NatMEG lab FAQ

Version 2021-01-27

Fixing bad channels before recording
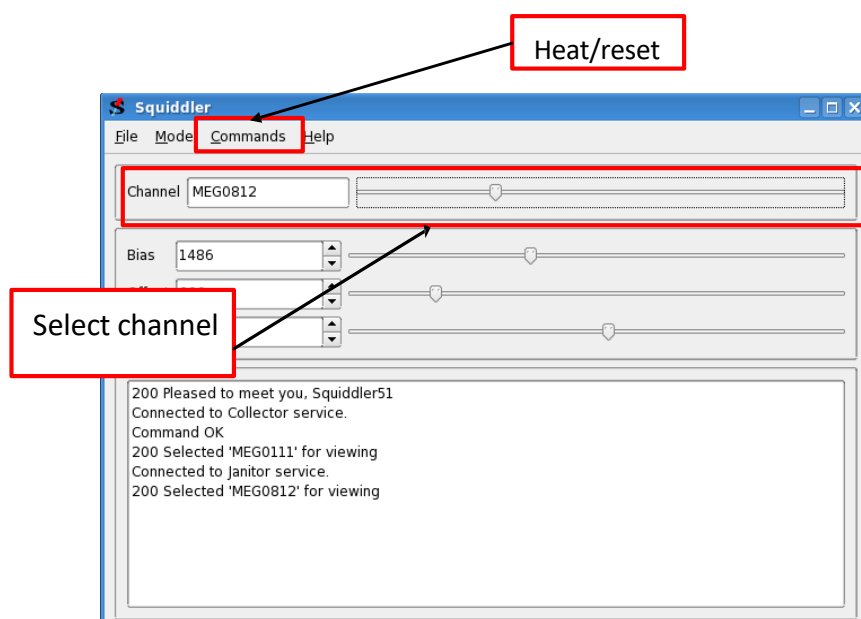
<u>Problem</u>: Jumpy or noisy channels

<u>Solution</u>: Use Squiddler to heat bad channels.

Open: Menu -> Neuromag -> Squiddler

In Squiddler:

1. Select channel with slider
2. Open Commands, click Heat Channel. Wait until the channels settle then inspect if the channel looks fine. Inspect if other channels have been affected by the heating.
3. Repeat 1-2 for all bad channels.

How to load the tuning before recording?

To load the default tuning open Acqusition, then click the menu Tools -> Tuner. The tuning tool will appear. Click file -> load tuning. A message will pop up asking if you want to read the default state tuning. Click ok.

Optionally, you can click "measure noise" before loading the tuning and again after loading the tuning to see the noise level. The average noise level should be around 2.6-2.7.

Problem: The average noise level is too high (> 3) after loading the default tuning.

Solution: First, check that there are no objects in the MSR that could be causing disturbances, e.g. non-tested metallic stimulus equipment, left items, etc. Remove those items.

Run new tuning: click "measure noise" and when it has measured the noise level, click "Tune". The tuning procedure with iterate through tuning parameters and try to minimize the noise in the system. Each iteration takes about 20 seconds. Click "stop tuning" when the average noise level is below 2.7. NB! The tuning procedure takes up to 15 min. Make sure that you have enough time to run the tuning procedure and always check the tuning well in advance before your participant arrives.

If channels are missing, you might have to restart Acquisition (see this FAQ) before continuing with the tuning or call for assistance.

Acquisition does not ask about measuring HPI.

Acquisition will automatically ask if you want to do/redo HPI fit every time you click START or RESTART. If you pressed Skip but want to do the HPI fit anyway, you need to restart the recording.

If Acquisition does not ask about measuring HPI, it might be because it has not registered the HPI digitization. You can check if HPI is digitized in the Acquisition main window. It will either specify the time the HPI was digitized or say "HPI: not digitized!"
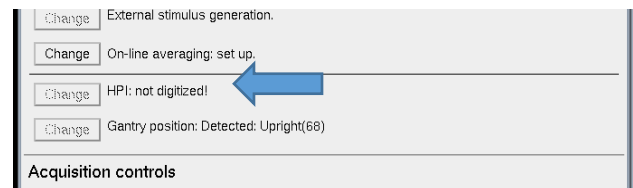
Solution: load the correct preparation with the digitized HPI coil locations.

Note that every time you click start in Acquisition, it saves a new preparation, so make sure that you note the time you saved the preparation with the digitized HPI on the digitization PC.

HPI errors

Problem: Errors with HPI. It gives an error message or Suggestion is redo HPI.

