



BrainMaster 2.5 Software User Manual

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Minimum PC Computer Requirements

Atlantis I/II, 2EB, Discovery with BMrMMP** and up to 4 Channel LZT*

| | |
|--------------------------|---|
| CPU: | Dual-Core 2.2GHz Processor |
| Operating System: | Windows XP, Windows Vista, Windows 7 |
| Memory(RAM): | Windows XP - 1GB(Minimum) 2GB(Recommended) Windows Vista - 2GB(Minimum) 4GB(Recommended) Windows 7 - 2GB(Minimum) 4GB(Recommended) |
| Graphics Card: | 512MB Dedicated OR 1GB Shared Graphics |
| Optical Drives: | DVD-ROM Drive: Required for BMrDVD** |
| Input: | 1 USB Port |
| Additional SW: | Microsoft Office: Required for Certain reports and EEGAudio** Windows Media Player or 3 rd Party DVD Decoder: Required for BMrDVD** Adobe Acrobat Reader Adobe Flash Player: Required for BMrFlash Player Adobe Shockwave Player: Required for BMrFlash Player |

Discovery with BMrMMP** and up to 19 Channel LZT*

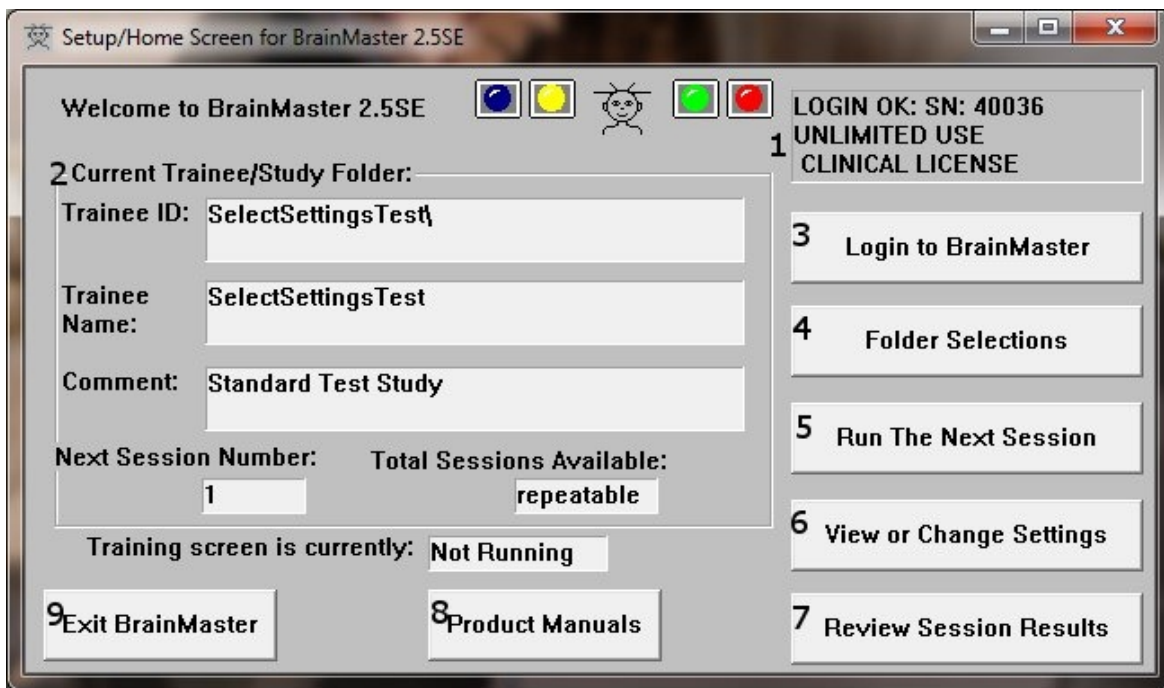
| | |
|--------------------------|---|
| CPU: | Intel® Core™ i7-740QM processor |
| Operating System: | Windows Vista-64 Bit, Windows 7-64 Bit |
| Memory(RAM): | Windows Vista-64 Bit: 6GB(Minimum) 8GB(Recommended) Windows 7-64 Bit: 6GB(Minimum) 8GB(Recommended) |
| Graphics Card: | 1GB Dedicated |
| Optical Drives: | DVD-ROM Drive: Required for BMrDVD** |
| Input: | 1 USB Port |
| Additional SW: | Microsoft Office: Required for certain reports and EEGAudio** Windows Media Player or 3 rd Party DVD Decoder: Required for BMrDVD** Adobe Acrobat Reader Adobe Flash Player: Required for BMrFlash Player Adobe Shockwave Player: Required for BMrFlash Player |

*Live Z-Score Training is an optional purchase

**BMrMMP is an optional purchase

BrainMaster Software Display

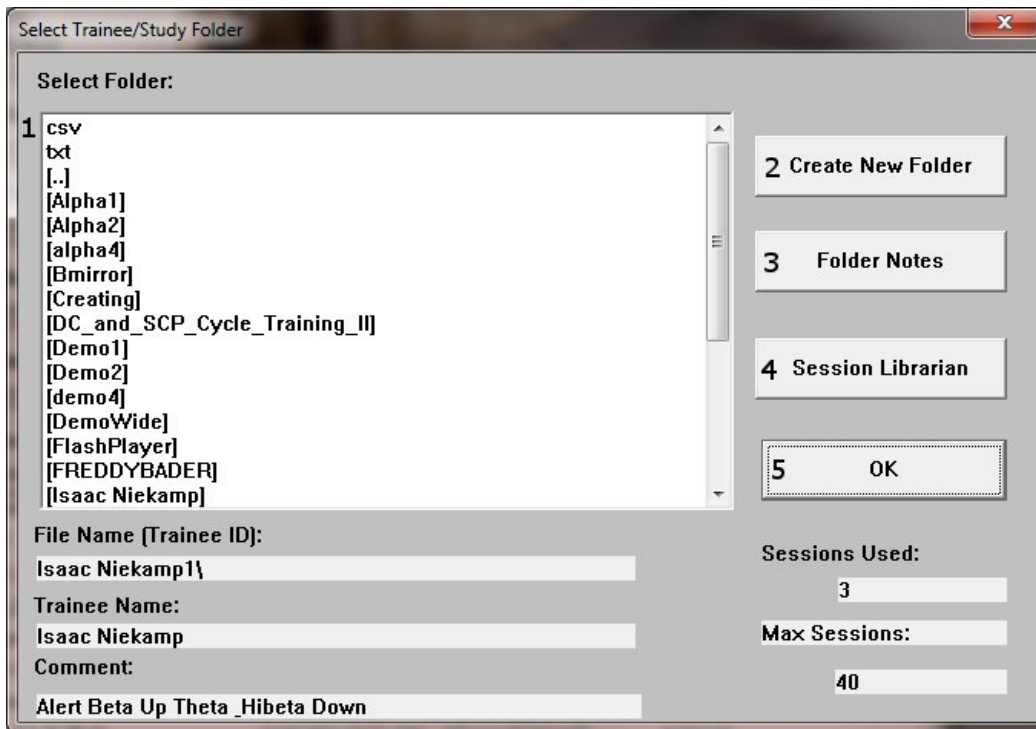
Setup/Home Screen Menu



1. **Log-In Display** – Shows the current Serial number of the BrainMaster unit that is logged in, the expiration of the software if any, and status of the units license.
2. **Current Trainee/Study Display** – Shows the current trainee folder, the settings being used, how many sessions that have been used, and how many more that can be run.
3. **Login Button** – Click to open the Login Menu.
4. **Folders Selections Button** – Click to open the Select Trainee/Study Folder Menu.
5. **Run The Next Session Button** – Click to open the Training/Control Screen.
6. **View or Change Settings Button** – Click to open the Setup Options Menu.
7. **Review Session Results Button** – Click to open the BReview Screen.
8. **Product Manuals Button** – Click to open a menu displaying documentation on our software.
9. **Exit Button** – Click to close the BrainMaster software. *****Please Note: We do not at any point in time recommend that you use the red “X” located in the top portion of the various menus and screens of our software, unless otherwise stated.**

Login Menu

1. **Current Login Status** – Displays what your Current Login status is.
2. **Serial Number and Passkey Box** – Area where you will input the Serial Number and Passkey of your BrainMaster unit for logging into the BrainMaster Software.
3. **Serial Number Box** – Box where you will type in the Serial Number of your BrainMaster unit.
4. **PassKey Box** – Box where you type in your Passkey supplied by BrainMaster Technologies.
*****PLEASE NOTE: Always be sure to keep record of your passkey. If BrainMaster Technologies is needed to retrieve the passkey for you, an Administration fee will be charged.**
5. **Remember PassKey Check Box** – If checked, the BrainMaster Software will remember your passkey. If unchecked, The BrainMaster Software will remember the passkey until the software is closed.
6. **(Optional) Personal Information** – Name and E-Mail information utilized for sending BMZ Files via E-Mail. See 533-309 for more information.
7. **OK Button** – Click when all information is entered to exit the Login Menu. *****PLEASE NOTE: If you are having any difficulties logging in, please double-check your passkey. When entering, it is highly recommended that CAPS Lock is on, and the “-“are left out. If you are still having difficulties, please contact BrainMaster Technologies Technical Support.**
8. **Login Notes Button** – Brings you to the Login Notes Note Pad. It is highly recommended to utilize this for your Passkey, and COM Port information.
9. **Cancel Button** – Click if you do not wish to save any information entered and exit the Login Menu.

Select Trainee/Study Folder Menu

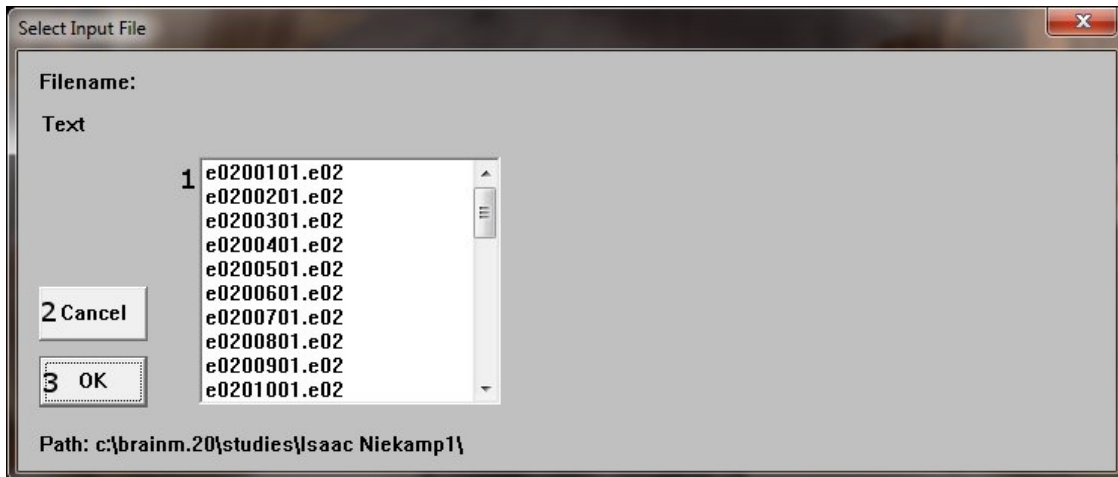
1. **Folder Selection List** – List where you can select from already created Studies folder. You may double-click to select a file. When highlighted information on the folder will be displayed below this box.
2. **Create New Folder Button** – Click to create a new Study Folder to be used. See 533-311 for more information
3. **Folder Notes Button** – Click to create or look at a Note page for a specific client folder.
*****PLEASE NOTE: In order for notes to stay, you must save the completed Note file.**
4. **Session Librarian Button** – Click this to utilize the Session Librarian to create a BMZ File. See 533-309 for more information.
5. **OK Button** – Click to confirm the folder that you have highlighted and exit the Select Trainee/Study Folder Menu

Training/Control Screen



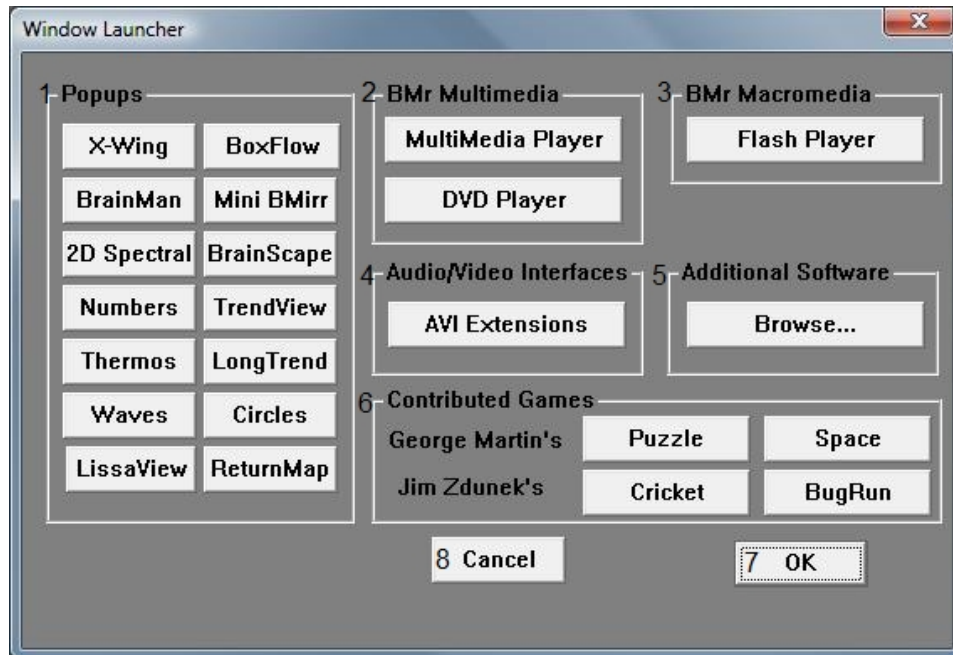
1. **Data Tab** – Click to access COM, filter settings, playback options, and Atlantis Setup Menu.
2. **Display Tab** – Click to choose from various display options.
3. **Freq. Bands Tab** – Click to choose what filtered waveforms to display.
4. **Color Tab** – Click to choose between filtered waveforms to be displayed either in color or in white.
5. **Sound Tab** – Click to choose your sound settings.
6. **GO Button** – Click to run a session. *****PLEASE NOTE: Be sure that before clicking GO that your BrainMaster Unit is plugged in, installed, and the software is set to the proper COM Port.**
7. **STOP Button** – Click to stop a session.
8. **Window Button** – Click to open the Window Menu.
9. **Clock** – Used to keep time for the Training session.
10. **Points** – Used to keep track of the amount of Reward points earned in a training session.
11. **Close Button** – Click to close the Training/Control Screen when completed. *****PLEASE NOTE: If a session is ended before it is completed, it will be counted as a completed session.**

File Playback Menu



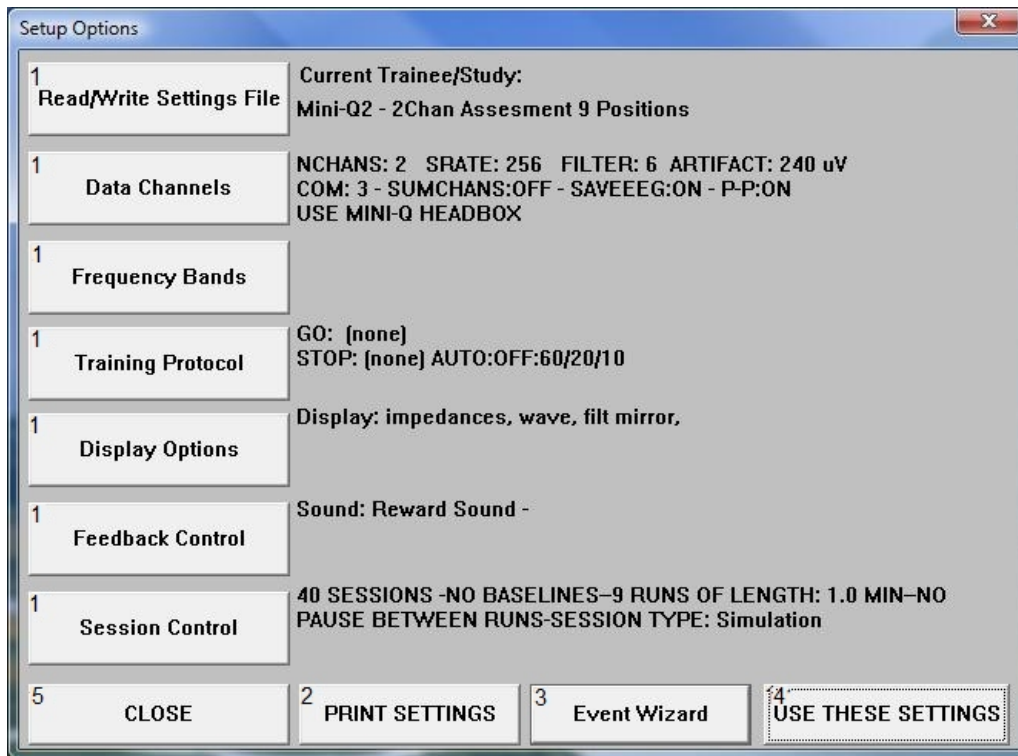
1. **File Selection Section** – Section where you can choose a recorded run for either playback or converting.
2. **Cancel Button** – Click to cancel playback and exit the File Playback Menu.
3. **OK Button** – Click to confirm the selected file for playback from the File Selection Section.

Window Menu

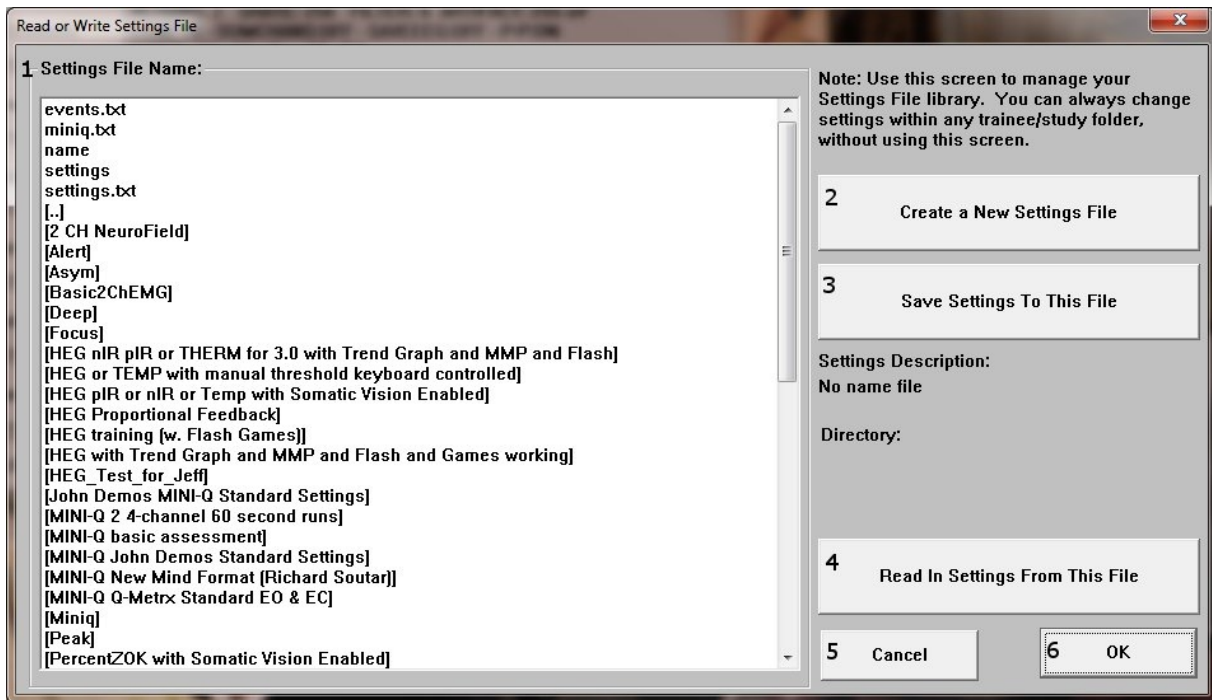


1. **Popups Section** – Click the included buttons to launch additional display/training feedback options used for feedback.
2. **BMr Multimedia Section*** – Click the included buttons to launch either BMrDVD* or BMrMMP* used for feedback.
3. **BMr Macromedia Section** – Click the included buttons to launch the BMrFlashPlayer used for feedback.
4. **Audio/Video Interfaces Section** – Click the included buttons to launch EEGAudio*.
5. **Additional Software Section** – Click the included buttons to launch additional software.
6. **Contributed Games Section** – Click the included buttons to launch contributed games used for feedback.
7. **OK Button** – Click to close the Window Menu.
8. **Cancel Button** – Click to close the Window Menu.

*BMrMMP, BMrDVD, and EEGAudio make up the MultiMediaPlayer Suite. MultiMediaPlayer is an Optional Purchase.

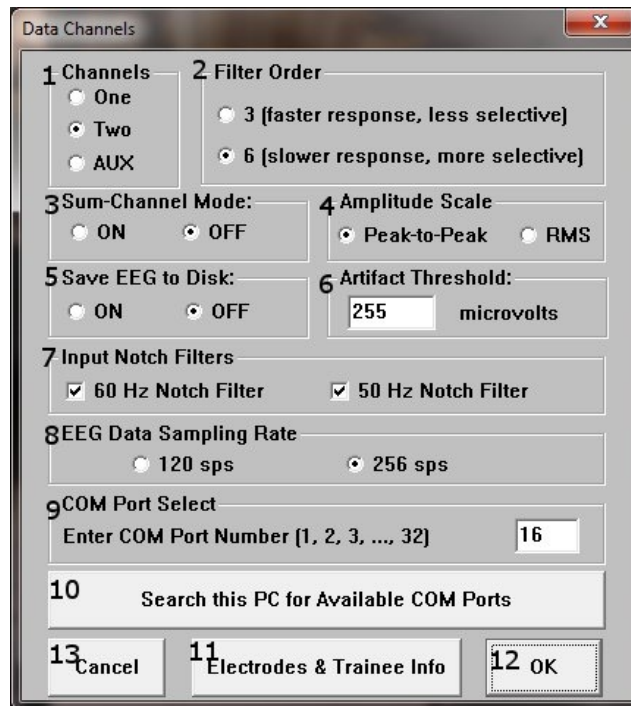
Setup Options Menu

1. **Various Menu Buttons** – Click to open the associated menus.
2. **PRINT SETTINGS Button** – Click to print a hard copy of all of your Settings.
3. **Event Wizard Button** - Click to open the Event Wizard.
4. **USE THESE SETTINGS Button** – Click to confirm all settings changes and exit the Setup Options Menu.
5. **CLOSE Button** – Click to cancel all changes made and exit the Setup Options Menu.

