nucleus system uses the Hi/Lo Reference Generator board. Set System Type to Broadband ( <code>rfType='fe'</code> ) for this system window. If the board type is unknown, look at the rf card cage in the back of the console. The third rf board from the left is the reference generator. If the top of the board is labeled Hi/Lo, select Broadband, but if it is labeled 4-Nucleus or 5-Nucleus select 4-Nucleus as the system type.
Proton Frequency	200, 300, 400	Sets the proton frequency for spectrometer-type systems.
VT Controller	Not Present, Present	Sets whether the VT controller is present
Type of Amplifier	4-Nucleus (35W/35W) Broadband (75W/125W) CP/MAS (100W/300W)	Specifies the type of amplifier.
Sample Changer	None, Carousel, SMS 50 Sample, SMS 100 Sample, VAST, NMS	Sets the type of optional sample changer. Select None if no sample changer is present or, if a sample changer is attached, to disable its use.
Sample Changer Serial Port	None, Com1, Ethernet	Sets serial port used for the sample changer. Select None if no sample changer is present.
Shim Set	Varian 14 Shims, Varian 18 Shims, Varian 23 Shims,	Sets type of shims on the system.
Pulsed Field Gradient	Not Present, Homospoil, Performa I, Performa II	Sets whether the optional pulsed field gradient (PFG) hardware is present. Homospoil is always present and can be used for gradient shimming and homospoil; It does not work with gradient experiments, such as gHMQC.

**Table 6** *MERCURYplus/-Vx* Configuration (continued)

Parameters*	Values	Descriptions
Lock Frequency	1 MHz to 160 MHz, in 0.1 Hz steps (entered directly)	The $^2\text{H}$ observe frequency. It is used to set the lock transmitter frequency. <b>To observe NMR signals, the Lock Frequency value must be set correctly.</b>
Max. Decoupler	0 to 63 dB, in steps of steps of 1 dB. Usually less than 50.	This value is normally limited to 50. Higher-power, continuous-decoupling can damage the probe. Increase the maximum power cautiously.
ProTune	Not Preset, Present	Sets whether or not ProTune hardware is present.

\* Several other system-wide parameters are set automatically.

## VnmrJ 3 Patches

The latest VnmrJ 3 patches can be downloaded from the Agilent NMR Software Corner, <http://www.chem.agilent.com/EN-US/Support/Pages/nmrsoftwarecorner.aspx>.

### Checking the patch level

In VnmrJ, go to **Help > About VnmrJ**.

Any installed patches will be displayed on the **About VnmrJ** pop-up.

### Downloading and installing a patch

- 1 Log in as the VnmrJ administrator.
- 2 Go to <http://www.chem.agilent.com/EN-US/Support/Pages/NMRPatches.aspx>.
- 3 Select the appropriate patch for download and installation.
- 4 Read patch-specific instructions in the associated “Readme” file.
- 5 Follow the instructions in the “Readme” file.
- 6 Click the patch name to download it.

## Restoring VnmrJ 2.2D after Installing VnmrJ 3.2

- 1 Switch the link /vnmr to VnmrJ 2.2D. As root, enter:

```
rm /vnmr
```

- 2 Confirm removal of symbolic link by entering “y”, as shown below.

```
rm: remove symbolic link `/vnmr'? y
```

- 3 Establish symbolic link to VnmrJ 2.2D by entering:

```
ln -s /home/vnmrj_2.2_D /vnmr
```

- 4 To confirm the restored link, enter:

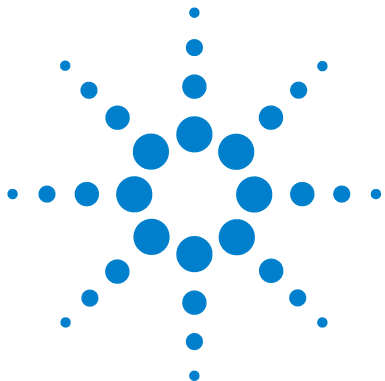
```
ls -l /vnmr
```

The following output will be displayed:

```
lrwxrwxrwx 1 root root 20 Feb 6 09:14 /vnmr ->  
/home/vnmrj_2.2_D
```

- 5 Run `setacq`.
- 6 Run `dbsetup`.





## 2 VnmrJ 3.2 Administration

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This chapter describes VnmrJ 3.2 administration procedures, administrative functions, and account administration.



## Agilent NMR Software Corner on the Web

The NMR Software Corner offers the following information for registered VnmrJ 3.2 users:

- Software patches
- Online manuals
- Agilent MR and MRI News - current issue and searchable archive
- User library - also provides additional software such as BioPack
- Magnetic Moments newsletter archive
- Upgrade information
- FAQs
- Bug lists

### Registering for Software Corner access

Use the following procedures to register as a VnmrJ 3.2 user:

- 1 Register as a VnmrJ 3.2 user to be eligible to access the User Pages.
- 2 Click **Registration Form**.
- 3 Fill in the form and click **Submit**.

## Starting the VnmrJ 3.2 Admin Interface

- 1 If the current user is the administrator, click the VnmrJ 3.2 Admin icon on the desktop and log in to the workstation using the VnmrJ 3.2 administrator login.
- 2 If the current user is not the administrator, open a terminal window and change users to the VnmrJ 3.2 administrator account.  
Enter `vnmrj admin` at the prompt.
- 3 If prompted, enter the administrator password to start VnmrJ 3.2 Admin; see [Figure 1](#).

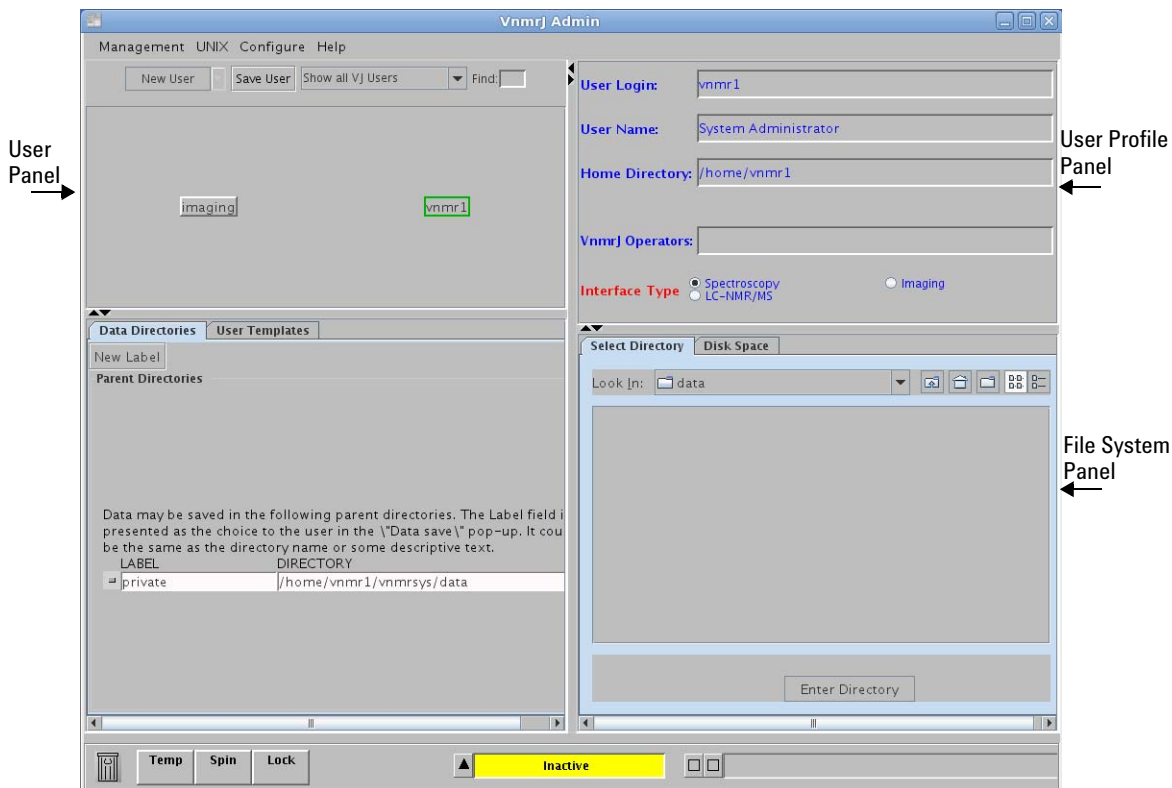


Figure 1 VnmrJ 3.2 administrator window

## VnmrJ 3.2 Admin Interface

The VnmrJ 3.2 Admin interface provides the tools for administering VnmrJ 3.2 software and user accounts, see [Figure 1](#). Select Administration functions from the menu bar.

**Table 7** VnmrJ 3.2 Admin menu

Menu item	Description
<b>Users</b>	Displays users in the users panel and makes available all the administrative functions, see <a href="#">“User Account Administration”</a> on page 31.
<b>Printers</b>	Displays printer functions using pop-up window, see <a href="#">Chapter 4, “Configuring Printers for VnmrJ 3.2”</a> .
<b>Cost/Time accounting</b>	VNMR ACCOUNTING window. See VnmrJ 3.2 Accounting Administration.
<b>Console display sharing</b>	Turns on sharing of display 0 for virtual network connections.
<b>Exit</b>	Exits and closes VnmrJ 3.2 Admin.

**Table 8** UNIX menu

Menu item	Description
<b>File system</b>	Pop-up window displays file system information; see <a href="#">“Viewing the File System”</a> on page 66, for more information and instructions.
<b>Command window</b>	Opens an operating system terminal window.

**Table 9** Configure menu

Menu Item	Description
<b>Users</b>	Select additional functions using pop-up windows: <ul style="list-style-type: none"> <li>• Convert users-opens the Change vnmr users to VnmrJ 3.2 user window. See <a href="#">“Converting user accounts to VnmrJ 3.2”</a> on page 37.</li> <li>• Defaults-opens the default values window. See <a href="#">“User account defaults”</a> on page 40.</li> <li>• Update users-opens the Update VnmrJ 3.2 Users window. See <a href="#">“Updating user accounts”</a> on page 38.</li> </ul>
<b>Operators</b>	<ul style="list-style-type: none"> <li>• Edit operators-opens the Modify Operators window (Modify Operators tab). See <a href="#">“Adding Operators to a User Account”</a> on page 46.</li> <li>• Delete operators-opens the Modify Operators window (Delete Operator tab). See <a href="#">“Deleting Operators from User Accounts”</a> on page 63.</li> <li>• Reset password-opens the Reset Operators Password window. See <a href="#">“Resetting Operator Password”</a> on page 56.</li> <li>• Preferences-opens the Preferences window for setting the default operators password and for selecting a default login icon. See <a href="#">“Setting Operator Default Password”</a> on page 55.</li> </ul>
<b>Edit profiles</b>	Creates and assigns user profiles containing the protocols, rights and tools. See <a href="#">“Creating, Editing, Viewing, and Deleting Profiles”</a> on page 50.
<b>Investigator list</b>	Enter investigators in the pop-up window.
<b>Background colors</b>	Changes the default background colors of the VnmrJ 3.2 Admin windows.

**Table 10** Help menu

Menu item	Description
<b>Online Manuals (PDF)</b>	Opens VnmrJ manuals in PDF format.
<b>Online Manuals (HTML)</b>	Opens VnmrJ HTML merged-help pages.

**Table 10** Help menu (continued)

<b>Menu item</b>	<b>Description</b>
<b>Agilent NMR Home Page</b>	Opens the Agilent NMR home page in a browser.
<b>About VnmrJ</b>	Opens information about the VnmrJ software.

## User Account Administration

User accounts are created or set up using the VnmrJ 3.2 Admin interface. You can use the VnmrJ 3.2 interface to set up new accounts and configuration, assign a group of operators to a single user account.

### VnmrJ 3.2 interfaces

Each VnmrJ 3.2 account can be set up with an interface and appropriate privileges. The main interfaces are listed in the below table.

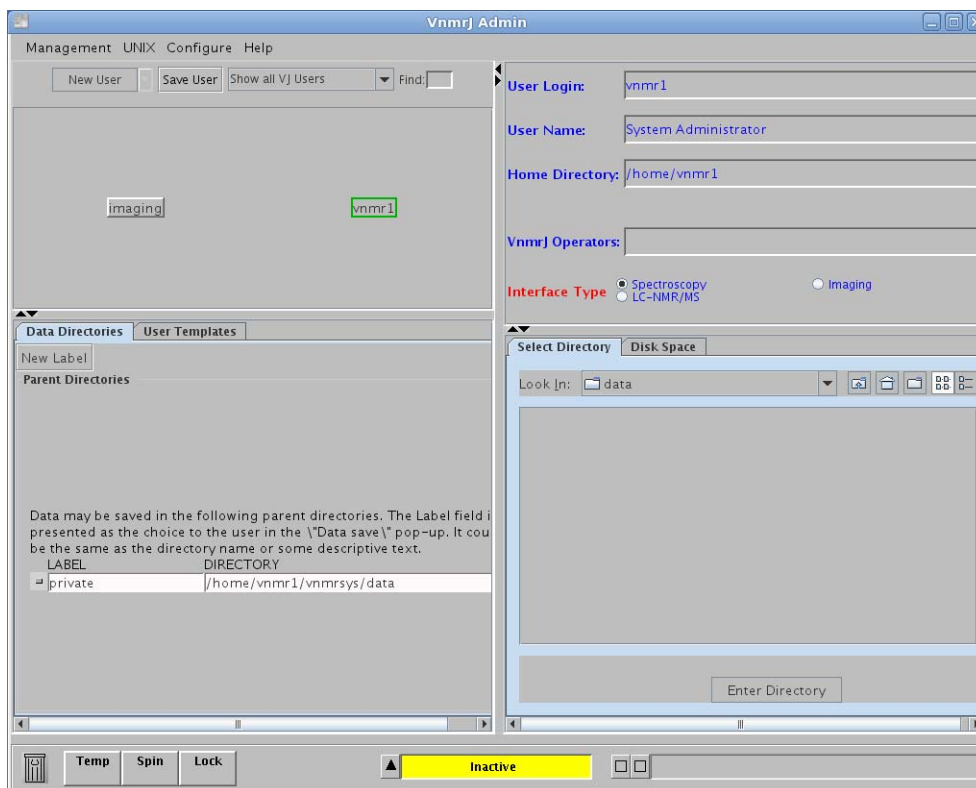
**Table 11** VnmrJ 3.2 interface menu

Interface	Description
Spectroscopy	The spectroscopy interface is designed for both automated and manual operation, with or without a sample changer. There can be two types of users of the spectroscopy account- the account owner and the operator.
Account owner	The account owner is the operating system (OS) login user, and therefore, the owner of the account and any acquisitions and data while logged in. The VnmrJ 3.2 login window (if displayed) sets the operator parameter and other properties set by VnmrJ 3.2 Admin, such as the user profile, panellevel, etc. The account owner sets up the preferences and settings of the account.
Operator	The operator is a user of the account but is not the OS login user of the account, therefore, does not own any of the files in the account. The operator has VnmrJ 3.2 access via a name and password entered on the VnmrJ 3.2 login window and can operate the software.
Imaging	The imaging interface provides the user with the full range of functions necessary for the acquisition of MRI data, the design of imaging sequences, building study protocols, and processing of imaging data.

## Creating a single new user account

Use this procedure to create a single new user account. New user accounts will contain default values set in User Account Defaults, see “User account defaults” on page 40. To create multiple new user accounts, see “Creating multiple new user accounts” on page 34.

**1** Select **Management**.



**Figure 2** VnmrJ 3.2 Admin window

- 2** Select **Users**.
- 3** Select **Show all VJ Users**.

**4 Click New User.**

New User appears with a box around it and the account's profile is displayed in the User Profile Panel.

**5 Fill in the User Profile Panel as appropriate.**

The User Profile Panel (by default) has five sections. See “[User account defaults](#)” on page 40 to view other fields, data dir, and so on.

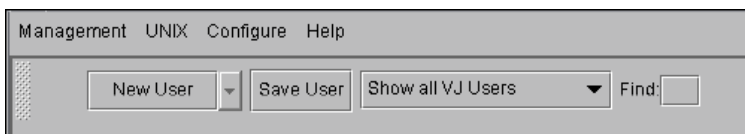
Field	Description
<b>User login</b>	Type login name and select <b>TAB</b> . Prompt is displayed in the user login field.
<b>User name</b>	Optional. Enter a user name.
<b>Home directory</b>	New users with no operating system account: Setup is automatic and applies the user defaults (see User Account Defaults). Current users with an operating system account: The user's operating system account home directory is used.
<b>VnmrJ 3.2 operators</b>	Optional. List other users with VnmrJ 3.2 operation privileges.
<b>Interface type</b>	Click the <b>Option</b> button to select the interface type, See “ <a href="#">VnmrJ 3.2 interfaces</a> ” on page 31.

**6 Click Save User.**

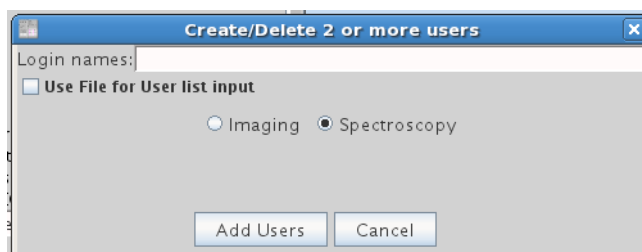
## Creating multiple new user accounts

Use this procedure to create multiple new user accounts. The new user accounts will contain default values set in User Account Defaults, see “[User account defaults](#)” on page 40. To create a single new user account, see “[Creating a single new user account](#)” on page 32.

- 1 Select **Management** from the main menu bar.



- 2 Select **Users**.
- 3 Click the **New User** arrow.
- 4 Select **Multiple Users** from the drop-down menu.
- 5 Click **New Users (2 or more)**.  
The Create 2 or more users window opens.
- 6 Enter the **login name** for each user. Separate each user name by a space.
- 7 Select the interface assigned to the multiple users. See “[VnmrJ 3.2 interfaces](#)” on page 31.



- 8 Click **Update Users**.

The home directory is automatically setup (new users - no operating system account) based upon the user defaults (see “[User account defaults](#)” on page 40). Or if the user was first set up as an operating system account, the user's operating system account home directory is used.

## Using a .csv file to add users

- 1 The .csv file's comment lines must start with a number.
- 2 In the first line, enter a list of column keywords separated by commas. The only required columns are login and itype. Column keywords can be listed in any order on the first line. List subsequent lines of values, separated by commas, in the same order as the column keywords listed on the first line.

Column keyword	Description
login	required-user login
itype	required-Spectroscopy or Imaging
name	full name or description
home	home directory for user
email	user email address
profile	basic liquids, all liquids, common liquids, all imaging

Default user information will be used for Information not defined in the .csv file, see “[User Defaults and Directories](#)” on page 40.

- 3 For each subsequent line, enter a list of values separated by commas in the same order of column keywords listed in the first line.

Example:

```
login,name,home,itype,email,profile
myuser1,My User 1,/home/myuser1,Spectroscopy,
user1mai@abc.com,BasicLiquids
```

```
myuser2,My User 2,/home/myuser2,Spectroscopy,  
user2mai@abc.com,CommonLiquids
```

### To create multiple new user accounts from a .csv file

- 1 From the menu bar, go to **Management > Users**.
- 2 Select **New User**.
- 3 Select **Multiple Users** from the drop-down menu.
- 4 Select **New Users (2 or more)**.
- 5 Select the **Use File for User list input** check box.
- 6 Select the **Create** button.
- 7 Enter the file path for the .csv input file.
- 8 Select the **Add Users** button.

### To delete multiple users through inputting a .csv file:

The input file format is technically the same as for adding users. The only required keyword and value are for “login”. That means the file must have the word “login” in the first non-comment non-empty line.

- 1 From the menu bar, go to **Management > Users**.
- 2 Select **New User**.
- 3 Select **Multiple Users** from the drop-down menu.
- 4 Select **New Users (2 or more)**.
- 5 Select the **Use File for User list input** check box.
- 6 Select the **Delete** button.
- 7 Enter the file path for the .csv input file.
- 8 Select the **Delete Users** button.

## Deleting a user account

Use this procedure to delete a user account.

- 1 Select **Management**.
- 2 Select **Users**.
- 3 Select **Show all VJ Users**.

4 Right-click the user's account and select **Delete**.

Only the user account is deleted-operators assigned to the account are not deleted. Operators can be assigned to other user accounts, see “[Adding Operators to a User Account](#)” on page 46, or deleted, see “[Deleting Operators from User Accounts](#)” on page 63.

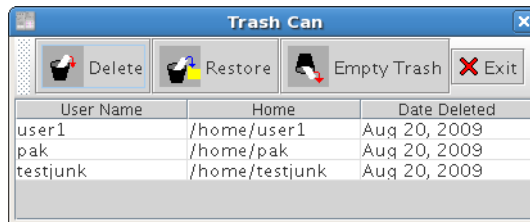
The home directory and VnmrJ 3.2 files can be restored from the trash can if the trash can has not been deleted.

## Restoring a user account

A deleted user account can be restored if the trash can has not been emptied.

1 Double-click the **Trash Can** icon.

The Trash Can window appears.



2 Select the account to be restored by clicking on it once.

3 Select **Restore**.

4 Exit the **Trash Can** window.

## Converting user accounts to VnmrJ 3.2

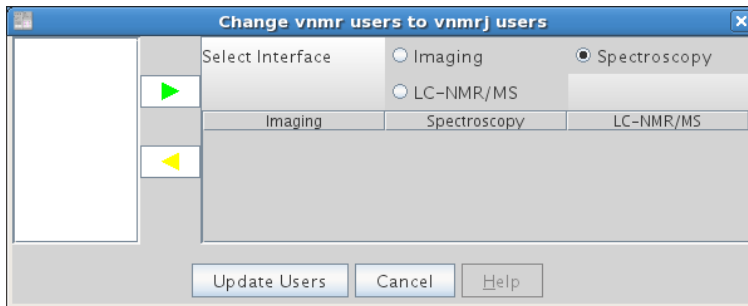
Use this procedure to convert VNMR users to VnmrJ 3.2 users.