Solution: check in the following order:

1. Make sure the correct preparation is loaded with the digitized HPI coil locations.
2. Check that the HPI cable is connected to the panel at the side of the scanner.
3. Click "Try again" to see if the fit has improved.
4. Make sure that all HPI coils on the participant's head is inside the helmet. If possible, reposition the participant, so at least three HPI coils are inside the helmet. Click "Try again" to see if the fit has improved. If not, proceed to step six.
5. Check for loose coils that might have come off. Do not try to re-attach them; go to step six.
6. Redo HPI/isotrak fit: Get the participant out of the scanner to the preparation area. Then reposition/re-attach HPI coils and redo the digitization.
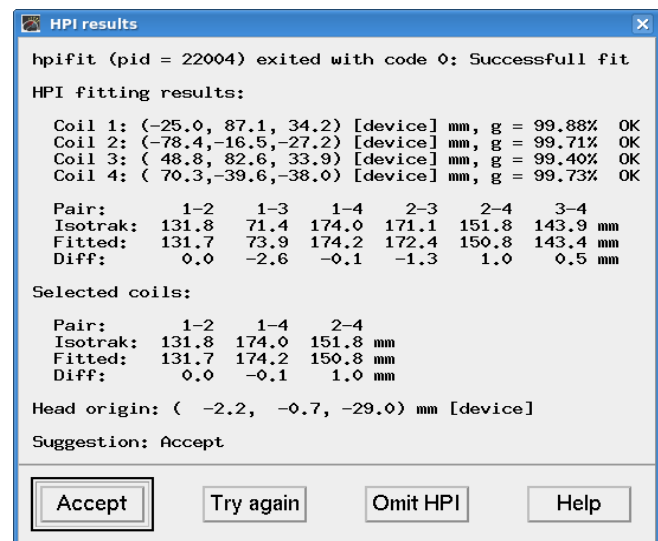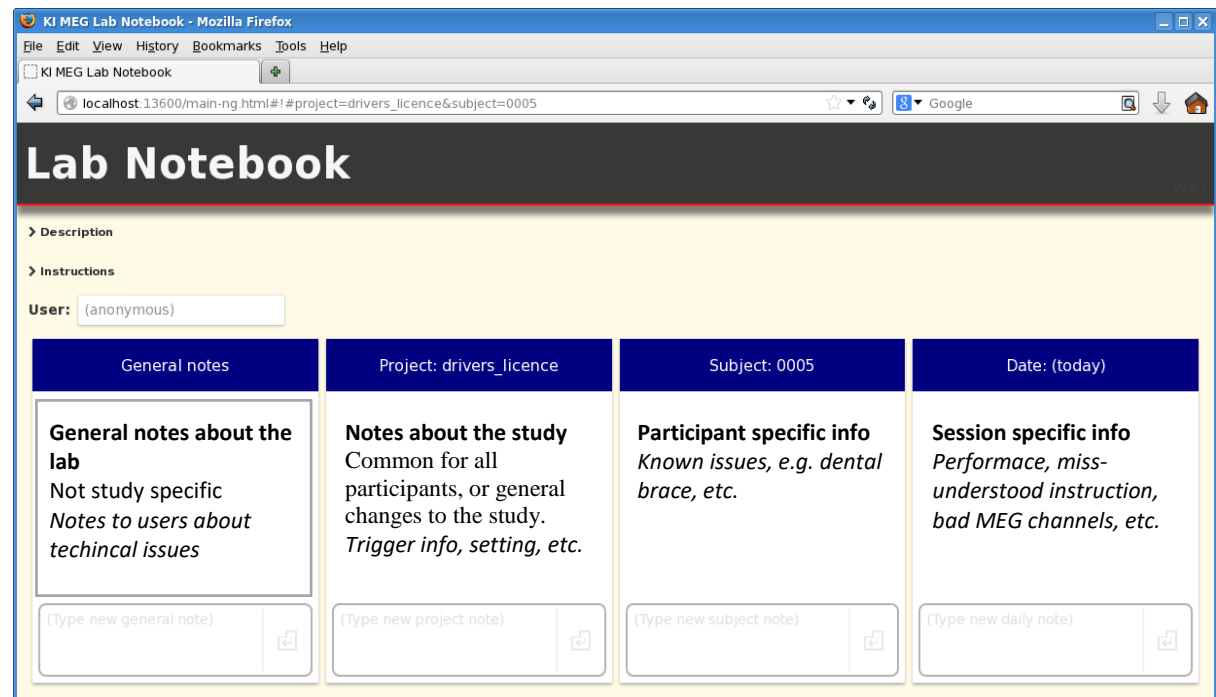
The Lab Notebook

How do I start Lab Notebook?

To open the Lab notebook, first start the Notebook server and then open the Lab Notebook. On the desktop on the Acqusition PC:

1. Click "Notebook server"
2. Click "Start Lab notebook"

Guide for using Lab Notebook

Lab Notebook does not start

Problem: If you cannot open Lab Notebook and get and error message saying Firefox is already running.