Read/Write Settings File Menu

1. **Settings File Name Section** – Section where a new setting may be selected. If you would like to have the selected setting file used in your Studies folder, you may double-click the Settings file to read the settings file into the folder.
2. **Create a New Settings File Button** – Click to save the current Studies folders settings into a new Settings file.
3. **Save Settings To This File Button** - Click to save the current Studies folder settings into the selected Settings file from the Settings File Name Section.
4. **Read In Settings From This File Button** – Click to read the Settings file from the Settings File Name Section into the current Studies folder.
5. **OK Button** – Click to confirm changes and exit the Read/Write Settings File Menu.
6. **Cancel Button** – Click to cancel changes and exit the Read/Write Settings File Menu.

Data Channels Menu



1. **EEG Channels Section** – Section where you choose the EEG Channels for feedback.
2. **Software Digital Filter Order Sections** – Section where you set the Digital Filter order. The higher the filter order, the more selective the system is.
3. **Sum-Channel Mode Section** – Section where you set the Sum-Channel mode on or off.
4. **Amplitude Scale Section** – Section where you can set the Amplitude scale to either Peak-to-Peak or RMS.
5. **Save EEG to Disk Section** – Section where you can turn on or off the EEG saving option.
6. **Artifact Threshold Section** – Section where you can adjust the artifact rejection range.
7. **Software Notch Filters Section** – Section where you can turn on or off the Software notch filters.
8. **EEG Data Sampling Rate Section** – Section where you can adjust the Sample rate you are collecting from the data.
9. **COM Port Select Section** – Section where you can set what COM Port your BrainMaster is on. *****PLEASE NOTE: COM 1 – 8 can also be chosen under the Data Tab of the Training/Control Screen.**
10. **Search this PC Button** – Click to let the BrainMaster Software search for the BrainMaster unit.
11. **Electrode & Trainee Info Button** – Click to enter the Electrode & Trainee Info Menu.
12. **OK Button** – Click to confirm changes and exit the Data Channels Menu.
13. **Cancel Button** – Click to cancel changes and exit the Data Channels Menu.

Electrode & Trainee Info Menu

Electrode and Trainee Information

1 Active 1 Reference 1 GROUND Reference 2 Active 2
 C3 A1 Cz A2 C4

2 Use MINI-Q Headbox (ignore above selections)

Age: [optional - must be nonzero to use Z-Score Training] 0 6

3 Condition: (required for Z-Score Training)
 eyes open eyes closed

5 Cancel 4 OK

1. **Electrode Information Section** – Section where the sites for training are selected.
*****PLEASE NOTE:** The amount of sites that can be chosen is dependant upon the amount of channels selected in EEG Channels Section on the Data Channels Menu.
2. **Use MINI-Q* Headbox Check Box** – Used to control whether or not the Mini-Q* add-on is used for the training/assessment.
3. **Condition Section** – Section to choose eyes open or eyes closed for Z-Score PZOK training**.
4. **OK Button** – Click to confirm changes and exit Electrode and Trainee Info Menu.
5. **Cancel Button** – Click to cancel changes and exit Electrode and Trainee Info Menu.
6. **Age Section** – Section to enter the age of the client.

*MINI-Q Add-on is an optional purchase

**Z-Score PZOK is an optional purchase

Frequency Bands Menu

Component Frequency Bandwidth Settings

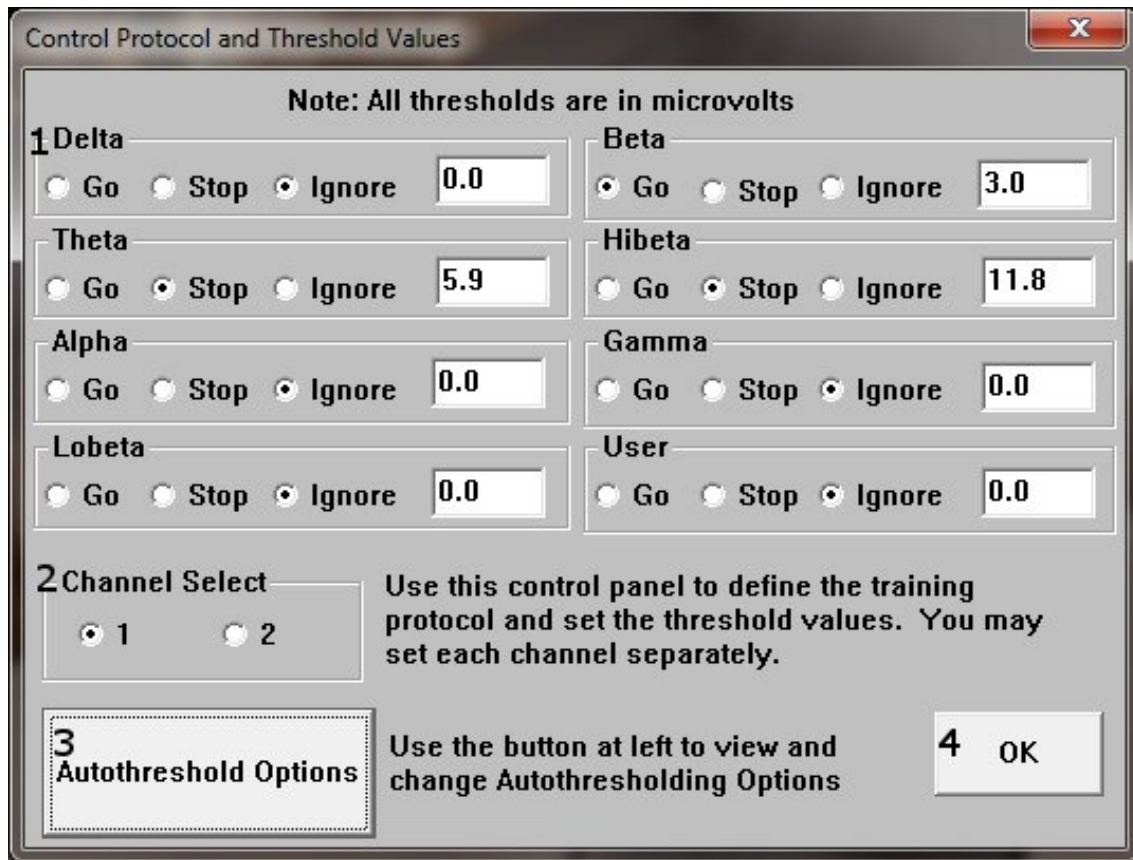
Use Hz with 0.1 resolution, 0.0 minimum e.g. 0.0, 0.1, 0.2,..., 44.8, 44.9, 45
All bands should be 1.0 Hz wide minimum for reasonable transient response

| | Low: | High: | | Low: | High: |
|---------|------|-------|--------|------|-------|
| 1 Delta | 1.0 | 3.0 | Beta | 15.0 | 20.0 |
| Theta | 4.0 | 7.0 | Hibeta | 20.0 | 30.0 |
| Alpha | 8.0 | 12.0 | Gamma | 38.0 | 42.0 |
| Lobeta | 12.0 | 15.0 | User | 30.0 | 35.0 |

Damping Factor (used to slow value changes for text) 2 100
(0=no damping, 100=typical)

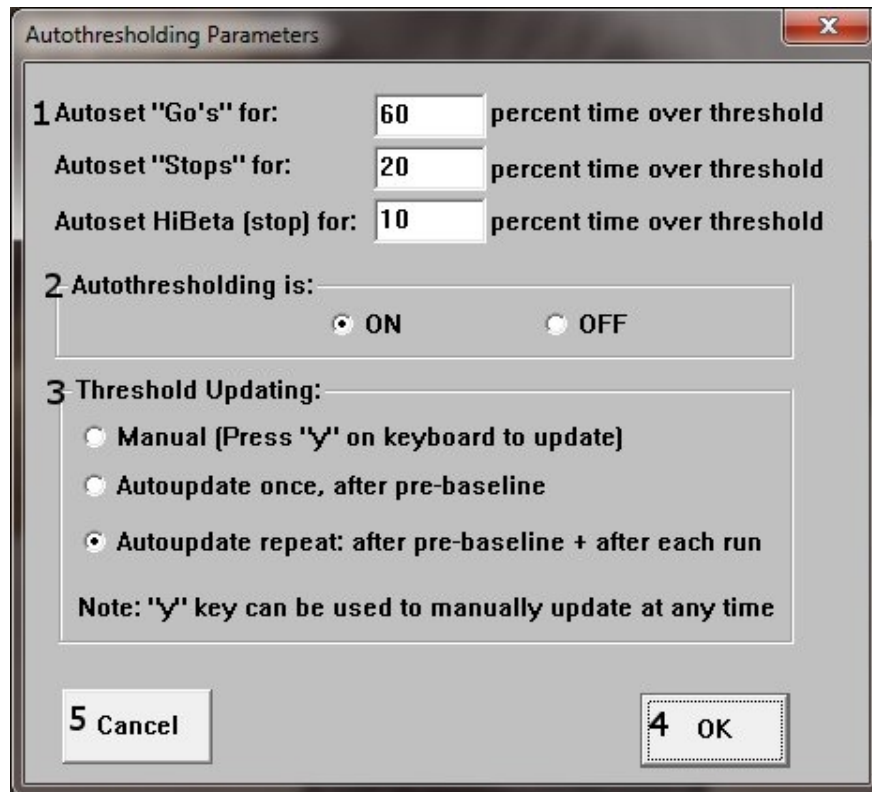
5 Cancel 3 Standard Settings 4 OK

1. **Frequency Band Section** – Section where the frequency band range and name can be adjusted.
2. **Damping Factor Section** – Section where Text Damping Factor can be adjusted.
3. **Standard Settings Button** – Click to re-adjust all changes back to original settings.
4. **OK Button** – Click to confirm changes and exit the Frequency Bands Menu.
5. **Cancel Button** – Click to cancel changes and exit the Frequency Bands Menu.

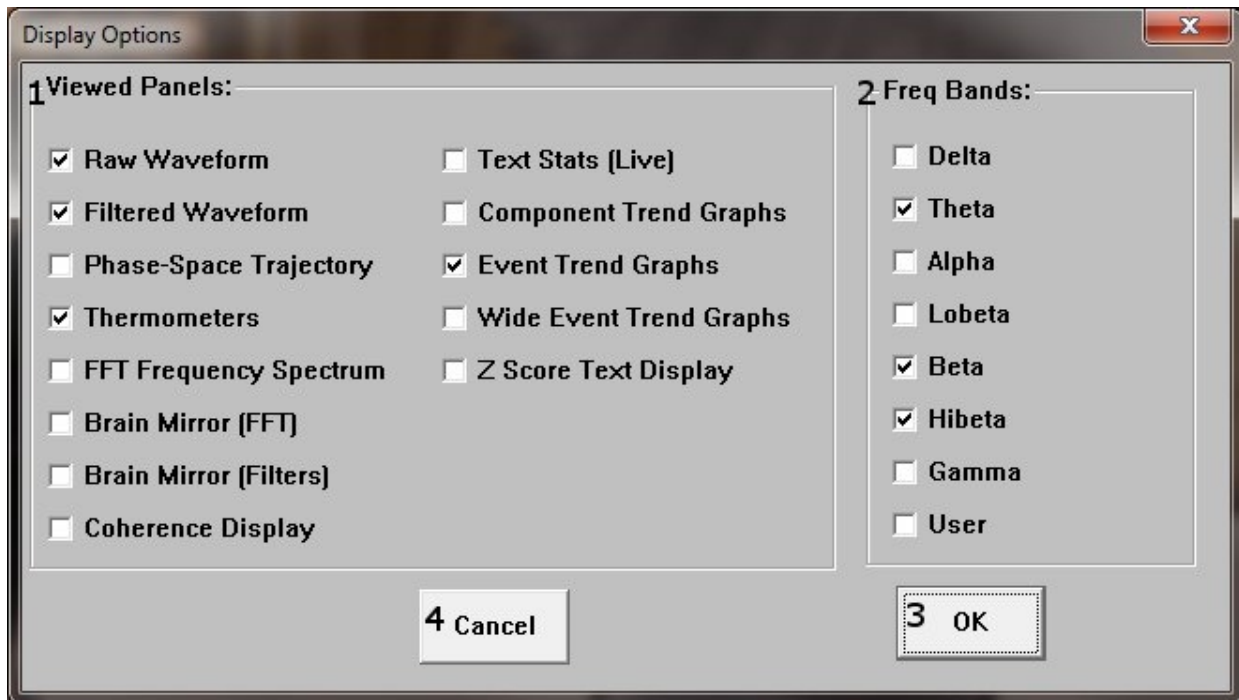
Training Protocol Menu

1. **Frequency Training Section** – Section where the adjustments for the frequency bands training settings can be adjusted.
2. **Select Channel to Adjust Section** – Section where you can choose which channels frequency bands training settings to adjust.
3. **Autothreshold Options Button** – Click to enter the Autothreshold Options Menu.
4. **OK Button** – Click to Confirm changes and exit the Training Protocol Menu.

Autothreshold Options Menu

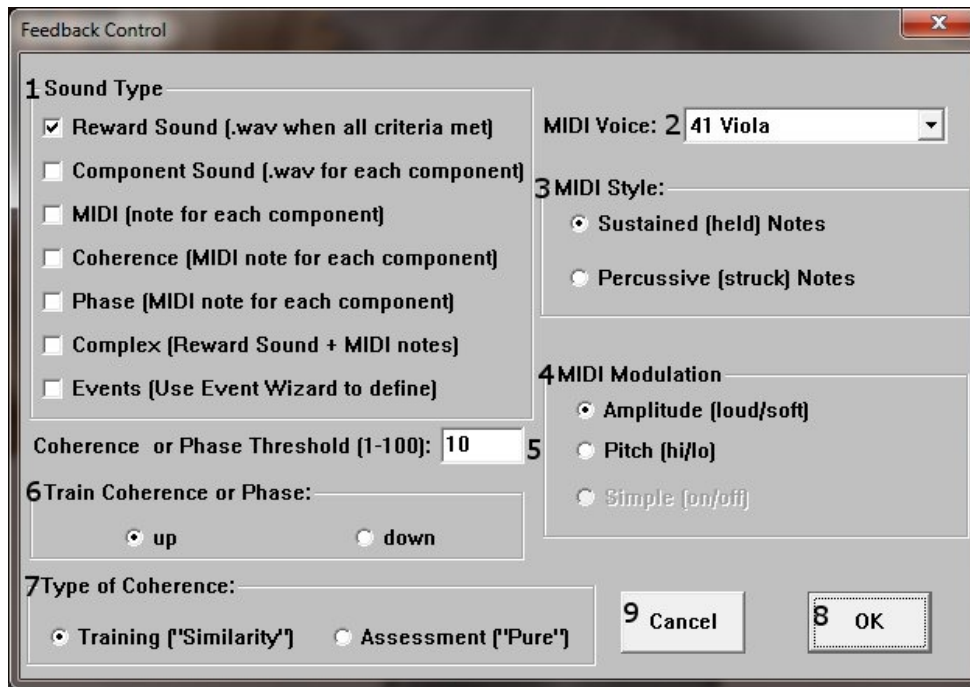


1. **Autoset Percent Section** – Section to set the percent time over threshold settings for the Go's, Stops and HiBeta(stop).
2. **Autothresholding Is: Section** – Section to turn on or off Autothresholding.
3. **Threshold Updating: Section** – Section where you can set the threshold updating options.
4. **OK Button** – Click to confirm changes and exit the Autothreshold Options Menu.
5. **Cancel Button** – Click to cancel changes and exit the Autothreshold Options Menu.

Display Options Menu

1. **Viewed Panels Section** – Section where you can choose what panels are to be viewed during training. *****PLEASE NOTE: All Panels can also either turned on or off by clicking the Display Tab of the Training/Control Screen.**
2. **Viewed Components Section** – Section where you can choose what components are to be viewed during training. *****PLEASE NOTE: All components can also either turned on or off by clicking the Components Tab of the Training/Control Screen.**
3. **OK Button** – Click to confirm changes and exit the Display Options Menu.
4. **Cancel Button** – Click to cancel changes and exit the Display Options Menu.

Feedback Control Menu



1. **Sound Type Section** – Section where you can choose the sound type for training *****PLEASE NOTE: All Sounds can also either be turned on or off by clicking the Sound Tab of the Training/Control Screen.**
2. **Midi Voice Section** – Section where you can choose the type of MIDI sound for feedback that utilizes MIDI Playback.
3. **MIDI Style Section** – Section where you can choose the MIDI Style for feedback that utilizes MIDI Playback.
4. **MIDI Modulation Section** – Section where you can choose the MIDI Modulation for feedback that utilizes MIDI Playback.
5. **Coherence or Phase Threshold Section** – Section where you can adjust the threshold for either Coherence or Phase training.
6. **Train Coherence or Phase Section** – Section where you can adjust the method of training for either Coherence or Phase training.
7. **Type of Coherence Section** – Section where you can choose the type of Coherence training.
8. **OK Button** – Click to confirm changes and exit the Feedback Control Menu.
9. **Cancel Button** – Click to cancel changes and exit the Feedback Control Menu.

Session Control Menu

NOTE: Please enter all times as whole seconds (1, 2, 3, etc)

1 Baseline Length (pre and post) Seconds (before and after Runs)
(Length of 0 means "no baselines")

2 Run Length: Seconds
(0 means run indefinitely)

3 Number of Sessions: sessions (80 maximum)
(0 allows repeated use of Test Session 1)

4 Number of Runs (Trials) Runs
(Must have at least one Run)

5 Session Type:

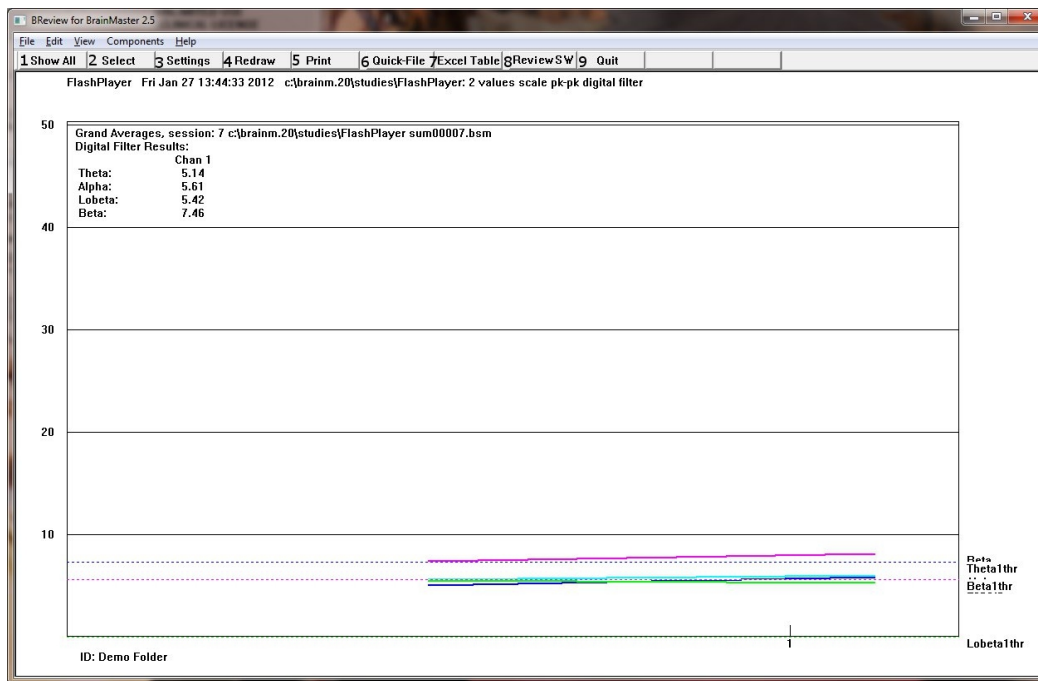
Assessment Training

Simulation Playback

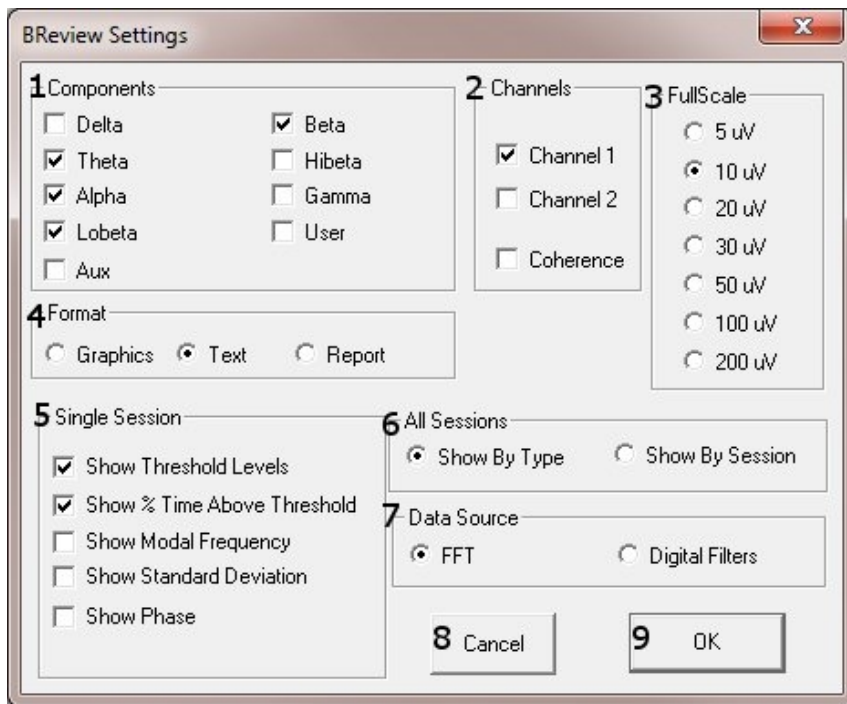
6 Pause Between Runs?

8 Cancel **7** OK

1. **Baseline Length Section** – Section where you can adjust the length of the pre and post Baseline.
2. **Run Length Section** – Section where you can adjust the length of the runs for the training session.
3. **Number of Sessions Section** – Section where you can adjust the amount of Sessions a particular training can be used for.
4. **Number of Runs Section** – Section where you can adjust the amount of runs for the training session.
5. **Session Type Section** – Section where you can change the type of session that is being used.
6. **Pause Between Runs? Check Box** – Click to choose whether or not you would like the training to pause at the end of a run.
7. **OK Button** – Click to confirm changes and exit the Session Control Menu.
8. **Cancel Button** – Click to cancel changes and exit the Session Control Menu.

Review Session Results Control Menu Display

1. **Show All Button** – Click button to display all sessions in a particular study file plotted by session.
2. **Select Button** – Click to choose the session that you would like to view.
3. **Settings Button** – Click to open the BReview Settings Menu.
4. **Redraw Button** – Click to update the data.
5. **Print Button** – Click to print the current displayed Review Screen.
6. **Quick File Button** – Click to generate a Quick-File (Mini-Q) excel file.
7. **Excel Table Button** – Click to generate a Excel Table Summary for the Session.
8. **Review SW Button** – Click to view optional 3rd Party Review Software's.
9. **Quit Button** – Click to quit the Review Session Results.