1 Select **Configure** from the VnmrJ 3.2 Admin interface.

2 Select **Users**.

3 Select **Convert users**.

The Change vnmr users to VnmrJ 3.2 users window appears. VNMR user accounts are listed on the left side of the screen.



- 4 Click an **interface type** to sort by **interface type**.
- 5 Select the **VNMR account** to be converted.
- 6 Select the **interface type** and click the **green arrow**.
- 7 Hold the **Control** and **Shift** keys to make multiple selections of accounts with the same interface.
- 8 Repeat the previous step for other accounts using other interfaces.
- 9 Click **Update Users**.

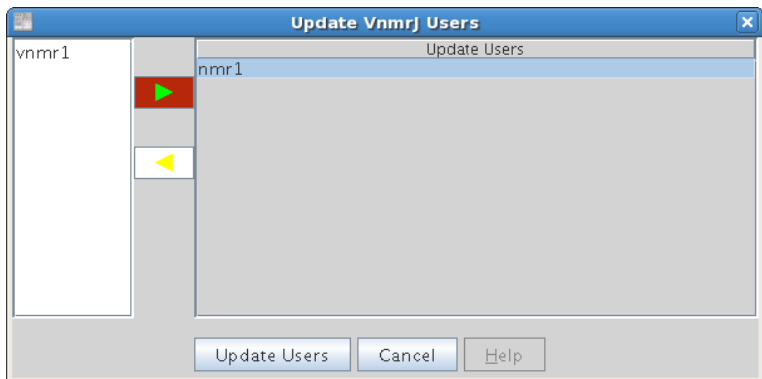
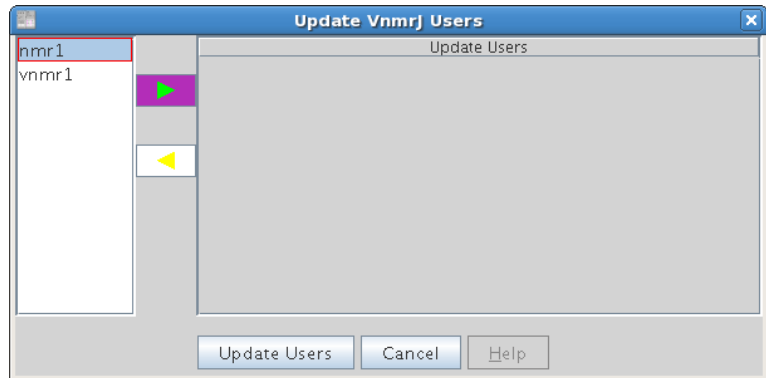
## Updating user accounts

Use this procedure to update multiple VnmrJ 3.2 user accounts.

### CAUTION

Update user accounts after upgrading or reloading software.

- 1 Select **Configure**.
- 2 Select **Users**.



**3 Select Update Users.**

The Update VnmrJ 3.2 Users window appears with VnmrJ 3.2 user accounts listed on the left side of the window.

**4 Click an **interface** to sort by that interface.**

**5 Select the accounts to be updated.**

**6 Hold the **Control** and **Shift** keys to select multiple accounts with the same interface.**

**7 Click the highlighted, green arrow to move the accounts to Update Users.**

**8 Click **Update Users**.**

## User Defaults and Directories

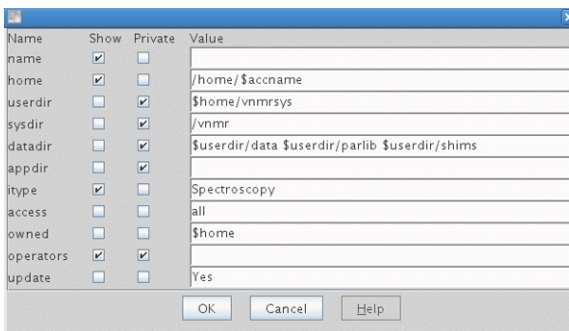
Use the VnmrJ 3.2 Admin interface to set up user account defaults, templates, and directories.

### User account defaults

Review and configure user account default properties before creating a new user account. These properties apply to all new VnmrJ 3.2 user accounts.

- 1 Select **Configure**.
- 2 Select **Users**.
- 3 Select **Defaults**.

The Defaults window appears and shows the defaults that will be used when a new user account is established.



Field	Description
Name	Full name of a user.
Home	Home directory of a user.
Userdir	Directory that contains private VnmrJ 3.2 files for a user.
Sysdir	System directory for VnmrJ 3.2.
Datadir	Path of the directories where user data is stored.

Field	Description
Appdir	Directory search path used to search for application-specific files.
itype	The itype field specifies the user interface. Spectroscopy for automation and manual operation systems.
Access	User's access level to other users' data
Owned	Directories that are owned by the user
Operators	Authorized account users. A system login is not required.
Update	When creating users, <code>makeuser</code> is automatically run to update user preferences if the value is set to Yes. This setting is only for operating system or VnmrJ 3.2 users who are already in the system

- Review the `home` field, which shows the path of a new user's home directory.

The default is set to `/home/$accname`.

The account name is `$accname` and `/home` is where the home directory of a new user account is located. This path is only used if the user is not a defined operating system user. The current home directory of existing operating system user is used.

Replace `/home` with the directory path to the user's home directory if `/home` does not exist or if the home directory of the user is located in another directory.

- Review the `itype` field (the default interface type) for new VnmrJ 3.2 users.
- Click **OK** to save your changes or **Cancel** to leave the settings unchanged.

## User Directories and Data Saving Templates

User Directories and Data Saving Templates are now set up in the user preferences interface.

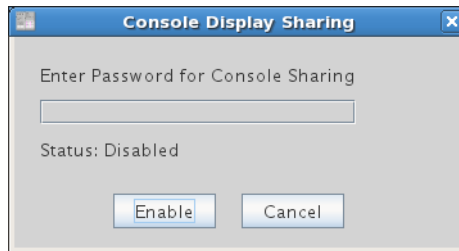
## Console Display Sharing

Use this procedure to share the console display with the virtual network connection (VNC) viewers.

To enable:

- 1 From the VnmrJ 3.2 admin interface, click **Management**.
- 2 Click **Console Display Sharing...**

The Console Display Sharing window will appear.



The status field shows if sharing is enabled or disabled. If disabled, a password entry box is present. This is the password one will use to remotely access and view the shared display (display 0).

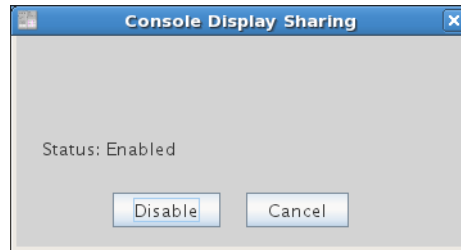
- 3 Enter a password and click **Enable**.

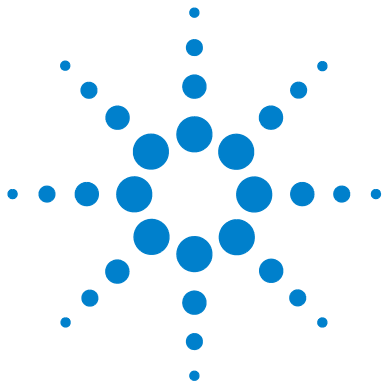
The window will now update. If this is the first time display sharing is turned on, the workstation needs to be rebooted.

To access the shared display, a new vnc viewer is needed, which will require the IP address of the workstation, the display (display 0) and the password provided in step 3.

To disable:

- 1 To disable Display Sharing, click the **Disable** button.





## 3 VnmrJ Account Administration

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Deleting Operators from User Accounts	63
Changing the Icon on the Operator Login Screen	65
Viewing the File System	66

VnmrJ 3.2 administrative functions are controlled at the VnmrJ 3.2 Admin level. Additional Spectroscopy administration functions are controlled by the Spectroscopy account owner. See Preferences in the *Automation User Guide*.



## Adding Operators to a User Account

VnmrJ 3.2 operators can be added to user accounts. Operators are added to a Spectroscopy user account—a Spectroscopy account with an operating system login. A Spectroscopy account owner sets up automation runs for operators. Operators can be VnmrJ 3.2-only operators or established VnmrJ 3.2 users.

- 1 Click **Show all VJ Users** and select the user account to which operators are to be added.
- 2 Enter the name of each operator, who has NMR privileges in the selected account in the VnmrJ 3.2 Operator field on the right panel.

Separate each operator with a space. The operators can have a mixture of VnmrJ 3.2 only operators and operators with both an operating system and VnmrJ 3.2 account.

Operators with no operating system account are assigned the default password, see [“Setting Operator Default Password”](#) on page 55.

Operators that have an operating system account use their operating system account password to access the VnmrJ 3.2 operator interface

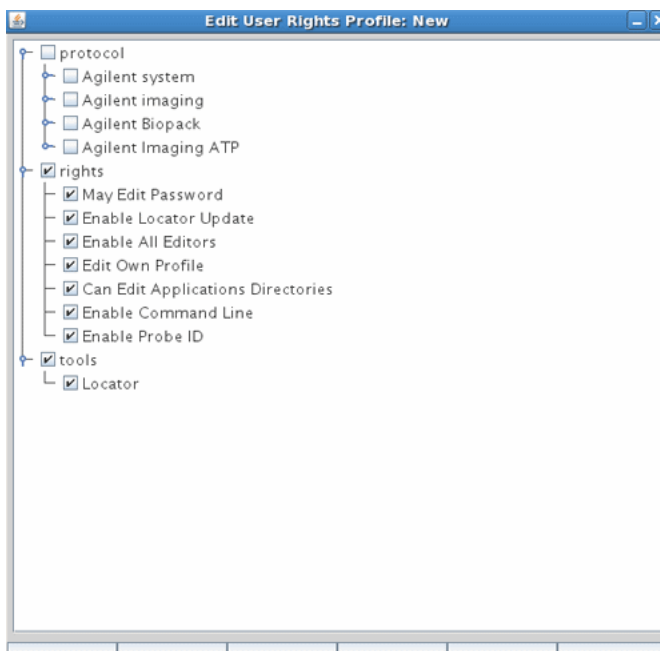
- 3 Click **Save User**.

## Creating Profiles - Spectroscopy Accounts

### Implementing profiles

Implement the operator profile for the Spectroscopy account owner and operator. The administrator creates and assigns a profile containing the protocols, rights, and tools that are available to a specific operator or assigned to several operators.

Protocols are selected from the available list of protocols or from the Profile pop-up, see [Figure 3](#).



**Figure 3** Edit user rights profile window

Rights are selected from the available rights listed in [Table 12](#).

**Table 12** User rights

<b>Right</b>	<b>Function or action allowed</b>
May edit password	Shows the Edit Password item in the Tools menu.
Enable locator update	Shows the following items in the Tools menu: Update locator submenu, Import files to locator, Save/Delete custom locator statement.
Enable all editors	Shows all items in the Edit menu, and show the Create protocols submenu in the Tools menu.
Edit own profile	Shows the Edit Config Profile item in the Edit menu.
Can edit applications directories	Allows applications edits.
Enable command line	Shows the Command Line.
Enable probe ID	Shows the Probe ID.

**Table 13** User tools

<b>Tools</b>	<b>Description</b>
Locator	Accesses database search interface.

**Table 14** User profiles

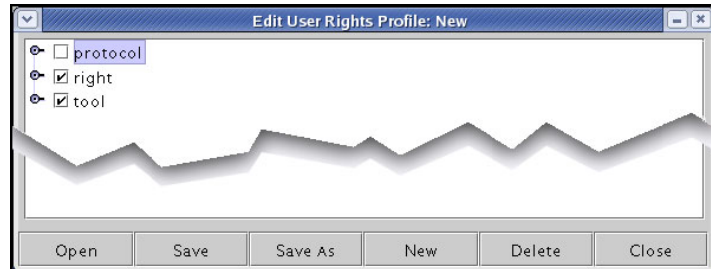
<b>User profile</b>	<b>Description</b>
AllLiquids	Contains all liquid protocols, all rights, and available tools.
BasicLiquids	Contains only a few protocols, a few rights, and available tools.
CommonLiquids	Contains common liquid protocols.
BasicLiquidsSecure	Contains a few protocols, a few rights, and available tools.

**Table 14** User profiles (continued)

<b>User profile</b>	<b>Description</b>
AllImaging	Contains imaging protocols, all rights, and all tools.
AllSolids	Contains all solids protocols, all rights, and all tools.

## Creating, Editing, Viewing, and Deleting Profiles





- 1 Start **VnmrJ 3.2 Admin**.







- 2 Click **Configure** in the main menu.
- 3 Select **Edit Profile**.

The Edit User Rights Profile window opens and displays the Profile named at the top of the window.

### Creating a new profile

- 1 Select **New** to create a new profile.
- 2 Use the file tree controls to expand or contract the file tree:
  - Expand – click the  to change it to .
  - Collapse – click the  to change it to .
- 3 Set Rights as follows:
  - Allow: Select the check box.
  - Not Allow: Clear the check box.
- 4 Use the controls at the bottom of the **Edit User Profile** window to **Save** (uses existing file name), **Save As** (prompts for new file name), or **Close** (no change) the Edit User Profile window.

## Editing or viewing an existing profile

- 1 Select **Open** to edit an existing user rights profile.
- 2 Use the file tree controls to expand or contract the file tree:
  - Expand – click the  to change it to .
  - Collapse – click the  to change it to .
- 3 Do one of the following:
  - Close after viewing the profile - Go to Step 5 and click **Close**.
  - Continue and edit the profile by going to next step (Set Rights).
- 4 Set Rights as follows:
  - Allow: Select the check box.
  - Not Allow: Clear the check box.
- 5 Use the controls at the bottom of the **Edit User Profile** window to **Save** (uses existing file name), **Save As** (prompts for new file name), or **Close** (no change) the Edit User Profile window.

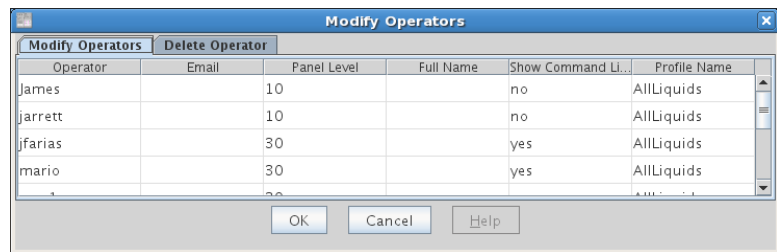
## Deleting an existing profile

- 1 Click the **Delete** button to bring up a profile browser.
- 2 Select the user profile to be deleted.
- 3 Click the **Delete** button to delete or click the **Cancel** button to exit without deleting any profiles.

## Assigning Operator Profiles

Assign a named profile to an operator using the VnmrJ 3.2 Admin interface as follows:

- 1 Start **VnmrJ 3.2 Admin**.
- 2 Click **Configure** on the main menu.
- 3 Select **Operators**.

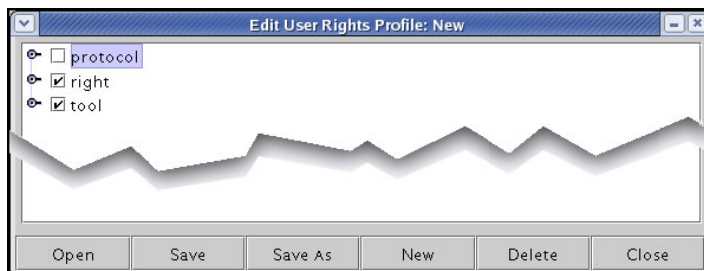




- 4 Select **Edit Operators...** to open the Modify Operators window. The last column in the Modify Operators window is for assigning the operator or account owner a Profile Name. The default is AllLiquids.
- 5 Click in the field under Profile Name for an operator to access the drop-down menu of profiles.
- 6 Select a **Profile** for operator rights. For custom profiles, see [“Creating, Editing, Viewing, and Deleting Profiles”](#) on page 50.
- 7 Click **OK** to apply the selected profile.

## Setting Rights to Edit Applications Directories Search Paths

The user AllLiquids, BasicLiquids, and AllSolids profiles supplied with VnmrJ 3.2 set many rights including the Can Edit Applications Directories right. AllLiquids user profile enables the Can Edit Applications Directories right and the BasicLiquids user profile disables the Can Edit Applications Directories right. The AllSolids profile replaces the liquids experiments in the experiment panel with the full set of solids related experiments.

- 1 Start **VnmrJ 3.2 Admin**.
- 2 Click **Configure** in the main menu.
- 3 Select **Edit Profile**.



- 4 Expand the list under right by clicking on the  to change it to .
- 5 Do one of the following:

- Select the check box next to **Can Edit Applications Directories** right, to allow the operator to edit the applications directory (default for experimental and walkup account owners).
- 1** Clear the box next to **Can Edit Applications Directories** right, to remove the right to edit the applications directory.
    - Account login users with write permission to the `/vnmr/adm/users` directory and subfiles can set applications directories for all users. Account login users without these systems write permissions and having the **Can Edit Applications Directories** right can edit and customize their private applications directories. Account login users operators who are not granted the `canEditAppdi` right cannot change their applications directories.
  - 2** Save the profile with new name or overwrite the current profile. Assign the profile to the operators associated with the spectroscopy account.
    - 1** Click **Configure**.
    - 2** Select **Operators**.
    - 3** Select **Edit operators...**
    - 4** Click in the **Profile Name** field for the operator.
    - 5** Select a Profile from the drop-down menu list. Continue for each operator.
    - 6** Click **OK** to set the assignments of the profiles and close the Modify Operators window.
  - 3** Click **Save User**.
  - 4** Click **Management**.
  - 5** Click **Exit** to close the VnmrJ 3.2 Admin window.

## Setting Operator Default Password

Set the default password for VnmrJ 3.2 operators who do not have an operating system login:

- 1 Select **Configure**.
- 2 Select **Operators**.
- 3 Select **Preferences**.

The Preferences window appears.

- 4 Enter a default password in the password field for operators who do not have an operating system login.

Operators with an operating system account login use the operating system account password to access the walkup operator interface. Operators, both with and without an operating system account, can change their passwords by selecting Change Password from the Tools menu on their interface. Change Password will change both the Operator and operating system login password, if an operating system account exists.

- 5 Click **OK**.

## Resetting Operator Password

This applies only to operators that do not have an operating system (OS) account login. Refer to the OS manual(s) to reset the password for an operator/OS account.



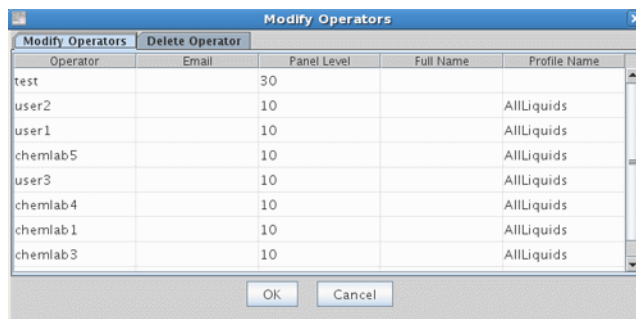
Reset an operator's password to the default password set in, [“Setting Operator Default Password”](#) on page 55, by entering the operator name and clicking on OK.

## Modifying Operators

### Opening the modify operators window

- 1 Start the **VnmrJ 3.2 Admin** interface.
- 2 Select **Configure**.
- 3 Select **Operators**.
- 4 Select **Edit operators**.

The Modify Operators window appears.



- 5 Select the **Modify Operators** tab.

## Adding or editing operator's email

If the operator's email is added, the operator is notified when a sample is finished.

- 1 See [“Opening the modify operators window”](#).
- 2 Edit or add an e-mail address.
- 3 Do one of the following:
  - Continue with [“Setting Panel Levels and Command Line Access”](#).
  - Click **OK** to close the Modify Operators window.
  - Click **Cancel** to exit from the Modify Operators window and make no changes.

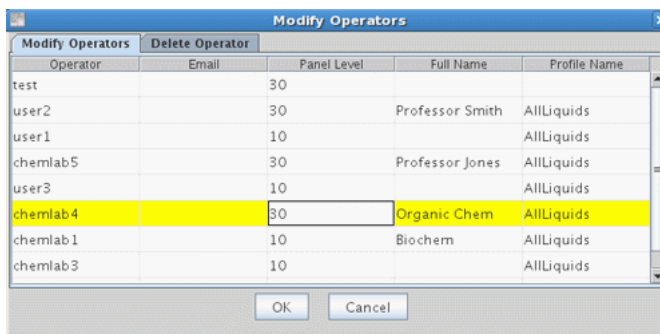
## Setting Panel Levels and Command Line Access

Panel levels are set by the VnmrJ 3.2 Administrator and determine which VnmrJ 3.2 interface pages are available under the tabs in the parameter page area. Setting panel levels applies only to walkup account owners and walkup account operators. The default is 10 for operators and 30 for the account owner. Setting the panel level higher allows for more pages to be available. The experimental VnmrJ 3.2 account has a fixed panel level of 100.

### NOTE

Panel levels can only be changed during the operator login process in the Walkup interface.

- 1 See “Opening the modify operators window” on page 57.
- 2 Change the panel level for any operator by entering a value in the Panel Level cell for the operator.



Panel level values and displayed pages are:

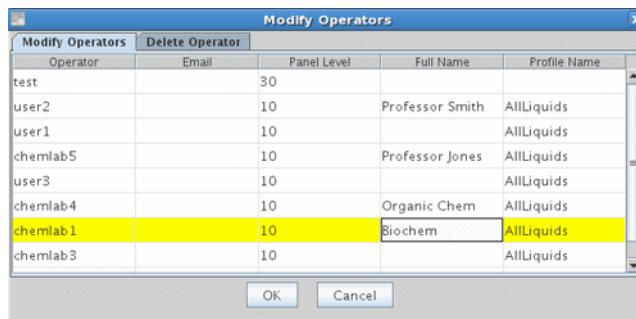
Value	Display
0-9	Shows minimum number of pages.
10-29	No shim, lock, or processing, and minimal parameter control is available. This may be used for routine automation users and is typical for a basic user. Shim and lock are available only if there is a no sample changer. Basic processing is available. Pages are not fully populated, allowing control of a few basic parameters.
30-49	All pages are available and fully populated.

**3** Type **Yes** in the field under Show Command Line to give each operator command line access. The default is no command line access.

