Experiment HP-30: Control of EEG and Biofeedback Lab/Research Study

Equipment Required

PC or Mac Computer

IXTA, USB cable and power supply

ROAM-EEG

Conductive gel

ROAM Setup

1. Locate the ROAM and remove it from the dock.
2. Put on the head strap:
   - Place a small amount of electrode gel on the electrodes.
   - Place the headband on the head such that the ROAM transmitter is at the center of the forehead.
   - Make sure that all electrodes are making contact with the skin.

Select one person from your group to be the subject in this experiment.

NOTE – If doing this experiment as a competition – use an iWireR-EEG plugged into the iWire-1 port on the front of the TA unit. Set the 2nd subject up in the same manner as stated below.

If adding the iWireR-EEG for the 2nd person

Go to Edit Preferences and put a check mark in:

- i1 1 – name it Person 2 Right
- i1 2 – name it Person 2 Left
- Set the mode to 25
- Click OK

iWorx Sample Lab

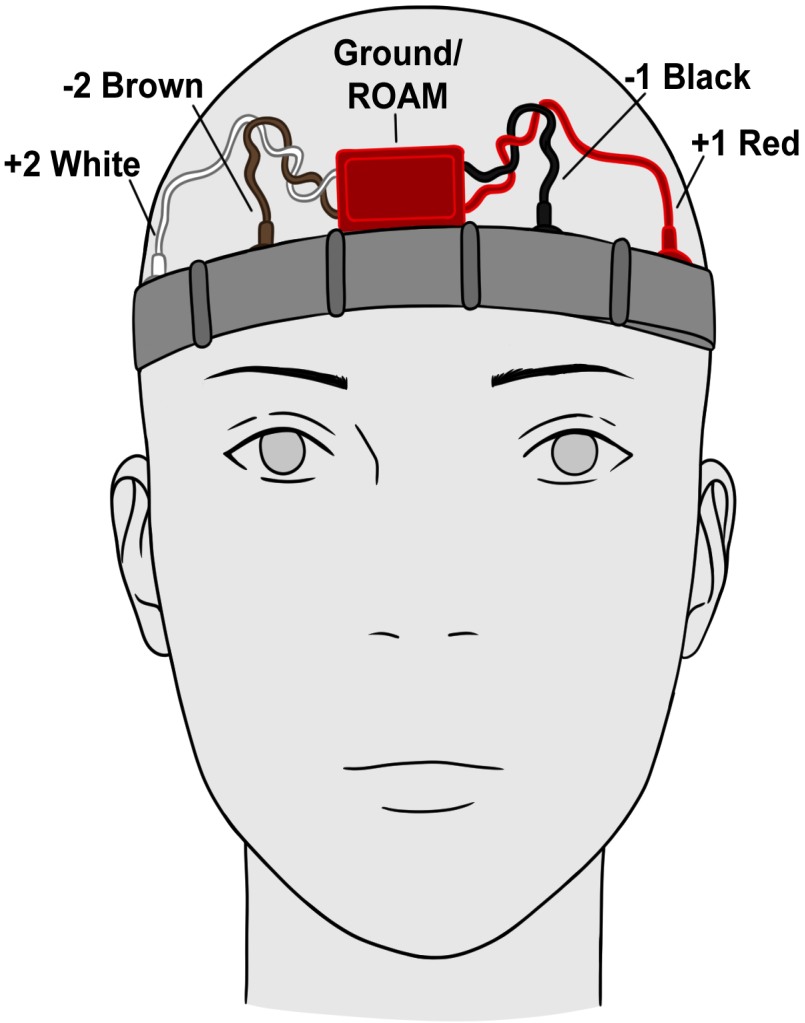


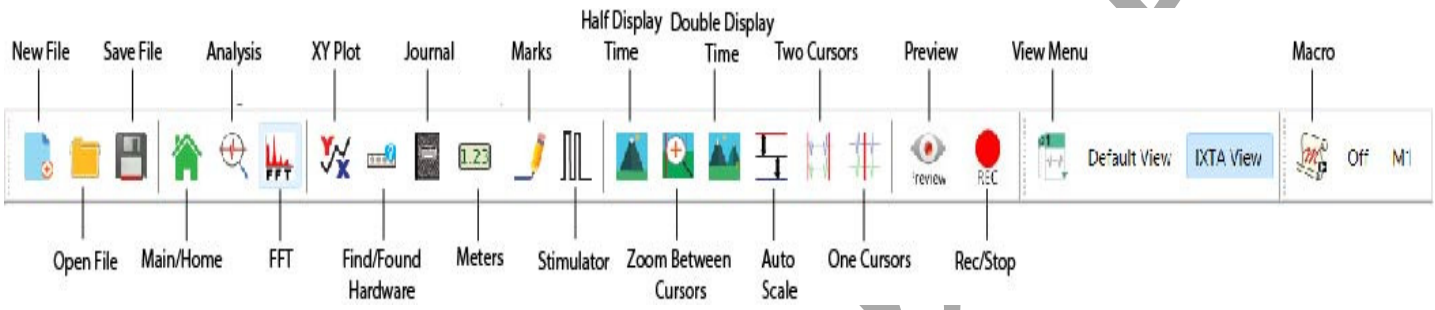
Figure HP-30-S1: The ROAM – EEG.

