USING THE OPTICAL DRIVE ON THE SUNDS1

NMR data that are acquired on one of the Varian spectrometers in the VOICE NMR Lab and saved in your own directory (i.e., /export/home/userId/data/username) are instantly accessible on the Sun Data Station SUNDS1 as well as the PC Data Station PCDS1. However, data that are mistakenly saved in the home directory on the spectrometer will be invisible on the Data Stations (contact Lab staff if that happens).

Users are responsible for the backup of their own data. Remember that on the first Monday of each month, all user data files will be deleted from the spectrometers by Lab staff.

The optical drive is the preferred method for data backup and retrieval on the SUNDS1, although a 1/4" tape drive is also available mainly to allow research groups to read their old backup tapes.

**Users Be Aware:**

1. The optical drive on the SUNDS1 can accept the following 5 1/4", 512 bytes/Sector optical disks: 650MB, 1.3GB, and 2.6GB.
2. Brand new optical disks must be formatted before use.
3. Optical disks are two-sided, and both sides should be formatted and used separately.
4. The optical disk must be mounted first before any data can be written to or read from the disk.
5. If mounted, the optical disk must be unmounted first before it can be ejected.
6. All copying functions are executed through the use of the Optical sub-menu. In order to prevent user mistakes, these menu functions will check and make sure that certain conditions are met before the commands are executed. However, for it to be effective, users will have to pay close attention to all system messages and follow the instructions very carefully.
7. It doesn't matter if you are writing to or reading from the optical disk, your working directory should always be the originating directory, i.e., the directory that contains the data being copied.
8. Before deleting your own data files on the SUNDS1, make sure that they have been backed up successfully. Mistakenly deleted data may not be recoverable.
9. For your own protection, always keep a detailed record of data file activities, such as filenames and the time they are created, backed up, and deleted. The availability of this kind of information will greatly increase the chance of recovering your lost data.
10. Back up your data frequently to avoid accidental loss, and clean off your fids directory regularly to avoid the storage charge (see handout).

**Optical Disk Ordering Information:**

Vendor (phone)  The Diskette Connection (1-800-654-4058)
Specifications  650MB/1.3GB/2.6GB, 5 1/4", 512 Bytes/Sector, ISO Compatible, Rewritable
Unit Price  call

(NOTE: If you find a better place to get them, please let us know.)
Overview of the Optical Menu:

Menu Path: Main → 2:Optical

1:Format  formats optical disk
2:Mount  mounts optical disk
3:Unmount  unmounts optical disk
4:Calc Size  calculates file sizes for selected files or for the whole working directory.
5:Write  copies mouse-selected files or the whole working directory to the optical disk
6:Write Sub  copies files or the whole working directory to a sub-directory on the optical disk
7:Read  copies selected files or the whole working directory to a sub-directory on the optical disk
8:Return  returns to the Main menu

Built-in Safety Features:
1) Copying will be aborted if optical disk is not inserted or mounted;
2) Copying will be aborted if total file size being copied exceeds the available disk space;
3) Writing will be aborted if working directory is not a sub-directory of /export/home/user1d/data;
4) Reading will be aborted if working directory is not the optical disk or a sub-directory on the optical disk;
5) Before the copying starts, you will be given the opportunity to confirm the origin and destination directories.

Summary of Related Macros:
checkod  checks optical disk mounting status and shows disk usage
edod  changes working directory to the optical disk and shows its contents
dirod('p')  displays or prints the optical disk directory and disk usage
dirsübod('p')  displays or prints a specified sub-directory on the optical disk with the disk usage

1. Formatting, Mounting, Unmounting, and Ejecting the Optical Disk

1A. Formatting the Optical Disk

IMPORTANT: Brand new optical disks must be formatted before use.

LC Main Menu → 2:Optical → 1:Format  format the optical disk
y <rtn>  confirm that the disk is inserted and start formatting

You will then be prompted to specify the media from a list of three choices. Formatting will take about 2 minutes for each side. When it is done, the console will beep and the message "Optical disk is ready to be mounted" will appear at the bottom of the screen. If you don't see the message after 10 minutes, ask Lab staff for help.