**4** Do one of the following:

- Continue to the next section.
- Click **OK** to close the Modify Operators window.
- Click **Cancel** to exit the Modify Operators window and make no changes.

## Adding operators full name



- 1 Edit or add the full name of the operator in the field below Full Name.
- 2 Do one of the following:
  - Click **OK** to close the Modify Operators window.
  - Click **Cancel** to exit the Modify Operators window and make no changes.

## Adding or editing user profiles

- 1 See [“Creating Profiles - Spectroscopy Accounts”](#) on page 47.
- 2 Create or edit an existing user profile.
- 3 Close the Edit User Rights Profile window.
- 4 Write down the name or names of the user profiles that will be assigned to the operators.
- 5 See [“Opening the modify operators window”](#) on page 57.
- 6 Type the name of the profile (with no extension) in the field below Profile in the operator's row.

### 3 VnmrJ Account Administration



#### 7 Do one of the following:

- Click **OK** to close the Modify Operators window.
- Click **Cancel** to exit the Modify Operators window and make no changes.

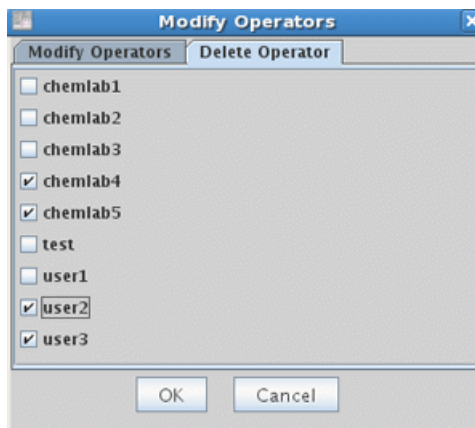
## Deleting Operators from User Accounts

Operators can be removed from all accounts or from a single account.

### Deleting operators from all assigned accounts

- 1 Select **Configure**.
- 2 Select **Operators**.
- 3 Select **Delete Operator**.

The **Modify Operators** window appears displaying the Delete Operators tab.



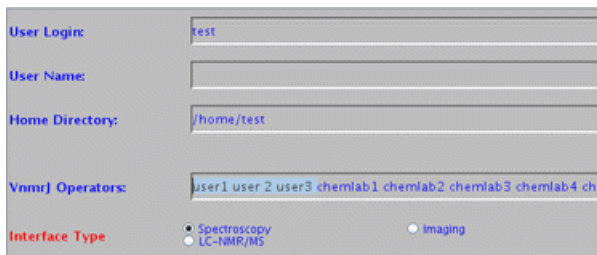
- 4 Select the operators to be removed and click **OK**.

## Deleting an operator from a single account

- 1 Select a user account.

The operators are listed in the right panel, in the VnmrJ 3.2 Operators field.

- 2 Delete the operator(s) from the list.
- 3 Click **Save User**.



The screenshot shows a user administration form with the following fields and options:

- User Login:** A text input field containing the value "test".
- User Name:** An empty text input field.
- Home Directory:** A text input field containing the value "/home/test".
- VnmrJ Operators:** A text input field containing a list of operators: "user1 user 2 user3 chemlab1 chemlab2 chemlab3 chemlab4 che".
- Interface Type:** A section with two radio button options: "Spectroscopy" (which is selected) and "Imaging". Below "Spectroscopy" is the sub-label "LC-NMR/MS".

## Changing the Icon on the Operator Login Screen


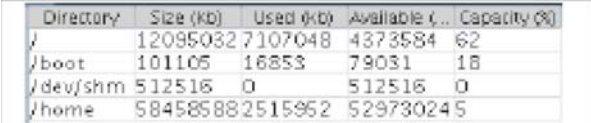





The Default Operator Login window contains the Agilent Technologies, Inc. logo, which is a GIF file. Change the logo as follows.

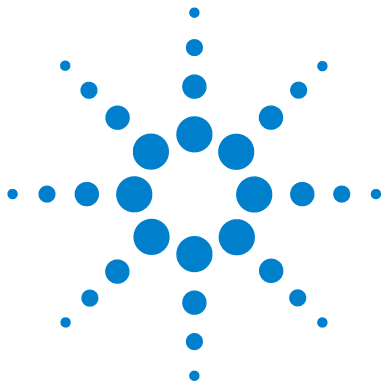
- 1 Select **Configure**.
- 2 Select **Operators**.
- 3 Select **Preferences** to display the Preferences window.
- 4 Enter the complete path to the GIF file.
- 5 Click **OK**.

## Viewing the File System

The lower right panel of the VnmrJ 3.2 Admin interface shows information about the operating system.

The Select Directory tab has the following icons:

Instruction/button/icon	Description or window																									
<p>1 Select <b>UNIX</b>.</p> <p>2 Select <b>File System</b>.</p> <p>The View Directories window opens.</p>																										
Disk space window	 <table border="1"> <thead> <tr> <th>Directory</th> <th>Size (Kb)</th> <th>Used (Kb)</th> <th>Available (Kb)</th> <th>Capacity (%)</th> </tr> </thead> <tbody> <tr> <td>/</td> <td>12095032</td> <td>7107048</td> <td>4373584</td> <td>62</td> </tr> <tr> <td>/boot</td> <td>101105</td> <td>16853</td> <td>79031</td> <td>18</td> </tr> <tr> <td>/dev/shm</td> <td>512516</td> <td>0</td> <td>512516</td> <td>0</td> </tr> <tr> <td>/home</td> <td>58458588</td> <td>2515952</td> <td>52973024</td> <td></td> </tr> </tbody> </table>	Directory	Size (Kb)	Used (Kb)	Available (Kb)	Capacity (%)	/	12095032	7107048	4373584	62	/boot	101105	16853	79031	18	/dev/shm	512516	0	512516	0	/home	58458588	2515952	52973024	
Directory	Size (Kb)	Used (Kb)	Available (Kb)	Capacity (%)																						
/	12095032	7107048	4373584	62																						
/boot	101105	16853	79031	18																						
/dev/shm	512516	0	512516	0																						
/home	58458588	2515952	52973024																							
	Change the directory to selected directory.																									
	Go to admin's <code>/home</code> directory.																									
	Create a new directory in the current directory.																									
	List files with small icons.																									
	List files with small icons and details.																									
Look In drop-down menu	Select a directory from the drop-down list. Click a directory in the directories window to select a directory. The directory is inserted in the empty directory field of user directories. See <a href="#">"User Directories and Data Saving Templates"</a> on page 42.																									



## 4 Configuring Printers for VnmrJ 3.2

Setting Up a Printer for VnmrJ 3.2 68

To configure printers for VnmrJ 3.2, first set up the printer in Linux using standard Linux system tools. Then use the Vnmr Plotter Configuration window to add or configure a printer for VnmrJ 3.2.

### NOTE

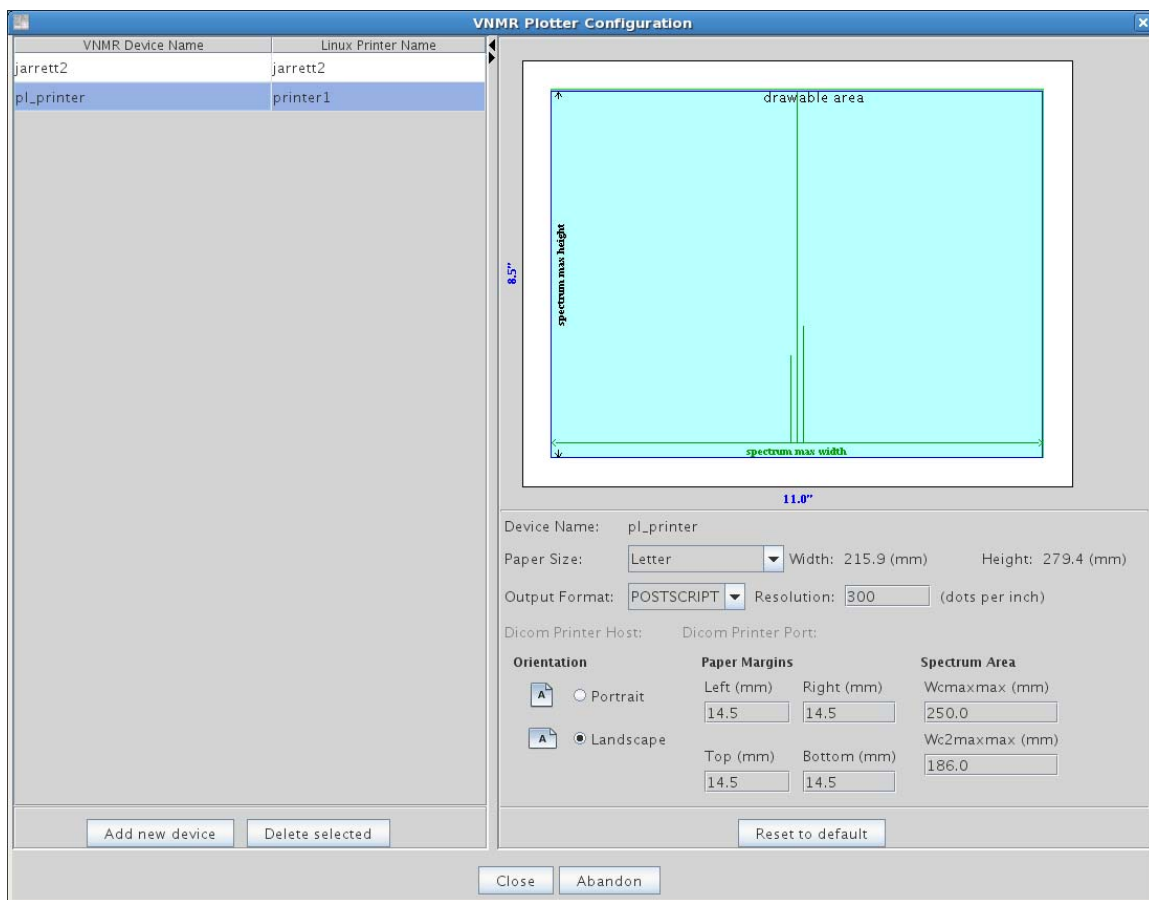
Adding or managing a printer is done by the Linux or VnmrJ 3.2 administrator.



## Setting Up a Printer for VnmrJ 3.2

Set up a VnmrJ 3.2 printer using the VNMR Plotter Configuration window.

- 1 Click the **VnmrJ 3.2 Admin** icon.
- 2 Click **Management**.
- 3 Select **Printers...** to open the VNMR Plotter Configuration window.



- 4 Select an available printer from the Linux Printer Name pull-down menu.
- 5 Enter in a Name that VnmrJ 3.2 will use to recognize this printer in the VNMR Device Name entry window.
- 6 Configure VnmrJ 3.2 page settings on the right of the VNMR Plotter Configuration window: paper size, output format, dots per inch (dpi), paper orientation, and printable area.

**NOTE**

The **Reset to default** button resets the printer configuration to the last saved settings. It does not restore the settings to a “factory default.”

- 7 Click **Close** to save and close the VNMR Plotter Configuration. To abandon all changes, click **Abandon**.
- 8 To delete a printer, select the printer in the VNMR Device Name column.
- 9 Click **Delete selected**, then click **Close** to save the deletion and close the VnmrJ 3.2 Plotter Configuration window.

**NOTE**

To use a non-standard device type, create a printer with the VNMR Plotter Configuration window then edit that printer entry in the `/vnmr/devicenames` file to contain the appropriate type. See [Table 15](#) for various types and descriptions.

**Table 15** VnmrJ 3.2 printer and plotter types with descriptions

VnmrJ 3.2 device type	Description
HP7475A	HP7475 plotter
HP7550A	HP7550 plotter using 11x17 inch paper
HP7550A8	HP7550 plotter using 8 1/2 x 11 inch paper
DeskJet_300	HP DeskJet using 300 dpi and a vertical (portrait) orientation in which only the top part of the page can be used for plotting. This value not recommended.
DeskJet_300R	HP DeskJet using 300 dpi and a horizontal (landscape) orientation in which the entire page can be used for plotting, and a vertical orientation for printing.
DraftPro_C	HP DraftPro plotter using size C paper

## 4 Configuring Printers for VnmrJ 3.2

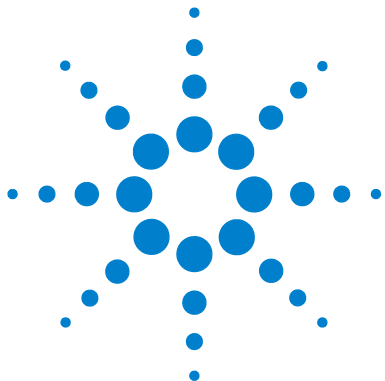
**Table 15** VnmrJ 3.2 printer and plotter types with descriptions (continued)

VnmrJ 3.2 device type	Description
DraftPro_D	HP DraftPro plotter using size D paper
DraftMaster_A	HP DraftMaster plotter using size A paper
DraftMaster_B	HP DraftMaster plotter using size B paper
DraftMaster_C	HP DraftMaster plotter using size C paper
DraftMaster_D	HP DraftMaster plotter using size D paper
DraftMaster_E	HP DraftMaster plotter using size E paper
LaserJet_150	HP LaserJet (or DeskJet) using 150 dpi and a vertical (portrait) orientation in which only the top part of the page can be used for plotting. This value not recommended.
LaserJet_150R	HP LaserJet (or DeskJet) using 150 dpi and a horizontal (landscape) orientation in which the entire page can be used for plotting, and a vertical orientation for printing.
LaserJet_300	HP LaserJet (or DeskJet) using 300 dpi and a vertical (portrait) orientation in which only the top part of the page can be used for plotting. This value not recommended.
LaserJet_300R	HP LaserJet (or DeskJet) using 300 dpi and a horizontal (landscape) orientation in which the entire page can be used for plotting, and a vertical orientation for printing.
LJ_B_300R	HP LaserJet (or DeskJet) using 300 dpi, B-size paper, and a horizontal (landscape) orientation in which the entire page can be used for plotting, and a vertical orientation for printing.
LJ_A3_300R	HP LaserJet (or DeskJet) using 300 dpi, A3-size paper, and a horizontal (landscape) orientation in which the entire page can be used for plotting, and a vertical orientation for printing.
LJ_A3_300R	HP LaserJet (or DeskJet) using 300 dpi, A3-size paper, and a horizontal (landscape) orientation in which the entire page can be used for plotting, and a vertical orientation for printing.
LaserJet_4550	HP Color LaserJet using 600 dpi.
LaserJet_600R	HP LaserJet (or DeskJet) using 600 dpi and a horizontal (landscape) orientation in which the entire page can be used for plotting, and a vertical orientation for printing.
LJ_B_600R	HP LaserJet (or DeskJet) using 600 dpi, B-size paper, and a horizontal (landscape) orientation in which the entire page can be used for plotting, and a vertical orientation for printing.
LJ_A3_600R	HP LaserJet (or DeskJet) using 600 dpi, A3-size paper, and a horizontal (landscape) orientation in which the entire page can be used for plotting, and a vertical orientation for printing.
PS_A	PostScript printer using vertical (portrait) orientation in which only the top part of the page can be used for plotting. This value is not recommended.

**Table 15** VnmrJ 3.2 printer and plotter types with descriptions (continued)

<b>VnmrJ 3.2 device type</b>	<b>Description</b>
PS_AR	PostScript printer (for example, PS4069) using horizontal (landscape) orientation in which the entire page can be used for plotting, and a vertical orientation for printing.
PS4079_HPGL	Lexmark PS4079 or PS4079 plus using 11x17 inch paper in HPGL mode. HPGL mode is required for color output.
QuietJet_96	HP QuietJet using low 96 dpi and a vertical (portrait) orientation in which only the top part of the page can be used for plotting. This value not recommended.
QuietJet_96R	HP QuietJet using 96 dpi and a horizontal (landscape) orientation in which the entire page can be used for plotting, and a vertical orientation for printing.
QuietJet_192	HP QuietJet using 192 dpi and a vertical (portrait) orientation in which only the top part of the page can be used for plotting. This value not recommended.
QuietJet_192R	HP QuietJet using 192 dpi and a horizontal (landscape) orientation in which the entire page can be used for plotting, and a vertical orientation for printing.
ThinkJet_96	HP ThinkJet using 96 dpi and a vertical (portrait) orientation in which only the top part of the page can be used for plotting. This value not recommended.
ThinkJet_96R	HP ThinkJet using 96 dpi and a horizontal (landscape) orientation in which the entire page can be used for plotting, and a vertical orientation for printing.
ThinkJet_192	HP ThinkJet using 192 dpi and a vertical (portrait) orientation in which only the top part of the page can be used for plotting. This value not recommended.
ThinkJet_192R	HP ThinkJet using 192 dpi and a horizontal (landscape) orientation in which the entire page can be used for plotting, and a vertical orientation for printing.

## 4 Configuring Printers for VnmrJ 3.2



## 5 Automated Hardware

Setting Up Automated Sample Handling [74](#)

Setting Up Automatic Probe Tuning [75](#)

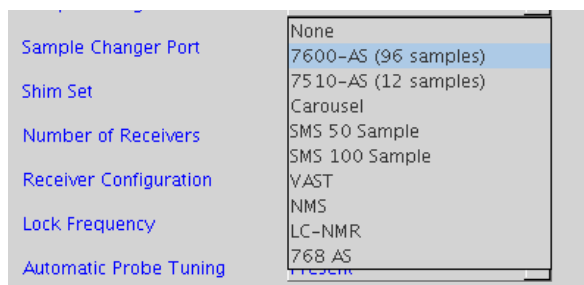
This section describes how to configure software to control automated hardware.

Setup procedures require administrator access.



## Setting Up Automated Sample Handling

- 1 Log in as the administrator.
- 2 Click **Edit** on the main menu.
- 3 Select **System settings**.
- 4 Click the **System config** button.
- 5 Click the **drop-down** menu next to the Sample Changer field and select a sample changer option.



- 6 Click the **drop-down** menu next to the Sample Changer Port field.
- 7 Select a sample changer port.
- 8 Click the **drop-down** menu next to the Sample Changer Port field.

SMS 50, SMS 100, Carousel, VAST	Select Com1
Not used or no sample handler	None

Operating and other instructions specific to an automated sample handling option are contained in the Automation manual and their corresponding hardware manuals.

- 9 Click **OK**.

## Setting Up Automatic Probe Tuning

### Configuring the Software for ProTune

- 1 Log in as the administrator.
- 2 Click **Edit** on the main menu.
- 3 Select **System Settings**.
- 4 Click the **System config** button.
- 5 Select **Present** from the drop-down menu next to the Automatic Probe Tuning field.
- 6 Click **OK**.
- 7 Continue with “[Loading chan# and motor# Persistence Files](#)”.

### Loading chan# and motor# Persistence Files

AutoX-compatible probes ship with a CD containing Persistence files (chan# and motor# files) specific to that probe. These files characterize the probe for the Automatic probe tuning accessory and are used the first time the probe is automatically tuned.

Load the Persistence files as follows:

- 1 Insert the CD with probe Persistence files into the CD ROM drive.
- 2 Open a terminal window and do one of the following:

Locate the system **probe** file.

**a** Type:

```
cd /vnmr/probes
ls
```

**b** Write down the <name of probe file>.

**c** Continue with step 3.  
Create a probe system file.

**d** Follow the procedure in “[Setting up, selecting, and creating a probe calibration file](#)” on page 117.

**e** Type:

```
cd /vnmr/probes
ls
```

**f** Verify and write down the <name of probe file>.

**g** Continue with step 3.

**3** Type:

```
cd /vnmr/tune
mkdir <name of probe file>
```

**4** Change to the CDROM directory and enter one of the following:

```
cd /media/cdrecorder
```

**5** Copy the Persistence files from the CDROM to the created probe directory:

```
Type: cp * /vnmr/tune/<name of probe file>
```

**6** Verify that the files were copied.

```
Type: ls /vnmr/tune/<name of probe file>
```

The new ProbeName directory should contain six chan# files (chan#0 through chan#5) and six motor# files (motor#0 through motor#5) for standard AutoX and OneNMR probes.

ProTune software copies the probe Persistence files to the directory `~user/vnmrsys/tune` the first time it is run by a user. If the directory has not been created, the directory is created. A database of reference values is maintained in the local directory.

## Configuring Default Tuning Parameters for Autotuning in Automation

Click the "Edit Probe" button in the "Probe" window and the "Probe Edit: ProbeName" window will open:

ADD Screenshot

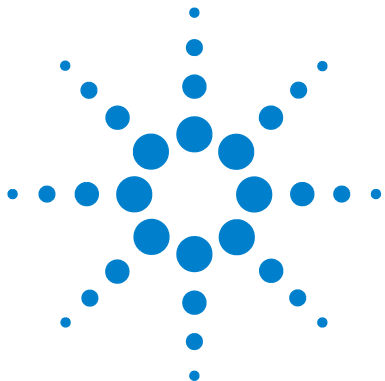
For OneNMR and AutoX probes we recommend following default entries:

Probewtune - 'st12'

Probetunemethod - 'lohi'

For more information about these parameters refer to the User and/or Commands and Parameters manuals.





## 6 VnmrJ 3.2 Accounting Administration

Starting VnmrJ 3.2 Accounting	80
VnmrJ 3.2 Accounting Window Interface	81
Generating Invoices	84
Creating or Editing an Account	85
Establishing or Editing a Billing Rate Schedule	87
Controlling Properties	90
Invoice Properties	91
File Locations	92
Properties File Contents	93
Error Messages	95
Accounting Limitations	98

The VnmrJ 3.2 Accounting tool provides NMR administrators an effective way to keep a log of VnmrJ 3.2 users. Use VnmrJ 3.2 Accounting to create groups of console users with single-rate or multi-rate billing, show and print invoices and accounting reports.



