

NMR NOTES #14

Using SUN Floppy Disk Drive

All of the Sun workstations include a 3.5" floppy disk drive that can be used to store up to 1.44 Mb of data. This drive uses a standard 1.44Mb, 3.5" floppy disk, which can be formatted either as simply raw magnetic storage or with a file system. If a file system is used, it can be either a Unix file system or a DOS file system. In all three cases, the diskette storage capacity is about the same, but storage times are very different, with the DOS file system being the slowest and the raw storage being the fastest. The table below shows a comparison of storage times, both for a single large file and for 500 small files. Clearly, a DOS file system should be used only when DOS compatibility is **required**. If you must move data to a DOS environment consider using FTP instead.

File System	1 large file	500 small files
Raw storage (tar)	36 seconds	45 seconds
Unix file system	50 seconds	9 minutes
DOS file system	11 minutes	90 minutes

The floppy disk drive is located in the front right corner of the computer box (the 'Pizza Box' under the monitor) and is accessed from the side. To format a floppy disk for use with the system, simply insert the diskette in the drive, make it available with the `volcheck` command, and issue (from Unix) one of the formatting commands:

`fdformat -U` - Formats the disk without a file system. Use with the tar command.

`fd_ufs` - Format the diskette and construct a Unix file system.

`fd_dos` - Format the diskette and construct a DOS file system. This is not necessary if the disk is already formatted for use on a DOS system.

Once a floppy disk has been formatted for use on the system, it is mounted and made available by using the `volcheck` command after inserting the diskette in the drive. This command will either mount the floppy disk as `/floppy/floppy0` if it has a file system installed or make it available as `/vol/dev/aliases/floppy0` if it is raw storage. The `volcheck` command will sometimes fail if there is a problem with the volume management daemon (`vold`). If this happens, the `su volmgt` command can be used to stop and then restart the volume management daemon. Using the command `ls -lL /floppy/floppy0` will tell you whether or not the floppy disk was mounted. If the system says that the directory does not exist, then either there is no file system on the diskette, or there is a problem with `vold`. It may be necessary to run `su volmgt` two or more times to get the `vold` running again. The `ls -lL` command will also tell you whether the file system is a Unix file system or a DOS file system. The presence of a `lost+found` directory indicates a Unix file system. If this directory is missing, the diskette has a DOS file system installed.

To store NMR data on a floppy disk, you can either store it directly from within VnmrX, or copy it later, using Unix commands. To save data from within VnmrX, use the `save-fid` command, and specify a file name on the floppy disk: `svf('/floppy/floppy0/dataname')`. This will create a directory `/floppy/floppy0/dataname.fid` with the NMR data. Other save commands, such as `svp` to save parameters or `svs` to save shims may also be used. Note that if the file system is a DOS file system, the name specified must be DOS-compatible. To copy data, use the Unix copy command `cp`. If you are copying NMR data sets or anything else with a subdirectory structure, it is necessary to use the `-r` (recursive) option:

```
cp -r dataname.fid /floppy/floppy0
```

Determining the amount of free space on the floppy disk is fairly straight forward. The command `du -k /floppy/floppy0` will display the current diskette usage, in kbytes, for the floppy disk. Simply compare this to the 1.44 Meg that are nominally available.

Using the floppy disk without a file system allows the maximum amount of data to be stored, and for that data to be stored quickly. The `tar` command is used to create, update, and extract data from an archive, which may be on magnetic tape, a disk file, or on the floppy diskette. See NMR note number 8 for more information on using the TAR command. Simply use `tar -cf /vol/dev/aliases/floppy0 *.fid` to archive all of the fid data in the current directory to the floppy disk. Some time later you can add new data to the archive with the `tar -uf /vol/dev/aliases/floppy0 *.fid`. Use caution here, in that the update function will replace an old file by a newer file with the same name. A data set can be extracted at any time from the floppy disk with the extract command: `tar -xf /vol/dev/aliases/floppy0 mydata.fid`. The biggest problem in using the floppy disk with the `tar` command is in determining how much of the floppy disk has been used- how full is it? A convenient script called `disk_dir` has been written, similar to the `tape_dir` script. The `disk_dir` script will list the names and sizes of all of the component files in a floppy disk archive and display a total of all of the file sizes, letting you know how much of the diskette is being used. If you attempt to write past the end of the diskette, you will get a 'Write Error - EOF' indicating that you tried to write past the end of the file. The `disk_dir` script will show this file name and its full size even though it is not complete in the archive. The total disk space used will be listed as greater than the 1.44 Meg available on the diskette. Beware, and watch for write errors so that you do not lose any data! The operating system does not have provision for splitting an archive across several floppy disks (or tapes, for that matter).

When you are done with the floppy disk, regardless of how it is formatted, `eject floppy` will eject it from the drive.