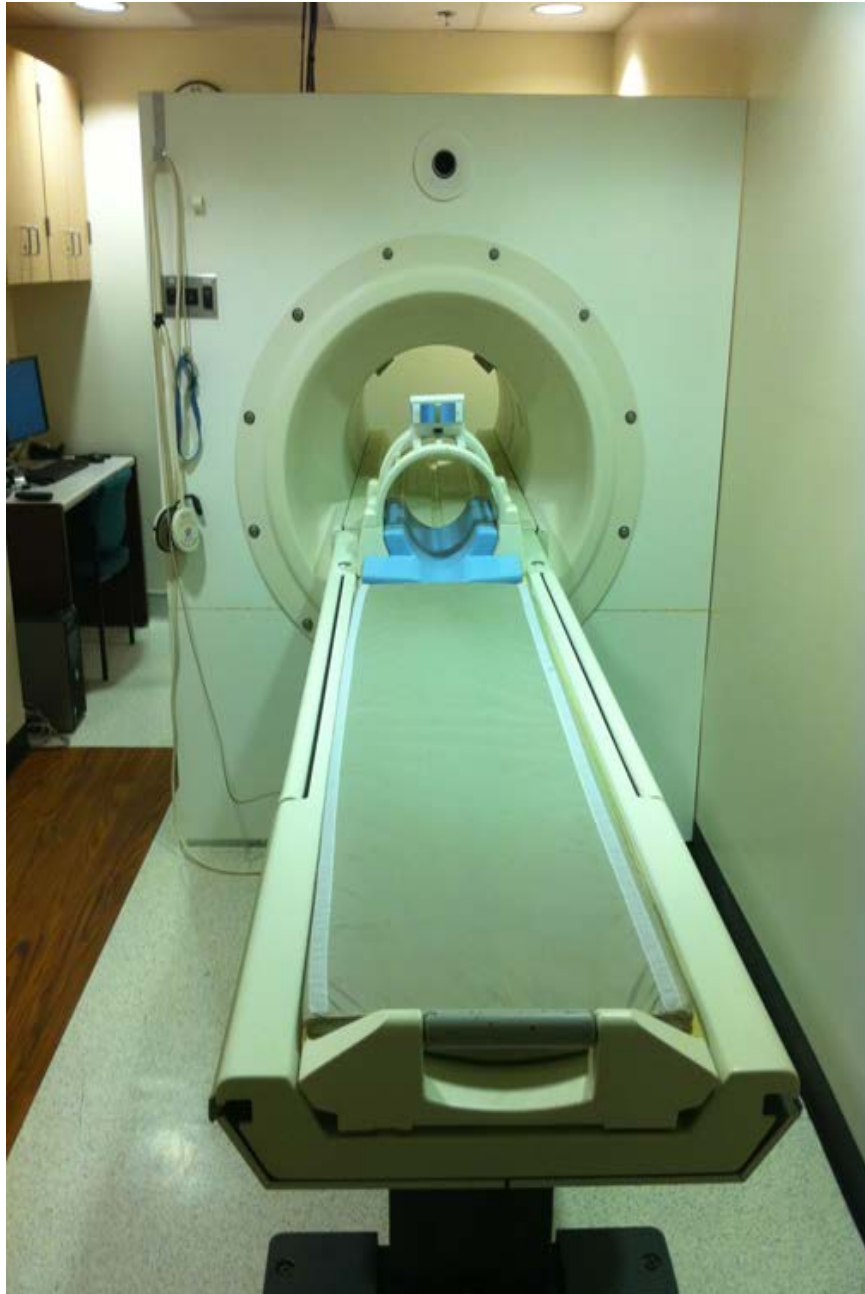# CFMRI Mock Scanner User's Manual

(Last Updated 10/23/2014)

UCSD Center for functional MRI (CFMRI) provides a mock Scanner that simulates the look and feel of a real MRI scanner. The mock scanner allows research subjects to be prepared for functional MRI scans prior to going into the real MRI scanner, increasing the rate of successful data acquisition and the quality of fMRI data. The mock scanner also helps scan operators to become familiar with setting up for running a study at the 3T scanners.

This manual contains basic instructions on how to operate the mock scanner. Please note that this manual does not replace the hands-on training which is mandatory for all mock scanner operators.
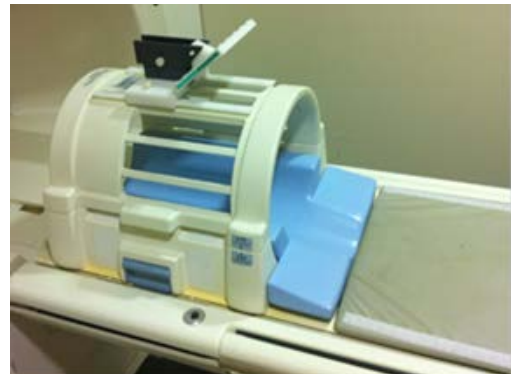
Step–by-step Instructions

1. **Turn on the POWER.**
    a. POWER switch (switch on the right) controls power to all the electronics including the patient table electronic foot pedal, fans, motion tracking device, patient alarm, and the video projector.
    b. You may selectively turn on/off the in-bore fan using the switch labeled FAN.
    c. The middle switch powers the motion tracking device. If you don't plan on using the motion tracking device for your session, leave this switch at off position.
    N.B. This switch must be turned on before opening the motion tracking program on the desktop computer to avoid software error. If you get an error message saying "MoTrak Console not connected", please turn off the program, power on the switch, then restart the program.