BReview Settings Menu

1. **Components Section** – Section where you can choose the components that you would like to be viewed.
2. **Channels Section** – Section where you can choose the channel and channel combinations that you would like to be viewed.
3. **Full Scale Section** – Section where you can choose the scale for the data being displayed.
4. **Format Section** – Section where you can choose what type of format you would like the information being reviewed be displayed **PLEASE NOTE: not all formats are available for all views.**
5. **Single Session Settings Section** – Section where you can set what you would like to be displayed for a single session.
6. **All Sessions Settings Section** – Section where you can set what you would like to be displayed for a single session.
7. **Data Source Section** – Section where you can choose between the type of Data Source
8. **Cancel Button** – Click to cancel any changes and close the BReview Settings Menu.
9. **OK Button** – Click to confirm any changes and close the BReview Settings Menu

Keyboard Quick Keys

The following keyboard controls can be used at any time when the BrainMaster is operating.

PLEASE NOTE: When autothreshold is used, threshold commands change percent target value. ALSO NOTE: Pressing <Tab> switches into “frequency adjust” mode. Pressing “a” for alpha, “t” for theta, etc, will make the frequency band changed per what you have selected for the on-the-fly Frequency adjustment.

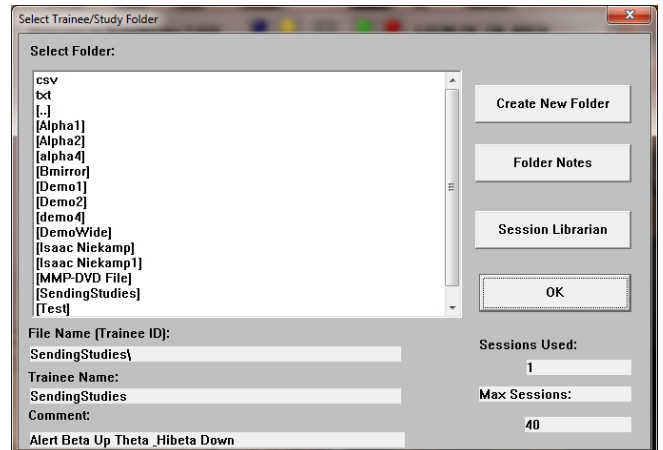
| Key | Function |
|---------|--|
| a | Increase alpha (8-12 Hz) threshold by 0.1uV or target by 1 percent |
| A | Decrease alpha (8-12 Hz) threshold by 0.1uV or target by 1 percent |
| b | Increase beta (15-20 Hz) threshold by 0.1uV or target by 1 percent |
| B | Decrease beta (15-20 Hz) threshold by 0.1uV or target by 1 percent |
| c | Increase coherence/phase threshold |
| C | Decrease coherence/phase threshold |
| d | Increase delta (1-3 Hz) threshold by 0.1uV or target by 1 percent |
| D | Decrease delta (1-3 Hz) threshold by 0.1uV or target by 1 percent |
| g | Increase “gamma” (38-42 Hz) threshold 0.1 uV or target by 1 percent |
| G | Decrease “gamma” (38-42 Hz) threshold 0.1 uV or target by 1 percent |
| h | Increase “hibeta” (20-38 Hz) threshold 0.1 uV or target by 1 percent |
| H | Decrease “hibeta” (20-38 Hz) threshold 0.1 uV or target by 1 percent |
| l | Increase “lobeta” (12-15 Hz) threshold 0.1 uV or target by 1 percent |
| L | Decrease “lobeta” (12-15 Hz) threshold 0.1 uV or target by 1 percent |
| M | Toggle “Brain Mirror” between FFT and Filtered Mode |
| r | Reduce artifact rejection threshold value by 10 microvolts |
| R | Increase artifact rejection threshold value by 10 microvolts |
| t | Increase theta (3-8 Hz) threshold by 0.1 uV or target by 1 percent |
| T | Decrease theta (3-8 Hz) threshold by 0.1 uV or target by 1 percent |
| u | Increase user band threshold by 0.1 uV or target by 1 percent |
| U | Decrease user band threshold by 0.1 uV or target by 1 percent |
| y | Copy autothresholds into current thresholds (“Autoupdate”) |
| + | Increase display gain by 20% |
| - | Decrease display gain by 20% |
| <Space> | Pause or end pause |
| 1 | Set mode so keys (d, t, etc) adjust channel 1 only for thresholds, etc. |
| 2 | Set mode so keys (d, t, etc) adjust channel 2 only for thresholds, etc. |
| 3 | Set mode so keys (d, t, etc) adjust channel 3 only for thresholds, etc. |
| 4 | Set mode so keys (d, t, etc) adjust channel 4 only for thresholds, etc. |
| 0 | Set mode so keys (d, t, etc) adjust both channels 1 and 2 for thresholds, etc. |

Trainee Folders

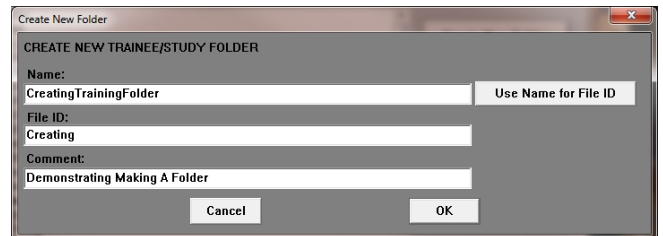
Creating a Trainee Folder

PLEASE NOTE: This process can only be done if you have purchased a BrainMaster Clinical License

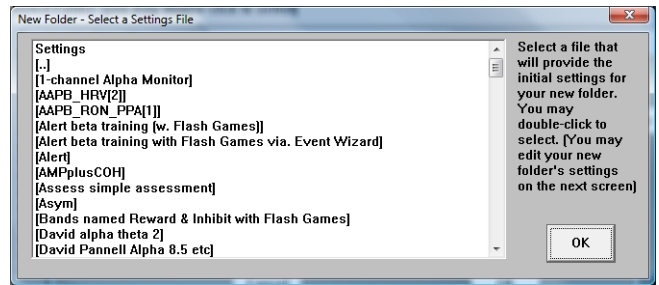
1. From the Setup/Home Screen, click the Folder Selection Button. This will bring you to the Select Trainee/Study Folder screen. On this screen, click the Create New Folder Button to begin creating a new folder.



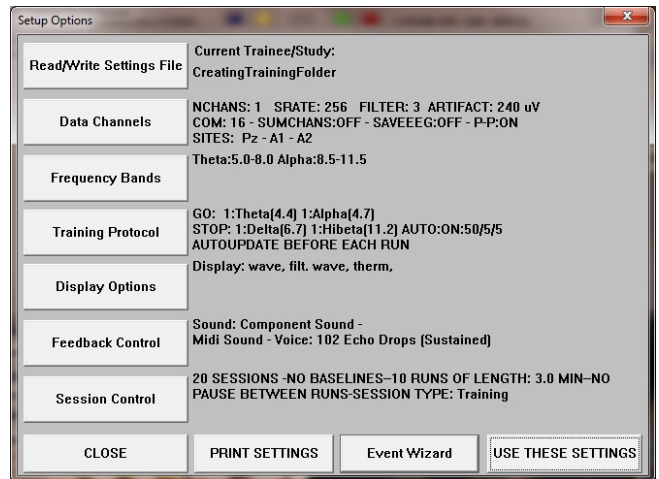
2. Type in the name that you would like, and the file ID for the folder in the proper fields. When naming the folder, please take HIPAA compliance into consideration. When you have entered the name and file ID, click OK to continue.
3. Another screen will pop up to confirm the name of the folder. If the name and file ID are OK, click OK to continue.



- The following screen will allow you to select a settings protocol. Highlight the Settings File that you would like to use, and click OK to continue. **PLEASE NOTE: It is not recommended to choose [..] as a settings protocol.**



- The Setup Options Screen will now open. At this time, you can adjust the protocol to the settings that you would like. When completed, click the "USE THESE SETTINGS" Button.



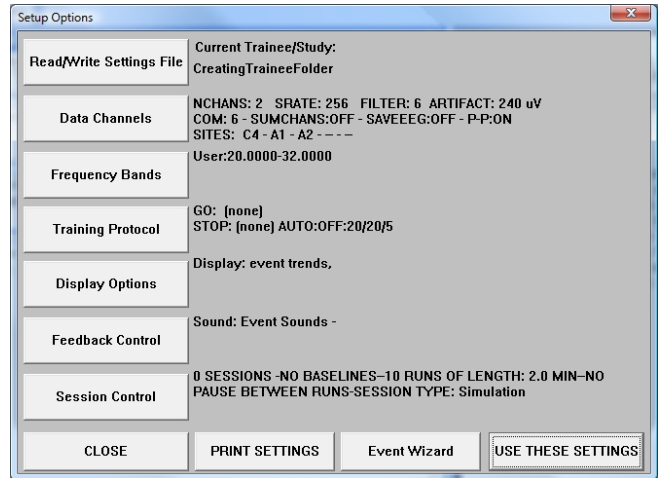
You have now created a folder for training. You will be able to tell this, as you will see the Trainee ID and Trainee Name are now displayed on the Setup/Home Screen. You might need to click somewhere on this screen in order for the updates to take place.



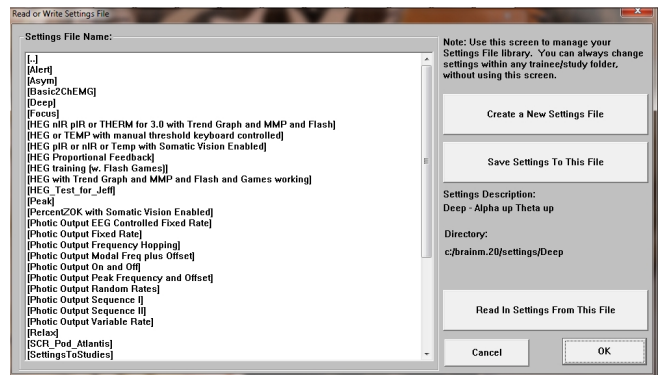
Changing to a new Settings Files

PLEASE NOTE: This process can only be done if you have purchased a BrainMaster Clinical License

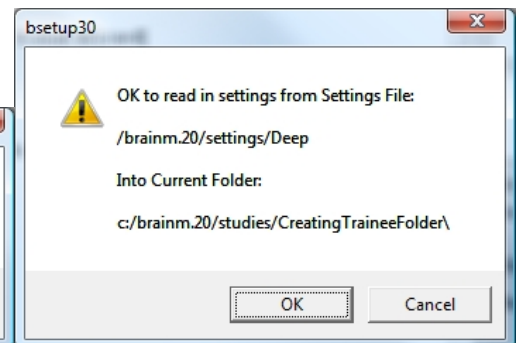
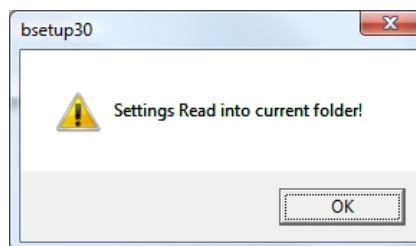
1. From the Setup/Home Screen, click the View or Change Settings Button. On the Setup Options Menu, click Read/Write Settings File Button to continue.



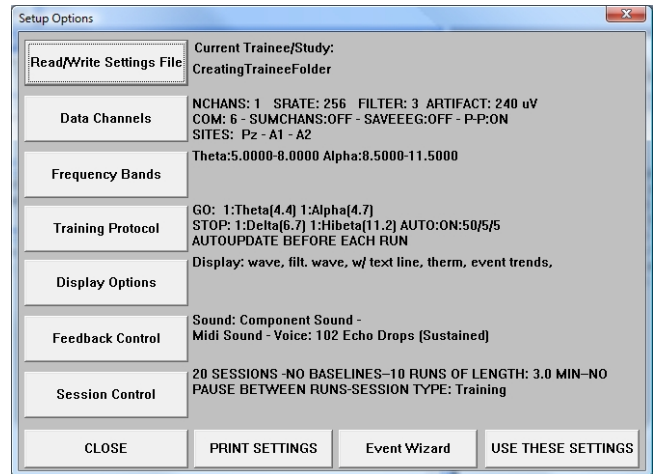
2. On the Read or Write Settings File Menu, highlight the settings file that that you would like to use, then click the Read In Settings From This File Button to continue.



3. The following pop-up will ask to confirm your changes. After you click OK, another Pop-Up will appear to confirm the changes.



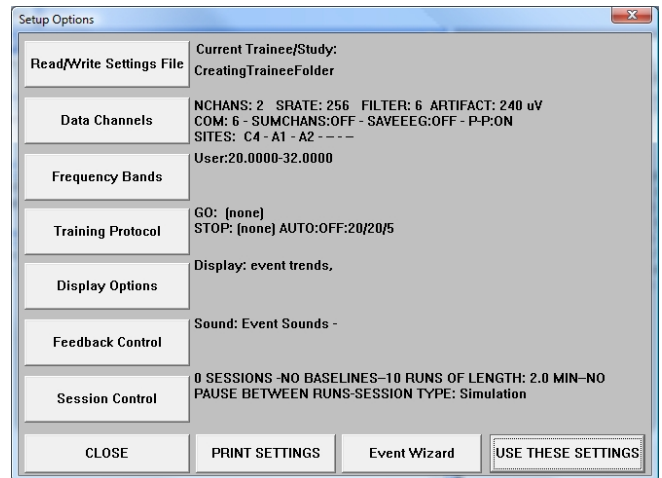
The settings for your Trainee folder have now been changed. You will be able to tell this, by seeing the information on the Setup Options screen will be different as it was before.



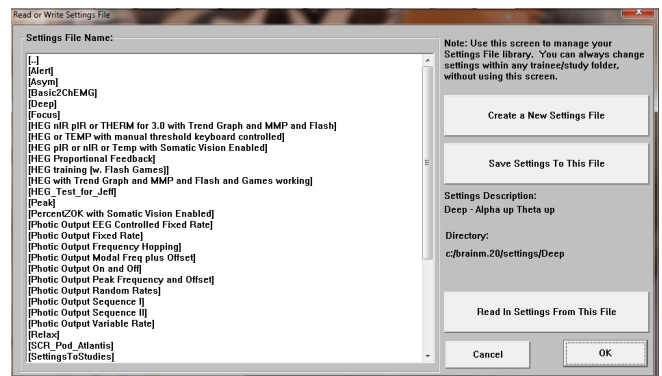
Saving Changes to Settings Files

PLEASE NOTE: This process can only be done if you have purchased a BrainMaster Clinical License

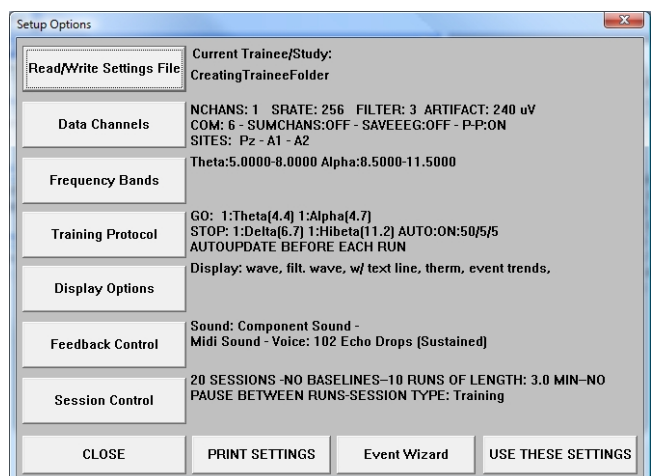
1. From the Setup/Home Screen, click the View or Change Settings Button. On the Setup Options Menu, click Read/Write Settings File Button to continue.



2. On the Read or Write Settings File Menu, highlight the settings file that that you would like to change, then click the Save Settings To This File Button to continue.



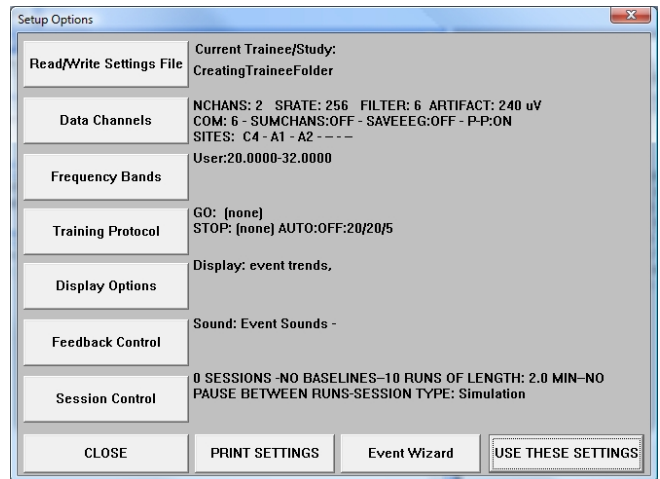
The settings have now been changed to the selected Settings File.



Playing Back a Session

PLEASE NOTE: You can only play back a file that has the Save EEG to Disk option set to on.

1. From the Setup/Home Screen, click the View or Change Settings Button. On the Setup Options Menu, click the Session Control Button



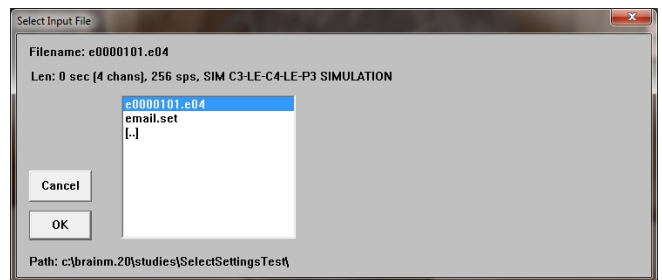
2. From the Session Control Menu, set the Session Type to Playback, then click the OK button to continue.



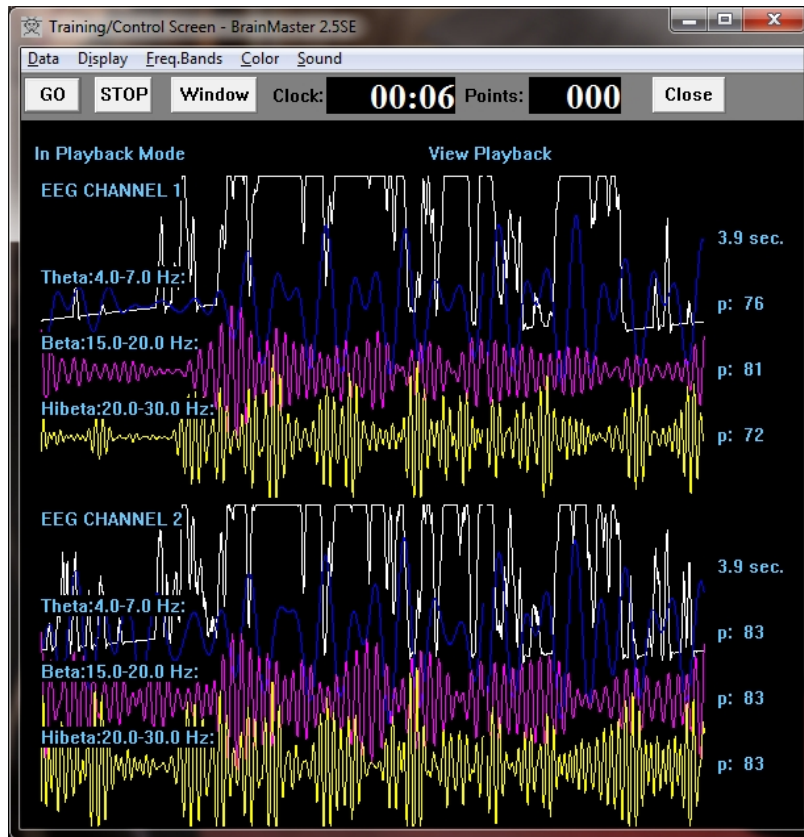
3. From the Setup Options Menu, click USE THESE SETTINGS Button. When you return to the Setup/Home Screen, click the Run The Next Session Button. On the Trainee Screen, click the GO Button to Continue.



4. From the File Playback Menu, choose the file that you would like to playback, and how you would like this file to be played back. When all of the settings are as you would like, click the OK Button to continue.



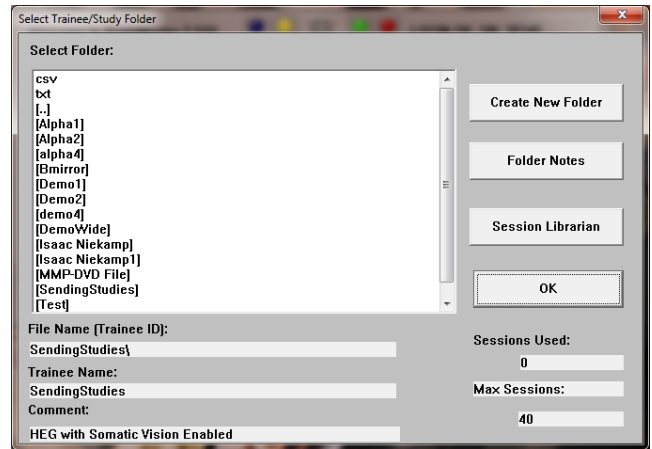
You will now be playing back the run that you selected. You can tell this, by seeing the information be played on the Training/Control Screen.



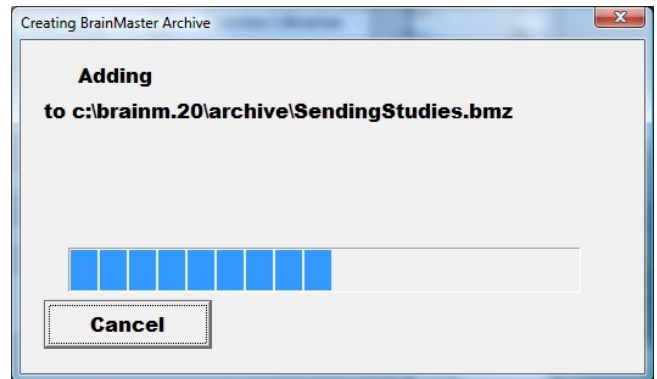
BMZ Files

Creating A BMZ from a Studies File

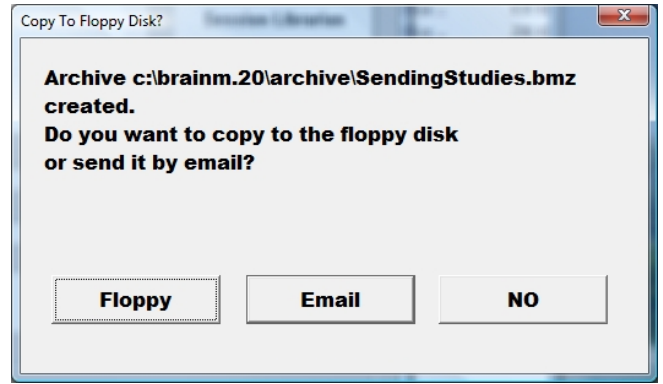
1. From the Setup/Home Screen, click the Folder Selection Button. This will bring you to the Select Trainee/Study Folder screen. On this screen, highlight the Folder you would like to create into a BMZ file, and click Session Librarian Button.



