

MEG Setup Procedures

Head Size / Fit Test

- Determine head size by measuring the subject's head.

Gantry Limits	Nasion-Inion	Preauriculars	Circumference
MEG	≤ 40cm	≤ 40cm ?	≤ 60cm

- Determine fit by placing the MEG helmet along with a protective cap, towel or a pillow case draped over the subject's head.

Fiducial Points/Head Coil Placements

*If subject has had previous digital pictures of the fiducial points retrieve images to match placement.

- 1) Place a small black dot at the nasion (indentation between the forehead and the nose) midline.
- 2) Place a small black dot at the left & right preauricular points (indentation just above the tragus).
- 3) Take a picture of these locations using the digital camera. Download and print pictures using the Dell/NEC LCD 1850E (black) computer.
- 4) Attach adhesive washers to head localization cables.
- 5) Attach head localization cables to subject at marks (Nasion –Blue; Rt. Ear – Red; Lt. Ear – Green).
- 6) Secure with tape.

Gantry Position – Tilting the Gantry

***Never operate the gantry while a subject's head is in the helmet.**

- 1) The gantry has an indicator and several controls which are located on the right side of the base. These include:
 - **Brake Lever** - (lower handle) releases the brakes.
 - **Tilt Control Lever** -(upper handle) controls the UP/DOWN movement of the gantry.
 - **Angle Indicator** – indicates the gantry's angle of tilt.
- 2) The controls have been designed so that the operator is required to use both hands.
- 3) Pulling up on the Brake Lever turns on the power and releases the brake. Releasing the brake lever turns off the power.
- 4) The Tilt Control Lever is OFF when in the center position.

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- 5) To re-position the Gantry, lift the brake lever.
- 6) If the gantry brake does not release immediately when the brake level is raised, raise the gantry up a few degrees before starting downward motion.
- 7) As the Tilt Control Lever handle is lifted further the gantry will begin to rise.
- 8) Pushing the Tilt Control Lever handle down will cause the gantry to lower.
- 9) Returning the Tilt Control Lever to the center OFF position will cause the gantry motion to slow to a stop.

Chair Adjustments

The chair is a pneumatic-hydraulic unit and sometimes there may be a 2-3 second delay when turning controls from the "0" (off) to the "1" (on) position.

****Never operate the gantry while a subject's head is in the helmet. Care should be taken when adjusting the chair with a subject seated. Until familiar with the operation of the chair adjust very slowly in small increments.***

1) Front Panel Controls

- a) There are two valves (**Height Adjust Valve** and **Tilt Adjust Valve**) and a hand wheel (**Motion Control Hand wheel**) located on the front control panel. The Brake Valve is located on the side of the control panel. Using these controls there are three adjustments that can be made:
 - The chair can be raised up or down (Height Adjust Valve),
 - The backrest can be raised or lowered (Tilt Adjust Valve) and
 - The chair can slide back or forward (Brake Valve).
- b) The Height Adjust and Tilt Adjust Valves located on the front control panel controls whether the hand wheel adjusts the height of the chair or the tilt of the backrest. The two valves cannot be activated at the same time.

2) Chair Backrest Adjustment

- a) The upper valve controls the **TILT** of the chair backrest.
- b) To adjust the back rest turn the valve to the "1" (on) position.
- c) With the **Tilt Valve** in the "1" position the hand wheel controls the backrest angle. The hand wheel is turned clockwise to make the backrest move up and is turned counter-clockwise for downward motions.
- d) The Tilt Control Valve should always be left in the "0" (off) position unless adjustments are being made.

3) Chair Height Adjustment

- a) The lower valve controls the **HEIGHT** of the chair.
- b) To adjust the height of the chair turn the valve to the "1" (on) position.

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- c) With the **Height Adjust Valve** in the “1” position the hand wheel controls the speed and direction of movement of the chair height. The hand wheel is turned clockwise to make the chair move up and is turned counter-clockwise for downward motions.
 - d) The Height Adjust Valve should always be left in the “0” (off) position unless adjustments are being made.
- 4) **Chair Movement**
- a) The **BRAKE** valve controls the back and forward movement of the chair.
 - b) Turn the valve to the “1” (unlocked/on) position.
 - c) Push the chair back or forward to position the chair so that the subject’s head is directly under the gantry.
 - d) The brake provides only a light braking effect. While it is possible to move the chair with the brake in the “locked” position this should be avoided as it will cause premature wear to the brake pad.
 - e) After adjusting the chair set the Brake to the LOCKED (“0”) position.

Positioning a Subject in the Chair

***Never operate the gantry while a subject’s head is in the helmet.**

- 1) The gantry should be at 15° tilt in the upright (sitting) position.
- 2) Move the attached visual stimulus screen when placing a subject in the chair.
- 3) Place the head positioning air bladder over the subject head before positioning subject in the Dewar.
- 4) **Care should be exercised when adjusting the chair height while a subject is seated under the gantry. The operator should be completely familiar with the operation of the controls before operating the chair with a subject or patient’s head inside the gantry.**
- 5) Adjust the chair very slowly in small increments. Adjust the chair height so that the subject’s head is near the top of the gantry. Query the subject with each adjustment.
- 6) Place a rolled up towel or pillow under subjects knees and so that the subject does not slide down in the chair.
- 7) Place neck bladder around neck if it is anticipated the subject will be required to keep head / neck still for extended periods of time.

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Positioning a Subject on the Bed

***Never operate the gantry while a subject's head is in the helmet.**

- 1) Gantry should first be lowered to the 90° position.
- 2) Remove the armrest cushions from the chair.
- 3) Raise the chair to the highest level.
- 4) Fully recline the chair backrest. Make sure that the head end cushion is locked in place. The bed can now be mounted onto the chair.
- 5) Using two people, lift the bed by the ends. Hand grips have been mounted to the under side of the bed to assist with this operation.
- 6) Set the bed onto the unpadded armrests of the chair.
- 7) Four mounting bolts are tied to the base of the bed. Insert them through the holes in the bed base into the holes in the chair armrests. All four bolts should be screwed in a couple of turns and then fully tightened when all four are engaged.
- 8) If the head end cushion will have its angle adjusted, the cushion lock bolts should be removed from their locked position and stored in the holes in the blocks to which they are tied.
- 9) **Install bed side rail on one side.** At least one side rail must be in place before allowing a subject to get onto the bed. Tighten rail clamp to secure.
- 10) Place the step stool on the opposite side to assist the subject in getting onto the bed.
- 11) Once the subject is on the bed place the side rail on the remaining side. Tighten rail clamp to secure.
- 12) The head end cushion of the bed can be adjusted in angles from horizontal to approx. 30° using a link to the adjustable chair backrest.

Subject Monitoring Inside the MSR

- 1) **Never leave a subject unattended in the MSR.**
- 2) The operator can converse with and monitor the activities of the subject inside the MSR by:
 - a) voice intercom,
 - b) video cameras,
 - c) infrared lighting for video in darkness,
 - d) a video display near the operator console and
 - e) a VCR for recording the video.

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- 3) The operator can listen to the sounds inside the MSR by turning on the Intercom System. There are no intercom controls inside the MSR, just a parabolic microphone and flat speaker.
- 4) To speak to a subject who is inside the MSR the operator can press a button located on the front of the Intercom Electronics Box.
- 5) The operator can adjust the volume in the MSR or at the Console by using the knobs located on the front of the intercom electronics box.

References:

- 2) MEG/EEG Operation and Technical Reference Manuals, CTF Systems Inc.