2. **Position subject on the table.**
    a. Make sure that the patient table is fully out from the bore.
    b. Lower the table using the foot pedal near the floor.
    c. Remove the top of the bird cage coil using the two release buttons on the side of the bird cage.
    d. Ask the subject to lie down on the table and center the head in the bird cage coil.
    e. Put on headphones if desired. Disposable headphone covers and ear plus are available in the storage cabinet above the desktop computer.
    f. Attach motion sensor if motion tracking is desired (see details in the notes below).
    g. Place top half of the bird cage back on.
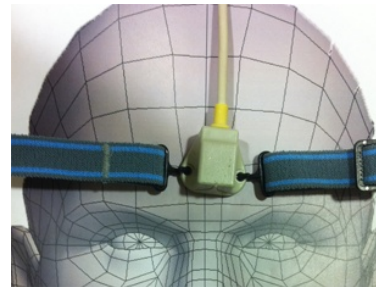   h. Use pads to help keep subject's head in place.

i. Raise the table using the electronic foot pedal.

j. Provide the patient alarm ball to the subject to hold in his/her hand.

k. Turn the release handle bar at the end of the table to unlock the table and push subject/table to the isocenter of the bore. Once the table is at the isocenter the lock will automatically engage to prevent further moving of the table. To take the subject/table out turn the release handle bar and pull.

Release handle

*Notes: **Attach the motion sensor***

a. *The motion tracking sensor should be put on before the subject lies down on the table.*

b. *Sensor should be placed in the center of the forehead using the supplied head band. Adjust the head band for a good fit. The wire coming out of the sensor should be pointing towards the bore and away from the subject.*

3. **Turn projector on if desired.**
   a. Use the projector remote to turn on the projector.
   b. Pull down the screen.
   c. Ask the subject to adjust the mirror on top of the coil for a clear and unobstructed view of the screen.

4. **Login to the computer.**
   a. Password is posted on the LCD screen.
   b. Load "***Scanner Sound Simulator***" software for recorded MRI sound effects (See "Scanner Simulator" section below).
   c. Load "***MoTrak***" for motion tracking (see "MoTrak" section below).

5. **End the session.**
   a. Bring the table/subject fully out.
   b. Turn off the projector (press the power button on the remote twice while pointing it at the projector) and retract the screen.
   c. Turn off the main POWER.
   d. Log out on the computer.
   e. Put back pads, motion sensor, head phones etc, and put used sheets in the laundry basket.
   f. Clean up any mess.
   g. Lock the door behind you.
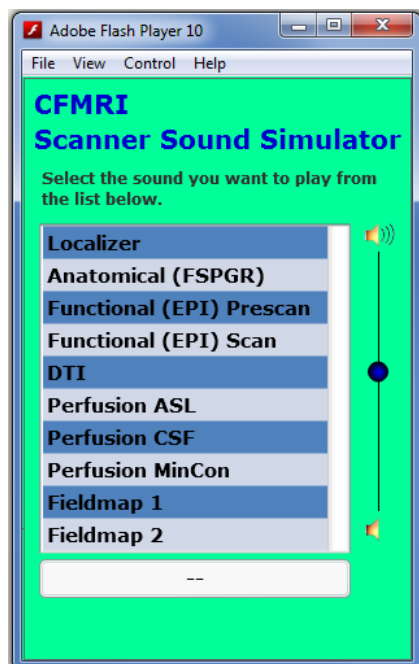
Scanner Sound Simulator

Scanner Sound Simulator is a software program that plays recorded sounds of MRI scans.

1. Load the "Mock Scanner Sound Simulator 2.0" from the desktop.

Scanner
Simulator

2. Select the type the scan for the sound you would like to play.
   a. The sound track will play immediately after you select a scan.
   b. The duration and current position of each sound track is displayed at the bottom of the window.
   c. The volume can be adjusted by using the sliding volume bar on the right side of the window.

3. To stop the sound push pause button or wait for the soundtrack to finish.

MoTrak

MoTrak is a motion tracking software that measures and displays a subject's head motion while the subject is lying in the mock scanner. The program can be used to help subjects practice staying still for the duration of the MRI scan.

Basic Controls

A. Save the current configuration and settings.
B. Load a previously saved configuration.
C. Start motion tracking.
D. Reset the current cross hair position to zero.
E. Go to full screen mode
F. Open the options window.
G. Select what is displayed to the subject on the screen (Target or Movie).
H. Select what is displayed in the active target window (Angle or Position).

Getting Started

1. Load MoTrak from the desktop.

2. Click on the Run button to start tracking and a data logging message will pop up.
3. Click on yes if you desire to record data to a file.
4. Click on the Center button to zero the cross hairs

Target Options

1. Click on the Options Button.
2. The Options window should open up.
3. Click on the Target tab.
4. Target has two different sets of configuration, one for Position and one for Angle.
5. Make the desired changes to Sensitivity, Size Ratios and other options as desired.
6. Click on OK.

Target Sensitivity

In Position target mode, Sensitivity is in millimeters from center to the edge or the outer circle or radius of the circle.

In Angle target mode, sensitivity is in rotation degrees from the center to the edge of the outer circle.

Movie Display

You can display a movie to the subject instead of the target. The movie will pause if the subject has moved out of the center target and will resume when the subject moves back.

The program plays only movies in avi or mpeg formats and does not support any plugins.

1. Click on the Options button.
2. In the "Movie Settings" select your movie.
3. Click on OK.
4. Change the User Display window to Movie.
5. Click on Run and choose to save data if desired.
6. Click on play button on the lower left of the main window.

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Questions??

Please contact the Center by email: ddshin@ucsd.edu

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