2. A screen will pop up to show progress. Nothing is needed to be done. Simply wait for the extraction to complete to continue.

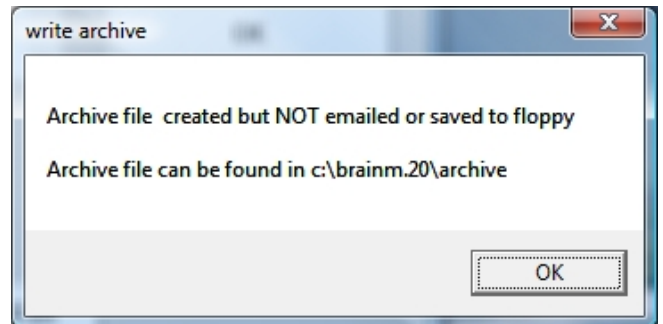


3. When the following screen appears, it will give you 3 options: Floppy, Email, NO.
 - A. **Floppy** – This option will only work with a Floppy Disk. If you do not have a floppy drive, it will not function properly.
 - B. **Email** – In order for this to work properly, two things are needed. First, proper E-mail information needs to be filled in from the Login page(See attached Picture). Second, the E-Mail account has to be tied through Microsoft Outlook.

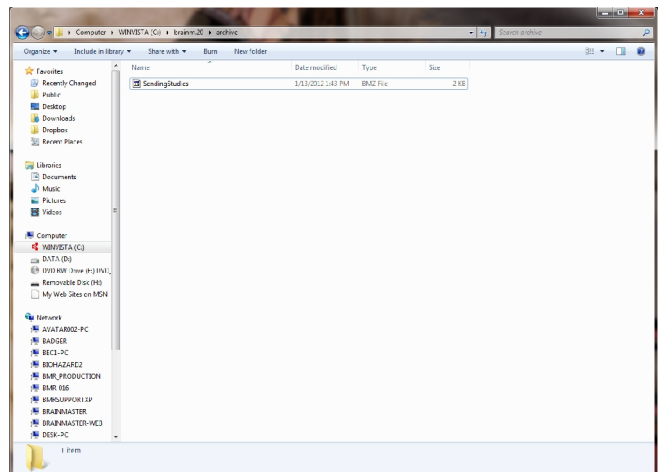


- C. **NO** – This is the option that most people will use. This will still create the BMZ, but it will not E-Mail it, or save it to a Floppy, it will simply create the BMZ File at C:\brainm.20\archive

4. Depending on which option that you choose above, you will receive a message stating that the action has been completed.

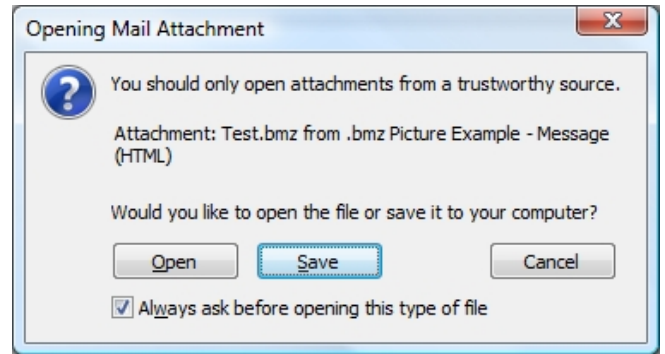


You now have a BMZ file created. You will be able to tell this is complete by seeing the archive of the folder in c:\brainm.20\archive.

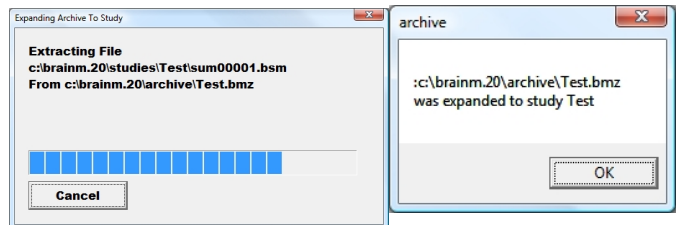


Import Received/Downloaded BMZ Files

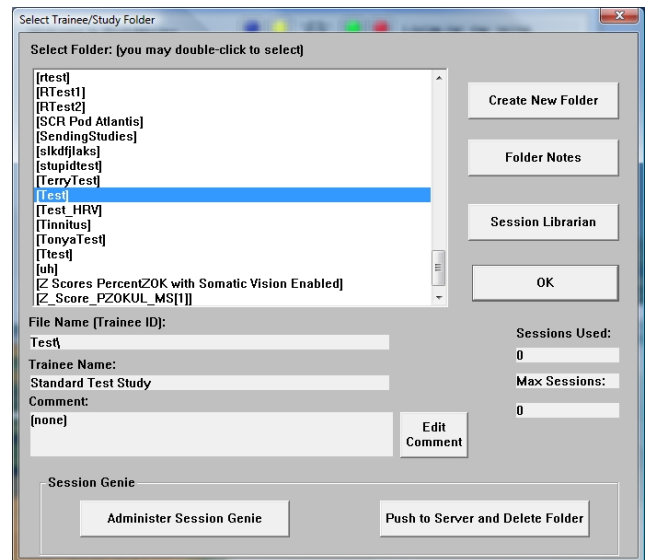
1. There are 3 ways BMZ Files can be received: E-Mail, Removable media, or downloading from the internet. Double-click on the BMZ file, and choose Open or Run, depending on your version of Windows.



2. The system will now take over. Press OK when prompted.



3. The folder is now expanded for use in your studies folder. You can access this folder by clicking Folder Selection Button on the BrainMaster Setup/Home Screen.



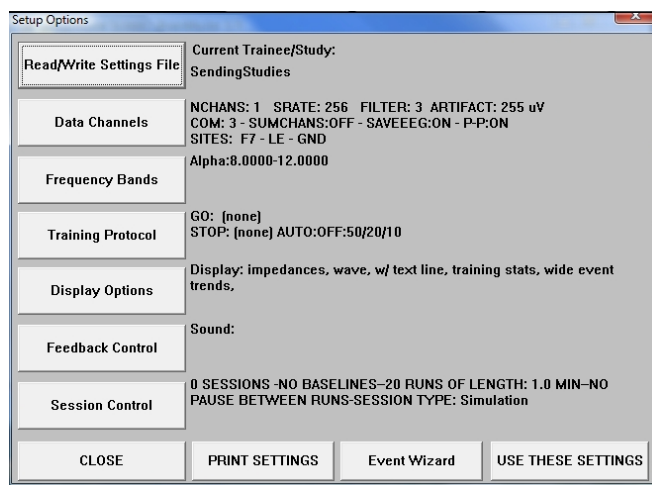
Moving Studies File to be Used as Settings File

PLEASE NOTE: This method can only be done if you have purchased a BrainMaster Clinical License

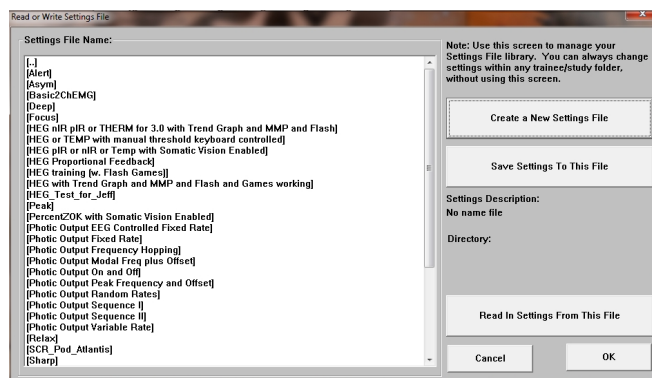
1. On the BrainMaster Setup/Home Screen, click the Folder Selections Button and select the file that you would like to be converted to a Settings File.



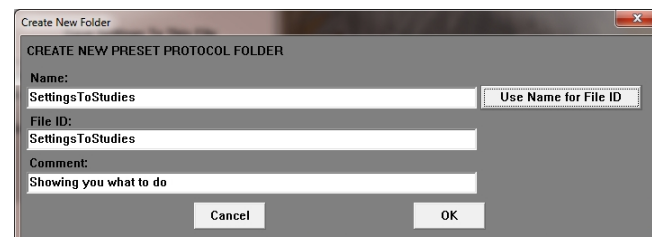
2. From the Setup/Home Screen, click the View or Change Settings Button. Once this is complete, then click the Read/Write Settings File Button.



3. In the Read or Write Settings File Menu, you will click the Create New Settings File Button.



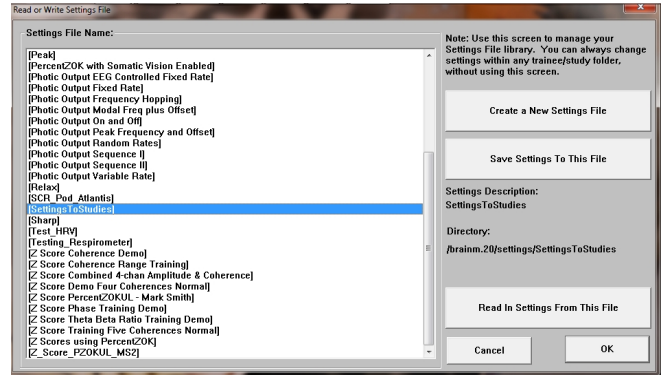
4. Place the name, the File ID and Comment for the setting file that you are creating, and click OK to continue.



5. You will have to now confirm the Name, ID and Comment. Click OK to continue.



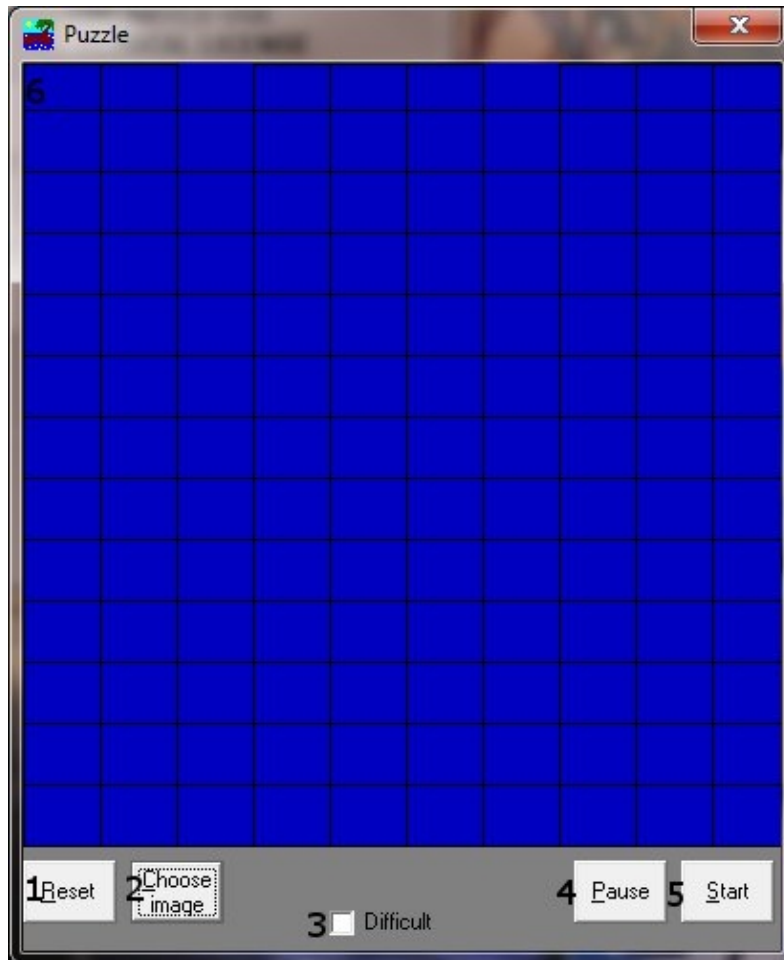
The settings file is now created. You will be able to see that this complete by scrolling through the settings files, and seeing the newly created settings file in this list now.



BMr Extras

BMr Contributed Games

Puzzle



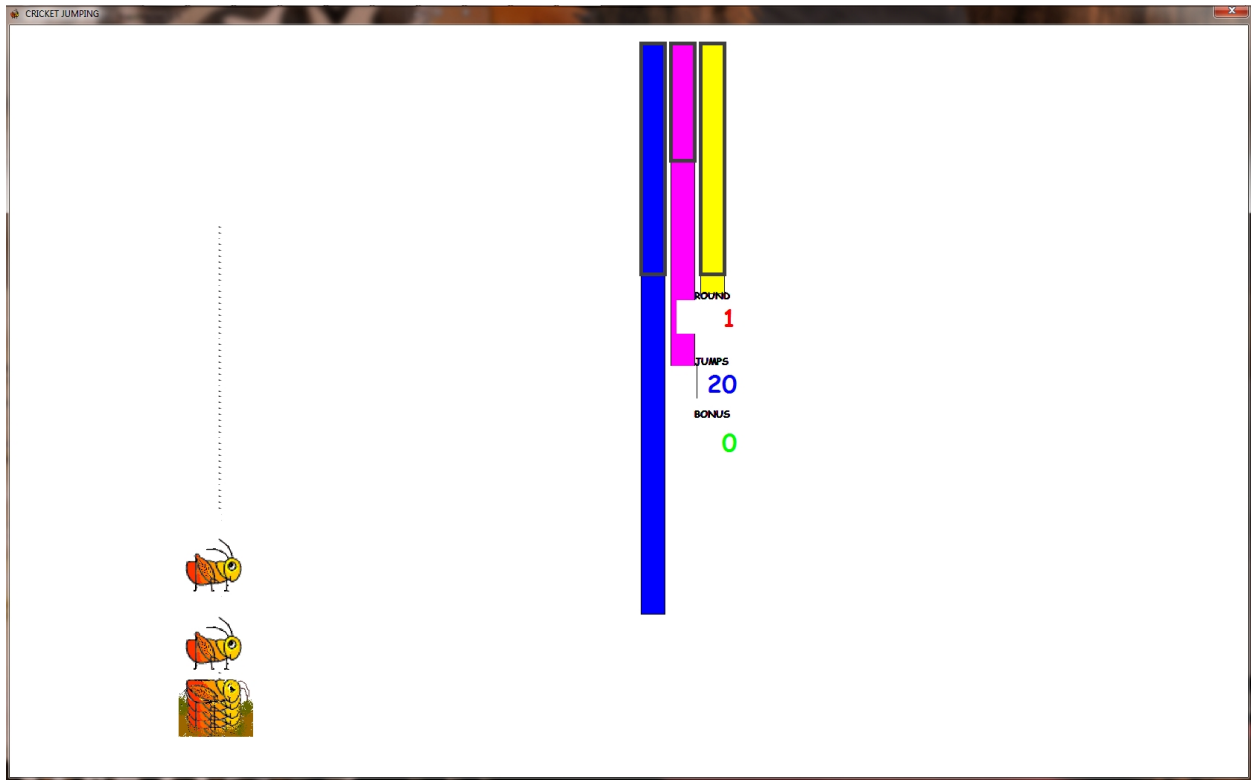
1. **Reset Button** – Click to make the blue squares visible. This can also be performed by clicking Alt + R.
2. **Choose Image Button** – Click to place a new image behind the blue squares. This can also be done by clicking Alt + C.
3. **Difficulty Check Box** – Check to change the difficulty. If the difficulty is checked on, then the customer must score two points to reveal a piece of the picture.
4. **Pause Button** – Click to pause the game in progress. This can also be performed by clicking Alt + P.
5. **Start Button** – Click to start the game. This can also be performed by clicking Alt + S.
6. **Display** – This is display, which is a square covered with 130 small blue squares. The puzzle will be revealed one square every time a point(depending on difficulty) is scored in the BrainMaster software.

Space Race



1. **Interceptor** – The Interceptor Rocket will advance when points are not being scored.
2. **Lunar Lander** – The Lunar Lander will advance whenever points are scored. The object is to get the lander to the top of the screen before the interceptor.
3. **Score Board** – Section that keeps track of how many times each ship wins the race.
4. **Start Button** – Click to start the game. This can also be performed by clicking Alt + S.
5. **Pause Button** – Click to pause the game. This can also be performed by clicking Alt + P.
6. **Change Background Button** – Click to choose between several background images for the screen. This can also be performed by clicking Alt + B.
7. **Choose Sound Button** – Click to choose an explosion sound(if you desire) for when the lander wins the race. There are several that are included. This can also be performed by clicking Alt + C.
8. **Hide Controls Button** – Click to shrink the screen and obscure the control buttons. This can also be performed by clicking the Alt + H. To get the controls back, click Alt + “=”.

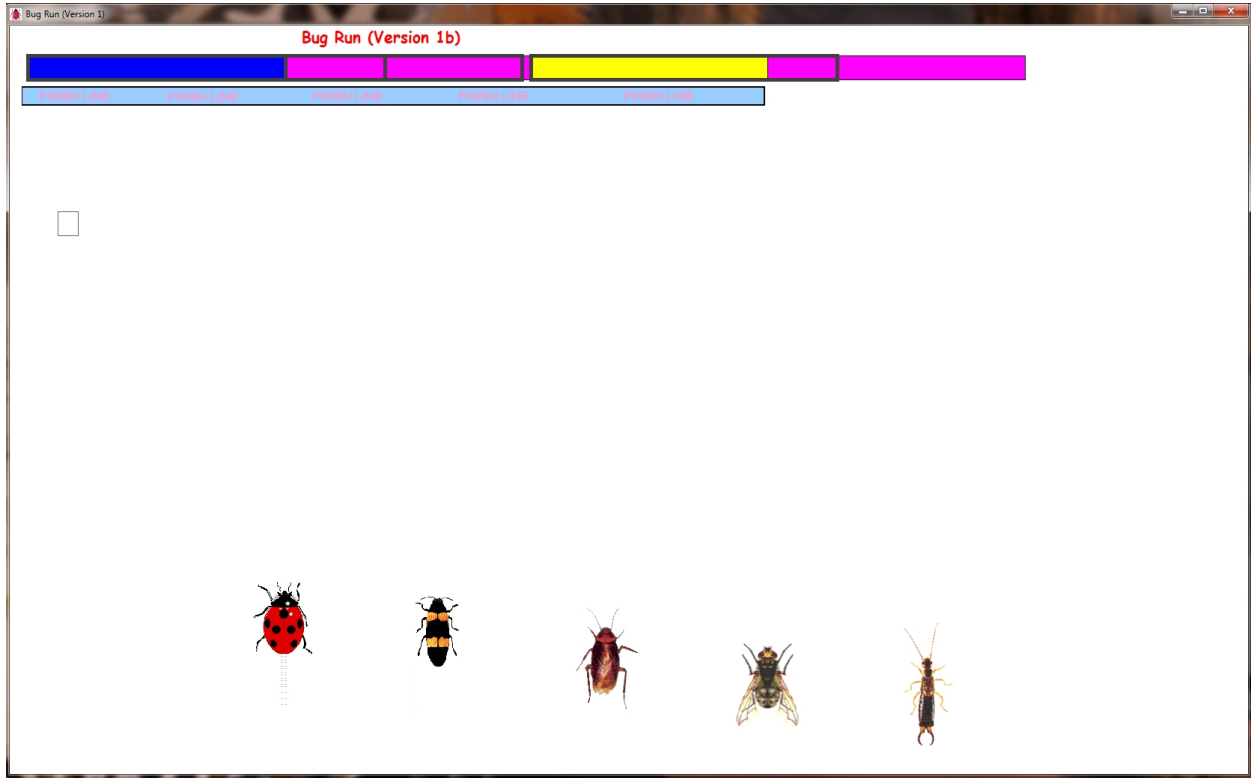
Cricket



As training proceeds, the crickets “stack up” and pile on top of each other.

Later on, the bottom images change, bonus points are awarded, and the screen becomes more interesting.

Bug Run



This screen provides a “bug race”. As the trainee meets the training criteria, the bugs will advance at random, running a race. If the trainee has excessive amounts of “stop” component, some of the bugs will slip down a bit, and fall behind. The goal of the game is to have the race progress.

After a while, one of the bugs will win, and be declared the winner.

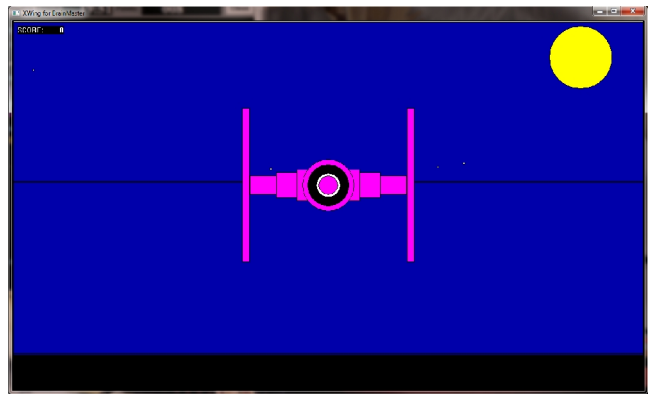
BMr Popups Displays

Display: X-Wing

Display Type: Game

Requirements: Basic amplitude training

Brief Description: The space ship will rise when the reinforced component (e.g. lobeta or beta) is high, and the ground will rise when the inhibited component (e.g. theta) is high. Both thresholds are shown as lines on the screen. When a point is scored, the spaceship will briefly turn red, and the point will be registered in the indicator area. When two channels are trained, this window shows two space ships, with the left panel showing Channel 1, and the right panel showing channel 2.



Display: BrainMan

Display Type: Game

Requirements: Basic amplitude training

Brief Description: BrainMan will advance 1 point for each target “hit”. Since what constitutes a “hit” is determined by the setup of the Thermometer system, the exact criteria for causing BrainMan to move can be set up in any desired fashion. Whenever an inhibited component is over its threshold (e.g. theta), BrainMan will turn blue, signaling the trainee.

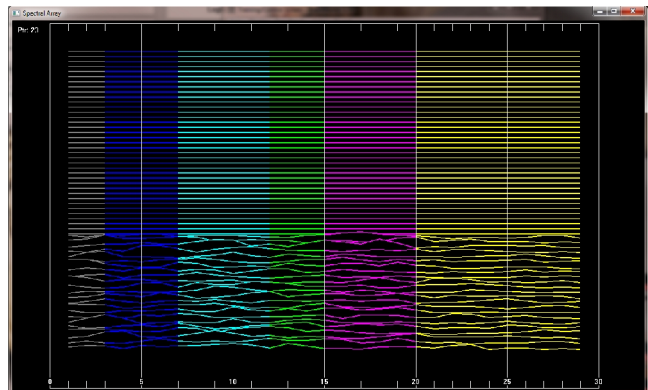


Display: 2D Spectral

Display Type: Display

Requirements: Basic amplitude training

Brief Description: This provides a cascade of past FFT spectra, covering the previous 1 minute of activity. Each frequency band is colored according to the frequency ranges selected. This coloring is the same as used on the FFT and the BrainMirror displays. There are tic marks and the labels to identify the frequency coordinates of the display. When two channels are used, two spectra are shown.