## Starting VnmrJ 3.2 Accounting

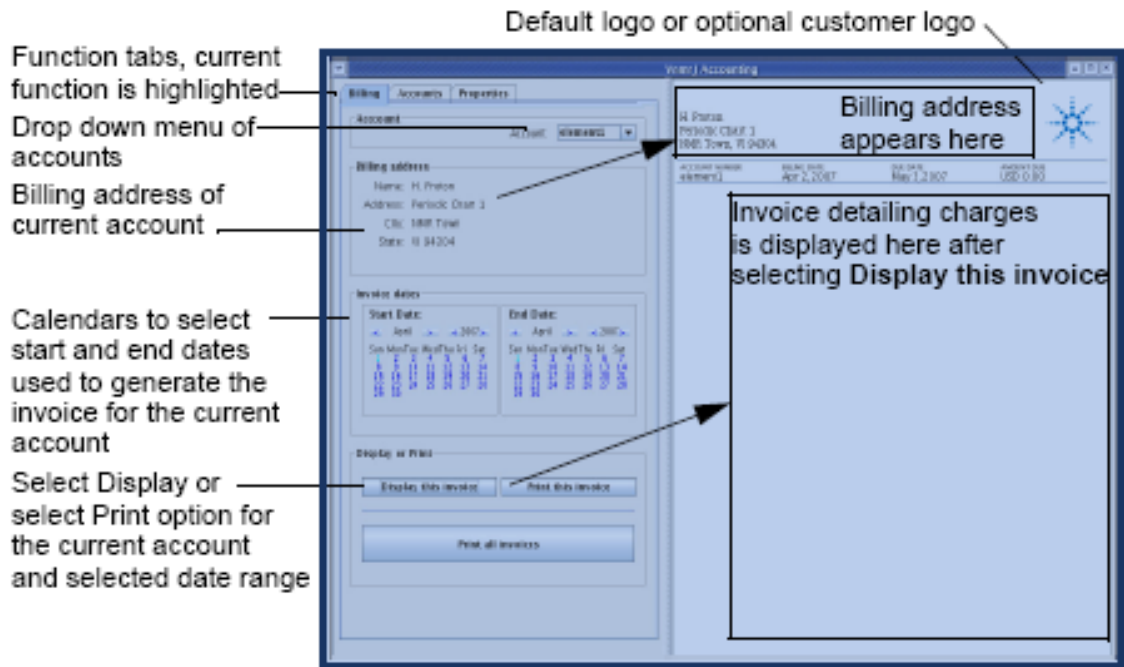
Start VnmrJ 3.2 Accounting from:

- VnmrJ 3.2 Admin
  - a Log in as the administrator.
  - b Start **VnmrJ 3.2 Admin**.
  - c Click **Management** in the menu bar.
  - d Select **Cost/Time Accounting**.
- Terminal Window
  - a Open a terminal window.
  - b Change users to the administrator if the terminal window is not opened while logging in as the administrator.
  - c Type `vnmr_accounting`

# VnmrJ 3.2 Accounting Window Interface

## Billing

Click the **Billing** tab to open the Billing window. See [Figure 4](#).



**Figure 4** VnmrJ 3.2 accounting billing window

## Accounts

Click the **Accounts** tab to open the Accounts window; see Figure 5.

Default logo or optional customer logo

Function tabs, current function is highlighted

Drop down menu of accounts to edit or add new account

Billing address of current account to edit or enter address for a new account

Rate schedules for access charge and hourly usage charges

List of all VnmrJ account owners and VnmrJ operators

Click Save bar to save account details to selected or new account

Billing address appears here

Invoice layout for detailing charges is displayed here

VnmrJ Accounting

Billing Accounts Properties

Account: [selected] [dropdown]

Billing address

Name: [text box]

Address: [text box]

City: [text box]

State: [text box]

Rate schedule

Start	Time	Login Rate	Login/hr
None	08:00:00	1.0000	1.0000
5x	17:00:00	1.0000	1.0000

Buttons: [Add Rate] [Delete Row]

Owners and operators

Pr

[selected]

Save

Figure 5 VnmrJ 3.2 accounting accounts window

## Properties

Click the **Properties** tab to open the Properties window; see Figure 6.

The screenshot shows the 'VnmrJ Accounting' window with the 'Properties' tab selected. The window is divided into two main sections: a configuration panel on the left and a preview panel on the right. The configuration panel includes sections for 'Record Keeping', 'Record Sorting', 'Invoice Properties', and 'Billing Mode'. The preview panel shows a sample invoice layout with a logo and a billing address.

Default logo or optional customer logo

Function tabs, current function is highlighted.

Check the box to activate record keeping.

Click radio button to select record type.

Remove all data prior to selected date.

Cut Records button.

Enter local currency.

Use default logo or select a logo.

Click radio button to select billing mode.

Define table headings

Billing address appears here

Invoice layout for detailing charges is displayed here

**Figure 6** VnmrJ 3.2 accounting properties window

## Generating Invoices

- 1 Start VnmrJ 3.2 Accounting if it is not running.
- 2 Select the **Billing** tab.
- 3 Select an account number from the drop-down list of accounts in the **Account:** field.
- 4 Select the start day using the **Start Date:** calendar controls as follows:
  - a Select a month and year using the calendar controls.
  - b Select a date by clicking on the calendar date in the selected month and year.
- 5 Select the end day using the **End Date:** calendar controls as in step 4.
- 6 Do one of the following:
  - Print Invoice for currently displayed account
    - a Click the **Display this invoice** button to display the invoice on the right side of the Billing tab; see [Figure 4](#) on page 81.
    - b Click **Print this invoice** to print the displayed invoice.
  - Print invoices for all accounts on system
    - a Click **Print all invoices** to generate an invoice for each account on the system.
    - b Click **Print Summary** button to print out the summary page. The summary can be saved as a comma separated value (.csv) file for use with other software.

## Creating or Editing an Account

A billing account gathers the time and use charges for system login account owners and any operators with privileges to use the system login account.

The screenshot shows a software window with three tabs: 'Billing', 'Accounts', and 'Properties'. The 'Billing' tab is active. At the top, there is a label 'Account:' followed by a dropdown menu showing 'element1'. Below this is a section titled 'Billing address' containing four text input fields: 'Name' (H. Proton), 'Address' (Periodic Chart 1), 'City' (NMR Town), and 'State' (VI 94304). The next section is 'Rate schedule', which contains a table with four columns: 'Day', 'Time', 'Login Rate', and 'Login/hr'. The table has two rows: 'Mon' with '09:00', '1.00', and '1.00'; and 'Fri' with '17:00', '1.00', and '1.00'. Below the table are two buttons: 'Insert Row' and 'Delete Row'. The final section is 'Owners and operators', which contains a list of checkboxes. The first checkbox is labeled 'fv' and is unchecked. The second checkbox is labeled 'vnmr1' and is checked. At the bottom of the window is a large 'Save' button.

Day	Time	Login Rate	Login/hr
Mon	09:00	1.00	1.00
Fri	17:00	1.00	1.00

- 1 Create any required system login accounts that are required, see [“User Account Administration”](#) on page 31.
- 2 Add any required operators to each system login in account; see [“Adding Operators to a User Account”](#) on page 46.

- 3 Start **VnmrJ 3.2 Accounting**, see “[Starting VnmrJ 3.2 Accounting](#)” on page 80.
- 4 Select the **Accounts** tab.
- 5 Enter an account name in the **Account** field in the Account region or select an existing account number from the drop-down menu.  

Account name can be alphanumeric, a combination, and can contain dashes or underlines. Do not use spaces, special characters, or non printing characters. Any string that is a legal filename may be used.
- 6 Complete the Billing address information work sheet for a new account or edit the information as required to update of an existing account.
- 7 Create or edit the billing rate, see “[Establishing or Editing a Billing Rate Schedule](#)” on page 87.  
Add owners and operators whose usage is tracked and billed to this new account by selecting the checkbox next to the owner or operator.
- 8 Click **Save** to save the new or updated account information.

## Establishing or Editing a Billing Rate Schedule

### Billing rates

Usage is billed at the sum of the hourly rate times the number of hours plus the login or go rate charge.

The rate schedule for the current account is shown in the Rate schedule region. A new account will have only one billing row. An existing account will have one or more billing rows.

- 1 Enter account values for: Set the day, time, login rate, and hourly rate (Login billing default) or set the day, time, Go rate, Go hourly rate (Acquisition billing default) by using the control to set the required value or enter the information into the fields.

**Billing** Accounts Properties

Account: element1

**Billing address**

Name: H. Proton  
 Address: Periodic Chart 1  
 City: NMR Town  
 State: VI 94304

**Rate schedule**

Day	Time	Login Rate	Login/hr
Mon	09:00	1.00	1.00
Fri	17:00	1.00	1.00

Insert Row Delete Row

**Owners and operators**

fv  
 vnmr1

Save

## 2 Insert or delete rows as required.

To insert a new row:

- a Place the cursor in any field of the row below which a new row is required.
- b Click the **Insert Row** button to add a row below the row with the cursor.

To delete a row:

- a Place the cursor in any field of the row to be deleted.
- b Click the **Delete Row** button to delete the row.

## 3 Click the **Save** button to save the new rate schedule for the current account.

## Billing rates example

The billing period and rate begins on the day specified in the Day field at the time specified in the Time field and continues at the specified rate until a new time (on the same day) or new time and day are encountered. The rate of the last row applies until the time specified in the first row.

Set up a weekday/weekend schedule as follows:

- 1 Set the day on the first row to Mon.
- 2 Set the Time to 06:00 (6 AM). Change the hours using up and down arrows by double-clicking on the hours first. Change the minutes using up and down arrows by double-clicking on the minutes first. The time can also be entered.
- 3 Set a Rate for Login or Go.
- 4 Set the hourly rate.
- 5 Add a new row below the current row.
- 6 Set the day on the new row to Sat.
- 7 Set a new time of 00:01 (12:01 AM Saturday morning).
- 8 Set a new Rate.
- 9 Set a new hourly rate.

The weekday rate in this example begins at 06:00 hours on Monday and continues until one minute past midnight on Friday or 00:01 hours Saturday morning. The weekend rate continues until 06:00 hours Monday morning when the weekday rate starts.

## Controlling Properties

Properties apply to all system accounts.

### Enable/disable record keeping

- 1 Select the **Properties** tab to display the current account properties.
- 2 Activate the record keeping type by selecting the check box next to the type of record keeping:
  - Login/out records keeping
  - Acquisition records keeping

The label changes from inactive or on hold to active when the box is selected.

- 3 Type the command `su acqproc` twice if the Acquisition record keeping is (re)activated.

### Reducing record size

The accounting record files can be large over time. To reduce their size:

- 1 Select a month and year using the calendar controls.
- 2 Select a date by clicking on the calendar date in the selected month and year.
- 3 Select **Logout records** or **Acquisition records**.
- 4 Click the **Cut Records** button.

## Invoice Properties

### Locale

Enter a two letter local code in the **Locale** field to establish the billing currency correct currency format. Local codes and currency formats are available at:

[http://www.chemie.fu-berlin.de/diverse/doc/ISO\\_3166.html](http://www.chemie.fu-berlin.de/diverse/doc/ISO_3166.html)

### Logo

Keep the default Agilent logo or select a custom logo using the **Browse** button. Place any custom logo in `/vnmr/adm/accounting/` as `.gif` files. The default logo is 87x70 pixels. The logo does not have a size limit and the invoice layout can adjust to accommodate logo size.

### Billing modes

Account billing is determined by one of two billing modes: Acquisition Time, VnmrJ Use.

#### Acquisition Time

Tracks the time from start to completion and processing of an experiment. This is tracked in:

`/vnmr/adm/accounting/gorecords.txt`

#### VnmrJ Use

Tracks the time the owner or operator starts or logs into VnmrJ 3. this implementation is used to track operator time during walkup, owner time in walkup or experimental mode, or both. If more than one VnmrJ 3.2 is opened, both are tracked and invoiced. This is tracked in:

`/vnmr/adm/accounting/loginrecords.txt`. This is the only method to track operator time. This was previously referred to as Login or Logout Use.

## File Locations

- Account information –  
`/vnmr/adm/accounting/accounts/<account>.txt`
- Records –  
`/vnmr/adm/accounting/gorecords.txt`  
`/vnmr/adm/tmp/macrorecords.txt`
- Logo –  
`/vnmr/adm/accounting/*.gif`
- Properties file –  
`/vnmr/adm/accounting/accounts/accounting.prop`

## Properties File Contents

The `/vnmr/adm/accounting/accounts/accounting.prop` file contains the properties and keyword-value pairs required to customize the accounting software. Use the controls under the **Properties** tab to maintain this file. Each keyword-value pair appears on a separate line and is formatted as:

```
keyword<space>=<space>value
```

Lines starting with the `#` character are treated as a comment and ignored.

### Currency

Enter the two-letter name for the country (for example, `us` for United States, `de` for Germany) to set the number format and currency symbol for the local. Refer to the following Website for a complete list:

[http://www.chemie.fu-berlin.de/diverse/doc/ISO\\_3166.html](http://www.chemie.fu-berlin.de/diverse/doc/ISO_3166.html).

The currency keyword defines currency symbol used in the invoice Amount Due and determines the use of the decimal period or comma in numbers.

### Billing mode

Invoices are written based on the billing mode; Login time or Acquisition time, the choices are mutually exclusive.

```
billingmode = macros
```

Time is tracked by the `operatorlogin` and `operatorlogout` macros. When the file `/vnmr/adm/accounting/macrorecords` exists, these macros will record one line for each login and logout. The file is in ASCII and has world read/write permissions.

```
billingmode = goes
```

Time is tracked for any `su`, `go`, `ga`, `au`, `shim`, `lock`, `spin`, `change`, or `sample` command. One data line is written for each acquisition when the file `/vnmr/adm/accounting/gorecords.xml` exists and the following are recorded:

- `account` – usually ""
- `operator` – the operator name
- `goflag` – whether `su`, `go`, `au`, etc.
- `result` – ""
- `seqfil` – the name of the pulse sequence
- `submit` – time of submit action
- `start` – time the acquisition started
- `done` – time the acquisition stopped, including data handling, plotting, etc.

The difference between the last two dates is invoiced.

## Table header

Enter table headers. For example:

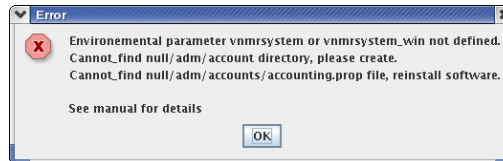
- If `billingmode = goes`,  
Use `tableheaders = "Day" "Time" "Go Rate"`  
`"Go/hr"`
- If `billingmode = macros` or `login`,  
Use `tableheaders = "Day" "Time" "Login Rate"`  
`"Rate/hr"`

## Error Messages

### Messages displayed at start up

The software checks if certain items exist at start up and displays error messages if a required item is missing. Only some of the error messages are shown in this section.

If the item exists, the message is as follows:



Other messages that are displayed:

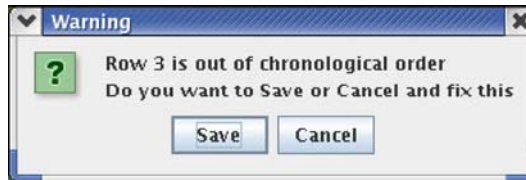
- Environment parameter `vnmrsystem` or `vnmrsystem_win` not defined.
- In Linux, this parameter is normally defined in the `.login` or `.cshrc` file using the line: `setenv vnmrsystem /vnmr`
- The line must be added to the `.login` or `.cshrc` file when VnmrJ 3.2 accounting is run by an operating system login (local or remote) account that was not created by VnmrJ 3.2 Admin.
- Cannot find the `nulladm/accounting/accounts` directory, please create.
- This is the directory where the accounts' information is stored. It must exist for the software to store and retrieve the information. In this example, the path starts with `null` because `vnmrsystem` or `vnmrsystem_win` was not defined either. The correct directory path is `/vnmr/adm/accounting/accounts`. Create the path manually if it is not present.
- Cannot find the `'nulladm/accounts/accounting.prop'` file, reinstall software.

- The software needs the properties file to determine logos, currency, and billing mode. The path starts with null, because `vnmrsystem` was not defined. The correct file path is `/vnmr/adm/accounts/accounting.prop`. Reinstalling the software is the method to recover this file, unless you can copy it from another place. The file is installed with the VnmrJ 3.2 software.

## Account information error message

Times in the rate table must be in chronological order to generate accurate and correct invoices. The software checks that the times in the rate table are in chronological order when the Save button in the account panel is pressed.

A warning message is displayed if the rate table is not in chronological order.



Do one of the following:

- Click the **Cancel** button, correct the order, and click the **Save** button.
- Continue with clicking on the **Save** button – the invoices may not be correct. The software searches for the first entry beyond a login or go time. If the entries are not in chronological order the wrong entry may be used.

## Comma separated value (or comma delimited)

Write the printer output to a CSV text file for an individual invoice or all invoices. This file can be imported into an Excel spreadsheet for further processing.

Create the following file to write the printer output to a CSV file:

```
/vnmr/adm/accounting/account/CSV_yes
```

The file can be a file or directory. Create this file on Linux using:

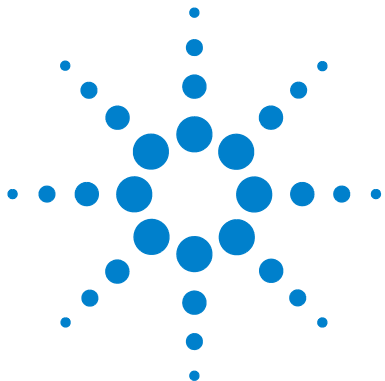
```
vnmr1>cd /vnmr/adm/accounting/accounts
```

```
vnmr1>touch CSV_yes
```

Return to normal printing by renaming the file to CSV\_no or by deleting the CSV\_yes file.

## Accounting Limitations

- VnmrJ 3.2 Accounting is only run on systems that create billing records. Records are created and invoices generated by the VnmrJ 3.2 Accounting package running on the system where the VnmrJ 3.2 software is installed. Accounts are invoiced by the system. A billing account on multiple systems will have an invoice for each system. Merging records from different systems is not supported.
- Pruning large record files is supported.
- The files `/vnmr/adm/accounting/gorecords.xml` and `/vnmr/adm/tmp/macrorecords` grow larger and larger with time. The VnmrJ 3.2 Administrator must periodically delete records in these files. The `gorecords.xml` file grows the fastest. Use the Properties tab and the Cut Records button to reduce the file size or use any ASCII editor to delete records.
- Billing modes of **Acquisition** (goes) and **Login** (macros) are mutually exclusive. Records for both billing methods can be kept at the same time. Invoices are written based on one or the other mode. Create an invoice using one mode then change the billing mode and create a second invoice in the other mode.
- VnmrJ 3.2 macros write to the `macrorecords.txt` file from different user accounts and set the file access permission to `rw-rw-rw-`. This leaves a lack in the security that allows anyone to modify records. Keep a local copy of the macros that do not write these records.
- `Expproc` writes the `gorecords.xml` file. Access permission for this file is `rw-----`. `Expproc` executes with root permission and does not need general access permission to write to `gorecords.xml`, making it more secure.



## 7 System Calibrations and Autotest

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This chapter describes the liquids NMR system calibration procedures for a newly installed Agilent Technologies, Inc. NMR Spectrometer system. These calibrations and system test procedures can be used for routine system calibration maintenance. Procedures described here cover pulse width calibration, decoupler field strength, decoupler 90° pulse width, and decoupler pulse calibration. Additional calibration procedures are described in various probe installation and acceptance test procedure manuals, accessory test and installation manuals, and other test manuals.



## Procedure Requirements

- Magnet is installed and ready for normal operation.
- System operating software is installed.
- All required network issues and connections are completed.
- VnmrJ 3.2 software is installed, printers set up, and hardware configuration set.
- All accessories are installed and ready for calibration.

## Referenced Manuals

This system calibration procedure references the following manuals:

- *Probe Installation and Acceptance Test manual(s)*
- *AutoTest*
- *Spectroscopy User Guide*

## Calibrating the System

- 1 Install the primary system probe and complete all the acceptance test procedures.

Typically, this configuration consists of a conventional probe using 5 mm sample tubes, VT system, and gradient(s) (if present). Sample changers, flow systems and probes, cryogenic probe and system, and other specialized accessories are installed and calibrated last.

See Gradient Shimming in the *Spectroscopy User Guide*.

- 2 Run AutoTest.

See the *AutoTest* manual for instructions and the console acceptance test and installation procedures manual for specifications.

- 3 Calibrate the probe and create a calibration file.

Choose all the calibration procedures that are appropriate for the probe. A new system or probe installation requires the creation of a system level probe calibration file. See “[Calibrating a Probe](#)” on page 117 for instructions—choose the calibration procedures that are compatible with the probe functions.

- 4 Install any additional probes - follow the instructions in the *Probe Installation and Acceptance Test* manual.

- 5 Calibrate and create a calibration file for each additional probe.

Choose all the calibration procedures that are appropriate for the probe. A new system or probe installation requires the creation of a system level probe calibration file. See “[Calibrating a Probe](#)” on page 117 for instructions – choose the calibration procedures that are compatible with the probe functions.

- 6 Edit the probe calibration file for each probe as necessary and add any manually determined calibrations, for example, add the  $^{15}\text{N}$  calibrations for an HCN probe.

See “[Adding calibrations for  \$^{15}\text{N}\$  calibrations](#)” on page 126.

**7** Calibrate any installed accessories such as:

- Cold Probe – refer to the Cold Probe Installation and Cryogenic Systems Installation manuals.
- Sample Changers – refer to the related manual.
- VAST – refer to related manual.
- ProTune – refer to Calibrating ProTune Calibrating ProTune.

## Calibrating ProTune

This section applies only to systems equipped with ProTune.

### Changing probes

- 1 Remove the current probe.

*If the currently installed probe is compatible with ProTune:*

- a Eject the sample if one is present.
- b Turn OFF the master module or probe tuning controller.
- c Disconnect ProTune flexible shafts from the probe to the driver modules.
- d Remove the RF cables and pneumatics lines.
- e Remove the probe from the magnet.

*If the currently installed probe is not compatible with ProTune:*

- a Eject the sample if one is present.
  - b Remove the RF cables and pneumatics lines.
  - c Remove the probe from the magnet.
- 2 Install the next probe in the magnet.
  - 3 Set the system probe name to the currently installed probe.

**4** Do one of the following:

*If the installed probe will use ProTune:*

- a** Connect flexible shafts to the probe, see [Table 16](#).
- b** Connect the RF cables and turn the Master module or probe tuning controller ON.
- c** Set or verify that the system hardware option, ProTune, is set to **present**. See “[Spectrometer configuration](#)” on page 24.

