

# Head Position Indicator (HPI) measurement

## 1) Prepare yourself, the system and the environment

- turn Polhemus on
- make sure that necessary equipment is present
- remove all metals nearby
- start “Subject preparation” on the DACQ workstation

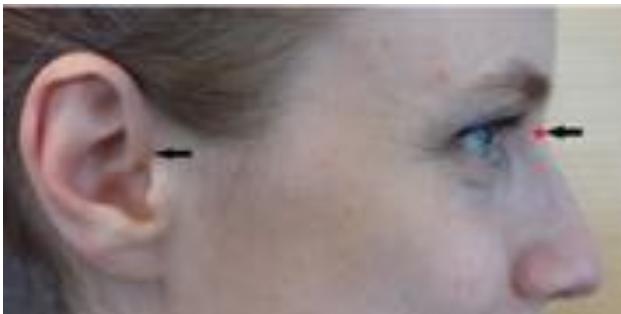
## 2) Fix the HPI coils to the scalp or EEG cap

- five coils as high as possible
- two behind earlobes, two on the temples, one on forehead or vertex
- use tape on a clean skin; don't try fixing to hair



## 3) Document nasion and preauricular point locations for later use

- use mobile or decent camera, remember to add subject ID



## 4) Fix the glasses, the headband or a separate receiver element on the subject

- glasses should be stable and not cover the points to be digitized
- Headband is quite stable if the cable is taped onto the back of the wooden chair
- head should not move during digitization

## 5) Digitize anatomical landmarks, HPI coils, EEG electrodes and extra points

- start by selecting *Coordinate frame alignment*
- if you have an assistant, individual points/coils can be clicked with the mouse
- do at least 50 extra points (if EEG not used)
- save the preparation
- check anatomical landmark digitization by repeating that part

## 6) Perform the HPI measurement once subject is in MEG

- suggested by the system when data collection started
- check that Polhemus  $\leftrightarrow$  MEG coil localization difference is  $< 2$  mm
- if the results are not acceptable, redo HPI measurement a couple of times
- if this is not helping, reposition the subject and retry a couple of times again
- when “Accept” is suggested, take note of the head coordinates origin
- Check *cHPI* in Acquisition if you want to compensate head movements

*If in doubt or trouble, contact CIBR Support : [cibr-support@jyu.fi](mailto:cibr-support@jyu.fi) or support team directly*

# MEG Data Acquisition

1. Log into the DACQ workstation using your personal JYU user name and password
2. Start *Elekta Neuromag* → *Acquisition* and start following the *Change* buttons in order
3. Load an existing project or insert new project details
4. Load existing subject information or insert a new subject (*Volunteers* + a personal code)
  - DO NOT enter real subject information (names or birthdays)
5. Load settings or set up data acquisition information (channels, sampling rate, ...)
6. Define stimulus setup (internal for DACQ-generated sequences, external for Stim-PC)
7. Test that the stimuli and other devices work as intended
8. Check gantry position and that it is correctly recognized by the DACQ software
9. Check empty-room signal quality. A few bad channels is ok, otherwise heat / Tune

You are now ready to welcome the subject!

1. Check signal quality with the subject - if there are artefacts, check subject carefully for jewelry, clothing, dental work, make-up, dyes, tattoos, surgical leftovers, implants
2. Prepare the subject (see instructions). Bring him/her into the MEG, and make sure he/she is ready and comfortable and understands the instructions. Pump up once more!
3. Perform HPI, start recording and stimulation. Have session breaks if necessary.
4. When the experiment is complete, stop stimuli and recording, and bring out the subject
5. Save all your data with a consistent and exact naming policy
6. Thank the subject, answer any questions, make sure he/she leaves happy
7. Transmit the data to the CIBR data server (see separate instructions)
8. Log out of the DACQ workstation, but leave the workstation on

If you are the last user of the day, bring the gantry to the helium liquefaction position.

Clean up your mess, and make sure to leave everything as it was or better.

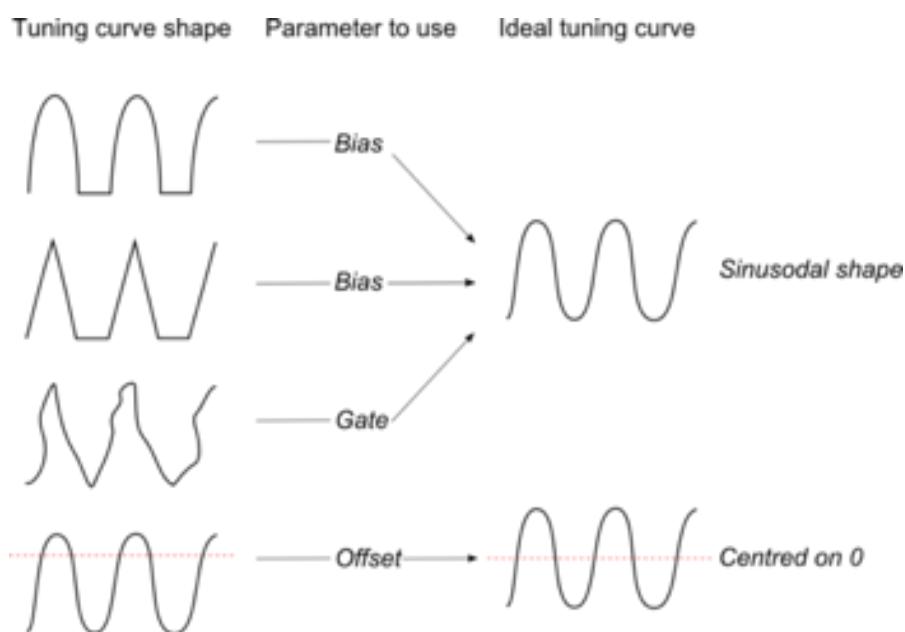
Fill in the log book.

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# Survival guide to Sensor Tuning and Helium Recycling

For detailed instructions to signal check and tuning, refer to TRIUX User's Manual

1. Start an empty-room measurement. Prepare the Acquisition software. Eliminate potential interference sources. Close the MSR door. Load proper tuning settings.
2. Use the on-line viewer to browse through all channels. Take a note on missing, high-amplitude, spiky, fluctuating, or otherwise noisy channels. Check the noise levels in IAS channels separately.
3. If there are noisy channels, start *Tuner*, select the noisy channel and heat it.
4. To tune channels manually, stop data acquisition and select *Job / Manual tune* in *Tuner*. First, try changing the *Offset* parameter, refresh, and revert the change. If this does not help, start changing the parameters little by little. See the figure below for guidance.



## Helium Recycling (IHR)

### When you are making a normal measurement:

1. Make sure there is a single solid green light on the Helium recycling cabinet
2. If you need to stop recycling, click "Start MEG session" or make changes to the *Scheduler*
3. Confirm positioning of the MEG gantry
4. Confirm the color in the *Scheduler* for upcoming days - report if going to reddish colors
5. Prepare and conduct your experiment as planned
6. Read the notifications during the session, if any, and take actions accordingly

### When you leave the laboratory:

Check the reservation calendar.

1. if there will be other measurements soon, clean up and leave the system as is
2. if there will be a break of < 3 hours, turn on recycling using the *Scheduler*
3. if you are the last user of the day or if there is a break > 3 hours, turn the gantry to the liquefaction position (blinking green in the position indicator) and select *Finish MEG Session*

### Using the Helium Recycling Scheduler

1. Open the application from the *Neuromag* menu
2. Select the date for changes
3. Write the new starting and finishing times to the window, taking into account the lab rules
4. Split the day to several sessions when there is a break > 1 hour

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