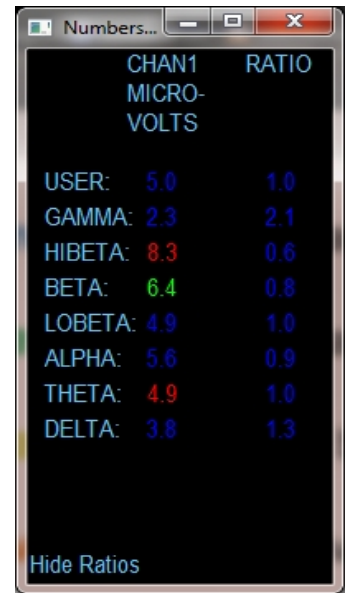


Display: Numbers

Display Type: Display

Requirements: Basic amplitude training

Brief Description: This screen shows numeric values for each component. “GO” components are shown in green. “STOP” components are shown in red. All other components are shown in blue. The values are “damped”, so they do not change too quickly. Ratios to theta can be shown by selecting the bottom text with the mouse. In 2-channel mode, it shows both channels.

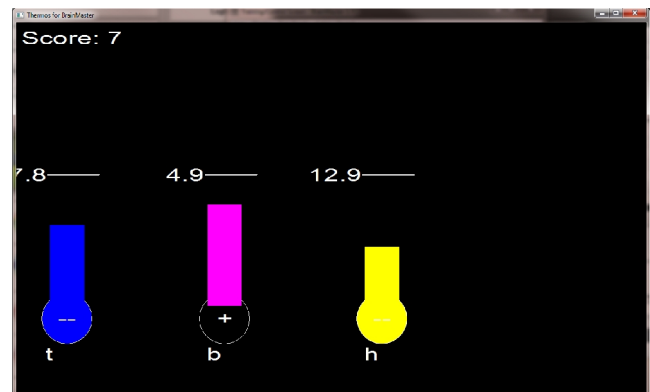


Display: Thermos

Display Type: Display

Requirements: Basic amplitude training

Brief Description: This window shows each of the major EEG component intensities as a bar graph with real-time response. “GO” components show a “+” in the bottom of the thermometer. “STOP” components show a “-” in the bottom of the thermometer. Un-trained components will not be shown in this screen.

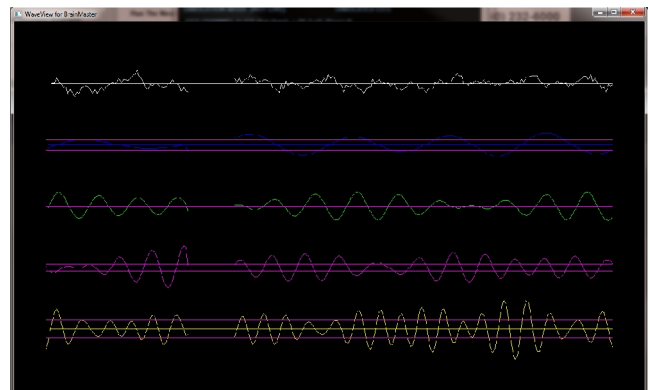


Display: Waves

Display Type: Display

Requirements: Basic amplitude training

Brief Description: This window shows the raw and filtered EEG waves in a resizable window. The display scale can be changed using the “+” and “-” keys, as usual. When two channels are used, both channels appear.

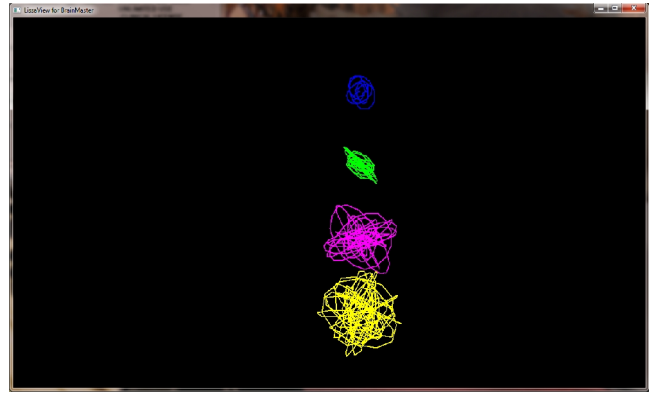


Display: Lissaview

Display Type: Display

Requirements: Basic amplitude training

Brief Description: This is a 2-dimensional display, using “rate of change” in place of the time axis. The vertical axis is exactly the same as in the EEG waveform display, while the horizontal axis is the first derivative of the EEG signal.

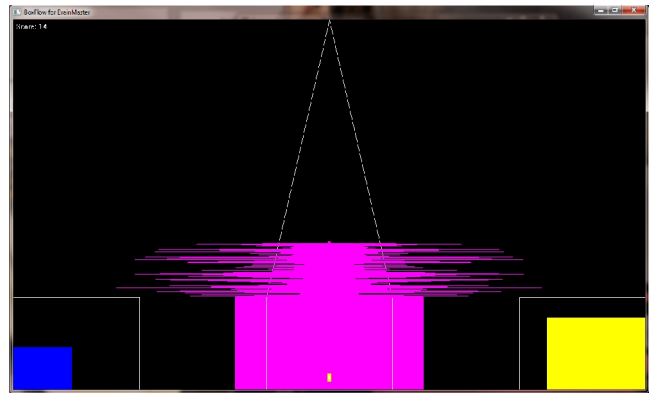


Display: BoxFlow

Display Type: Game

Requirements: Basic amplitude training

Brief Description: This is similar to that used in other common displays. The center box gets wider and narrower, so you can see the past history of the enhance band. You want it wide, to meet the threshold. The outer boxes are the “inhibits” and you want them small. If they get large, they encroach on the inner box, which inhibits feedback. When two channels are used, two “BoxFlows” appear.

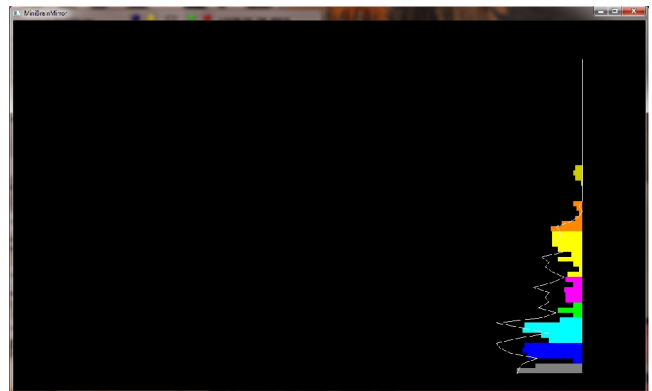


Display: MiniBMirr

Display Type: Display

Requirements: Basic amplitude training

Brief Description: This window shows the BrainMirror in a resizable window. It uses the FFT to show the current EEG component values. The BrainMirror window also works in 2-channel mode.

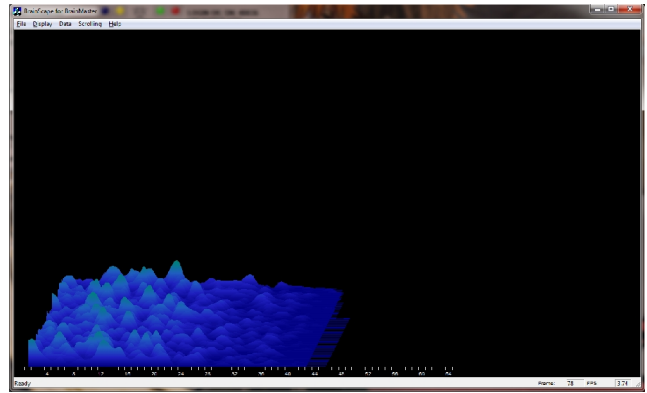


Display: BrainScape

Display Type: Display

Requirements: Basic amplitude training

Brief Description: BrainScape is designed to provide a 3-dimensional time/frequency representation of EEG signals, using a combination of frequency analysis, spline interpolation, and color-coded representation of signal amplitude. When two channels are used, a BrainScape for both channels appears. In two channel mode, when Sum/Difference channel mode is used, the two signals viewed are transformed into their sum and difference signals, and displayed in the usual manner.

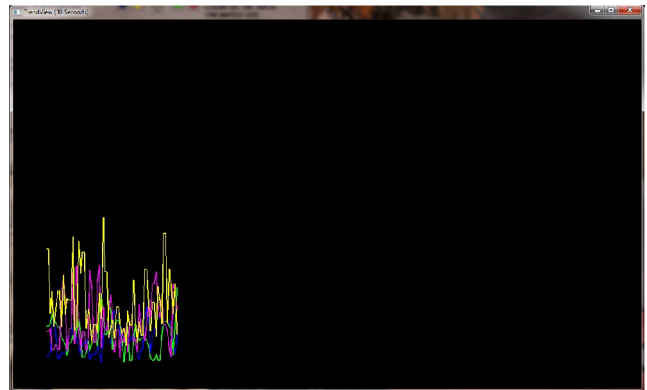


Display: TrendView

Display Type: Display

Requirements: Basic amplitude training

Brief Description: This shows the current and past activity of a component, in a plot of value vs. time, over a period of 30 seconds. After the plot reaches 30 seconds, it clears and redraws. The plot window displays only those components that are currently selected. When two channels are used, both appear on the display.

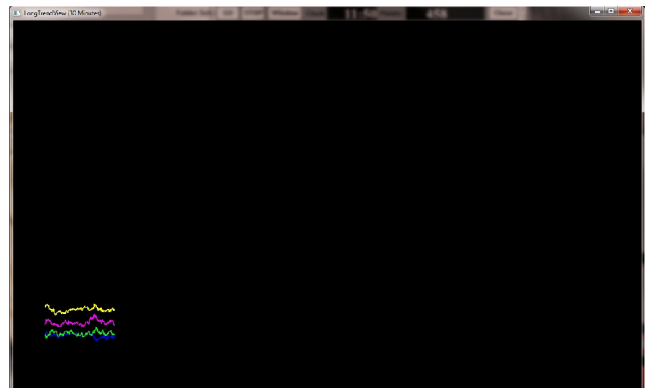


Display: LongTrend

Display Type: Display

Requirements: Basic amplitude training

Brief Description: This shows the current and past activity of a component, in a plot of value vs. time, over a period of 30 minutes. After the plot reaches 30 minutes, it clears and redraws. The plot window displays only those components that are currently selected. When two channels are used, both appear on the display.

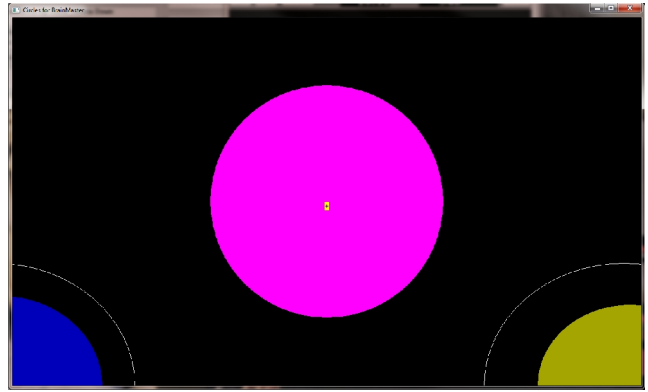


Display: Circles

Display Type: Game

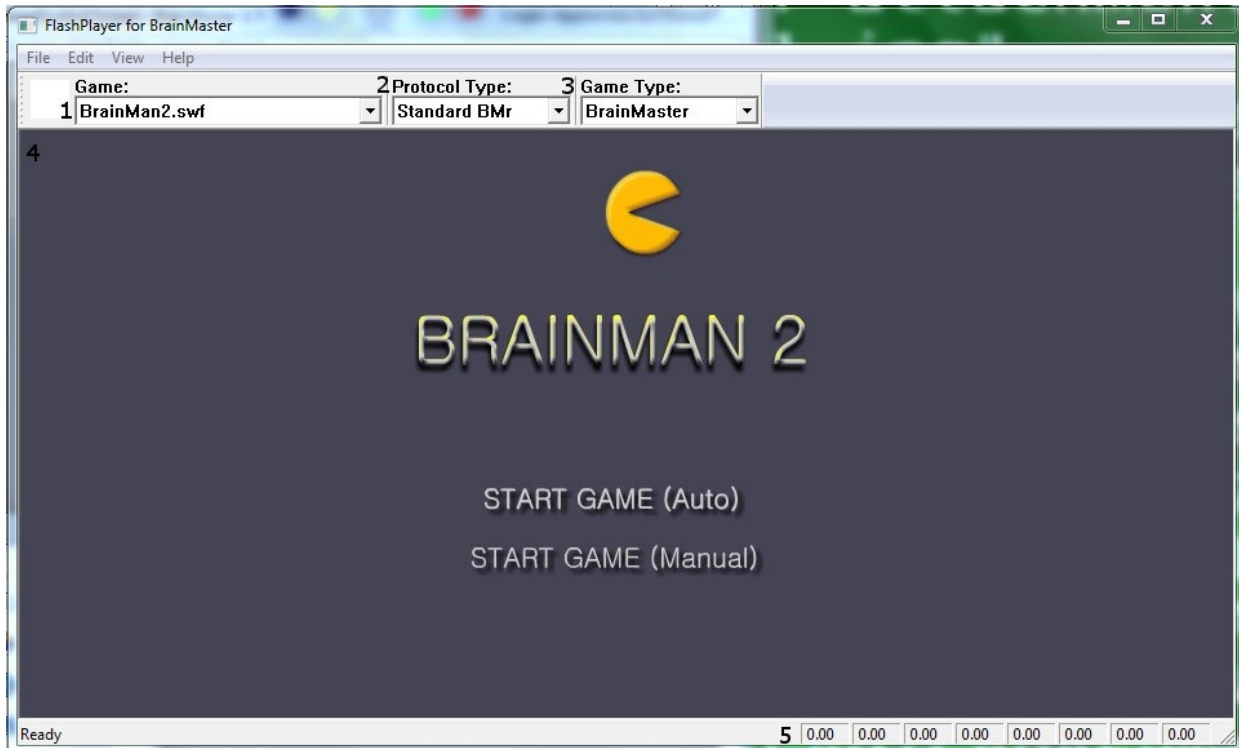
Requirements: Basic amplitude training

Brief Description: The Circles Window is similar to the BoxFlow, in that the center feature shows the main “uptrained” component, while the outer features show the high and the low “inhibits”. When two channels are used, this window adapts, to show the two “uptrained” components as an ellipse (width represents channel 1, and height represents channel 2). In addition, the total of 4 inhibits are shown in the corners. Channel 1 inhibits are shown on the left, and channel 2 inhibits are shown on the right



BMr Flash Player

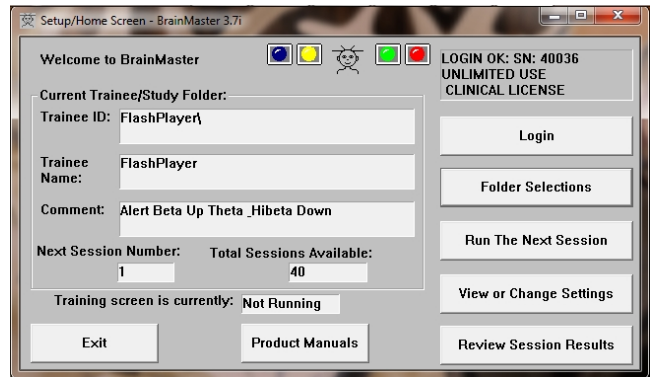
BMr Flash Player Control Menu Display



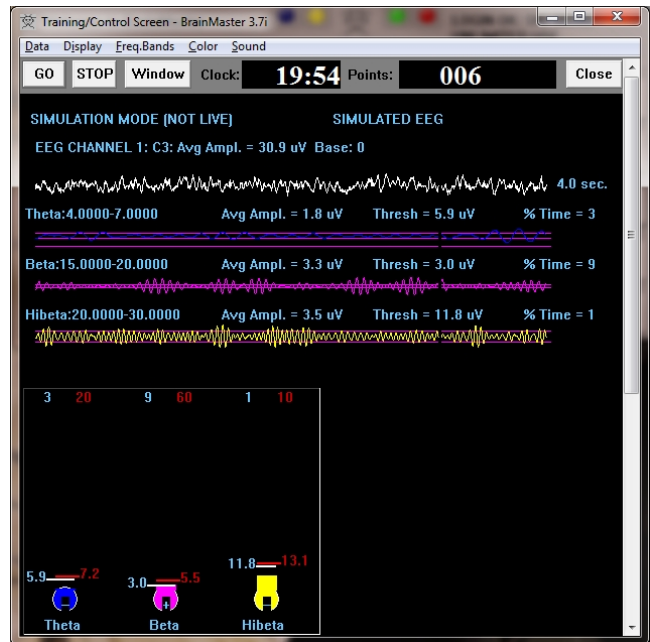
1. **Game Drop-Down Box** – Drop-down box where you can choose the game that you would like the Flash Player to use.
2. **Protocol Type Drop-Down Box** – Drop-down box where you can choose the type of Protocol you are using, whether it's a Standard BrainMaster, LZT-Live Z-Score, or RTZ-Real Time Z-Score.
3. **Game Type Drop-Down Box** – Drop-down box where you can choose the Game Type that the Flash Player is using.
4. **Display Window** – Display Window where the Flash Player Game is played.
5. **Event Wizard Readings** – Displays the information that is coming in from the Event Wizard.

Using BMr Flash Player

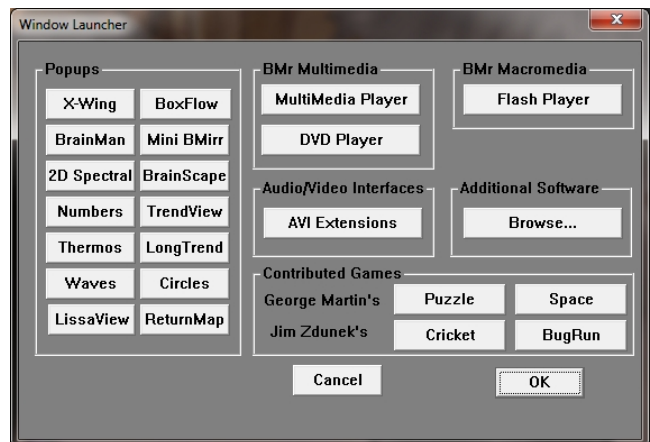
1. Setup the training that you would like to use, or choose an existing folder that you would like to us, and click the “Run The Next Session” Button.



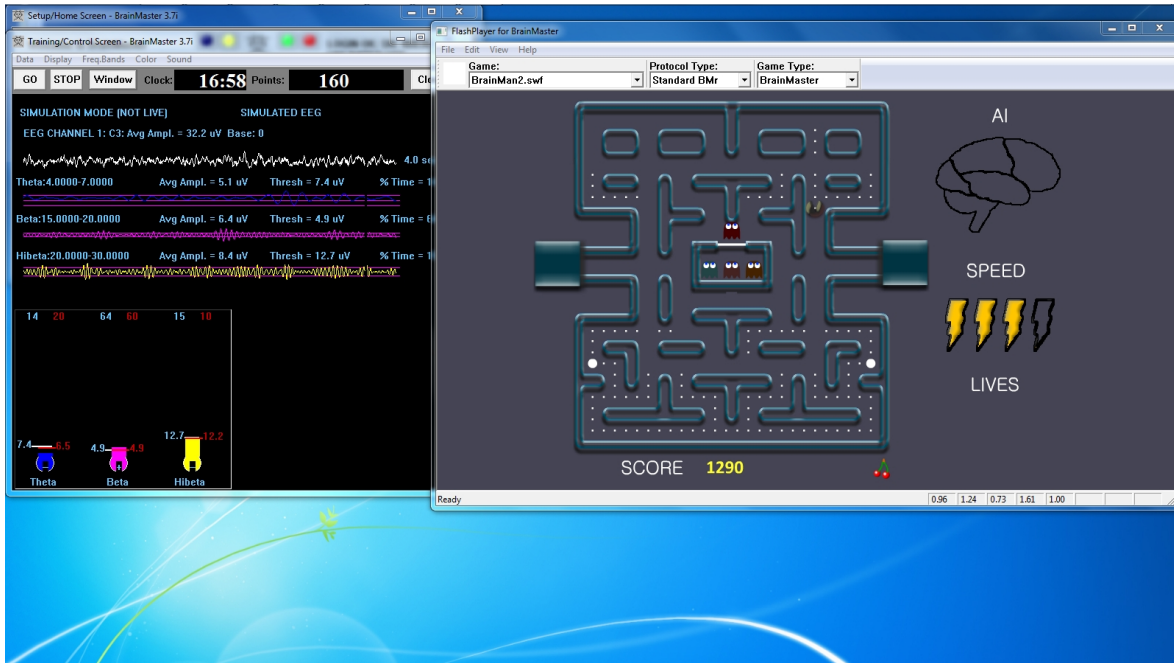
2. After you start the Session, click the “Window” Button.



3. In the Window Launcher Menu, click the “Flash Player” Button, located in the BMr Macromedia Section.



The Flash Player will now be running with the BrainMaster Software. You will be able to tell this has been successful, as the FlashPlayer Player for BrainMaster for BrainMaster Window will open, and the chosen Video file will play. Please make sure for proper use, the the Protocol Type, as well as the Game Type are properly set for optimal performance.



Flash Player Games

Color Quest



1. **Blimp** – Once a blimp has launched, the user will cause it to move every time its green progress bar fills up. When the blimp moves, it will move in the direction of the Colorful Ring (accuracy is dependent on user feedback). When the blimp hits the ring, it will change color. After 10 hits, the blimp will “spin out”, causing it to disappear, restoring color to the game screen. There are 6 total blimps.
2. **Launch Pad** – When there is no blimp on-screen, the user must fill the green progress bar in the top-left corner. Once this happens, a new blimp will launch from the Launch Pad. Also, the pink lights on the Launch Pad will illuminate when the user meets the requisite feedback conditions.
3. **Colorful Ring** – This ring is the target of the blimp. When the blimp hits it, the blimp will change color. Also, the ring will spin when the user meets the required feedback conditions.
4. **Progress Bars** – These progress bars measure the overall feedback of the user. The “rainbow” feedback bar, on the left, displays the user’s relative feedback for the last 3 seconds (i.e.: A full bar means the user met conditions 100% for the last 3 seconds, a half-bar means the user has met conditions 50% for the last 3 seconds, etc.). The green progress bar accumulates over time. If the user does not meet required conditions, the green progress bar will begin to descend. Filling the green progress bar once corresponds to 3 seconds of 100% feedback.
5. **Trophy Blimps** – As your blimp continually hits the Colorful Ring, three miniature models of your blimp will become visible, floating about in the background. They are purely aesthetic, and represent a visual reward for the user’s hard work.
6. **Progress Panel** – The Progress Panel has six blimp-shaped outlines. As the user “completes” each of the six blimps, the blimp-shaped outline will be filled in with a gold blimp “token”. This panel lets the user know how many blimps are left before the game is finished, as well as representing a visual reward for the user.