Iworx Sa Lab

Exercise HP-30: Control of EEG and Biofeedback Lab/Research Study

Directions:

1. Before starting the training, participants should be told that biofeedback training involves modifying the activity of their brain, and that they should try to remain calm and meditate for a full 5 minutes.
2. Remove all jewelry and metal objects from the subject's head.
3. The subject should be sitting facing the computer monitor.



Run the Experiment:

Checking the EEG Leads

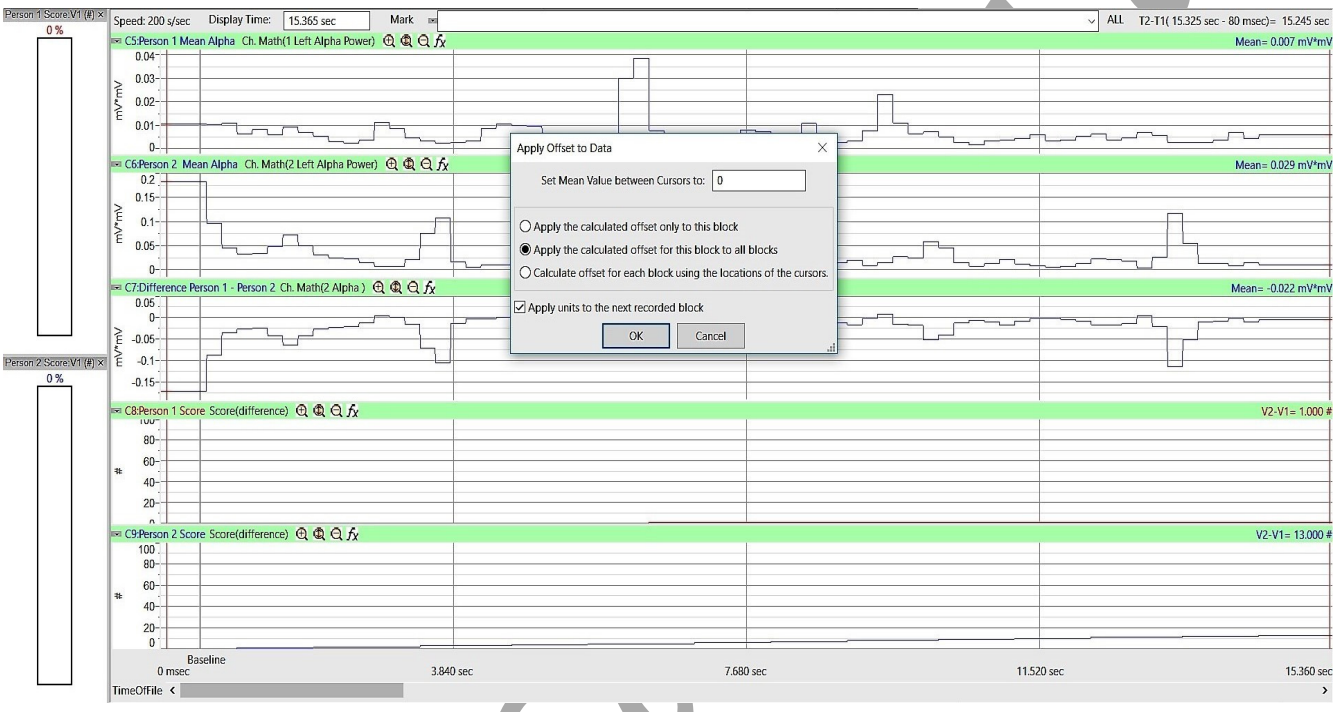
1. For this section of data collection, record in "Raw EEG" view
   - Click Raw EEG in the view menu on the tool bar.
   - Click Record to determine that the electrodes are making a good connection to the scalp and the recording from the subject(s) looks good and without electrical noise.
   - Click Stop.
2. Click File → SaveAs to save your data.

Baseline Data:

1. For this section of data collection, record in "Power" view
   - Click Power in the view menu on the tool bar.
2. Record for 1 minute then click Stop.
3. Click File → Save to save your data.
4. Double the display time by clicking the "Double display" icon so that the full 1 minute of data are on screen.
5. Move your cursors so that they are on each side of the full recording of baseline.

IWorx Sample Lab

6. Right click in the top Channel C5 – Person 1
   - Click Units → Set Offset
   - Set the offset to "0"
   - Click the 2nd radio button as shown in the image below, click OK.
   - Repeat the procedure for Channel C6 – Person 2
7. This will set the baseline.