To format the other side, LC on 3:Unmount, press the eject button on the optical drive to eject the optical disk, then flip it over, re-insert it into the optical drive, and format it as above.
1B. Mounting the Optical Disk

**IMPORTANT:** After the formatted optical disk is inserted into the optical drive, it must be mounted first before any data can be copied to and/or read from the disk.

LC Main → 2:Optical → 2:Mount mount the optical disk

After a brief moment, the message "Optical disk is now mounted" will appear at the bottom of the screen, along with a summary of the disk usage such as the one shown below:

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>kbytes</th>
<th>used</th>
<th>avail</th>
<th>capacity</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/rdsk/cd0d0s0</td>
<td>270523</td>
<td>76129</td>
<td>191688</td>
<td>28%</td>
<td>/export/home/user1d/optical</td>
</tr>
</tbody>
</table>

It indicates that the optical device is mounted on the directory /export/home/user1d/optical, and that the total space for one side of the disk is 270,523 kbytes, with 76,129 kbytes (28%) used and 191,688 kbytes still available.

1C. Unmounting/Ejecting the Optical Disk

**IMPORTANT:** If the optical disk is mounted, it must be unmounted first before it can be ejected.

LC Main → 2:Optical → 3:Unmount unmount the optical disk

Wait for the following message to appear, then press the eject button on the optical drive to eject the disk.

Optical disk is now unmounted.
You can press the eject button now.

**IMPORTANT:** If the system is having problem unmounting the optical disk, the following error message will appear at the bottom of the screen:

Problem unmounting the optical disk.
Please ask Lab staff for help.

2. Copying Data to the Optical Disk

Insert a formatted optical disk into the optical drive on the SUNDS1, then:

LC Main → 2:Optical → 2:Mount mount the optical disk

chdir <rtn> (if you haven’t already done so) change to your data directory

< TO COPY SELECTED DATA FILES >

<table>
<thead>
<tr>
<th>LC filenames</th>
<th>select all the data files you want to copy</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC 5:Write</td>
<td>copy the selected data files to the optical disk</td>
</tr>
</tbody>
</table>

< OR - TO COPY THE WHOLE WORKING DIRECTORY >

Make sure no files are selected by the mouse, then:

LC 4:Cal Size check total size of working directory

LC 5:Write copy the entire working directory to optical disk

Then, a message similar to the one below will appear at the bottom of the screen:

====== COPYING ======
FROM: /export/home/user1d/data/username
TO: /export/home/user1d/optical

Then, a confirmation box such as the one shown below will appear:
Copy mouse-selected file(s): OK to start?

Confirm  Cancel

Check the origin and destination directories and answer the question accordingly by clicking on Confirm to start the copying or Cancel to abort the copying.

When the copying is done, the console will beep and the optical disk directory and disk usage will be displayed in the text window. Check and make sure that the data has been copied successfully.

3. COPYING DATA TO A SUB-DIRECTORY ON THE OPTICAL DISK

Insert a formatted optical disk into the optical drive on the SUNDS1, then:

LC Main → 2:Optical → 2:Mount
chdir <rtn> (if you haven't already done so)

mount the optical disk
change to your fids directory that contains the data you want to copy to the optical disk

< TO COPY SELECTED DATA FILES >

LC filenames
LC 6:Write Sub

select all the data files you want to copy
copy the selected data files to a sub-directory on the optical disk

< OR - TO COPY THE WHOLE WORKING DIRECTORY >

Make sure no files are selected by the mouse, then:

LC 4:Cal Size
LC 6:Write Sub

check total size of working directory
copy the entire working directory to a sub-directory on the optical disk

Then, you will be prompted to enter the sub-directory name on the optical disk:

Input sub-directory on optical: \%

(NOTE: If your sub-directory on the optical disk is more than one layer deep, you may enter it in the general form of subdir1/subdir2, such as smith/bookII, where subdir1 is a sub-directory of the optical disk and subdir2 is a sub-directory of the directory subdir1.)