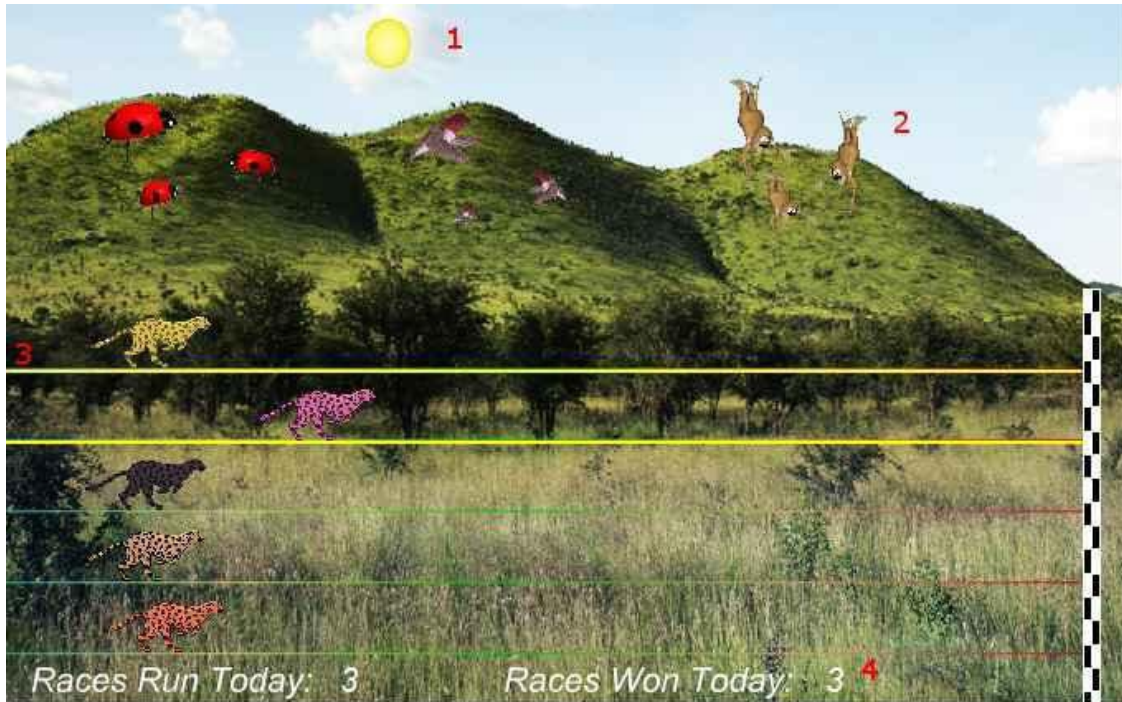
Similar Games – None

BrainCats 2



Opening Screen

1. **Select Cat Section** – Section where you select the cat who will run according to the user feedback.
2. **Race Length Section** – Section where you choose the length of the race. The non-user cats will take about this long to complete the race. Depending on the difficulty level and user feedback, the user could complete the race in a wide range of times. If the user meets the difficulty level consistently, they can be expected to take about as long as the non-user cats.
3. **Difficulty Setting** – Section where you set the difficulty. The difficulty corresponds to the percentage of client feedback that will put the player cat about “on par” with the race competition. The default value is 50%. For example: at a difficulty level of “25”, the client will have to meet the required conditions about 25% of the time to keep up with their opponents in the race. As the client meets conditions more consistently, the chance of the client winning will also increase. So, in the case of “25”, a client providing 35% feedback would have a good chance of winning the race.
4. **Sound On/Off Section** – Sections where you can control the sound settings for the game. The sounds act primarily as reward feedback, and appear in 5 different places during the game:
 - a. At the games start
 - b. At the result screen after a win
 - c. When the user earns the Monkey Trophy
 - d. When the user earns the Elephant Trophy
 - e. When the user reaches the nighttime scenario
 - f. When the user wins after completing the nighttime scenario
5. **Start Race Button** – Click to begin the game after all settings are set to your desired settings.



Race Screen

1. **Sun/Moon Graphics** – This graphic will move through the sky as you win more races. Eventually, when the sun passes the mountains on the west side of the screen, day turns into night, and the process begins again with the moon.
2. **Trophies Graphics** – As you gain points, trophies begin to appear. When the client meets feedback requirements, the trophies animate. Each stage has nine trophies, with three models. For the daytime, these are the ladybugs, hummingbirds, and monkeys. For the nighttime, these are bees, doves, and elephants.
3. **Race Track Borders** – When the client meets feedback requirements, the borders of the race track will light up around the players selected cat.
4. **Statistics Section** – Here, you can see the user's performance for that game.

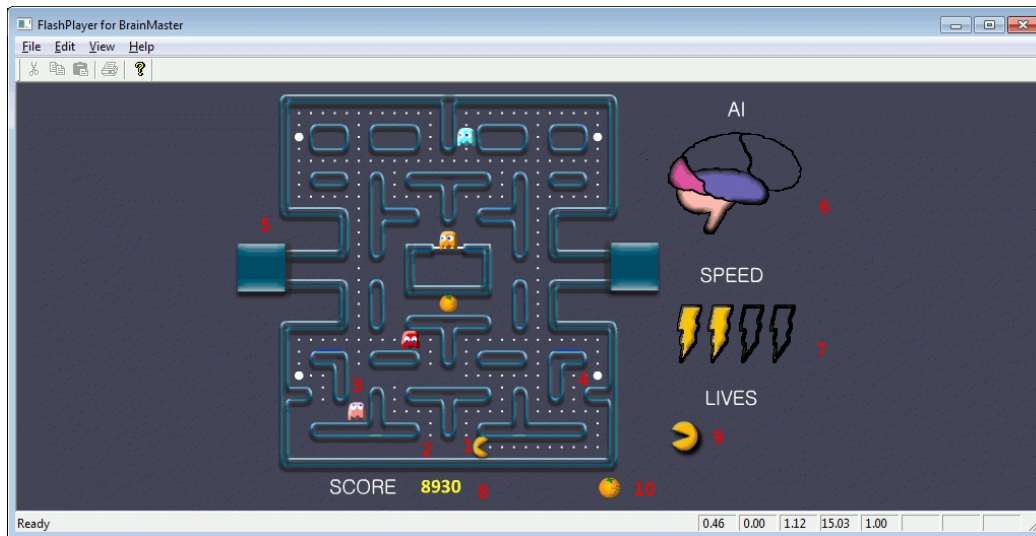
Similar Games – BrainCats, BrainCats 3D, Blimp Race, Blimp Race 3D

BrainMan 2



Title Screen

- 1. Automatic Gameplay Selection** – Click to choose the Automatic Gameplay mode. This is more akin to the original BrainMan for BrainMaster. BrainMan will move automatically across the board. His movements are a direct response to the user’s feedback. In addition, the user’s feedback over the last six seconds will govern the “intelligence” of BrainMan’s AI, with a more consistent feedback resulting in a more effective BrainMan.
- 2. Manual Gameplay Selection** – Click to choose the Manual Gamelay mode. This mode boasts a more arcade-style of gameplay, with the user directly controlling the movement of BrainMan.

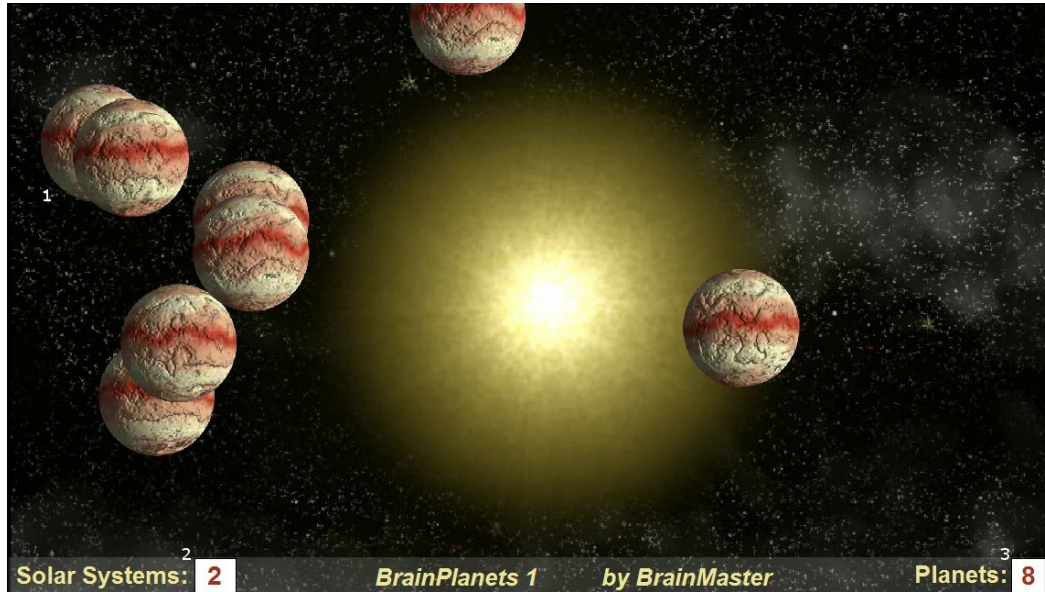


Training Screen

1. **BrainMan** – This is BrainMan. He moves according to the feedback of the user. If the user does not meet specified feedback requirements, BrainMan will not move.
2. **Pills** – When all the pills on a stage have been eaten, BrainMna will move on to the next stage.
3. **Ghosts** – These familiar foes begin to freely move about the screen on Stage 3. Unlike the ghosts that you are used to, these pose no threat to BrainMan. They are extra points, and can be eaten. If the client is meeting the requirements, then the Ghosts will be a blue color and will be able to be consumed. They will turn in to a set of eyes and have to return to their “base” to regenerate.. If the client is not meeting the training requirements, then the Ghosts will be their normal colors. If during this time, they make contact with BrainMan, they will pass through him.
4. **Power Pill** – The Power Pill delivers a reward sound to the client, and has a small chance of increasing BrainMan’s speed for the duration of the level.
5. **Maze** – In this version, even the maze borders respond to the feedback. As the client meets requirements, the borders will become brighter and more saturated. Conversely, as the clinet fails to meet requirements, the maze will grow dark.
6. **AI Level** – The AI is the controller of BrainMan’s movement. It is based on a combination of three things: the client’s relative feedback, the client’s progress through the game, and the client’s progress through the level. As these values increase, you will notice the Brain begin to “fill up”. This means that BrainMan will actually become smarter, and hunt pills more effectively.
7. **Speed Level** – This is self-explanatory. Much like the AI Level, it is governed by both the client’s relative feedback and progress through the game. It does not however, measure progress through the level. Instead, it has a chance to temporarily increase when the user eats a power pill.
8. **Score** – This number is raised by eating Pills, Fruit, and Ghosts.
9. **Lives** – These do not affect gameplay. Rather, they function as “trophies”. The user receives one life for every 8,000 points sored.
10. **Fruit** – Each level boasts a particular kind of Fruit. It will appear in the center of the game board for a brief interval of time during every level. They can be eaten for extra points.

Similar Games - BrainMan

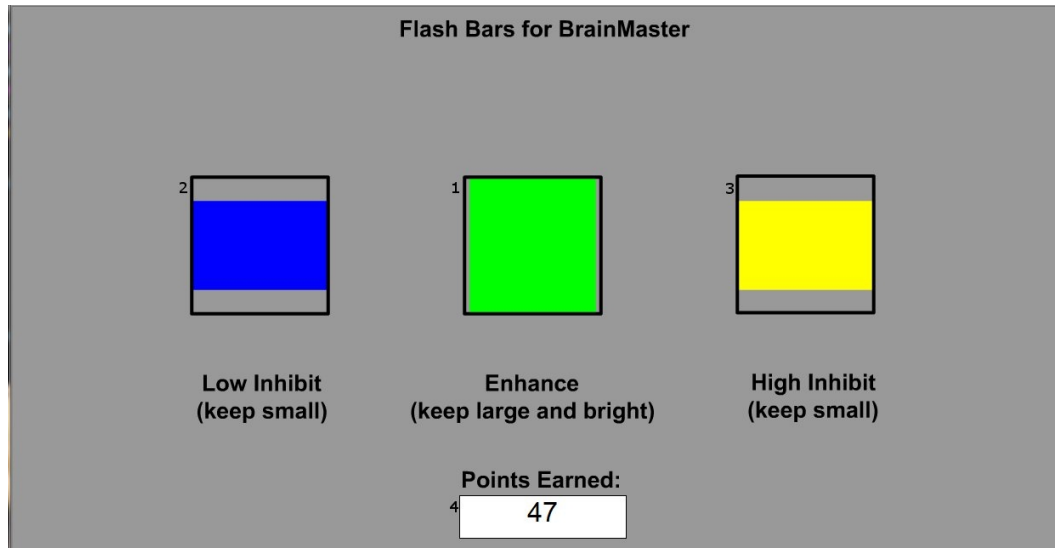
BrainPlanets



1. **BrianPlanets** – The BrainPlanets are created when the trainee meets the training criteria continuously for a certain period of time (approx. ½ second). The Planets are moving quickly when the criteria are met, and slow down otherwise. The number of cells reflects the success in keeping in state over a period of time. If the trainee falls out of state (or has inhibits) for a period of time (approx. 1 second), one planet will disappear. 10 Planets create a Solar System, and all planets disappear and the client begins to build a Solar System again.
2. **Solar System Counter** – This box counts the amount of Solar Systems that have been created.
3. **Planet Counter** – This box counts the amount of Planets that have been created.

Similar Games – BrainPlanet1lite, BrainPlanets2, BrainPlanets2lite, BrainCell

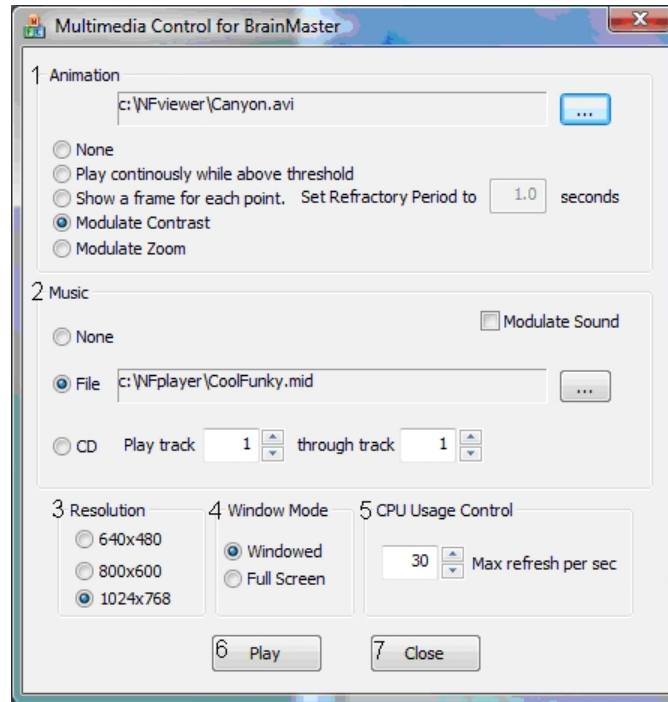
App Boxes



1. **Enhance Box** – Shows a box that represents the enhance band. This will increase and decrease in size horizontally, depending on your enhancement training.
2. **Low Inhibit Box** – Shows a box that represents the low inhibit band. This will increase and decrease in size vertically, depending on your low inhibit, and will also have an effect on the Enhance Box. When the inhibit goes above the threshold, they cause the Enhance Box to become dimmer. When both Inhibit boxes are above threshold, the Enhance Box is maximally dark.
3. **High Inhibit Box** - Shows a box that represents the High inhibit band. This will increase and decrease in size vertically, depending on your high inhibit, and will also have an effect on the Enhance Box. When the inhibit goes above the threshold, they cause the Enhance Box to become dimmer. When both Inhibit boxes are above threshold, the Enhance Box is maximally dark.
4. **Points Earned Box** – Box that displays the current amount of points that the client has earned during their training.
Similar Games – None.

BMrMultiMediaPlayer BMr DVD and EEGAudio(Optional Purchase)

BMrMultiMedia(BMrMMP) Player Control Menu Display



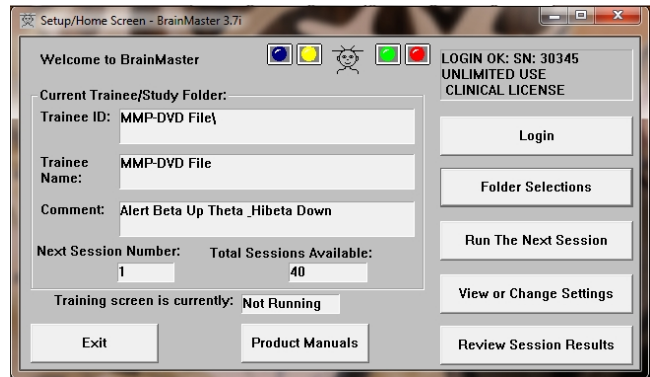
- 1. Animation Section** – Section where you can choose what type of animation being viewed, and the type(if any) modulation is occurring. In order to choose a different animation, you can do so by clicking the “...” button.
- 2. Music Section** – Section where you can choose what type of music is being played, and whether or not audio modulation will occur. In order to choose a different audio file, you can do so by click the “...” button.
- 3. Resolution Section** – Section where you can adjust the resolution the animation file is being displayed.
- 4. Window Mode Section** – Section where you can adjust whether the animation is being displayed as a Window, or in Full Screen Mode.
- 5. CPU Usage Control** – Section where you can control the Max refresh rate per second.
- 6. Play Button** – Click to confirm settings and launch BMr MultiMediaPlayer.
- 7. Close Button** – Click to close BMr MultiMediaPlayer Control Menu.

Acceptable Media Files: MPEG, AVI, WMV

Acceptable Audio Files: MIDI, MP3, WAV

Using BMrMMP

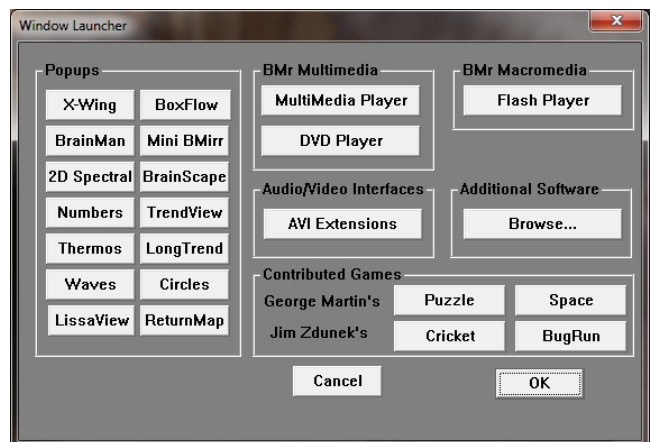
1. Setup the training that you would like to use, or choose an existing folder that you would like to us, and click the “Run The Next Session” Button.



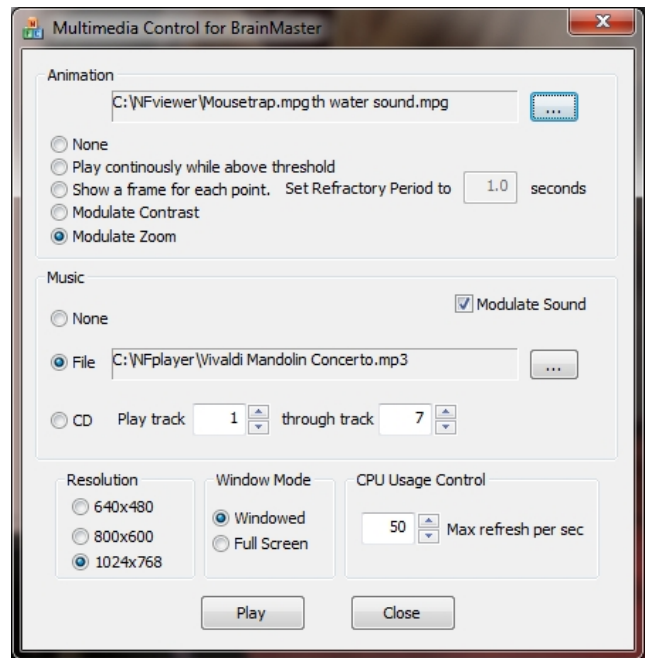
2. After you start the Session, click the “Window” Button.



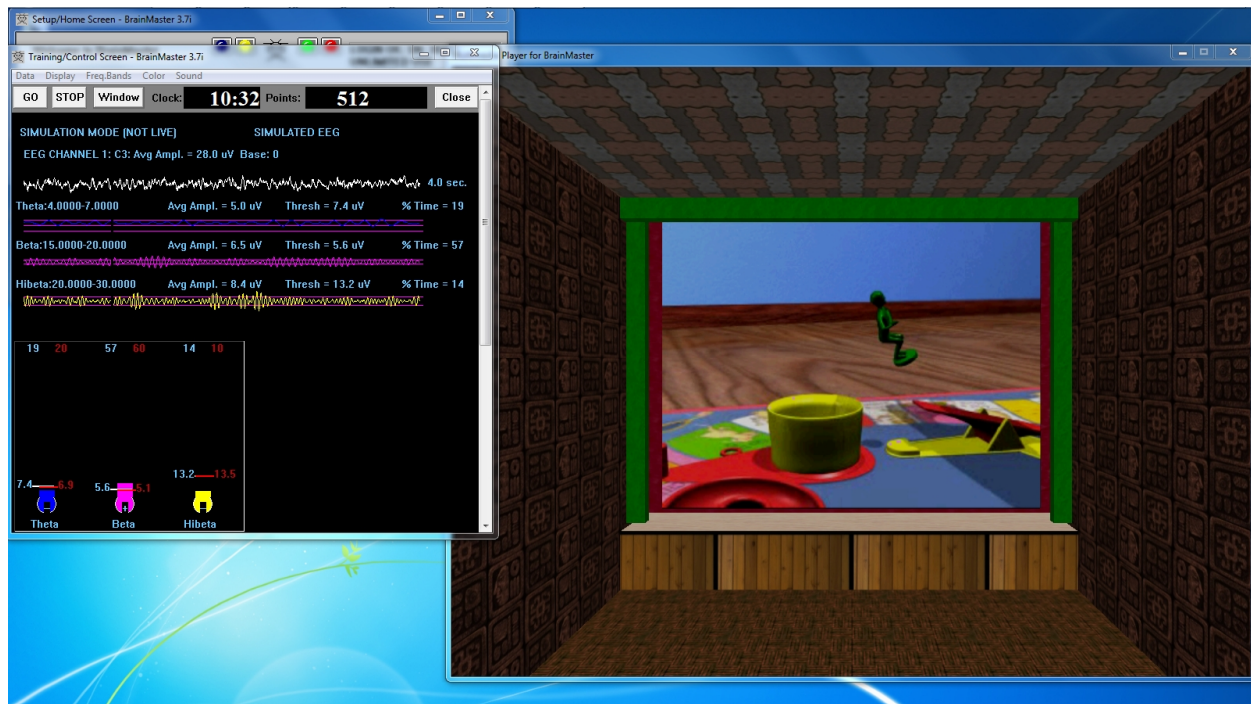
3. In the Window Launcher Menu, click the “MultiMedia Player” Button, located in the BMr Multimedia Section.

