

NMR Center News

Volume 1, Issue 3

October 22, 1997

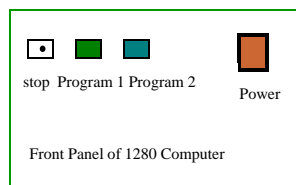
If you are planning to use NMR as a research tool, you should become an authorized NMR Center user.

To do So:

1. Obtain a training request form from the NMR Center. Fill it out and sign it, then return it to the NMR Center.
2. Make a training appointment with a service instructor.
3. You will have to practice with an authorized user until you feel comfortable with the instrument.
4. Arrange a check-out schedule with the instructor.
5. If you are qualified, you will be notified by Dr. Wu, and your name will be added to on the authorized user list.

QE300 Problems and Rebooting

The QE300 NMR is equipped with a very old computer (1280) for controlling the hardware and NMR data processing. There are three buttons on the front panel: **Start/Stop**, **Program 1** and **Program 2**. They have been replaced by three smaller switches since



we are unable to find the identical parts. The reboot board was modified too. Before rebooting the computer, please carefully read the instruction posted

on the computer.

Using command mode to operate the QE300 is far



Working with Commands on the

more efficient than using menu mode. The following commands are used to acquire and process data.

NA—number of acquisitions.
SG—auto set gain
CB—change block size
SW—change spectral width

D5—change pulse delay
TT—time for the experiment
WD—define disk to use
AP—autophase correction
PS—phase correction with saved values.
ID—integral display
IS—integral scale
LP—check parameters

If you would like to learn more, check out our QE300 Mini-Manual

DN—turn the decoupler on
DF—turn the decoupler off

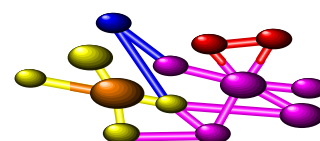
Use two keys:
Control+C —stop all operations
Control+P—stop plotting
Control+Q—stop acquisition

Keys, Keys, Keys, Keys and Keys

The key to the NMR lab has been changed. If you are an authorized NMR user, you may obtain a new key from Ethel. You need to fill out a request form

and pay a refundable \$15 deposit. We understand that \$15 is lots of money, but our NMR Center houses more than one million dollars of

equipment. All of the users



The Cost of major supplies in the NMR Center

Plotter Pen (QE300, GN500)	\$3.33/each	25 x 3.33 = 83.25	
Plotter Paper (QE300, GN500)	\$79.95/ per box	3 x 79.95 =239.85	
Liquid Helium	\$3.25/per Liter	160 x 3.25 =520.00	
Liquid Nitrogen	\$65/per 250 liter	4 x 65.00 =260.00	
			Total: \$1103.10 per month

The following safety precautions must be read and understood by everyone who comes into the NMR Lab.

Superconducting magnets exert large attractive forces on ferromagnetic objects. Some medical electronic implants will not function under the magnetic field, causing injury or death. Items such as watches, tape recorders, cameras and credit cards may be magnetized and irreparably damaged if exposed to a field above 10 gauss. Computer hardware and electronic equipment may become magnetically saturated in a field above 25 gauss. All loose ferromagnetic objects such as staplers, nails, keys and tools should not be within the 5 gauss line.

Only operators are allowed to enter the

Magnetic Field Safety and Shielding

To my knowledge, there are no scientific studies showing that static magnetic fields, even very strong fields like inside an MRI instrument harm biological tissues. Many people complain that the magnetic field makes them sick. Often those are the same people strapping magnets on their own bodies for the “beneficial and therapeutic effects of magnetic fields”.

NMR magnets can physically, not biologically affect surrounding metal objects. Movement of these objects can then affect the field shifts and magnet homogeneity.

In some cases, it may be necessary to understand the principles of magnet shielding before we take action.

The magnetic field consist of invisible magnetic flux lines. The

more flux lines, the stronger the magnetic field. The straighter the flux lines, the more homogenous the magnetic field. For a superconducting magnet, the flux lines come out from the top of the magnet and go through the channel of least resistance to the bottom of the magnet. All flux lines leaving the north pole must return to the south pole.

Magnetic materials have a lower resistance to the passage of flux lines. The flux lines will prefer to move through steel rather than through air and tend to collect in the steel for as long as possible, until the steel object is magnetically saturated. The steel grabs the incoming flux lines, then redirects their exit back to the magnet. So by placing a steel plate between the magnet and the area to be shielded,

the ends of the steel plate will direct the incoming flux lines to where they must exit back to the magnet. Then, the edge of plate will have a stronger field (more flux lines). One way to overcome this problem is to make the steel plate much bigger and thicker, but this is very expensive.

The other solution to this is to build a steel box totally surrounding the magnet. Then the flux lines going out the top of the magnet would enter the steel flux channel and back to the magnet. The outside of the steel box would have a very low residual magnetic field. This approach is very expensive and



How to Transfer NMR Data

From INOVA400 to INOVAdata station:

a. At INOVA400, in VNMR shell, find the files you want to transfer.

b. Type: `tar cvf temp.tar *.fid`.

c. At INOVAdata, in VNMR shell, type: `ftp inova400`, then login to your own account. Find the temp.tar.

d. Type: `get temp.tar`. The file will be transferred to inovadata station. Type: `bye`

for quit transfer.

e. Type: `tar xvf temp.tar` to extract your NMR data to VNMR format.

From INOVAdata to your PC with NUTs NMR processing Software:

Use FTP in your PC to get the temp.tar file from inovadata, and then use winzip to untar the files. These files can be read by your PC and processed by NUTS. The NMR spectra

can be saved as different format and pasted to other application software.

From QE300, GN500 and Omega600 to INDIGO:

Very few people want to know! If you need that, feel free to talk to me please.