Finally, a confirmation message similar to the one below will appear at the bottom of the screen:

====== COPYING ======
FROM: /export/home/user1d/data/username
TO:   /export/home/user1d/optical/sub-directory

Check the origin and destination directories and, if everything is OK, click on confirm to start the copying.

4. PROCESSING DATA DIRECTLY OFF THE OPTICAL DISK

Insert the optical disk into the optical drive on the SUNDS1, then:

LC Main → 2:Optical → 2:Mount
cdod <rtn>

mount the optical disk
change working directory to the optical disk
5. **READING DATA FROM THE OPTICAL DISK**

Insert the optical disk into the optical drive on the SUNDS1, then:

- **LC Main → 2:Optical → 2:Mount cdod <rtn>**
  - mount the optical disk
  - change working directory to the optical disk

After changing to the directory on the optical disk that contains the data you want to read:

### TO READ SELECTED DATA FILES

Select all the data files before clicking on the Read button:

- **LC 2:Optical → filenames → 7:Read**
  - copy the selected data files from the optical disk back to your directory on the spectrometer

### OR - TO READ THE ENTIRE SUB-DIRECTORY OR OPTICAL DISK

Click on the Read button with no data files selected:

- **LC 2:Optical → 7:Read**
  - copy the entire working directory, which is either the optical disk or a sub-directory on the optical disk, back to your directory on the spectrometer

You will then be prompted to select a spectrometer and enter your username on that spectrometer:

```
Input your directory name: 
```

And the origin and destination directory names will appear at the bottom of the screen for your confirmation:

```
====== COPYING ======
FROM: /export/home/user1d/optical/sub-directory
TO: /export/home/user1d/data/username
```

If everything is OK, click on Confirm to start the copying. If not, click on Cancel to abort the copying.

When the copying is done, the console will beep and your `username` directory on carol will be displayed in the graphics window. Check and make sure that the data has been copied successfully.
7A. Creating Sub-directories on the Optical Disk

If you are sharing an optical disk with other users in your group, you may want to create sub-directories for each user for better data management. To do so, insert and mount the optical disk as described above, then:

cdod <rtn>  
change working directory to the optical disk

LC 1:Set Directory → 7:More → 2:Create New  
menu method to create a new directory

Then, enter the new directory name at the following prompt:

New directory (enter name and <return>)? ¶

Repeat this process, starting from cdod, for each sub-directory being created on the optical disk.

7B. Deleting Data from the Optical Disk

Insert the optical disk into the optical drive on carol, then enter:

LC Main → 2:Optical → 2:Mount  
mount the optical disk

cdod <rtn>  
change working directory to the optical disk

---< IF DATA IS IN A SUB-DIRECTORY >---

LC sub-directory  
select the sub-directory on the optical disk

LC 1:Set Directory  
change to the selected sub-directory

---< IF DATA IS IN A SUB-DIRECTORY >---

LC filenames  
select all the data files that you want to delete

LC 7:Delete  
delete the mouse-selected files

LC Confirm  
confirm to delete

7C. Calculating Data and Directory Sizes

NOTE: This menu function requires that your working directory be /export/home/user1d/optical or its sub-directory, or a sub-directory of /export/home/user1d/data.

First, make sure the optical disk is inserted and mounted.

Then, change to the directory that contains the files of interest using chdir or cdod.

---< TO CALCULATE FOR SELECTED FILES >---

Select the files of interest with the mouse before clicking on the Cal Size button:

LC Main → 2:Optical → filenames → 4:Cal Size

---< OR - TO CALCULATE FOR THE ENTIRE WORKING DIRECTORY >---

Click on the Cal Size button with no files selected:

LC Main → 2:Optical → 4:Cal Size

7D. Displaying and Printing a File List

To display a file list: enter the macro dirod or dirsobod, without any argument, to display a file list for the optical disk or a sub-directory on the optical disk.

To print a file list: enter the appropriate macro with the p argument, such as dirod('p') for printing the file list for the optical disk.

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