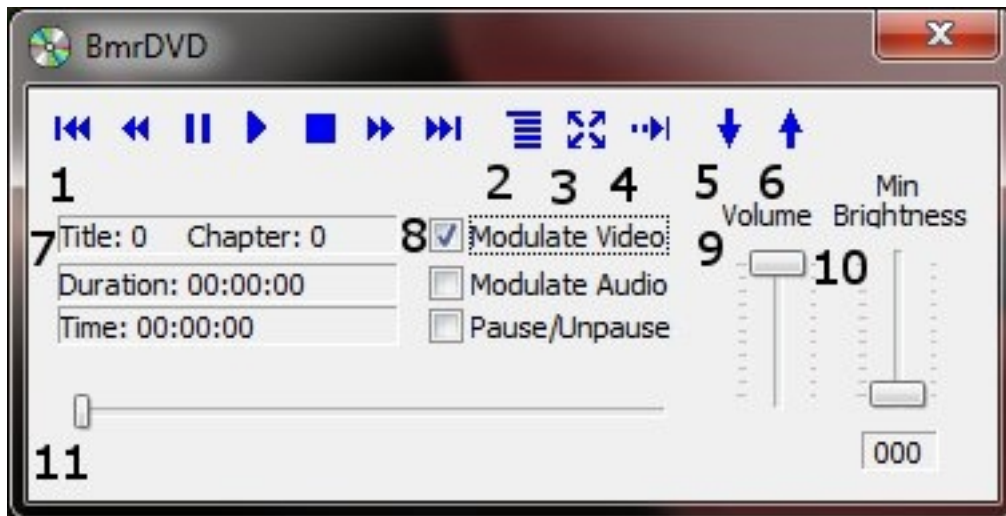


4. Setup the Controls for the BMrMMP as you would like them to react. When your settings are as you would like them, click the “Play” Button to continue.



You have now set up the MultiMedia Player for use with the BrainMaster Software. You will be able to tell this has been successful, as the Multimedia Player for BrainMaster for BrainMaster Window will open, and the chosen Video file will play.

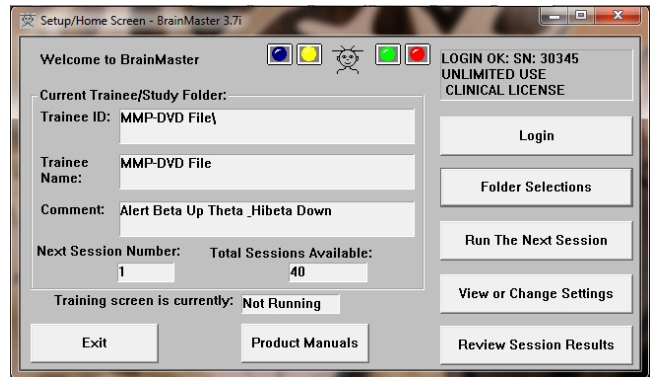


BMrDVD Control Menu Display

1. **DVD Basic Controls** – Basic DVD Controls(Skip Back, Rewind, Pause, Play, Stop, Fast Forward, and Skip Forward).
2. **Root Menu/Resume Button** – Click to switch from to the Main Menu, or back to your original position.
3. **Full Screen Button** – Click to Expand the DVD Window to Full Screen Mode.
4. **Step Forward Button** – Click to step through the different Title Screens.
5. **Save Bookmark Button** – Click to create a Bookmark for the Trainee Folder that you are currently using.
6. **Restore Bookmark Button** – Click to restore a Bookmark for the Trainee Folder that you are currently using.
7. **Disc Information** – Displays the Chapter Information, Duration and Time for the DVD.
8. **Modulate Check Boxes** – Section where you can choose the type of Modulation(if any).
9. **Volume Control** – Controls the Volume for the BMrDVD Program
10. **Min Brightness Control** – Controls how low the software modulates when the client is not meeting criteria.
11. **Scroll Bar** – Use to Scroll through the DVD with-out skipping or fast forwarding.

Using BMrDVD

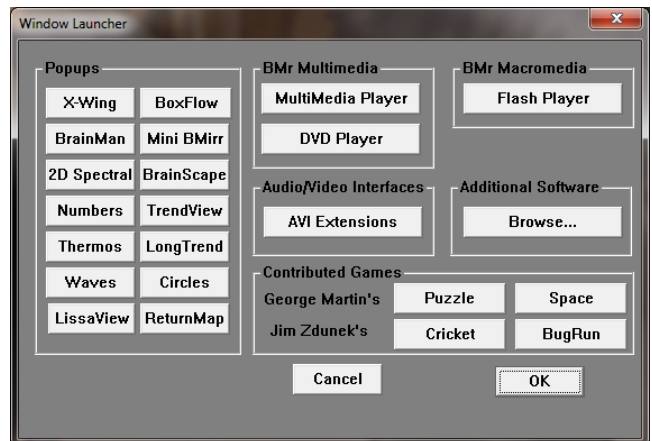
1. Setup the training that you would like to use, or choose an existing folder that you would like to us, and click the “Run The Next Session” Button.



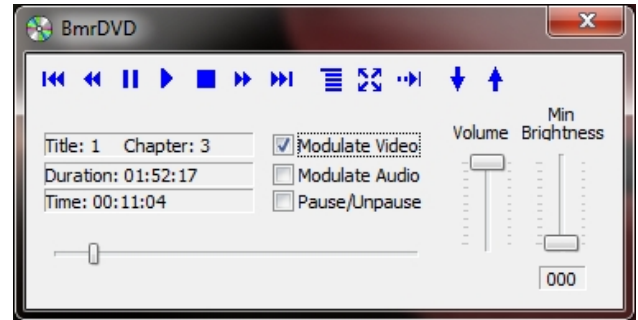
2. After you start the Session, click the “Window” Button.



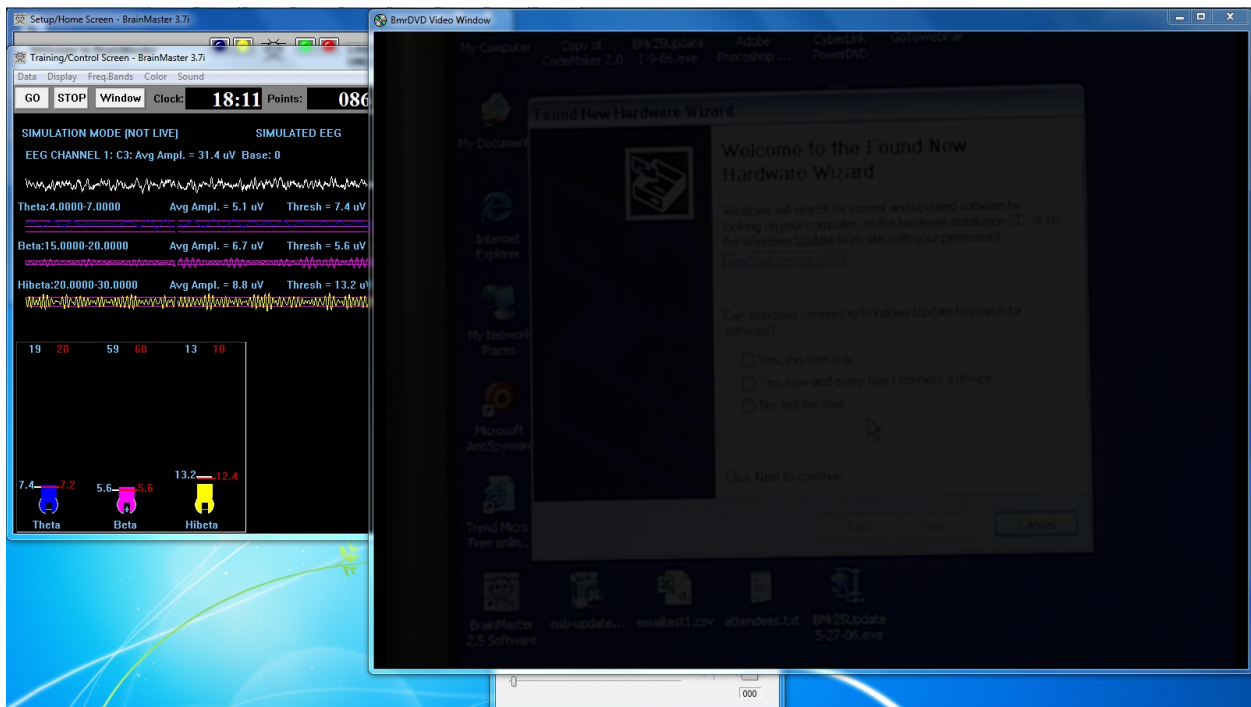
3. In the Window Launcher Menu, click the “DVD Player” Button, located in the BMr Multimedia Section.

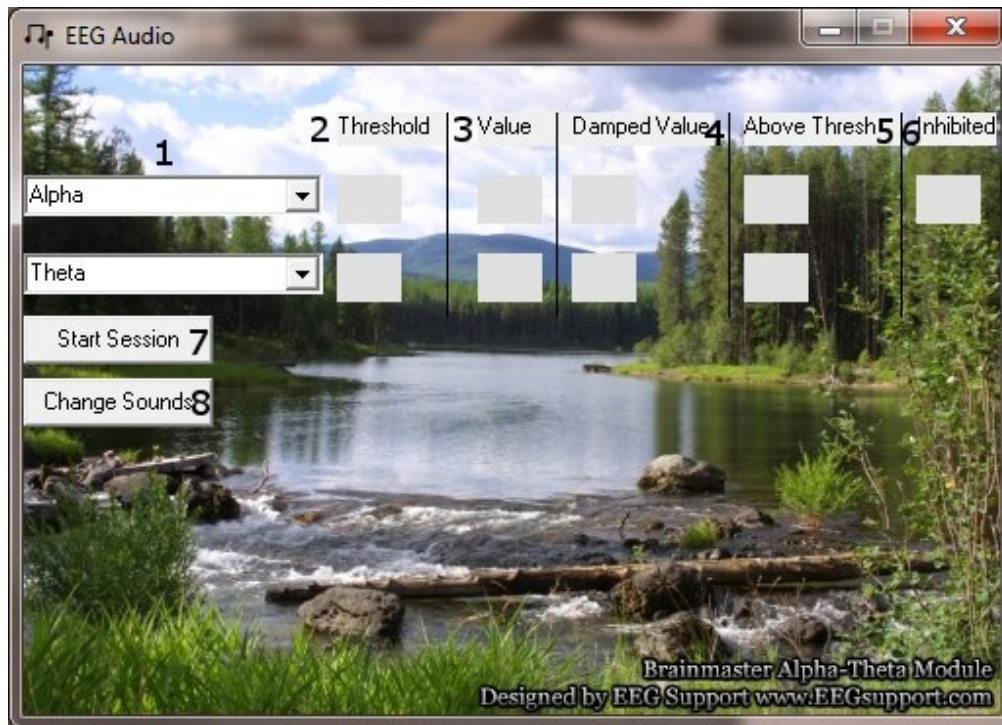


4. Click the “Play” Button or the “Restore Playback” Button to continue.



You have now set up the DVD Player for use with the BrainMaster Software. You will be able to tell this has been successful, as the BmrDVD Video Window will open, and the DVD will play.

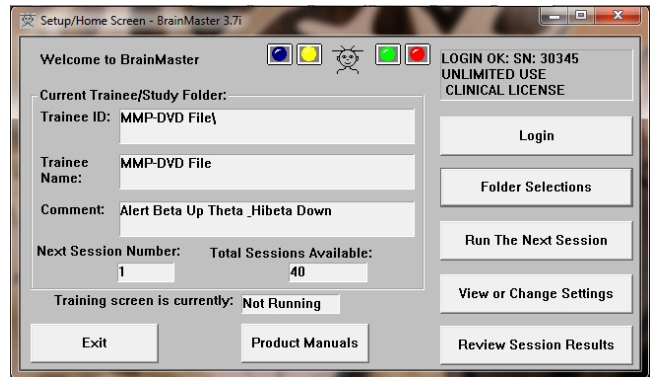


EEGAudio Control Menu Display

1. **Band Drop-Down Boxes** – Drop-Boxes, where you can choose which bands you would like use for the training. **PLEASE NOTE: EEGAudio is typically used for Alpha/Theta Training, but is versatile enough to be used with any type of protocol that includes two enhance (“Go”) components, in which it is desirable to inform the trainee of their relative size, as well as when either of the goes above threshold.**
2. **Threshold Boxes** – Display boxes that show the current Threshold values for the bands chosen from the Band Drop-Down Boxes.
3. **Value Boxes** – Display boxes that show the current value for the bands chosen from the Band Drop-Down Boxes.
4. **Damped Value Boxes** – Display boxes that show the damped(averaged) value for the bands chosen from the Band Drop-Down Boxes.
5. **Above Thresh. Boxes** – Display boxes that show the value that shows the amount that the component is currently above threshold(negative if below) for the bands chosen from the Band Drop-Down Boxes.
6. **Inhibited Box** – Displays whether or not any inhibits are active.
7. **Start/Stop Session Button** – Click when all settings are proper to run the EEGAudio Program.
8. **Change Sounds Button** – Click to change the sounds that are coming in for each band, as well as the background for each band.

Using EEGAudio

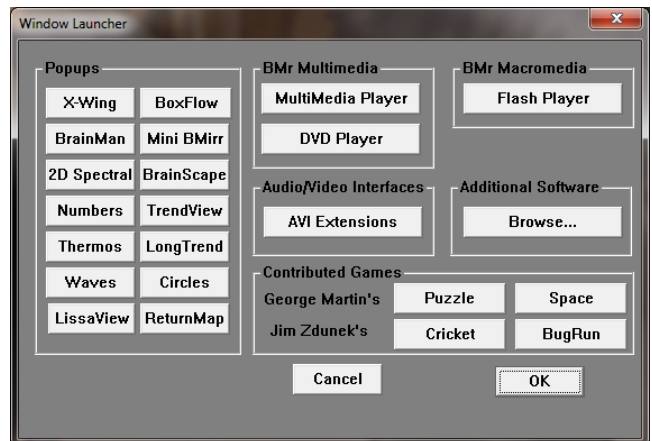
1. Setup the training that you would like to use, or choose an existing folder that you would like to us, and click the “Run The Next Session” Button.



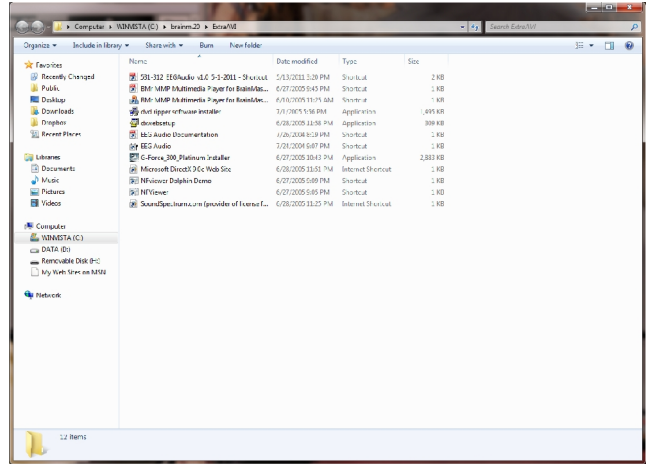
2. After you start the Session, click the “Window” Button.



3. In the Window Launcher Menu, click the “AVI Extensions” Button, located in the Audio/Video Interfaces Section.



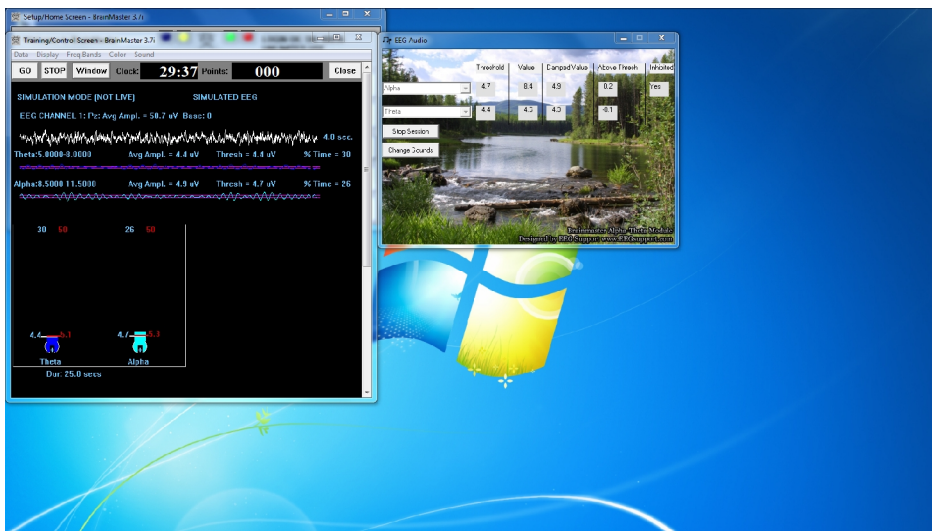
- The following menu will open. Double-Click “EEGAudio.exe” to open the EEGAudio program.



- Setup the sounds and bands as you would like them. When the set-up is complete, click the Start Session Button.



You have now set up the EEGAudio for use with the BrainMaster Software. You will be able to tell this has been successful, as EEGAudio will be having numbers, and you have chosen will be playing as the requirements are met.

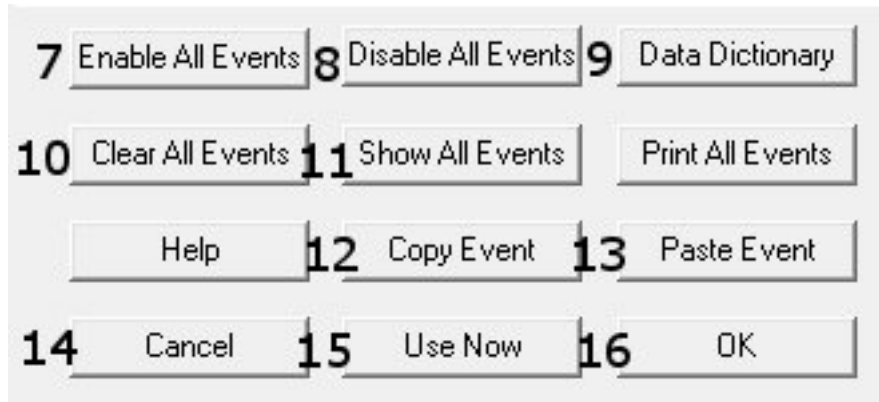


Event Wizard

Event Wizard Control Menu Display

1. **Event Number Section** – Section where you choose which Event you are viewing.
2. **Event Condition Section** – Section where you set the chosen Event Condition for operation.
3. **Event Result Section** – Section where you set what the chosen Event does when the Event Condition has been met.
4. **This Event Is: Section** – Section where you set whether the chosen Event is enabled or not.
5. **Visibility Section** – Section where you set whether the chosen Event Graph will be visible or not, when the Trend Graphs are chosen for display.
6. **MIDI Sound Properties Section** – Section where you can set the properties for MIDI reward feedback for the chosen Event.

Event Wizard Control Menu Display(Continued)



- 7. Enable All Events Button** – Click to enable all 16 Events.
- 8. Disable All Events Button** – Click to disable all 16 Events.
- 9. Data Dictionary Button** – Click to bring up the Data Dictionary.
- 10. Clear All Events Button** – Click to clear the data from all 16 Events.
- 11. Show All Events Button** – Click to show the Event Summary information for all 16 Events.
- 12. Copy Event Button** – Click to copy the chosen Event.
- 13. Paste Event Button** – Click to paste an Event that has been selected from the Copy Event Button.
- 14. Cancel Button** – Click to cancel any changes made, and exit the Event Wizard.
- 15. Use Now Button** – Click to accept all changes.
- 16. OK Button** – Click to Exit the Event Wizard.