*If the installed probe will not use ProTune:*

- a** Set system hardware to ProTune not present, see “[Spectrometer configuration](#)” on page 24.
- b** Connect all cables and pneumatics lines to the probe.

**NOTE**

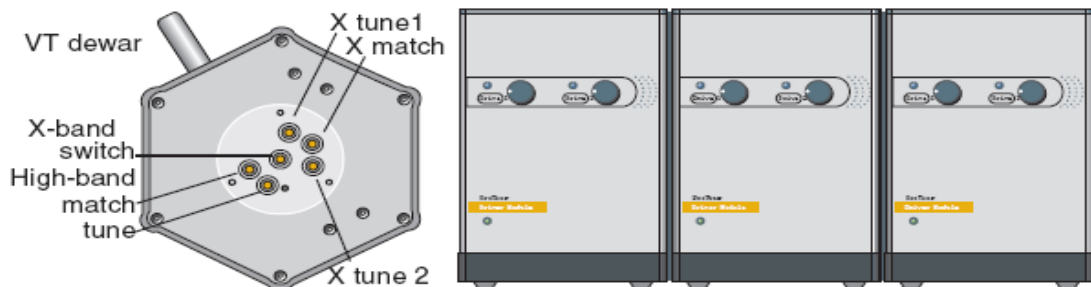
For MERCURY systems, set the Service switch inside the MIB to **Service** if the ProTune Master module has been turned OFF.

Set the Service switch to **Run** when using ProTune and the Master module is ON.

---

## Connecting ProTune modules to the probe

- 1 Connect the cables from the ProTune module to the probe in the order shown, using the procedure in the next step.



*AutoX Probe Capacitor*

X-band Switch

X Tune 1

X Match

X Tune 2

High-band Match

High-band tune

*Master*

*Drive Module 1*

*Drive Module 2*

—

—

Drive 1

—

—

Drive 2

—

Drive 1

—

Drive 2

Drive 1

Drive 2

**Table 16** Module and motor designations

	Master module		Dual module 1		Dual module 2	
Alternate name	Box 1	Box 2	Box 2	Box 3	Box 3	Box 3
Motor number	1	0	3	2	5	4
Drive number	1	2	1	2	1	2
Probe connection	HB Match	HB Tune	X Match	X Tune 2	X Switch	X Tune 1

- 2 Connect each cable from the ProTune modules to the probe as follows:



- a Align the slot on the cable end with the pin on the knob of the probe.
- b The slot (A) lines up with the set screw (B) on the flex shaft.
- c Push the shaft on to the knob and compress the spring in the knob.
- d Turn the capacitor knob approximately 90° clockwise to lock.
- e Repeat this procedure for each capacitor and cable pair.

## Connecting the probe tuning controller to the probe

Connect the cable from the Probe Tuning Controller to the Probe Tuning Module Driver with the red dot on the connector cable facing up.

## Motor Index

This section applies only to those systems equipped with ProTune. The ProTune motors may need to be indexed after the following:

- The probe has been changed.
- The Master Driver Module or probe tuning controller has lost power, has been power cycled, or is going through initial installation.

### NOTE

The motors will be automatically indexed with the current probe if power to the controlling unit has been interrupted since the last time the ProTune command was executed.

## Indexing ProTune motors

- 1 Log in as administrator, typically vnmr1.
- 2 Set the system probe name to the name of the currently installed probe.
- 3 Verify if all ProTune connections are correct.
- 4 Turn the ProTune modules On and the system is Idle.
- 5 Enter `protune('calibrate')` in the VnmrJ 3.2 command line.

The ProTune Interface window appears. All motors listed in the p-files will be automatically indexed if the ProTune Master module has been turned OFF since the ProTune was last used.

The ProTune status will display **Ready**.

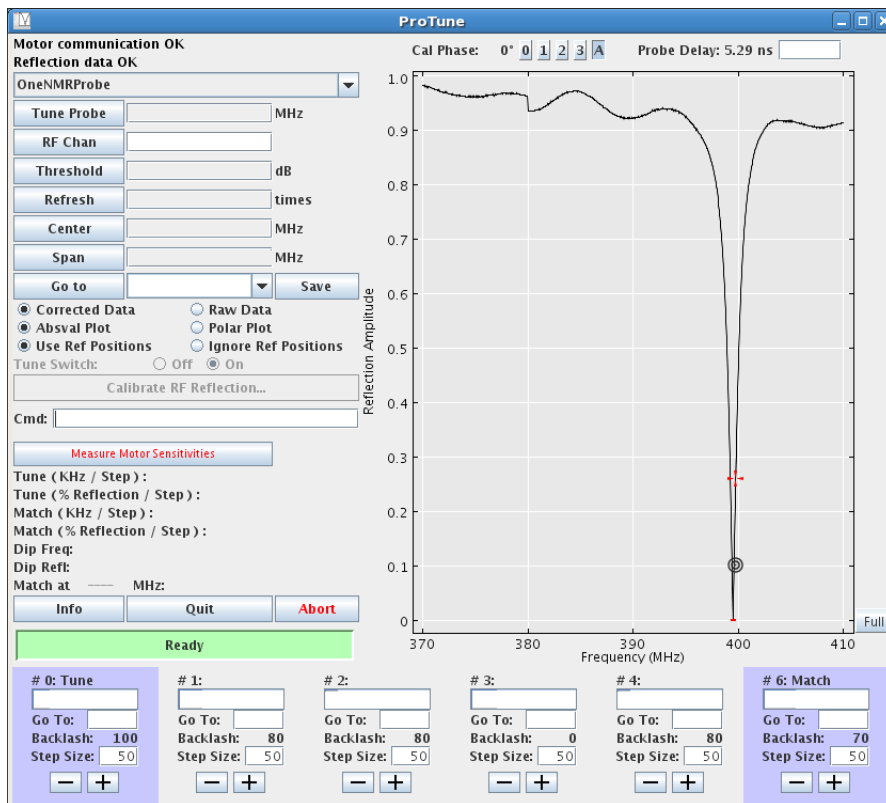


Figure 7 ProTune GUI

- 6 Verify that the Motor and Sweep communication show **OK** in the top left corner of the ProTune Interface window.
- 7 Alternatively, enter index all in the ProTune window **Cmd** field.  
Each corresponding motor will be automatically indexed. Wait for the indexing process to complete.
- 8 Exit from the ProTune Interface.

## Indexing individual ProTune motors

- 1 Log in as administrator, typically vnmr1.
- 2 Set the system probe name to the name of the currently installed probe.
- 3 Verify all ProTune connections are correct.
- 4 Turn the ProTune modules On and the system is Idle.
- 5 Enter `protune('calibrate')` on the VnmrJ 3.2 command line.

The ProTune Interface window appears.

- 6 Verify that the Motor and Sweep communication shows **OK** in the top left corner of the ProTune Interface window.
- 7 Enter `index <motor number>` in the ProTune window Cmd field, see [Table 16](#).
- 8 Wait for the indexing process to complete.
- 9 Repeat steps 7 and 8 for next motor to be indexed.
- 10 Exit ProTune Interface.

## Clearing motor stuck message with ProTune

### Clearing error messages

The software displays the motor stuck warning if the indexing process does not reach an end or if the motor cannot turn the capacitor.

The message will specify a box or a motor number or both. See [Table 16](#) for module and box number correlation.

Clear the error message using the following procedures:

#### **Indexing does not reach an end.**

- 1 Check and tighten all the screws on corresponding flexible shaft. Use the non-magnetic tools provided with ProTune Tool Kit.
- 2 Re-index the motor.

#### **Tune knob is stuck**

If the tune knob gets stuck at the end of its travel during the indexing process, then the tune knob must be manually freed from its end of travel.

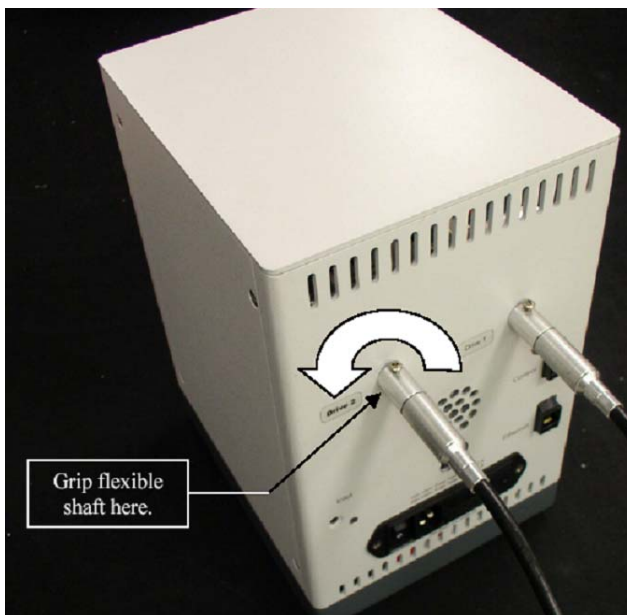
#### **CAUTION**

Rotate the flexible shaft in the direction indicated in [Figure 8](#).

**Rotation in the incorrect direction may result in damage to the probe.**

For Cold Probes, see *ProTune PAM for the Cold Probe*.

---



**Figure 8** Flexible shaft rotational direction for AutoX probes

- Grip the flexible shaft where it attaches to the motor module. For AutoX-type probes, rotate the knob in the direction, until you feel the tuning capacitor break free from the end, see [Figure 8](#). There is no need to re-index this motor.
- Alternatively, disconnect flexible shaft from the probe's tune knob and using the tuning tool provided with the probe (red stick), try to turn the knob in the opposite direction as indexing: for AutoX-type probes (only!) - clockwise, if looking UP. Once the knob freed, reconnect flexible shaft and re-index the motor.
- If the probe tuning knob remains stuck or becomes stuck during the tuning process, call Agilent Technical Support at 800-356-4437. Have the probe part number and serial number ready.

## Calibrating RF Reflections

This section applies only to systems equipped with ProTune. The sweep range must be calibrated if parts of the RF path, cables or filters, are changed. Sweep range calibration is probe independent.

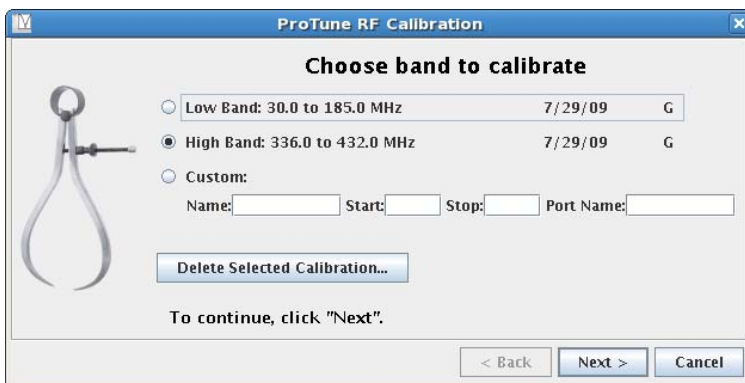
Calibrate the ProTune sweep range by measuring the RF reflection using the following procedure:

- 1 Log in as the VnmrJ 3.2 administrator (typically vnmr1) and start VnmrJ 3.2.
- 2 Type `protune('calibrate')` at the VnmrJ 3.2 command line.

The ProTune Interface window is displayed.

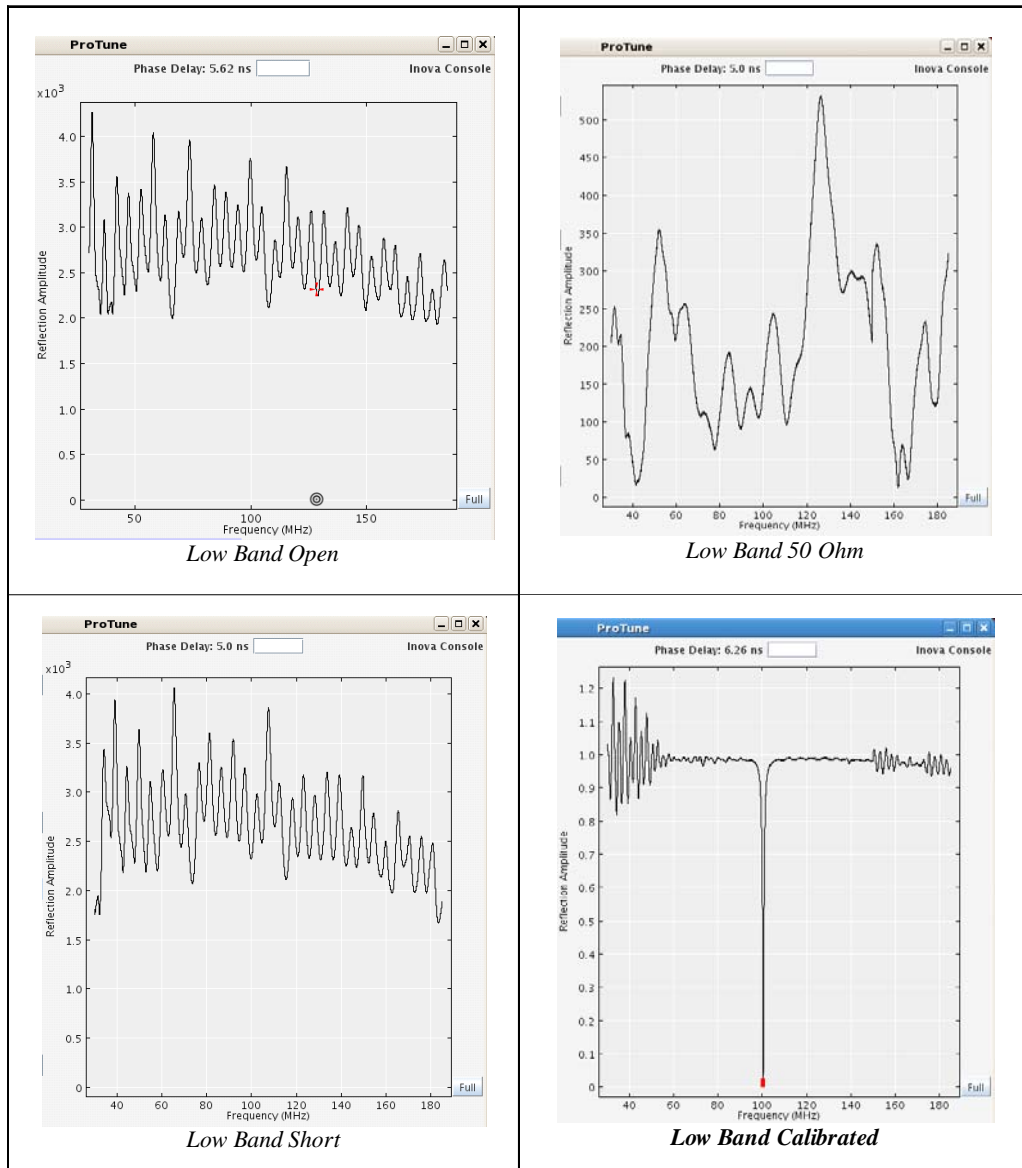
- 3 Verify that for both Motor and Sweep communication **OK** is displayed (upper left corner of the window).
- 4 Click the **Calibrate RF Reflection** button.

The following pop-up wizard appears. Choose High Band or Low Band, the sweep width is set for you. Then, click **Next** to continue.

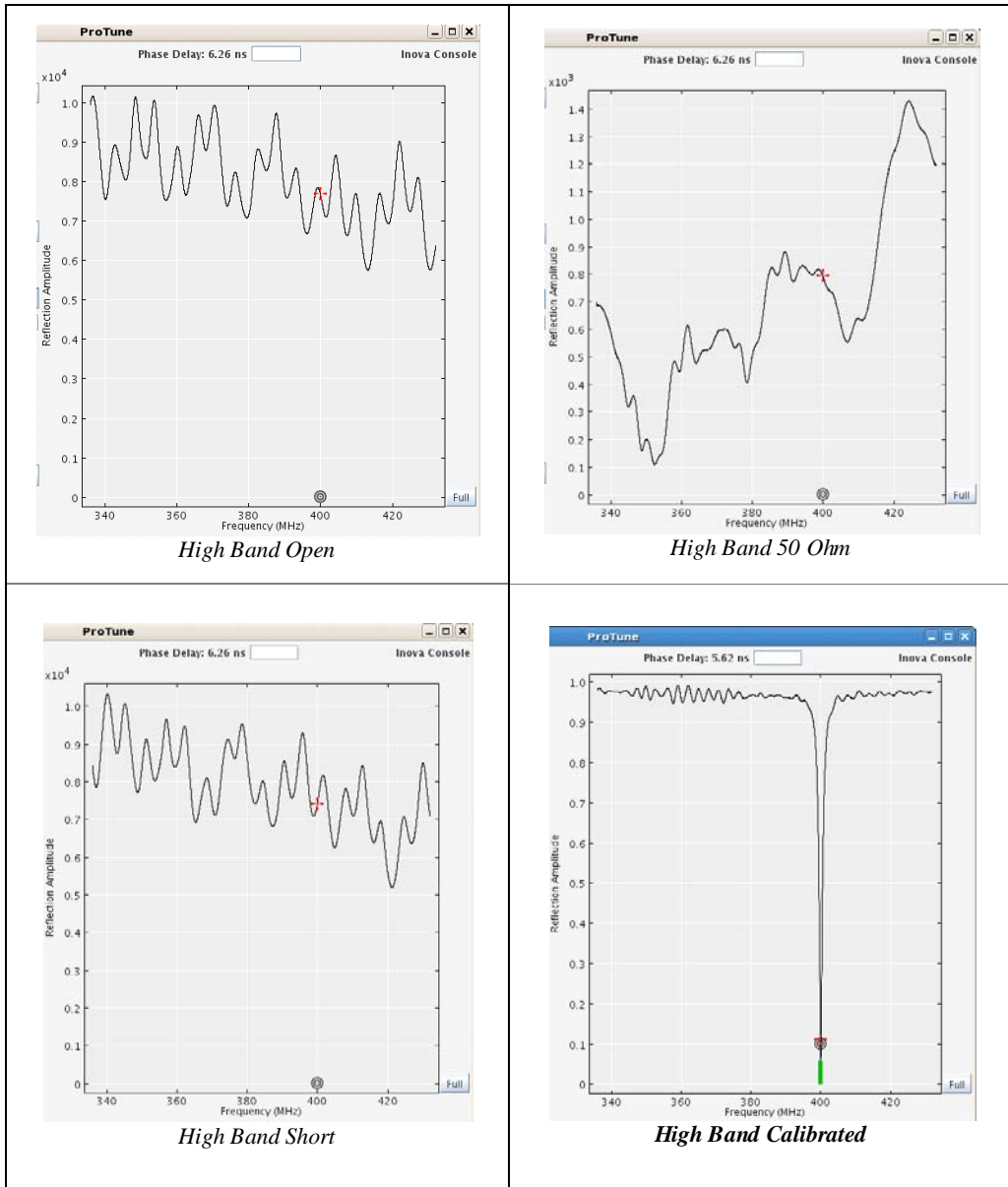


- 5 Follow the directions in the subsequent pop-ups to complete calibration of the selected band.
- 6 Repeat steps 4 through 6 for the other band.

## 7 System Calibrations and Autotest



**Figure 9** Examples of Low Band RF Reflection calibrations on 400 MHz Inova system. If calibrations are done properly, the base plot line will be near "1".



**Figure 10** Examples of High Band RF Reflection calibrations on 400 MHz Inova system. If calibrations are done properly, the base plot line will be near "1".

## Calibration verification

Verify the calibration of this channel as follows:

- 1 On the command line, type the command `setCalSweep` along with the sweep range to check. For example, the range for the low band from the graphics above is 30 to 185 MHz; so, the command `setCalSweep 30 185` is entered.
- 2 A flat line at `reflection=1` is the ideal response.

## Exiting the calibration mode

- 1 Check all connections to the probe.
- 2 Connect the proton and X channels to the probe.
- 3 Close the **ProTune Interface** window.

## Calibrating a Probe

This procedure uses the VnmrJ 3.2 Spectroscopy interface. A complete list of samples and calibration tests are in AutoCalibration.

### Logging in and installing the probe

Completion of these steps is required for all the procedures that follow.

- 1 Log in to VnmrJ 3.2 as the administrator, typically vnmr1, to create a system probe file (typical for initial installation).

#### NOTE

Write permission to `/vnmr/probes/probe_name` is required to create a system level probe file

- 2 Install the probe to be calibrated.

Probe installation instructions are provided in the *Installation and Operations* manual for the probe.

### Setting up, selecting, and creating a probe calibration file

To create the probe calibration file before calibrating a probe for the first time, use the procedure described below.

- 1 Click the **Probe** button in the hardware bar of the VnmrJ 3.2 interface or click **Tools** on the VnmrJ 3.2 menu bar, select **Standard Calibration Experiments**, and select **Calibrate probe**.

The probe selection window appears. See [Figure 15](#) on page 128.

- 2 In the **Manage Probe Files** section of the probe popup window, type the new probe name into the field for Probe name (letters first, followed by numbers and no spaces, e.g. abc456) and press the Return key.
- 3 If ProbeID is installed on the system, from the **Probe ID** pull-down menu choose either **Probe without ID** to create a

blank probe file or choose the probe ID that corresponds to the desired probe to create a probe file that is pre-populated with approximate calibration values for that style of probe.

**4** Do one of the following based upon the operating system login:

- VnmrJ 3.2 administrator or user with equivalent write permissions – select the appropriate radio button to choose either:

**Systemdir**– writes the calibrations into:

`/vnmr/probes/probe_name`

and makes all calibration available to all users – typical for new system and probe installation.

– OR –

**Userdir** – writes the calibrations into:

`~/vnmrsys/probes/probe_name`

and is available only to the logged in user creating the calibration file.

The User level calibration file can be written to the system level directory, if the user has write permission to the system level directory, by entering the desired file name and clicking **Copy**. See [Figure 15](#) on page 128.

- Logged in as a user (most users) without write permission to `/vnmr/probes` files.
- Continue with the next step – the Level option is not displayed and all calibrations will automatically be saved to `~/vnmrsys/probes/probe_name`.

**5** Click the **Create** button.

**a** Do the following for nano and AutoMAS probes:

Enter `tach` in the field next to Probespintype (do not use the nano option).