Solution: Open a new terminal and type

```
pkill -f firefox.
```

This shuts down all Firefox processes. Then open the notebook server and the notebook from the desktop.

Dual monitors on Stimulation PC

You can use dual monitors on the Stimulation PC if you want to run Presentation separate from the screen shown to the participant in the MSR, for example, if you want going to show a video to the participant instead of the Presentation screen.

1. On the Stimulation PC, right-click on the Windows desktop and select Screen Settings.
2. Change the so that the screens are extended. Confirm changes.
3. On the second screen (the one connected to the eye tracker), switch input to DVI.

Presentation will still as a default run on the first monitor. Change the monitor by changing your Presentation project settings. Under the menu "Monitors" you change the driver from "Standard Driver" to the one with a number.

Remember to switch the screens back to the standard setting when you are done.

How do I monitor head position during recording?

To use the head position monitor tool:

Open a terminal, type: `/data/MNE/mne_visualize_hpi`

The head position is read from the latest HPI fit. Click" Reload HPI" to update the view.

Be aware that the head position tool does not show the actual participants head. The head is a template head and should only be used as an approximation of the participant's real head position in the MEG helmet.

You can rotate the head using the buttons on the GUI or by using the mouse wheel. You can change what is displayed (helmet, transparency, HPI on/off, head point fits, etc.) by pressing "Options...".

To view the head position from a previous file (e.g. for comparison) open a new terminal window and type:
`/data/MNE/mne_visualize_hpi_file <filename>`

The <filename> is the filename of the file you want to read including the full path.
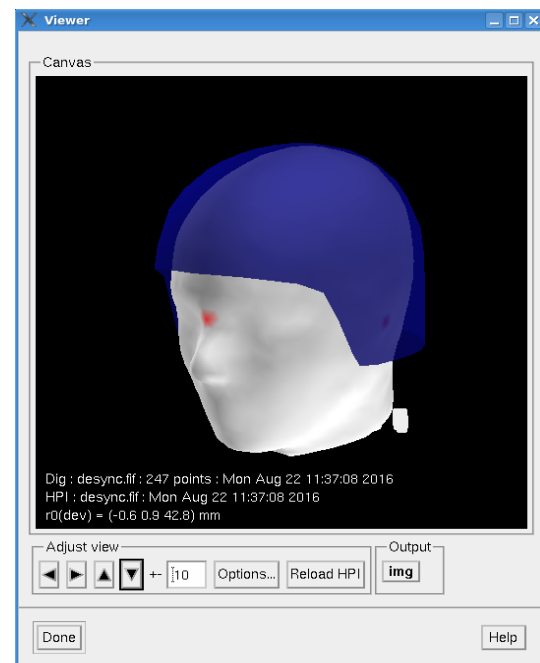
How do I use the sound mixer?

See picture below for an overview of how to control the sound mixer. The mixer should as default always be on. If it is switched off, use the on/off switch on the backside of the mixer to switch it back on.
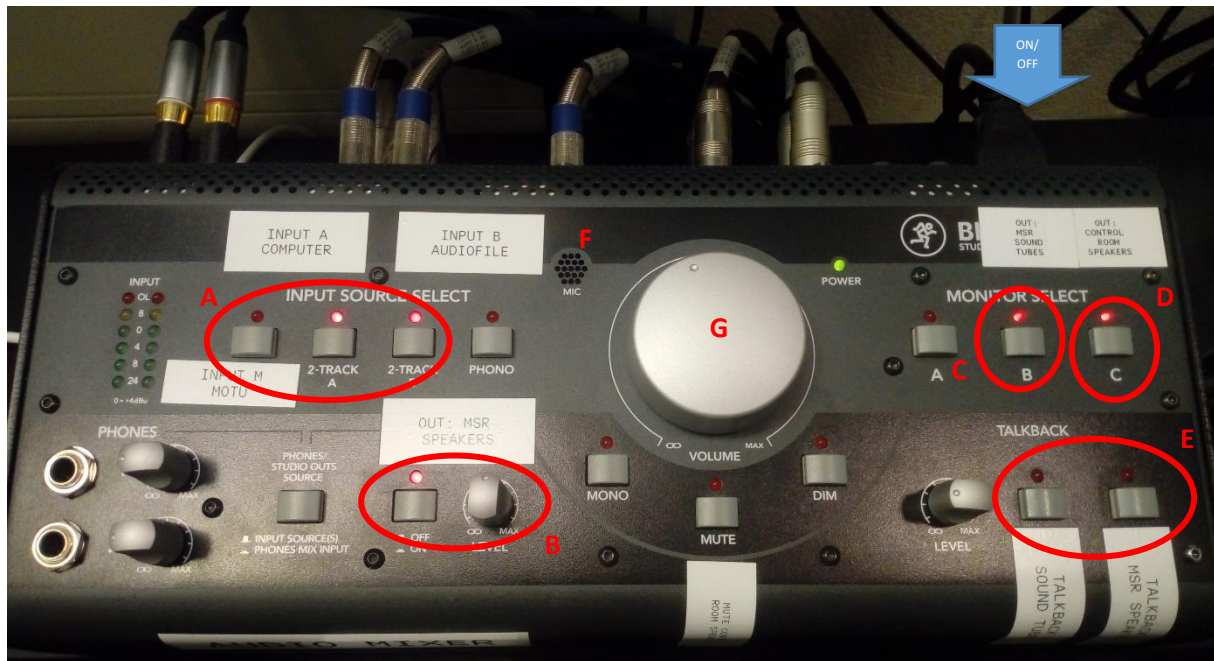
A. Select input. Sound from Stimulus Computer (A) and/or Audiofile (B)
B. Select the **MSR backpanal loudspeakers** as output and adjust the volume.
C. Select the **sound tubes** as output.
D. Select the Control Room speakers (the small speakers next to the mixer) as output.
E. Talkback. Hold down either button to use the mixer to speak to the participant inside the MSR.
   Left button: speak though sound tubes.
   Right button: speak though the backpanel speakers.
F. Microphone for talkback.
G. Volume adjustment