Experimental Data:

NOTE – It is important that you do NOT click the AutoScale All button when doing this section of recording. The score will not be calculated correctly.

- If the recording is accidentally AutoScaled, reset the scale for the two Score channels
  - Right click in the Score channel
  - Click Scale → Set Scale → Max 100, Min 0 → Click OK
  - Repeat for the 2nd Score channel

1. Remind your subjects that they should try to meditate and keep calm during this section of recording. They can use imagery, mindfulness meditation or other meditative techniques to keep themselves in a calm, relaxed state.
2. Type "Relaxed State" in the mark box. Once your subject are ready, click Record to begin recording data. Click the mark button to Mark the recording.

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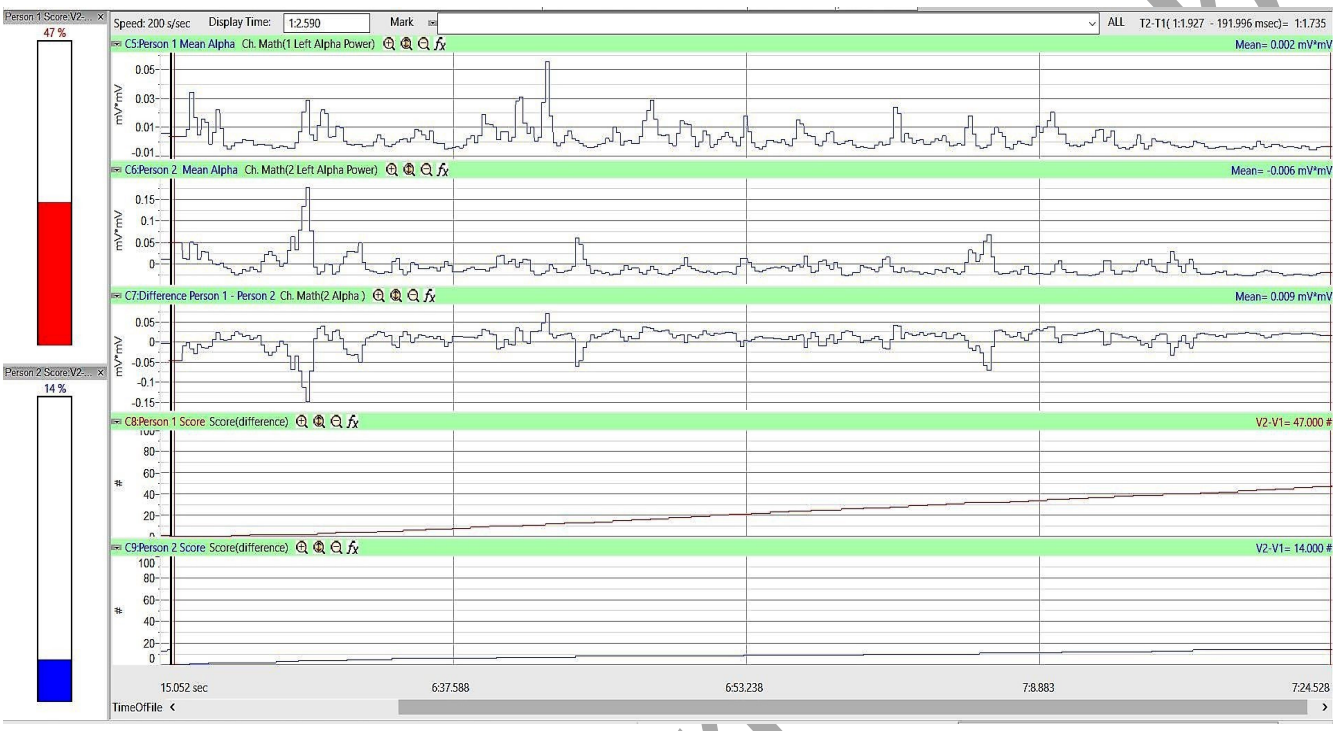
3. Record for at least 5 minutes then click Stop.
4. Click File → Save to save your data.



Data Analysis:

1. Double the display time, if needed, to show the full 5 minutes of data on screen.
2. Move one cursor to the start of the relaxed session and one cursor to the end of the relaxed session as shown above.
3. Look at the Meter or the Score channel, and note the subject's score for this session.
    - This value is the percentage of time the subject was able to keep their brain waves in a calm state of relation during the 5 minute meditation.

Questions:

1. Was your subjects able to control their brain waves and keep themselves calm?
2. Did you see an increase in score as time went on? Look at 1 minute intervals to answer this question.
    - If there was an increase in the score, what could be the reasons?
    - If there was no increase, explain.

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3. Ask the subject to verbalize what they were doing during the experiment. If they noticed their score not changing, were the able to alter their state of mind to control their stress levels?
4. Do you think it is easier or harder when competing with another person?

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