Enter an approximate maximum spinning speed based on the probe:

Nano probe – 2500 is typical

MAS probes – Maximum value for the spinner that will be used most often. Refer to the probe manual for specifications of spinner speed, material, and temperature.

Update the parameters after adding an MAS type probe

by entering `probe=probe` on the VnmrJ 3.2 command line. Selecting the new MAS type probe will now automatically set the `spintype` and the maximum speed. The Spin/Temp panel will require updating if it was open while the new probe was added. Select any other panel then select the Spin/Temp panel.

**b** Continue with “Starting a calibration” on page 120.

#### Existing probe

**a** Select the probe from the drop-down menu.

If this probe file was NOT created from VnmrJ 3.2, then the `probefile` should be updated so that it will contain additional parameters for use in VnmrJ 3.2. Take note of the lock power and lock gain values stored in the probe file.

Click **Edit**, then click the **lk** tab in the Probe edit window, then from the command line type `updateprobe` to update the probe. Then, re-enter the lock power and gain values for the various solvents in the probe file.

#### NOTE

The new/updated `probefile` will contain the parameters `Probetwtune` and `Probetunemethod`. If the probe is a ProTune-compatible probe, these parameters should be set for the desired operation. The directory `/vnmr/tune/methods` contains the entries valid for `Probetunemethod`. The parameter `Probetwtune` takes the same parameters and has the same usage as the parameter `wtune`. (See the *Command and Parameter Reference* entry for `wtune`.)

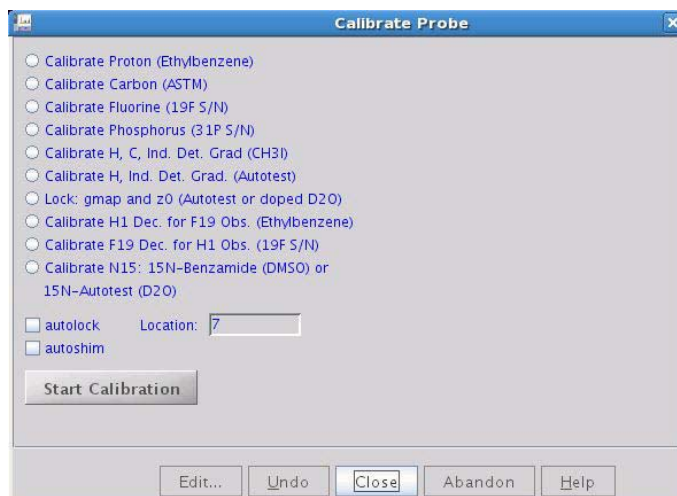
**b** Continue with “Starting a calibration” on page 120.

## Tuning probes

Probe tuning is covered in the *NMR Spectrometer User Guide*. Tuning operations and tuning ranges specific to each probe are covered in the manual provided with the probe.

## Starting a calibration

- 1 Click the **Setup Calibration** window in the **Probe** window.
- 2 Select **Calibrations** from the Calibration pop-up window.



- a Click an option button in the calibrate probe window to select the calibration experiment.
- b Enter the location of the calibration sample.  
No entry field appears if a sample changer is not attached to system.
- c If a sample change system is not present or not used, insert the sample into the magnet manually using the Insert and Eject buttons. It is located on the Lock page of the Start tab.

- d** Select the **autolock** check box to have the system automatically lock the sample.
  - e** Clear the **autolock** check box if your sample is already locked or if you would prefer to lock manually.
  - f** Select the **autoshim** check box to have the system automatically shim the sample.
  - g** Clear the **autoshim** check box if the sample is already shimmed or to shim manually.
- 3** Follow the procedure in “AutoCalibration” on page 132 for the autocalibration procedure that was selected in step 2a.
- Verify the correct sample is present in the probe. Probe calibration will begin.
  - The calibration files are created and written to the locations determined by the level that was selected in “Setting up, selecting, and creating a probe calibration file” on page 117. Some probes, like the Autoswitchable and 4 nucleus probes, require additional calibrations not covered in this manual. For information on the calibration of these probes, see the Installation and Operations manual for the probe.
- 4** Select **autoshim** to have the system automatically shim the sample.
- 5** Click the **NO** button if your sample is already shimmed or if you would prefer to shim manually.

## Starting a calibration in Experiment Selector

In VnmrJ 3.2, probe calibration tests are accessible in two locations:

- **Probe window > Setup Calibrations.**
- In Experiment Selector on the new Calibration tab: **Experiment Selector > Calibration.**

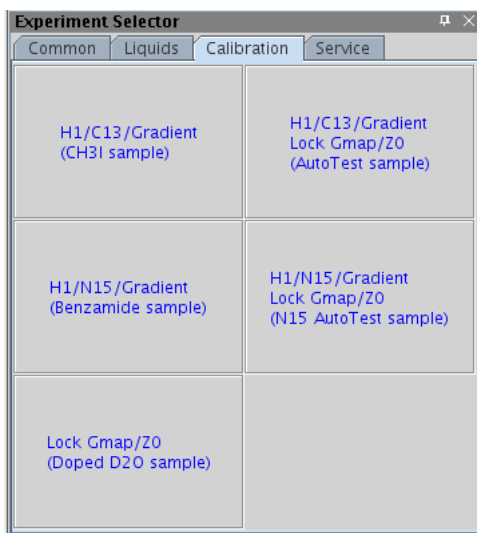
Performing calibrations from the Experiment Selector, allows the calibrations to be run similar to a study: foreground mode or automation.

Running calibrations as a study:

- allows a complete record of acquired data to be kept in the study folder
- allows for effective troubleshooting
- updates probe files with new values at the end of a calibration

### Using the Calibrations tab

The Experiment Selector is located on the left-hand side of the standard VnmrJ interface under the Protocols tab.

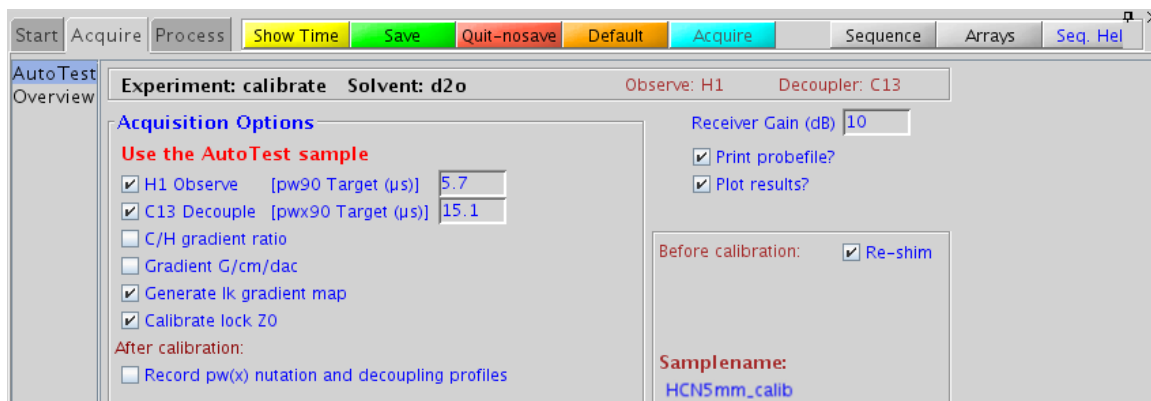


**Figure 11** Experiment Selector-Calibration tab

- 1 Select the Calibration tab in the Experiment Selector to view the available studies. Five studies are currently available, each of which correspond to a specific standard calibration sample.
- 2 Select **New Study** from the Study Queue panel in the bottom left.

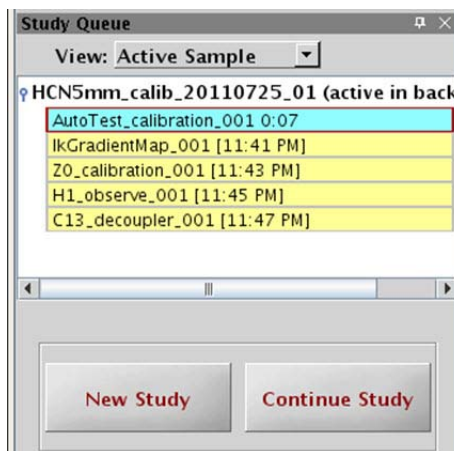
- 3 Select the Calibration experiment for the sample to load the experiment into the study.

The Acquire tab now has two panels loaded: selected standard sample and Overview. The Overview panel is simply a parameter display. The top panel shows a list of calibrations available for the chosen sample and a few key parameters.



**Figure 12** Acquire tab displaying selected Calibration experiment.

- 4 Select Acquisition Options for the selected calibration. Enter a target  $90^\circ$  in  $\mu\text{s}$  for pulse calibrations.
- 5 Enter the receiver gain to the right of the panel.
- 6 Select whether to print the probe file and plot the results after the calibration.
- 7 Select whether to re-shim the sample before calibration.
- 8 Select whether to record the nutation and decoupling profiles for subsequent review in the bottom left of the panel.
- 9 After selecting the desired experiments, parameters, and output, click **Submit** to submit the calibration study to either the foreground or background automation. The appropriate experiments will be placed in the Study Queue.



**Figure 13** Submitted calibration experiment in Study Queue.

Submission to background automation allows for calibration to be run unattended at night, or even in the middle of long automation runs for QC purposes. Or, if the current VnmrJ user is allowed to select to sample position, a standard sample can be stored in a seldom-used position of the autosampler to allow for quick calibrations at any time.

The probe file is updated automatically at the end of each calibration with the new value(s). Data and parameters are stored in the study file. If multiple arrays are used for pulse calibrations, these will be saved separately. The data can then be readily accessed from the study queue and examined for easy troubleshooting should any of the calibrations fail. The calibration study file also can provide a record of the calibrations for labs that may require documentation of regular QC for regulatory purposes. [Figure 14](#) displays an example of output from a CH3I calibration.

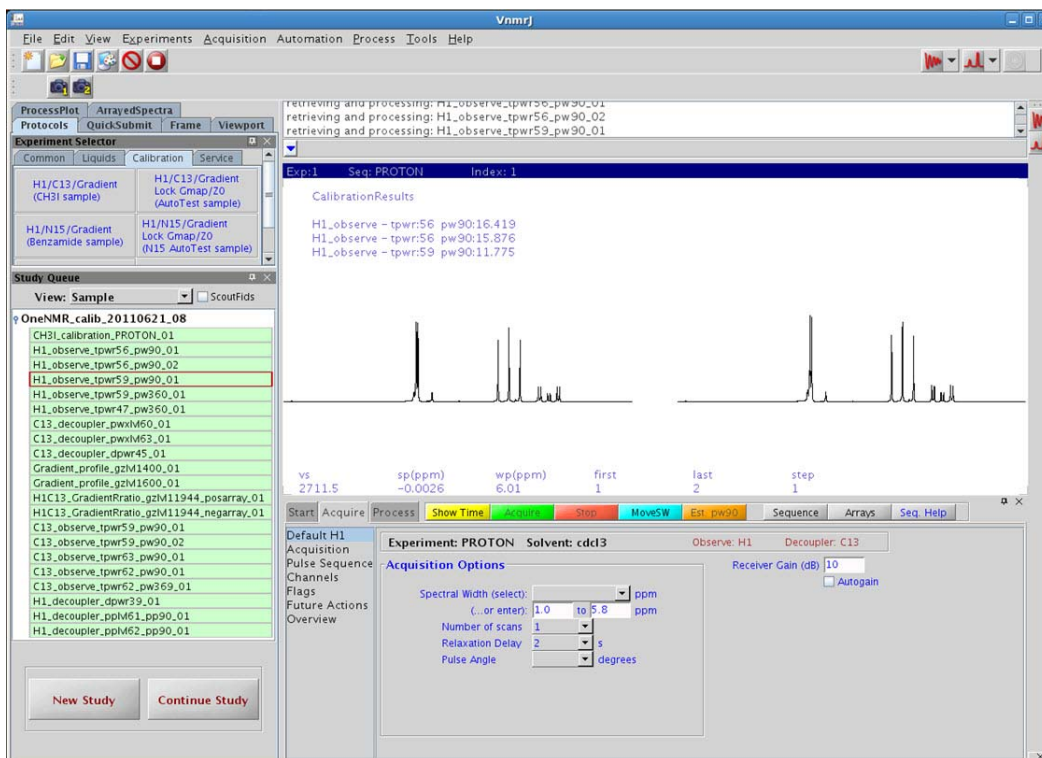


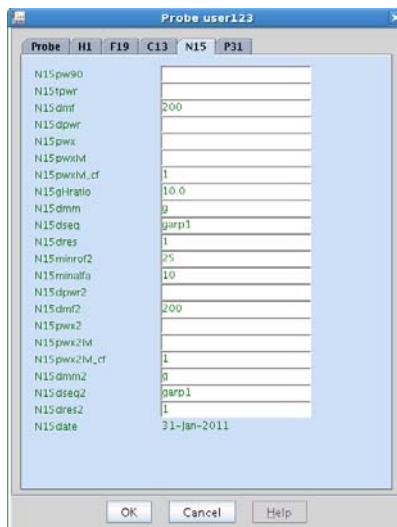
Figure 14 Example of calibration study file output from a CH<sub>3</sub>I calibration.

## Adding calibrations for $^{15}\text{N}$ calibrations

The calibrations for  $^{15}\text{N}$  can be added to the probe calibration file following the manual calibration for probes with an X channel that can tune to  $^{15}\text{N}$  or that have a pre-tuned  $^{15}\text{N}$  channel.

To add Calibrations for  $^{15}\text{N}$ :

- 1 Click the **Probe** button on the hardware bar in the VnmrJ 3.2 interface, or
- 2 Click **Tools** on the VnmrJ 3.2 menu bar, select **Standard Calibration Experiments**, and select **Calibrate** probe.
- 3 Select the **Edit** check box – editing options appear in the Probe window.
- 4 Click the **Select Probe File** drop-down menu and select the probe.
- 5 Click **Edit Probe File**.



A pop-up window appears with calibration names and fields to enter values.

- 6 Select the **N15** tab.

7 Add the calibration values in the provided fields – current calibration values are next to the parameter name, for example, pw90 (14).

Leave the field empty if a calibration is not available – do not enter a zero.

8 Click **Save**.

9 Click **Exit**.

## Viewing or editing calibration values

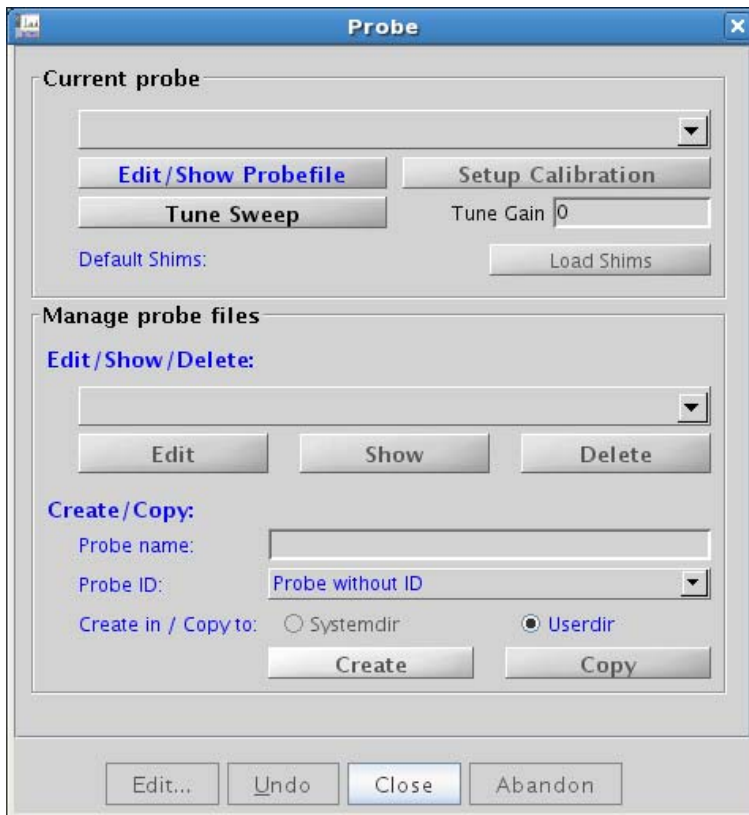
Each of the probe calibration files can be viewed and edited. Editing individual parameters is best done at the user level probe file and not at the system level. This is appropriate for specialized calibrations such as high salt concentrations, biological samples, and low temperature calibrations etc. that are specific to an individual user but not appropriate for all users.

To edit or view a calibration value:

1 Click the **Probe** button in the VnmrJ 3.2 interface or click the **Utilities** button in the VnmrJ 3.2 menu bar.

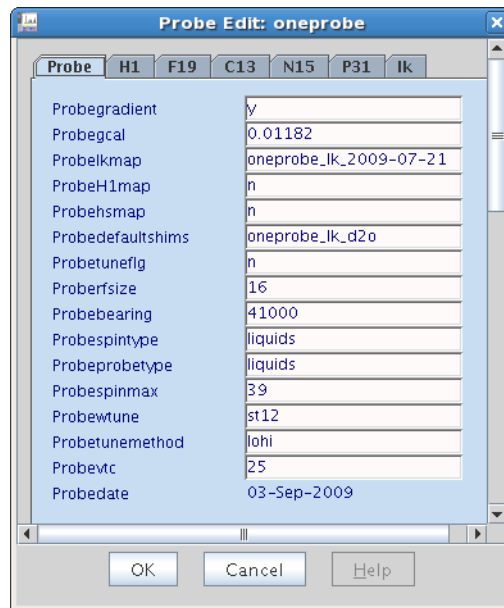
2 Select **a probe** from the Select Probe drop-down menu.

3 Select **the check box** next to Edit.



**Figure 15** Calibrating a probe

- 4 Check the **Edit** button—editing options appear in the Probe window, see [Figure 16](#).



**Figure 16** Probe file edit window

- 5** Select the tab to modify a probe calibration entry.
- 6** Change the calibration values in the fields provided.  
Leave the field blank if a calibration is not available – do not enter a zero.
- 7** Click **OK**.
- 8** Click **Exit**.
- 9** Repeat for each probe calibration file as required.
- 10** Click **Close** to exit the Probe calibration pop up window.

Optional – create a new version of the probe calibration file that will contain any special calibrations (typically a user level requirement):

- 1** Open a terminal window.
- 2** Do one of the following:
  - User level probe file:  
Type `cd ~/vnmrsys/probes`  
– this is the probes directory of the current operating system log in user.
  - System level probe file:  
Type `cd /vnmr/probes`.
- 3** Copy the directory for the probe of interest to a new directory name.
- 4** Change directories to the probe name directory.
- 5** Rename the probe file in the directory to exactly the same name as the directory.

## AutoCalibration Samples

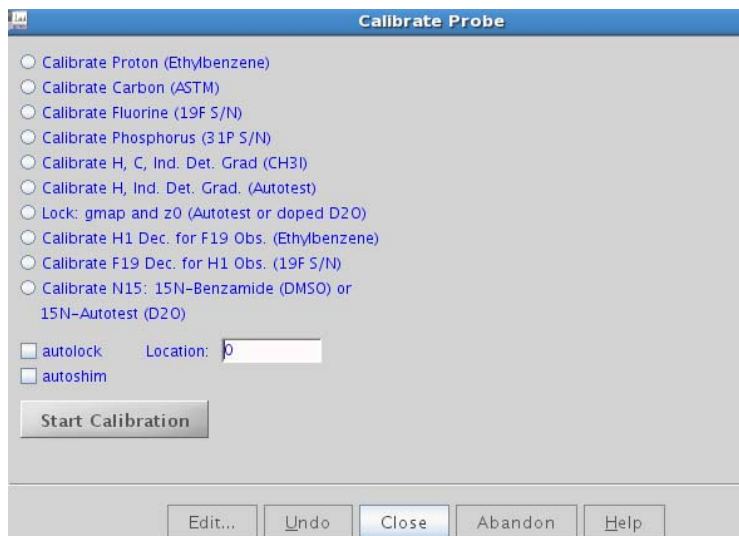
The samples listed in [Table 17](#) can be used for auto calibration. Not all samples are provided with each system. The required samples for the acceptance test procedures during system installation will include one or more of these samples.

**Table 17** AutoCalibration samples

Sample	Calibrate option	Part number
0.1% ethylbenzene in CDCl <sub>3</sub> 1H sensitivity	Proton	00-968120-70
40% dioxane in C <sub>6</sub> D <sub>6</sub> 13C sensitivity	Carbon	00-968120-69
0.485 M triphenylphosphate in CDCl <sub>3</sub> 31P sensitivity	Phosphorus	00-968120-87
0.05% trifluorotoluene in benzene d <sub>6</sub> 19F sensitivity	Fluorine	00-968120-82
1% <sup>13</sup> C-enriched methyl iodide, 1% trimethyl phosphite, and 0.2% Cr(AcAc) in Chloroform-d	Proton, Carbon, ID, and Gradients (organic solvents)	00-968120-96
0.1% <sup>13</sup> C-enriched methanol, 0.1% <sup>15</sup> N-enriched acetonitrile, and with 0.30 mg/ml GdCl <sub>3</sub> in 1% H <sub>2</sub> O/99% D <sub>2</sub> O (AutoTest Sample)	Proton, Carbon, ID, and Gradients (aqueous solvents)	00-968120-68
2 Hz D <sub>2</sub> O	LOCK, gmap and Z0	01-901855-01

## AutoCalibration

- 1 Click any one of the following **calibration option** buttons:
  - Calibrate Proton (Ethylbenzene)
  - Calibrate Carbon (ASTM)
  - Calibrate Fluorine (19F S/N)
  - Calibrate Phosphorus (31P S/N)
  - Calibrate H, C, Ind. Det. Grad (CH3I)
  - Calibrate H, C, Ind. Det. Grad (Autotest)
  - Lock:gmap and z0 (2Hz D2O)
  - Calibrate H1 Dec. for F19 Obs.(Ethylbenzene)
  - Calibrate F19 Dec. for H1 Obs. (19F S/N) or
- 2 Follow the prompts, enter any required values, select options, and proceed according to the instructions presented in the Calibrate probe window; see [Figure 17](#) for an example of the prompts presented.
- 3 Click the **Start Calibration** button.