There is no sound to the MSR

Problem: sound from the Stimulation Computer, Audiofile, or talkback does not appear inside the MSR

Solution: do in the following in order:

- Check that the sound on the Stimulation Computer is on and at full volume.
- Make sure that the correct input is selected (A in the figure above).
- Make sure that the correct output is selected (B or C in the figure above).
- *For sound tubes*: check that the sound tube amplifier is switched on. The sound tube amplifier is located in the Stimulus Cabinet. Switch it on if it is switched off. WARNING: do not switch it on a participant has the sound tubes in their ears.

- *For backpanel speakers*: check that the backpanel speaker amplifiers are switched on. The amplifiers are located on the top shelf of the MSR Cabinet. Switch on the amplifiers (the two small boxed; they should be blinking rapidly) and the input/output board if any are switched off.

There is no sound from the MSR/I cannot hear the participant

Problem: there is no sound from the MSR, and I cannot hear if the participant is saying anything.

NB! Your participant should, at all times, be able to speak to you. As the first thing, after you have positioned the participant in the scanner and left the MSR, you must test that the participant can hear you and you can hear them.

Solution:

- Make sure that the MSR monitor (the big loudspeaker on top of the Stimulation Cabinet) is switched on. The on/off switch is on the backside of the MSR monitor. The light in the logo on the front of the monitor will be on when the monitor is turned on.
- Make sure that you are using the correct talkback option; i.e. using the sound tube talkback when using the sound tubes.
- Make sure that the sound mixer is turned on. The sound also go through the video mixer; make sure that the video mixer is also turned on. Buttons on the video mixer have a red light when they are turned on. There is a small on/off switch on the back of the video mixer to turn it back on if it has been turned off.

Fixing wrong filenames of recordings

<u>Problem</u>: One or more recording is saved with a wrong filename.

<u>Solution</u>: rename filenames:

1. Open a terminal: go to the data folder (replace <text> with the text that applies your project; do not write the < > signs):
   `/neuro/data/sinhue/<your_project_name>/NatMEG_<number>/<YYMM DD>`
2. Rename the file:
   `mv <old_filename.fif> <new_filename.fif>`.
   Press enter.

Be aware that if a file with the new filename already exists, it will be overwritten with no option to recover the lost data. Rename any overlapping named file first.

How to restart Acquisition?

Problem: Channels are not appearing when running Acquisition. Acquisition is giving errors about "lost connection" or "cannot connect to channels".

Solution: In order do the following, if your problem keeps appearing then proceed to the next step; otherwise do not proceed:

1. Check that the correct setting is loaded (File -> Load Settings). See if the missing channels are still missing.
2. Close and re-open Acquisition Programs (remember to save preparations if you have already begun).
3. Restart Acquisition Programs. You find this option under the Neuromag top menu, "Maintenance". (Menu -> Neruomag -> Maintenance -> Restart Acquisition). A terminal will pop up— type y to confirm. The restart might take a couple of minutes. Once the restart has completed, you need to restart Acquisition and also launch the Tuner and reload the current tunings you are using.

4. If none of the above works, you will need to do a "hard reset". Close any open instances of Acquisition. You then need to go into the machine room (through Daniel's office). Open the right door on the cabinet in the middle of the room. Look for a sticker pointing to a reset button. Press that button. Watch all lights flash red and then go all green (look for any red lights; there should be none).