**Figure 17** Calibrate probe

## Calibrating - Manual Methods

The manual calibrations are run from the command line. Parameter arrays are general examples and may need to be adjusted for individual probes and systems.

### Calibrating pulse width

<b>Sample</b>	Any sample
<b>Parameter set</b>	None

- 1 Set up parameters to obtain a spectrum on the sample of interest.
- 2 Arrange the spectral window so that at least one resonance falls relatively near the center of the spectral window using either the macro `movetof` or the macro `movesw`.  
Estimate the relaxation time  $T$  of the sample so that any experiments using intervals between pulses several times greater than that  $T$  can be repeated.
- 3 Acquire one transient (`nt=1`) with no steady-state (`ss=0`) in absolute intensity mode (`ai`) using a transmitter power and pulse estimated at less than  $90^\circ$ .
- 4 Phase that spectrum properly.
- 5 Estimate the  $90^\circ$  pulse width, multiply by 4 to get the  $360^\circ$  pulse width, and enter an array around the  $360^\circ$  pulse width.
- 6 Make sure `d1` is greater than 3 times  $T$ , and acquire data using `ga`.  
The signals should be negative if the pulse is shorter than  $360^\circ$ , zero if the pulse is  $360^\circ$ , and positive if the pulse is longer than  $360^\circ$ .
- 7 Select a value of `pw` that gives the result nearest to zero, using rough mental interpolation if none of your results were exactly zero.

Divide this value by 4 to give the 90° pulse width and enter this value in `pw90` as well as in your log book. To be sure you were not off by a factor of two, set `pw` equal to a 180° pulse and obtain a spectrum—the result should be near zero. Now set `pw` to a 90° pulse and the result should be a maximum.

The peak is rarely *exactly zero* but instead shows a dispersive signal with some signal positive and some negative. Do *not* readjust the phase in this case. This is normal behavior. Simply select the value of `pw` that gives “equally balanced” up and down resonances.

## Calibrating decoupler field strength

<b>Sample</b>	60% C <sub>6</sub> D <sub>6</sub> /40% dioxane (5-mm probe, Part No. 00-968120-69; 10-mm probe, Part No. 00-968123-69; 16-mm probe, Part No. 00-949134-69)
<b>Parameter set</b>	/vnmr/tests/gammaH2

The strength of the decoupler field, known as  $\gamma H$ , is important to know for a number of reasons:

- `dmm= ' f '` (swept fm or fm-fm modulation) decoupling, the decoupler field strength gives a rough measure of the range over which protons will be efficiently decoupled. Thus, at 200 MHz, one might want a 10 ppm or 2 kHz decoupler field, at 300 MHz, a 3 kHz decoupler field, etc.
- `dmm= ' w '` (WALTZ-16) decoupling, protons are efficiently decoupled over roughly twice that range; that is, efficient decoupling over a 2 kHz range can be achieved using only a 1 kHz decoupler field strength.
- For WALTZ-16 decoupling, the decoupler field strength must be known because the modulation frequency parameter `dmf` must be set to equal  $4 \cdot \gamma H^2$ .
- Various experiments that require the use of decoupler pulses will also require knowledge of the decoupler field strength.

Decoupler field strength is a function of the decoupler power level (controlled by the parameters `dpwr` or `dhp/dlp`) and the probe. To a lesser extent, though more so when using highly ionic samples that can detune the probe, the decoupler field strength depends on the sample. For most organic solvents, calibrate the decoupler field strength for each probe at a variety of settings and repeat the calibration every few months. For polar solvents, and samples in water at high buffer concentrations, it may become necessary to calibrate the decoupler on a sample or a comparable sample.

The standard method of calibrating the strength of the decoupler field is off-resonance decoupling. Two experiments are performed, one with the decoupler at a higher frequency than the proper decoupling frequency for a particular proton, and one with the decoupler at a lower frequency.

This technique produces two carbon spectra with “reduced” couplings—multiplets that mostly have the same pattern as in a coupled spectrum (doublets, triplets, etc.), but the coupling constant is reduced. With these two spectra plus knowledge of the full coupling constant, an appropriate equation can be used (see K.G.R. Pachler, *J. Magn. Reson.* 7:442 (1972) to determine the value of  $\gamma$ . Use the following procedure:

- 1 Insert the standard  $^{13}\text{C}$  sensitivity sample (60%  $\text{C}_6\text{D}_6$  and 40% dioxane).

The dioxane produces a single resonance, a triplet with 1:2:1 amplitude, when coupled (from the carbon in dioxane). This pattern will change when decoupling is used.

- 2 Retrieve an appropriate parameter set (assuming that `dpwr` or `dhp` is set correctly) by typing `rtp('vnmr/tests/gammaH2')`.
- 3 Acquire two spectra by typing `ga`.
- 4 Display the first spectrum with two cursors by typing `ds(1)`.
- 5 Position the cursors on the outer lines of the triplet.
- 6 Read the value delta from the screen.

Divide the result by 2 (because we really want just the value of a single splitting) and write down that number.

- 7 Display the second spectrum by typing `ds(2)`.
- 8 Position the cursors in a similar fashion, and read the value of delta.
- 9 Write down half that difference.
- 10 Start the program to calculate the strength of the decoupler field by typing:  
`h2cal`.
- 11 When the system prompts for the low-field residual coupling value, enter the result from step 6.
- 12 When the system prompts for the high-field residual coupling, enter the result from step 8.
- 13 When the system prompts for the full coupling constant, enter 142, the value for dioxane.

The system displays the calculated value of the decoupler field strength  $\gamma H$ , the predicted coalescence point (the frequency at which single-frequency decoupling would collapse the dioxane to a singlet), and the pulse width for decoupler pulses if this decoupler level is to be used for pulsed decoupling.

## Calibrating decoupler 90° pulse width with polarization transfer

<b>Sample</b>	30% menthol in CDCl <sub>3</sub> (Part No. 00-968120-94)
<b>Parameter set</b>	/vnmr/stdpar/C13

The decoupler 90° pulse width value (parameter `pp`) from the test above should be appropriate for polarization transfer experiments. To calibrate `pp` separately, use a polarization transfer pulse sequence directly on the sample of interest. Use a sample such as menthol having CH, and CH carbons to test. If menthol is unavailable, use any small molecule organic compound that is highly soluble.

- 1 Type `jexp2 setup('C13','CDCl3') nt=4 ga`.
- 2 Phase the spectrum and place the two cursors around the aliphatic region.

- 3 Type `movesw ga` to narrow the spectral window. Phase the new, narrowed spectrum.
- 4 Type `jexp1 setup('H1','CDC13') nt=4 ga`.
- 5 Place the cursor in the center of the aliphatic region and type `sd`. Note the value of `dof` (decoupler offset) after typing `sd`.
- 6 Type `jexp2` and set `dof` to the value just found by `sd`.  
The follow is an alternative to this step:
  - a Set the decoupler offset `dof` to  $-2.5$  times the spectrometer frequency of the system (for example, on a 200-MHz system).
  - b Set `dof=-500`; on a 400-MHz, set `dof=-1000`.
- 7 Type `DEPT`.
- 8 Type an estimate of the decoupler  $90^\circ$  pulse width that was obtained previously, or some other conservative estimate, after the help file is displayed.
- 9 Type `mult=0.5 d1=1 ss=2 nt=16 ga`.
- 10 Phase the data when finished. All resonances should be positive.
- 11 Type `pp=10,20,30,40,50,60,70` and rerun the experiment.
- 12 Type `dssh` after the data are transformed.
- 13 Select the value of `pp` that gives the maximum peak heights (use `da` to check the array).
- 14 Type a new array of `pp` values, bracketing the value determined in step 12 by  $\pm 20\%$ , using about six smoothly-spaced values. Rerun the experiment and determine the `pp` value for maximum intensity, the same as step 12. This value is a reasonable estimate of the decoupler  $90^\circ$  pulse width.  
  
Very accurate value of the decoupler  $90^\circ$  pulse width is required for spectral editing. Determine the decoupler  $90^\circ$  pulse Obtain this by observing `pp` dependence of  $\text{CH}_3$  and  $\text{CH}_2$  carbons for `mult=1.0` (CH selection).
- 15 Type `mult=1`.

**16** Make an array of  $pp$  in steps of  $1 \mu s$ , from  $-5$  to  $+5 \mu s$  around the  $pp$  value determined above.

**17** Type `ga` and when finished, type `dssh`.

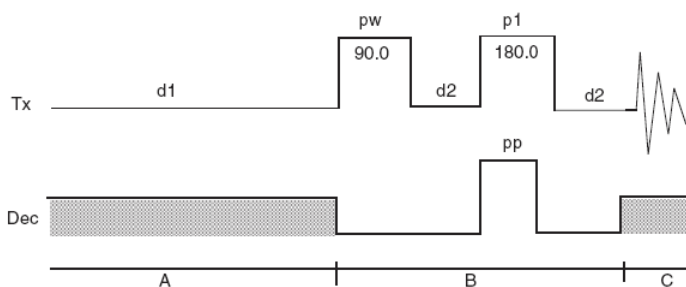
**18** Phase the CH carbons vertically.

The CH<sub>2</sub> carbons go from positive to negative with increasing  $pp$ . The CH<sub>3</sub> carbons decrease to zero and then increase. The  $pp$  value corresponding to a decoupler  $90^\circ$  pulse is the value that nulls the CHs. Use the J value in the parameter set is correct for the type of CH in the molecule: 125 Hz for menthol. Reset the  $pp$  range to cover a smaller span with smaller steps in  $pp$  if a more precise  $90^\circ$  pulse is required.

**19** Update the system log book and probe file.

## Calibrating $^1\text{H}$ decoupler pulse width with PPCAL

The PPCAL pulse sequence is used to calibrate the proton decoupler pulse width for experiments such as DEPT, INEPT, and HETCOR. Figure 18 shows the sequence.



**Figure 18** PPCAL pulse sequence

The ppcal macro sets up the parameters for PPCAL as follows:

**Table 18** Parameters

<b>pp</b>	Proton 90° decoupler pulse (in $\mu\text{s}$ ).
<b>d2</b>	Delay that should equal $1/(2 \cdot J_{\text{CH}})$ (in sec).
<b>pw</b>	90° pulse on $^{13}\text{C}$ (in $\mu\text{s}$ ).
<b>p1</b>	180° pulse on $^{13}\text{C}$ (in $\mu\text{s}$ ).
<b>dm</b>	Decoupler mode. The value should be 'yNy'.
<b>Dmm</b>	Decoupler modulation mode. Its value should be 'wcv' or 'fcf'.
<b>Pplvl</b>	Power level for the proton decoupler pulse. $\text{d}_{\text{pwr}}$ is the power level for broadband proton decoupling if the decoupler channel uses a linear amplifier.

The following technique is recommended:

- 1 Array parameter `pp`, starting at 0.  
Make sure that delay `d1` is reasonably long compared to the  $^{13}\text{C}$  relaxation times.
- 2 Phase the first spectrum (`pp=0`). CH and  $\text{CH}_3$  carbons should go from positive to negative and  $\text{CH}_2$  from positive to zero and again positive.  
All peaks should null when `pp` is a  $90^\circ$  pulse. The CH carbons are the most sensitive.

## Calibrating $^{13}\text{C}$ (or X) decoupler pulse width with PWXCAL

The PWXCAL pulse sequence is used to calibrate the pulse width characteristics of the probe's decoupler channel(s) in indirect detection or triple resonance experiments. PWXCAL can also be used to determine the rf field homogeneity of the decoupler. This calibration is a more sensitive measure of the decoupler X pulse widths than the first increment of HMQC.

The `pwxcal` macro sets up the parameters for PWXCAL as follows:

**Table 19** Parameters for PWXCAL

<code>pw</code>	proton pulse width (in $\mu\text{s}$ ).
<code>pwx1</code>	$90^\circ$ pulse on X (in $\mu\text{s}$ ) for the first decoupler.
<code>pwx2</code>	$90^\circ$ pulse on X (in $\mu\text{s}$ ) for the second decoupler.
<code>pwx3</code>	$90^\circ$ pulse on X (in $\mu\text{s}$ ) for the third decoupler.
<code>jC13, jN15, or jP31</code>	should be set to the appropriate coupling constant.
<code>jname</code>	set by the <code>pwxcal</code> macro to indicate which nucleus has been selected.
<code>dm</code>	decoupler modulation and must be 'nnn'.
<code>dmm</code>	decoupler modulation mode and should be 'ccc'.
<code>dof</code>	X-nucleus resonance location (note: $\text{CH}_3\text{I}$ dof is $-14800$ for a 500-MHz system at 11.4 T).
<code>pwxlvl1 (or pwxlvl2)</code>	power level of the "X" decoupler pulse, and <code>tpwr</code> is the power level for proton observe if the decoupler channel uses a linear amplifier.

Use the following technique:

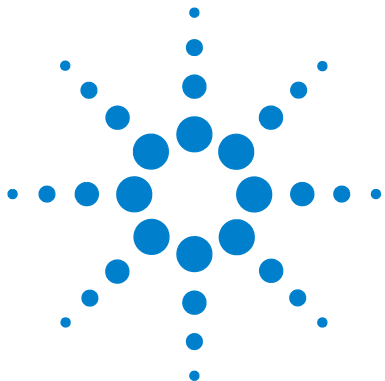
- 1** Starting from a 1D proton parameter set, type `pwxc1` and answer the questions “use decoupler 1, 2, or 3 [1]” and “calibrate C13, N15, or P31 [C13]”.
- 2** Press the **Return** key in response to either of the questions selects the default response enclosed in square brackets.
- 3** Array parameter `pwx1`, starting at 0, making sure that delay `d1` is reasonably long compared to the <sup>1</sup>H relaxation times.
- 4** Phase the first spectrum (`pwx1=0`). All peaks null when `pwx1` is a 90° pulse.

If a second decoupler is present, the parameter `pwx2` is arrayed to calibrate the 90° pulse width on that decoupler. If a third decoupler is present, the parameter `pwx3` is arrayed to calibrate the 90° pulse width on that decoupler.

## Running Autotest

Refer to the Autotest manual for details on how to run and work with Autotest.

- 1 Set the applications directory to enable autotest.
- 2 Click **Tools**.
- 3 Select **Standard Calibration Experiments**.
- 4 Select **Autotest Settings...**
- 5 Make any required changes.
- 6 Close the **Autotest Setting** window and save the changes by clicking on **OK** or click **Cancel** to exit from the window without making any changes..
- 7 Click **Tools**.
- 8 Select **Standard Calibration Experiments**.
- 9 Select **Start Autotest...**
- 10 Select the Autotest experiments to run from the choices in the Auto Test window (click **Clear Selection** to start over).
- 11 Click **Begin Test** to start Autotest using the selections or click **Exit** to close the window and not start Autotest.



## A VnmrJ 3.2 Terms

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## Liquids

### Account-Owner, account-administrator or user

Account-owner, administrator or user is the user that owns the operating system login account. User privileges include access to the command line, all parameter panels and all protocols, and right to create new or edit protocols for operator use. The user (account owner) is the head of a group of operators that share the particular login account. User responsibilities include maintaining special protocols and probe files for this group of operators.

### Acqlog

The acqlog file (in `/vnmr/tmp`) allows the spectroscopist to monitor an automation run as it progresses in background. The acqlog is a simple text file that (if it exists) is updated automatically as a study is submitted to the acquisition queue or Study Queue.

### Application directory

VnmrJ 3.2 application directories are directories where VnmrJ 3.2 looks for directories such as `templates`, `maclib`, `manual`, `menulib`, `parlib`, `probes`, `seqlib`, `shims`, `tablib`, `shapelib`, `gshimlib`, and `mollib`. These are directories that VnmrJ 3.2 uses during its normal operation.

### Application type

Application types (`apptype`) define how related experiments or a family of experiments, are set up, acquired, processed and plotted.

## Background acquisition

A background VnmrJ 3.2 process is spawned for this acquisition when one or more experiments are submitted for acquisition from the Study Queue if background or automation is selected. All workspaces are available for data analysis while VnmrJ 3.2 collects NMR data in a background process.

## DayQ

The DayQ is typically between the hours of 8:00 a.m. and 6:00 p.m. and provides 30 minutes of NMR time for each sample submitted by the operator. Submitted samples are accepted to the DayQ provided the sample data acquisition time does not exceed the time limit. See also NightQ.

## Direct acquisition

Direct acquisition is carried out as a foreground acquisition and the Study Queue is not used. Select an experiment/protocol from the vertical experiment panel in direct acquisition mode or from the list of experiments accessed by clicking **Experiments** on main menu. Parameters are loaded directly into the current workspace for manual data acquisition.

## Experiment

See “[Workspace](#) ” on page 150.

## File types

NMR data sets have the file extension .fid. The .fid file (FID free induction decay data) contains all of the raw data and parameters of an acquired data set.

A parameter file or set has the .par extension and contains the parameters necessary to set up and acquire an NMR experiment. Parameter files may be both local and global.

A shim file contains a list of shims and their values. Both .fid directories and .par directories contain a file called `procpar`, which includes the shim settings.

## Foreground acquisition

When working in direct acquisition mode, the workspace is tied to a particular manual acquisition. No other NMR data set may be loaded into the active workspace while data acquisition is in progress.

## Minimize spectral window

The `minsw` (minimize spectral window) process is often executed before a 2D experiment. First a full spectral width 1d is acquired. The software detects where the highest and lowest field peaks are, recalculates the spectral width, and reacquires the 1d experiment with the new spectral width. The `minsw` process is automatically turned on if a `proton`, `preset`, or `wet1d` protocol precedes a 2D protocol.

## NightQ

The NightQ is typically between the hours of 6:01 p.m. to 7:59 a.m. and provides 3 hours of NMR time for each sample submitted by the operator. Submitted samples are accepted to the nightQ provided the sample data acquisition time does not exceed the nightQ time limit. See also DayQ.

## Operator

The administrator creates operators as subservient users of a particular user's account. The operator does not own the login account. The operator may be considered a spectroscopist within a group where the group's head owns

the login account. The operator privileges such as limited access to parameter panels (`panellevel`), command line, or NMR experiments are defined by the VnmrJ 3.2 administrator.

## Panel level

The VnmrJ 3.2 parameter, `panellevel`, defines the number of pages an operator has access to in the horizontal panels. The VnmrJ 3.2 administrator determines the `panellevel` for each operator.

## Probe file

A probe file is a list of parameters that change with each probe: pulse widths, powers, decoupling patterns or shapes for proton, carbon and other nuclei (if applicable). The probe files are maintained in either local directories or globally in the probes directory of /vnmr. Users have a local probe file (vnmrsys/probes) that they keep current with the latest calibrations and gradient shimming files. The global probe file is maintained by the administrator. A probe file that corresponds to the installed probe must be selected for proper functioning of protocols within VnmrJ 3.2.

## Priority sample

A priority sample is submitted to the Study Queue by checking the Priority Sample box before submission. The sample is run after data acquisitions for current sample is completed, and before the other samples submitted to the Study Queue are run. The ability to run a priority sample can be assigned to an operator by the VnmrJ 3.2 administrator.

## Protocol

A protocol consists of any single or series of NMR acquisitions. A protocol may be a simple NMR experiment or involve a series of shorter acquisitions that are acquired but not stored in order to establish necessary parameters (such as solvent location) for the desired NMR experiment.

## Required experiment/protocol

A required experiment/protocol is an experiment/protocol consisting of one or more required experiments that are executed before the desired data set is acquired. All 2D protocols in the walkup interface require that a proton apptype protocol is run before the 2D protocol is run. Selecting a 2D protocol, such as the *Cosy* protocol, automatically adds a proton protocol ahead of the 2D protocol. The requirements for running a proton apptype protocol is met if a proton apptype protocol (*proton*, *presat*, or *wet1d*) already exists in the list of experiments before the 2D. A required proton experiment, that is part of the 2D protocol, is not added to the Study Queue. Solvent suppression parameters are carried forward to the 2D experiment if the proton apptype protocol is *presat*, or *wet1d* and the 2D experiment is acquired with these parameters. A *minsw* process executed if *proton*, *presat*, or *wet1d* listed ahead of any 2D experiment and, if it is not desired, must be turned OFF before the experiment is submitted.

## Spectroscopy interface

The walkup is primarily designed for point and click acquisition of NMR experiments with or without a sample handler (SMS, Carousel, VAST, 768AS).

## Study

A study consists of a one or more NMR experiments collected on one or more NMR samples.

## Study queue

The Study Queue is an area in VnmrJ 3.2 where a list of protocols (NMR experiments) to be acquired on a single sample or a series of samples is created. This area can reflect the sample that is active, the sample that is displayed, or a queue.

## Traymax

The parameter `traymax` is used define the type of autosampler or sample handler associated with the NMR system and can have the following values.

<b>traymax =</b>	<b>Sample handler</b>
0	No sample handler
9	Carousel
50	SMS with a rack for 50 samples
100	SMS with a rack for 100 samples
96	VAST

## Viewport

Activating viewports allows the user to view more than one workspace at a time. Each viewport must be linked to a specific workspace. Up to nine viewports can be open in VnmrJ 3.2 at a time. Viewports allow the user or operator to look at one or more spectra (with or without linking cursors) at a time.

## Workspace

The terms `workspace` and `experiment` are used interchangeably. Either one refers to a directory in the user's local `vnmsys` directory called `exp1`, `exp2`, `exp3`, etc., which correspond to workspace 1, workspace 2, workspace 3, or equivalently, experiment 1, experiment 2,

experiment 3 and so on. The exp directory contains parameters and, potentially, data for any given NMR experiment or protocol.

Data is directly acquired into a defined workspace or experiment corresponding to an exp directory in direct acquisition mode and must be stored into a FID file or it will be overwritten by the next direct, user-executed acquisition. The workspace or experiment can also act as a holding pen for processed data that is already stored on the disk.

## Imaging

### Applications type

Experiments are grouped in types of applications such as: 3D fast spin echo, localized spectroscopy (1D), global spectroscopy (1Dglobal), or EPI-like. Each application type has, a generic set-up, processing, and prescan procedure.

### Composite protocol

A composite protocol is a series of protocols, required protocols, prescans, or a series of NMR data acquisitions, clustered together into one unit.

### Exec-parameters

The exec-parameters (string parameters) define how a particular protocol is prepared for scan (execprep), processed (execprocess), or run in the prescan mode (execprescan). Typically, the exec-parameters contain just the name of a single macro, but generally they can be anything that could be typed on the command line or typed in a macro.

### File types

Spectroscopy data is stored with the raw data is saved a single file (fid) accompanied by an ASCII file listing all parameters in the subdirectory name.fid. Image data is stored with the processed images saved as individual files for each slice in a 2D experiment or as a single file in a 3D experiment in the subdirectory name.fdf.

## Protocol

A protocol can either be a basic or composite. A basic protocol is a single parameter set, for example, `sems` or `gems`, whereas a composite protocol is a collection of basic protocols.

## Study

A study consists of one or more scans run on a single subject in a single session.

## Study queue

The Study Queue is a list of protocols to be acquired. These protocols are coded with different colors and fonts to distinguish between active, completed and new protocols. The protocols move to the top as scans are acquired.

## Viewport

There are usually three available Viewports: Plan, Current, and Review. Each viewport is a separate work-area with different functions. Use the Plan Viewport to set up experiments and graphically plan the slices or volume. The data will be acquired and displayed in the Current Viewport, which therefore always has the most recent data. Use the Review Viewport to view and analyze previously acquired data.

## Administrator

### Administrator

The administrator of VnmrJ 3.2 (both hardware and software) is generally called “vnmr1” and is the owner of all files and directories of the VnmrJ 3.2 software. Typical functions of the VnmrJ 3.2 administrator are: creating new users and operators, assigning appmodes and various privileges such as access to panels and NMR experiments, and hardware configuration through the “vnmr1” user login.

### Application mode (appmode)

The application mode determines what features are displayed in the VnmrJ 3.2 window. The application modes are Spectroscopy, LC-NMR and Imaging. The administrator defines each user's application mode upon the creation of that user's operating system login account.

## General

### Folder

The user interacts with the parameters through panels in one of the four folders: Start, Acquire, and Process. Each folder can have a number of pages. The folders are found in the bottom horizontal region of the VnmrJ 3.2 interface.

### Global files

Global parameters, templates, experiments, file and so forth are available to all users and are stored in the `/vnmr` directory, which is owned by the administrator.

### Local files

Local files (parameters, templates, experiments, probe files, and so forth) are stored in the user's directory (`~/user/vnmrsys`). Local files typically are specified as the first application directory to search.

### Locator

The locator is a database manager that helps spectroscopists keep track of the location of automation runs, shim files, protocols, acquired data and so forth.

### Node in study queue

Each entry in the study queue is termed a node. A node is either a parent node (the name of the sample or a child node (the actual scan).

## Pages

The sub-panels in each folder are called pages, panels, or templates. These pages have entry fields, menus, check boxes, and so on, for setting up sample-specific, acquisition, or processing parameters.

## Prescan(s)

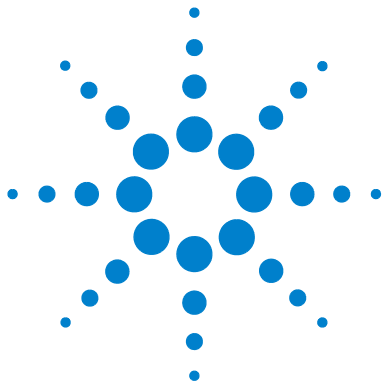
A prescan is a short acquisition generally not saved to disk that can be part of or precede protocols. Prescans that are integrated into protocols include solvent suppression optimization routines (presat in 90% water), and scout scans to find solvents for suppression. Prescans that precede protocols or data acquisition are automatic tuning, locking and gradient shimming. These prescans are set-up from the "Standard" page found in the "Start" folder.

## Push-pin

A small icon that looks like a tack or a push-pin is located in the upper right of the folders and vertical panels. By untacking the push-pin, the user can hide the folders or vertical panels. A tab to the side of VnmrJ 3.2 is created. When the mouse is rolled over the tab, the vertical panel or folder will be temporarily redisplayed. If permanent redisplay of the panel or folder is desired, the push-pin may be tacked in place.

## Vertical panels

The vertical panels are located on the left-hand side of the screen. They provide easy access to general cross-applications functions, which is particularly useful when the horizontal folders are hidden.



## **B** **Printers and Plotters Troubleshooting**

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This appendix contains troubleshooting and setup information for printers and plotters. It describes a number of printers and plotters tested as compatible with VnmrJ 3.2. Check the Agilent website for new printers that work with VnmrJ 3.2. Refer to the original system manuals supplied with the printer or refer to the on-line manuals for printers supplied with older spectrometers.



## Hewlett-Packard LaserJet 840C Printer

<b>Printer I/O</b>	HP IEEE-1284-B Parallel Universal serial bus 1284-B receptacle
<b>Printer language</b>	HP PCL 3
<b>Printer memory</b>	2 MB standard memory
<b>Cartridges</b>	black and color
<b>Resolution</b>	Black – 600 x 600 dpi with black pigmented ink Color – HP color layering technology
<b>Pages per minute</b>	Black – 4 ppm Black and color – 0.8 ppm
<b>Configuration control</b>	Software controlled

There are two buttons and three lights on the front panel of the printer. The lights indicate if the printer is operating correctly or indicate the time when the printer requires attention from the user.

### Self-Test procedure

Turn the HP DeskJet 810C and 830C series printer off and remove the cable that connects the printer to the computer.

Turn the printer back on.

Press and hold the **Power** (top) button. Press the **Resume** button 4 times and then release the **Power** button.

The self-test page will print with a report containing the printer model name, serial number and a diagonal self-test pattern. The test pattern verifies that all nozzles on the print cartridge are firing. If a gap appears along the diagonal self-test pattern, one or more nozzles are not firing.

## Operation

Turn off the power.

Connect the interface and power cables.

Press **Go** to turn the power on. The ready light should come on.

Open a terminal window, log in as root, and activate LaserJet\_150, LaserJet\_150R, LaserJet\_300, LaserJet\_300R, LaserJet\_600, and LaserJet\_600R using the procedures in the beginning of this chapter.

Set the parameter printer, from within VnmrJ 3.2, to the name you typed in the previous step, for example, `printer='LaserJet_300'` or `printer='lj'`. Type `printon dg printoff` to produce a test print.

To use as a plotter, set the parameter plotter to the name you typed in the previous step, for example, `plotter='lj 300'` (If you activated more than one resolution, there will be different names corresponding to the different resolutions). To test, type `pl page`.

## Lexmark Optra Color 45 Inkjet Printer

<b>Printer I/O</b>	IEEE 1284 ECP compliant, 1284-B receptacle, Internal Solutions Port (6 options).
<b>Printer language</b>	PostScript Level and PCL 5c emulation.
<b>Printer memory</b>	8 MB.
<b>Cartridges</b>	Dual head thermal inkjet
<b>Resolution</b>	600 x 600 dpi
<b>Pages per minute</b>	Black - 8 ppm Color - 4 ppm
<b>Configuration control</b>	Software controlled

The Agilent supplied customized Optra Color 45 printer/plotter includes special software and is HPGL, PS, and PCL compatible. This custom printer is not available from other sources. The optional tri-port serial port board is installed in the Agilent Optra Color 45 allowing either serial or parallel port mode. The Optra Color 45 replaces the Lexmark 4079, HP 7475, and the HP 7550A plotters.

### Self-Test procedure

- 1 Follow the set up instructions in the printer manual and then plug into ac power.
- 2 The print display shows Ready, and the green light is on.
- 3 Click the **Menu** button until TESTS MENU is displayed; and click **Select**.
- 4 Click the **Menu** button until Print Demo is displayed and click **Select** twice.

A multi-color page should be printed, and the Menu returns to Ready.

## Hewlett-Packard DeskJet 5550 Printer

<b>Printer I/O</b>	Centronics Parallel Universal serial bus
<b>Printer language</b>	HP PCL 3, PostScript
<b>Printer memory</b>	512 KB standard memory sufficient for full page graphics at 600 dpi
<b>Cartridges</b>	Black and color
<b>Resolution</b>	Black – 600 x 600 dpi Color – depends on paper type
<b>Pages per minute</b>	Black – 12 ppm Black and color – 10 ppm
<b>Configuration control</b>	Software-controlled

The Hewlett-Packard 5550 features 600 dpi color printing and is software-controlled. It has a color cartridge and a black cartridge. The control panel has two switches. Refer to the Hewlett-Packard manual for operating procedures.

There are three buttons in the user interface:

- Power button and light should always be used to turn the printer on and off.
- Using a power strip, surge protector, or a wall-mounted switch to turn on the printer may cause premature printer failure.
- Cancel button stops the print task.
- Resume button and light is used when the light above the resume button is flashing. Press the button to continue printing.

Agilent software does not support two-sided printing.

## Hewlett-Packard DeskJet 970Cxi Printer

<b>Printer I/O</b>	Centronics Parallel Universal serial bus 1284-B receptacle
<b>Printer language</b>	HP PCL 3
<b>Printer memory</b>	512 Kbyte standard memory sufficient for full page graphics at 600 dpi
<b>Cartridges</b>	black and color
<b>Resolution</b>	Black – 600 x 600 dpi Color – depends on paper type
<b>Pages per minute</b>	Black – 12 ppm Black and color – 10 ppm
<b>Configuration control</b>	Software controlled

The Hewlett-Packard 970CXI features 600 dpi color printing and is software-controlled. It has a color cartridge and a black cartridge. The control panel has two switches. Refer to the Hewlett-Packard manual for operating procedures.

There are three buttons in the user interface to control the printer:

- Power button and light should always be used to turn the printer on and off. Using a power strip, surge protector, or a wall-mounted switch to turn on the printer may cause premature printer failure.
- Cancel button stops the print task.
- Resume button and light is used when the light above the resume button is flashing. Press the button to continue printing.

Agilent software does not support two-sided printing.

## Hewlett-Packard LaserJet 2300 Printer

<b>Printer I/O</b>	Centronics Parallel, USB port
<b>Printer language</b>	HP PCL 6
<b>Printer memory</b>	4 MB standard memory (expandable to 52 MB)
<b>Cartridges</b>	black
<b>Resolution</b>	1200 x 1200 dpi
<b>Pages per minute</b>	10 ppm
<b>Configuration control</b>	Software controlled
<b>Devicetable entry</b>	LaserJet_600 and LaserJet_600R

The Hewlett-Packard LaserJet 2100 features 1200 dpi printing and is software controlled. The control panel has two switches and two lights. Refer to the Hewlett-Packard manual for operating procedures.

### Self-Test procedure

To print the configuration page, press and release the **GO** (large button at bottom of control panel) and **JOB CANCEL** (button at top of control panel with upside down triangle) buttons simultaneously when the printer is in the ready mode.

## Hewlett-Packard LaserJet 2100 Printer

<b>Printer I/O</b>	Centronics Parallel, 1284-B receptacle LocalTalk port
<b>Printer language</b>	HP PCL 6
<b>Printer memory</b>	4 MB standard memory (expandable to 52 MB)
<b>Cartridges</b>	black
<b>Resolution</b>	1200 x 1200 dpi
<b>Pages per minute</b>	10 ppm
<b>Configuration control</b>	Software controlled

The Hewlett-Packard LaserJet 2100 features 1200 dpi printing and is software-controlled. The control panel has two switches and two lights. Refer to the Hewlett-Packard manual for operating procedures.

### Self-Test procedure

To print the configuration page, press the **GO** button (at bottom of control panel) and **JOB CANCEL** button (at top of control panel with upside down triangle buttons) simultaneously when the printer is in the Ready mode.

## Hewlett-Packard Color LaserJet 4550 Printer

<b>Printer I/O</b>	Bidirectional parallel port (requires a “C” connector), Two Enhanced Input/Output (EIO) slots; paper handling accessory port; infrared receiver port. IEEE compliant, 1 open EIO slot, HP JetDirect EIO print server for fast Ethernet 10/100Base-TX in second EIO slot.  (optional) HP JetDirect 600N and 610N (EIO) internal print servers, external print servers, connectivity card
<b>Printer language</b>	HP PCL 5C, PostScript Level 3 Emulation, HP PCL 6
<b>Printer memory</b>	64 MB standard memory (expandable to 192 MB)
<b>Resolution</b>	600 dpi
<b>Pages per minute</b>	16 ppm (black); 4 ppm (color)
<b>Configuration switches</b>	Expanded control panel

### Operation

Set up the printer as described in the Hewlett-Packard manual. Specify the printer as a PostScript printer. On the Name and Type lines in the file `/vnmr/devicenames`, type PS for a printer and PS\_AR for a plotter. In the user's global file, set `maxpen=8`.

## Hewlett-Packard LaserJet 5000 Series Printers

<b>Printer I/O</b>	IEEE 1284-compliant bidirectional parallel, RS-232 9-pin serial, 2 PCI-based EIO slots
<b>Printer language</b>	HP PCL 5e, HP PCL 6, and Postscript Level 2 emulation
<b>Printer memory</b>	4 MB standard memory (expandable to 100 MB)
<b>Resolution</b>	1200 dpi
<b>Pages per minute</b>	16 ppm
<b>Configuration switches</b>	Control panel

### Overview

The Hewlett-Packard 5000 provides large format (11 x 17") printing at 16 pages per minute.

The control panel has an LCD display, three LEDs and six buttons.

The LaserJet 5000 features 1200 dpi resolution, but for NMR typical applications the plot lines are too fine. You may even fail to plot a full page at this resolution without expanding the printer memory since a full 11" x 17" page takes up to 32 MBytes of pixel information. Also even in parallel interface applications transferring data is unacceptably slow. For good plot resolution, 600 dpi is a good choice. For publication quality spectra and reproduction, 300 dpi is a better option since the plot looks darker.

Switching between large and standard formats requires changing the paper size in the printer configuration menu on the LaserJet 5000.

## Self-Test procedure

- 1 Load paper and toner cartridge. Press the **Go** button to turn printer on.

Wait until the printer warms up.

The READY message should be displayed.

- 2 Press **Menu** until the display reads **INFORMATION MENU**.
- 3 Press **Item** until the display reads **PRINT CONFIGURATION**.
- 4 Press **Select** to print the configuration page.
- 5 The configuration page shows the printer's current configuration.

## Operation

Set up as described in the Hewlett-Packard printer manual.

## Hewlett-Packard Color Inkjet CP1700 Printer

<b>Printer I/O</b>	Bidirectional parallel port (requires a "C" connector) Two Enhanced Input/Output (EIO) slots Paper handling accessory port Infrared receiver port. USB, IEEE-1284 (parallel), Infrared, and network LIO. (optional) HP JetDirect 600N and 610N (EIO) internal print servers, external print servers, connectivity card
<b>Printer language</b>	HP color Inkjet cp1700: HP PCL 3 enhanced HP color Inkjet cp1700d: HP PCL 3 enhanced HP color Inkjet cp1700ps: HP PCL 3 enhanced
<b>Printer memory</b>	16 megabyte (MB) built-in random access memory (RAM), cannot be upgraded. 4 megabytes (MB) built-in read only memory (ROM), cannot be upgraded
<b>Resolution</b>	1200 x 1200 dpi (black); 2400 x 1200 dpi (color)
<b>Pages per minute</b>	16 ppm (black); 14.5 ppm (color)

### Overview

The control panel has an LCD display representing ink levels and printer status. There are also three push buttons to control power on/off, resume, and cancel. The resume and power switches have a LED associated with them.

The CP1700D features 1200 dpi resolution for black and white printing and 2400 dpi for color, but for NMR typical applications the plot lines are too fine. It might not be possible to plot a full page at this resolution without expanding the printer memory because a full 11" x 17" page takes up to 32 Mbytes of pixel information. Also, even in parallel interface applications, transferring data is unacceptably slow. For good plot resolution, 600 dpi is a good choice. For publication quality spectra and reproduction 300 dpi is a better option since the plot looks darker.

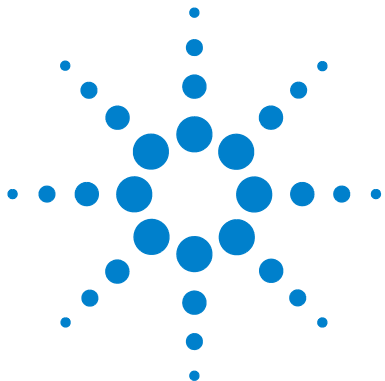
## Self-Test procedure

- 1 Load paper, ink tanks, and print heads.  
Click the **Power** button to turn printer on.
- 2 Wait until the printer initializes and reports Ready.
- 3 Press and hold down the **Resume** button in the control panel for three seconds until the LCD display reports processing Job.  
A test page is automatically printed.

## Operation

Set up as described in the Hewlett-Packard printer manual.

## **B Printers and Plotters Troubleshooting**



## C Locator Administration

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## Restricting User's Data Viewing Privileges in Locator

The administrator can restrict how files appear in the Locator for each user. An access list controls the data that is visible to the users.

### Show the access list

Use these steps to show the Access field in the User Information panel on the right side of the VnmrJ 3.2 Admin interface.

- 1 Open the **VnmrJ 3.2 Administration** interface, if is not already open.
- 2 Click the button with the **user's name** to select the user.
- 3 Open the Users Defaults window:
  - a Click **Configure**.
  - b Select **Users**.
  - c Select **Defaults**.
- 4 Select the **access** check box under the Show column.
- 5 Click **OK**.

An Access line appears in the user information panel on the right side of the VnmrJ 3.2 Admin interface.

### Access list

The following steps describe how to set up an access list for a user.

- 1 Select a user account by clicking on the **User's Name** button.
- 2 Type a space-separated list of users whose files the selected user can access.  
For example, if user1 will be allowed to view files for user2, user3, and user99, type: user2 user3 user99.
- 3 Click **Save User**.
- 4 Repeat for each user.

## Configuration Files

Configuration files for the Locator are contained in the following directories for the different appmode types:

<b>Interface</b>	<b>Directory</b>
Spectroscopy	/vnmr/shuffler
Individual users	Svnmruser/shuffler

## Large Database Recommendations

The maximum number of items to display in the Locator can be controlled by setting its value in Systems Settings window.

Do one the following:

- 1 Select **Edit**.
- 2 Select **System settings**.
- 3 Click the **Display/Plot** tab.
- 4 Type a value for Max # of items to show in Locator.

Setting the value in **Max # of items to show in Locator** higher than 2000 slows down the response of the Locator by filling Locator table with a large number of rows. A value between 1000 and 2000 gives optimal performance. A row is shown with the word Truncated if the database returns more items than the limit. The message indicates that more items returned but are not shown in the Locator to save time.

Use the following guidelines if the database contains more than 10000 items:

- Set the Locator to show only items that match the criteria of the statement as follows:
- Imager Interface
  - a Select **Tools**.
  - b Select **System settings**.
  - c Click the **Display/Plot** tab.
  - d Check the box next to Display only matching items in locator.

- Liquids Interface (Spectroscopy):
  - a Select **Edit**.
  - b Select **System settings**.
  - c Click the **Display/Plot** tab.
  - d Check the box next to Display only matching items in locator.
    - Do not type values in the Locator statement of all, etc.
- Set values in the Locator statement to match 1000 or 2000 items.
- Do not type values in the Locator statement of all, etc.
- Use the File Browser to limit the directory scope. The Locator only matches items that are in and under the directory the browser defines if the File Browser is displayed.
- Set Max # of items to show in Locator between **1000** to **2000**.

## Network Database

Several computers running VnmrJ 3.2 can access the same Postgres database server. This way, all of the VnmrJ 3.2 users will have immediate access to data saved on other machines (if the user has access to that data).

This access requires that all computers running in network database mode be mounted to any directories of other computers containing data that is intended to be accessed. The mounts can be hard mounts listed in the `vfstab` file or automount, but they must be mounted to gain access.

Set the environment variable `PGHOST` to the host name of the machine to use for the DB server in every user account. The default is the local host. Different users can use different DB servers, or some computers can use their own database server. A computer which is to be a DB server will need the Postgres postmaster daemon running on it. Even if it is running, if `PGHOST` is set to a remote computer, the remote computer will be used.

Non DB server computers default to network mode DB access by comparing `PGHOST` with the local host name. Specifying a remote host sets the non DB server computer in network mode. The DB server computer has itself as `PGHOST`, and the VnmrJ 3.2 administrator on the server computer must create an empty file

```
/usr/varian/config/NMR_NETWORK_DB
```

to force it into network mode. Data access from other computers will not work correctly if this is not done. Setting this variable on non server computer will force it into network mode.

The file `/usr/varian/config/NMR_NETWORK_DB`, if it is used, must be in place before `dbsetup` is run during installation, or the DB will not be set up correctly.

The attribute 'hostdest' in the database contains the host name where the file actually resides (destination) when a computer is set up for network mode. The attribute

'host\_fullpath' contains hostdest:fullpath where fullpath is the path as it looks on the machine, hostdest. It does show the mounted path from the current machine.

Pushing automount relations from a server makes the following necessary:

VnmrJ 3.2 must be able to translate between the mounted path and the actual path on the destination computer. It will first look for a file

```
'/usr/varian/mount_name_table'
```

It only uses this file if it is found. An example of this file is as follows:

```
# Table of remote system mount names and paths
# One line per entry, Syntax:
#host:direct_path mount_path
mongoose:/export/home/mongoose_home
voyager:/export/home/home
```

If 'mount\_name\_table' is not found, it looks in '/etc/mnttab' and in '/etc/auto\_direct' to get relationships. If automount relations are pushed from a server, they will not always be available in these files and will need to be put into a 'mount\_name\_table' file. Mounts from the vfstab file and from the local auto\_direct file, should work properly without a 'mount\_name\_table' file.

Changing the UNIX port number is not normally necessary, but might be done if more than one Postgres daemon is to run on the system at one time. The port will default to 5432 unless specified otherwise in every user's login file with the environment variable, PGPORT. It should be possible for different users (and thus different groups) to use entirely different database daemons and databases on the same computer. If PGPORT is set to something other than 5432, then every user on every computer using that DB server will need PGPORT set in their accounts.

## Database Hints

If the Locator shows Error under the column headings, or if the error message, DataBase contents version is not correct, appears on the bottom of the screen, exit VnmrJ 3.2 and run `dbsetup` in a terminal window.

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