Data Dictionary for the Event Wizard

| User-defined bands | |
|---|--|
| Any component names may be used to access data, including user-defined variables. | band name: channel 1 amplitude (from digital filters) for 8 components e.g. "User1" or "EMG" |
| Any component name followed directly by the letter "T" will automatically access the current threshold from the protocol processor for that band. | channel 1 thresholds (from digital filters) for 8 components, e.g. "User1T" or "EMGT" |
| Note: User-defined bandnames will automatically override any built-in names. For example, if you define your own band called "D", then "D" will be used for your band, not the default D (Delta) band. This allows you to completely redesign the component band names and use all of your redefined band names in the Math Wizard. | |
| Standard 1-channel variables computed in real time using BrainMaster built-in filter and protocol processing system | |
| D, T, A, L, B, H, G, U | channel 1 amplitude (from digital filters) for 8 components |
| DELTA, THETA, ALPHA, LOBETA, BETA, HIBETA, GAMMA, USER | channel 1 amplitude (from digital filters) for 8 components |
| DTHR, TTHR, ATHR, LTHR, BTHR, HTHR, GTHR, UTHR | channel 1 thresholds (from digital filters built-in autothresolder) |
| D1, T1, A1, L1, B1, H1, G1, U1 | channel 1 amplitude (from digital filters) for 8 components |
| DELTA1, THETA1, ALPHA1, LOBETA1, BETA1, HIBETA1, GAMMA1, USER1 | channel 1 amplitude (from digital filters) for 8 components |
| C1DA, C1TA, C1AA, C1LA, C1BA, C1HA, C1GA, C1UA | channel 1 amplitude (from digital filters) for 8 components |
| C1DF, C1TF, C1AF, C1LF, C1BF, C1HF, C1GF, C1UF | channel 1 modal frequency (from FFT) for 8 components |
| C1DE, C1TE, C1AE, C1LE, C1BE, C1HE, C1GE, C1UE | channel 1 percent energy (from FFT) for 8 components |
| C1DP, C1TP, C1AP, C1LP, C1BP, C1HP, C1GP, C1UP | channel 1 percent time over threshold (using digital filters) |
| C1DT, C1TT, C1AT, C1LT, C1BT, C1HT, C1GT, C1UT | channel 1 thresholds (from digital filters built-in autothresolder) |
| C1DV, C1TV, C1AV, C1LV, C1BV, C1HV, C1GV, C1UV | channel 1 variability (from digital filters) |
| Standard variables for channel 2 | |
| D2, T2,...DELTA2, THETA2,...C2DA, C2TA,...C2GV, C2UV | channel 2 repeats all channel 1 variables shown above that use a "1" e.g. D1, C1AF, etc., with the "1" replaced by "2" |

| | |
|---|--|
| Standard 1/2 channel cross-channel variables | |
| CT | Coherence Threshold currently in use in built-in coherence processor. This will automatically track any changes in the coherence threshold. |
| C1DC, C1TC, C1AC, C1LC, C1BC, C1HC, C1GC, C1UC | Coherence (currently selected type) between channels 1 and 2 |
| DCOH, TCOH, ACOH, LCOH, BCOH, HCOH, GCOH, UCOH | Coherence (currently selected type) between channels 1 and 2 |
| DPCOH, TPCOH, APCOH, LPCOH, BPCOH, HPCOH, GPCOH, UPCOH | "Pure" coherence between channels 1 and 2 |
| DTCOH, TTCOH, ATCOH, LTCOH, BTCOH, HTCOH, GTCOH, UTCOH | Similarity ("Training Coherence") between channels 1 and 2 |
| DSIM, TSIM, ASIM, LSIM, BSIM, HSIM, GSIM, USIM | Similarity ("Training Coherence") between channels 1 and 2 |
| DCOR, TCOR, ACOR, LCOR, BCOR, HCOR, GCOR, UCOR | "Spectral Correlation Coefficient" (SCC) between channels 1 and 2 |
| DCOM, TCOM, ACOM, LCOM, BCOM, HCOM, GCOM, | Comodulation (Sternan/Kaiser "SKIL" type) between channels 1 and 2 |
| C1DH, C1TH, C1AH, C1LH, C1BH, C1HH, C1GH, C1UH | Phase between channels 1 and 2 |
| DPHASE, TPHASE, APHASE, LPHASE, BPHASE, HPHASE, GPHASE, UPHASE | Phase between channels 1 and 2 |
| Values from other events: | |
| Events can read real-time data from other events. The events are processed in numerical order, so that the events are evaluated and act in order, e.g. Event 1 before Event 2, etc. Note that all events are checked for to see if any inhibits are generated, before events take action. All data passed between events are treated as double precision, floating-point numbers. | |
| E1A, E2A, E3A, E4A, E5A, E6A, E7A, E8A, E9A, E10A, E11A, E12A, E13A, E14A, E15A, E16A | values of "antecedent" variables in Events 1-16. These are the selected component values, or the values of the "x=" equation in the "IF" portion of the event design. Note: These are also the values of "In1", "In2", "In3", through "In16", in the Macromedia Flash Player for BrainMaster |
| E1, E2, E3, E4, E5, E6, E7, E8, E9, E10, E11, E12, E13, E14, E15, E16 | values of "antecedent" variables in Events 1-16. These are the selected component values, or the values of the "x=" equation in the "IF" portion of the event design. Note: These are also the values of "In1", "In2", "In3", through "In16", in the Macromedia Flash Player for BrainMaster |

| | |
|--|---|
| E1B, E2B, E3B, E4B, E5B, E6B, E7B, E8B, E9B, E10B, E11B, E12B, E13B, E14B, E15B, E16B | values of "condition" variables in Events 1-16. These are the selected component values, or the values of the "x=" equation after the "RULE" portion of the event design. Note: These are also the values of "In16", "In17", "In18", through "In32", in the Macromedia Flash Player for BrainMaster |
| E1F, E2F, E3F, E4F, E5F, E6F, E7F, E8F, E9F, E10F, E11F, E12F, E13F, E14F, E15F, E16F | values of flags for Events 1-16. These are 0 if the event's condition is not met, and 1.0 if the event's condition is met. These are also the values of "Flg1", "Flg2", through "Flg16" in the Macromedia Flash Player for BrainMaster |
| E1P, E2P, E3P, E4P, E5P, E6P, E7P, E8P, E9P, E10P, E11P, E12P, E13P, E14P, E15P, E16P | percent time meeting the condition for Events 1-16. These allow any events to "see" how often other events are "true" and use these values in rules. Values are returned as percent, e.g. between 0 and 100 |
| Built-in Training Control Variables: | |
| INHF1, ENHF1, NUME1 | channel 1 training flags: number of "stops" meeting criterion, number of "gos" meeting criterion, number of possible "go's" |
| INHF2, ENHF2, NUME2 | channel 2 training flags: number of "stops" meeting criterion, number of "gos" meeting criterion, number of possible "go's" |
| ALLOK | indicates that all "gos" are met, and no "stops" exceed threshold. Use e.g. "x=ALLOK" for Event 5, to allow games like BrainMan and BrainCell to work automatically with any amplitude-based protocol that is set up using the standard "Training Protocol" setup. |
| Special Built-in Functions (note that "arg" can be any number or variable name, including other Event Values, flags, etc. etc. | |
| Zor1(arg) | returns 0 if argument is <1, 1 otherwise. Note: when used with a fraction e.x. X/Y, returns 1.0 if X >= Y, 0.0 otherwise |
| GT(arg) | returns 0 if argument is <1, 1 otherwise. Note: when used with a fraction e.x. X/Y, returns 1.0 if X >= Y, 0.0 otherwise |
| Rng(arg1, arg2, arg3) | returns 0 if arg1 is within arg2 of arg3. E.g. Rng (C1AF, 0.5, 10) returns 1 if Channel 1 Alpha Frequency is within 0.5 Hz of 10 Hz. E.g. between 9.5 and 10.5 Hz, and returns 0 otherwise |
| Bnd(channel, low, high) or Band(channel, low, high) | returns total FFT energy in a band for a channel. E.g. Bnd(2, 4, 6) returns the energy in channel 2 between 4 Hz and 6 Hz |
| Modf(channel, low, high) | returns modal frequency ("first moment") from FFT in a band for a channel. E.g. Modf(2, 4, 6) returns the modal frequency in channel 2 in band from 4 Hz to 6 Hz |

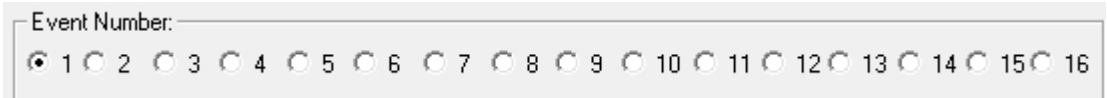
| | |
|---|---|
| Peakf(channel, low, high) | returns peak frequency (highest amplitude) from FFT in a band for a channel. E.g. Modf(2, 4, 6) returns the peak frequency in channel 2 in band from 4 Hz to 6 Hz |
| Special Built-in Constants: | |
| Schumann, SCH | Schumann Frequency = 7.81 |
| PHI, GOLDEN, GM | Golden Mean = 1.618 |
| PI | PI = 3.14159 |
| Standard Operators: Note: all arguments and parameters are treated as double precision floating point values | |
| + - * / | add, subtract, multiply, divide |
| % | modulus returns the remainder after an integer division |
| ^ | power: $y = x ^ 2$ |
| () | parenthetical grouping, unlimited, e.g. (2 + BETA) / THETA |
| ; | semicolon, needed at end of each equation in formula |
| // | comment, single line |
| /*...*/ | comment, multiple lines |
| Priority of Operators: | |
| () | highest |
| ^ | next |
| -x (unary minus) | next (e.g. $y=-x^2$, the ^ occurs before -) |
| */^ | next |
| + - | lowest |
| Standard Built-in Functions: | |
| abs(x) | return absolute value |
| acos(x) | calculate arccosine |
| asin(x) | calculate arcsine |
| atan(x) | calculate arctangent |
| atan2(x,y) | calculate arctangent with two parameters to preserve quadrant angle |
| bessj(n,v) | Bessel function of the first kind. n is order and v is input value |
| bessy(n,v) | Bessell function of the second kind. n is order and v is input value. |
| Ceil(x) | Find integer ceiling |
| Cos(x) | Calculate cosine |
| Cosh(x) | Calculate hyperbolic cosine |
| exp(x) | calculate exponential function "e to the x" |
| floor(x) | Find integer floor |
| hypot(a,b) | calculate hypotenuse of right triangle |
| log(x) | calculate natural logarithm |
| log10(x) | calculate base-10 logarithm |
| max(x,y) | return larger of two values |

| | |
|--|--|
| min(x,y) | return smaller of two values |
| rand(x) | get pseudorandom number between 0 and 1 |
| sin(x) | calculate sine |
| sinh(x) | calculate hyperbolic sine |
| sqrt(x) | find square root |
| srand(x) | initialize pseudorandom series |
| tan(x) | calculate tangent |
| tanh(x) | calculate hyperbolic tangent |
| Z-Scores (using optional NeuroGuide Real-Time Extensions for BrainMaster) | |
| With this option, the equation processor can access real-time z-score computations based upon the NeuroGuide normative database. (www.appliedneuroscience.com) | Note: With 2 channels, N Z scores = 26 * 2 + 24 = 76 targets (24 are connectivity-related). |
| Available output values: (76 total targets) | |
| ZAP1D, ZAP1T, ZAP1A, ZAP1B, ZAP11, ZAP12, ZAP13, ZAP1G, ZAP2D, ZAP2T, ZAP2A, ZAP2B, ZAP21, ZAP22, ZAP23, ZAP2G | delta, theta, alpha, beta, beta1, beta2, beta3, gamma Absolute Power 2 channels / 8 bands |
| ZRP1D, ZRP1T, ZRP1A, ZRP1B, ZRP11, ZRP12, ZRP13, ZRP1G, ZRP2D, ZRP2T, ZRP2A, ZRP2B, ZRP21, ZRP22, ZRP23, ZRP2G | delta, theta, alpha, beta, beta1, beta2, beta3, gamma Relative Power 2 channels / 8 bands |
| ZPR1DT, ZPR1DA, ZPR1DB, ZPR1DG, ZPR1TA, ZPR1TB, ZPR1AB, ZPR1AG, ZPR1BG, ZPR2DT, ZPR2DA,... | d/t, d/a, d/b, d/g, t/a, t/b, t/g, a/b, a/g, b/g Power Ratios 2 channels / 10 ratios |
| ZAAD, ZAAT, ZAAA, ZAAB, ZAA1, ZAA2, ZAA3, ZAAG | delta, theta, alpha, beta, beta1, beta2, beta3, gamma Amplitude Asymmetry 8 bands |
| ZCOD, ZCOT, ZCOA, ZCOB, ZCO1, ZCO2, ZCO3, ZCOG | delta, theta, alpha, beta, beta1, beta2, beta3, gamma Coherence 8 bands |
| ZPHD, ZPHT, ZPHA, ZPHB, ZPH1, ZPH2, ZPH3, ZPHG | delta, theta, alpha, beta, beta1, beta2, beta3, gamma Phase Difference 8 bands |
| PercentZOK(range) or PZOK(range) | Percentage of Z scores that are within "range" of normal. Returns value between 0 and 100 |
| PercentZOKUL(upper, lower) or PZOKUL(upper, lower) | Percentage of Z scores that are below upper limit, and above lower limit. Returns value between 0 and 100 |
| PercentZAOK(range) or PZAOK(range) | Percentage of ABSOLUTE POWER Z scores that are within "range" of normal. Returns value between 0 and 100 |
| PercentZAOKUL(upper, lower) or PZAOKUL(upper, lower) | Percentage of ABSOLUTE POWER Z scores that are below upper limit, and above lower limit. Returns value between 0 and 100 |
| PercentZROK(range) or PZROK(range) | Percentage of RELATIVE POWER Z scores that are within "range" of normal. Returns value between 0 and 100 |
| PercentZROKUL(upper, lower) or PZROKUL(upper, lower) | Percentage of RELATIVE POWER Z scores that are below upper limit, and above lower limit. Returns value between 0 and 100 |

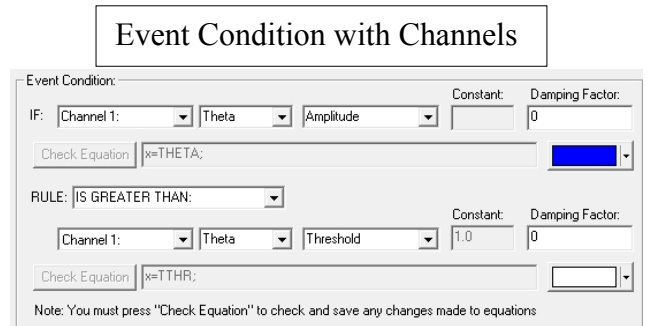
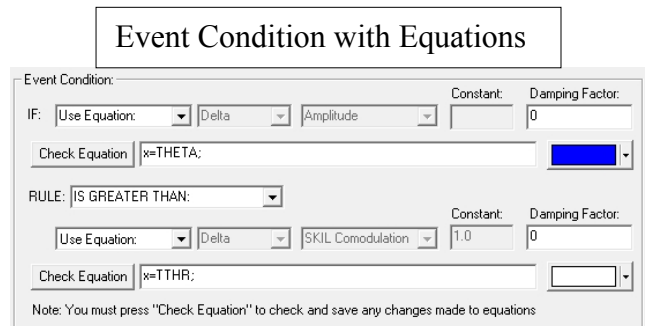
| | |
|--|--|
| PercentZPROK(range) or PZPROK(range) | Percentage of POWER RATIO Z scores that are within "range" of normal. Returns value between 0 and 100 |
| PercentZPROKUL(upper, lower) or PZPROKUL(upper, lower) | Percentage of POWER RATIO Z scores that are below upper limit, and above lower limit. Returns value between 0 and 100 |
| PercentZASOK(range) or PZASOK(range) | Percentage of ASYMMETRY Z scores that are within "range" of normal. Returns value between 0 and 100 |
| PercentZASOKUL(upper, lower) or PZASOKUL(upper, lower) | Percentage of ASYMMETRY Z scores that are below upper limit, and above lower limit. Returns value between 0 and 100 |
| PercentZCOK(range) or PZCOK(range) | Percentage of COHERENCE Z scores that are within "range" of normal. Returns value between 0 and 100 |
| PercentZCOKUL(upper, lower) or PZCOKUL(upper, lower) | Percentage of COHERENCE Z scores that are below upper limit, and above lower limit. Returns value between 0 and 100 |
| PercentZPOK(range) or PZPOK(range) | Percentage of PHASE Z scores that are within "range" of normal. Returns value between 0 and 100 |
| PercentZPOKUL(upper, lower) or PZPOKUL(upper, lower) | Percentage of PHASE Z scores that are below upper limit, and above lower limit. Returns value between 0 and 100 |
| PercentZCCOK(range) or PZCCOK(range) | Percentage of ALL CONNECTIVITY Z scores that are within "range" of normal. Returns value between 0 and 100 |
| PercentZCCOKUL(upper, lower) or PZCCOKUL(upper, lower) | Percentage of ALL CONNECTIVITY Z scores that are below upper limit, and above lower limit. Returns value between 0 and 100 |
| | NOTE: ALL CONNECTIVITY Z Scores includes scores for ASYMMETRY, COHERENCE, and PHASE |

Designing an Event

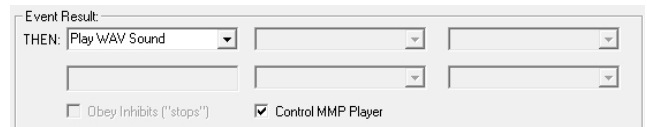
1. On The Even Wizard Screen, choose the Event Number that you would like to work with (For this Example, we will work with Event 1).



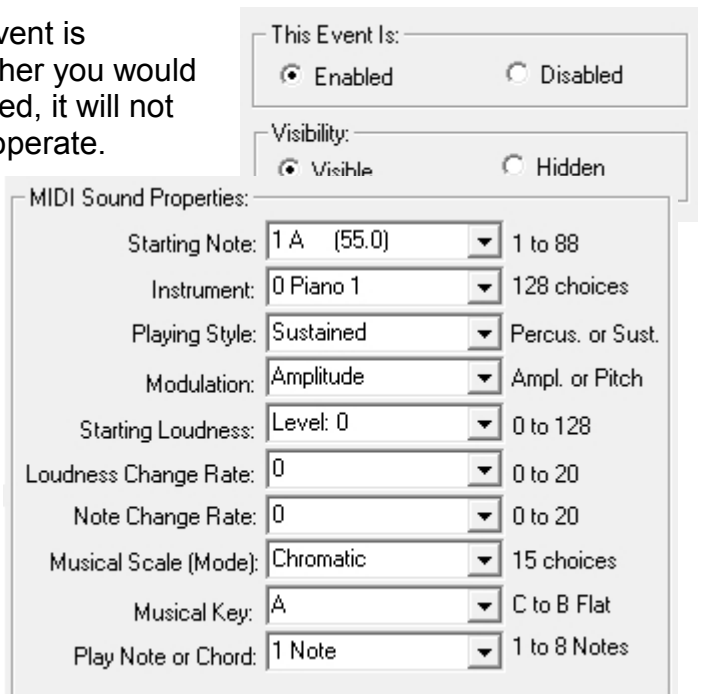
2. Next, set the Event Condition (For this example, we are going to reward the Channel 1 Theta band, when it is greater than its threshold). There are many ways that the Event Wizard can define what is being trained (See Attached pictures). If an equation is used, the Check Equation Button must be clicked, or it will not save this.



3. Next, set the Event Result (For This example, if the Event Condition is met, a .wav will play. This will also Control BMrMMP).

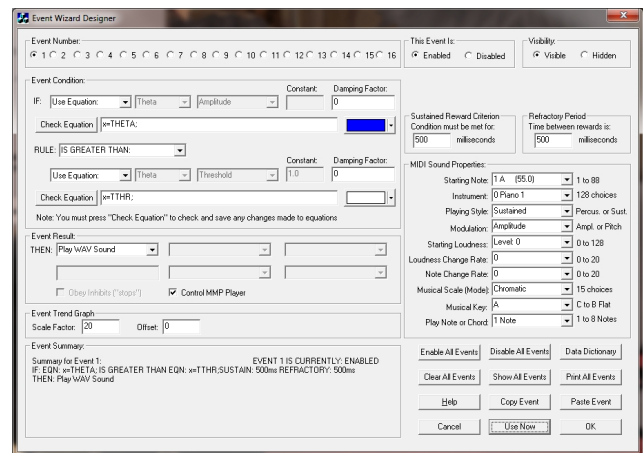


4. Next, you will need to make sure, that the Event is enabled. You will also need to choose whether you would like it visible or not. If the Event is not enabled, it will not work. But, if the Event is Hidden, it will still operate.



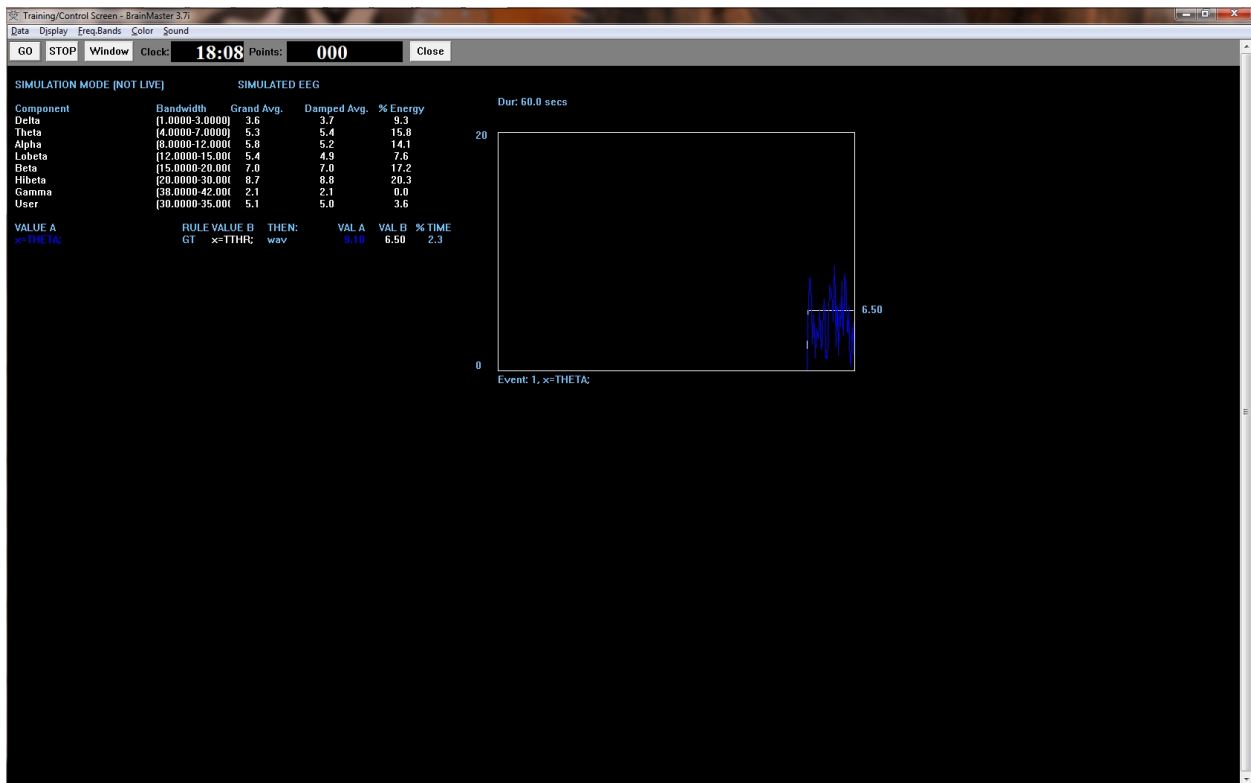
5. Next, set the properties of the MIDI Sound. If you are not utilizing a MIDI sound for a reward sound, you do not have to set this.

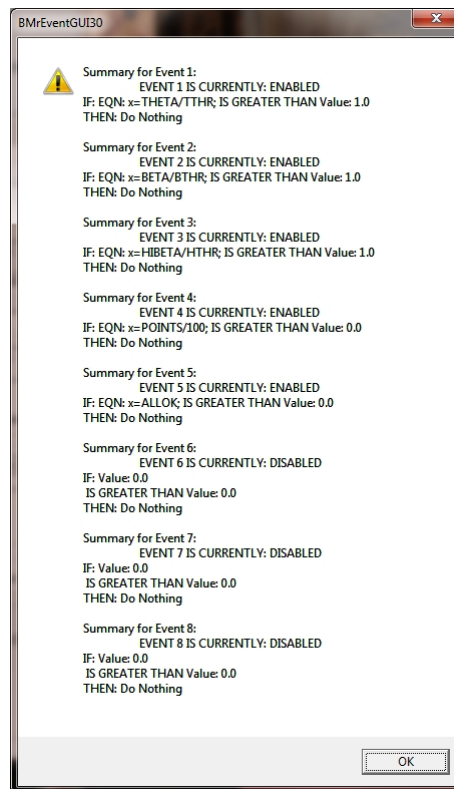
6. Click the Use Now Button, and then click OK.



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The Event Wizard has been set for the Client Folder. You will be able to tell this during the running of a session. If the Event was set to Visible, then you will see a graph if you choose the Display Event Trend Graph, or Wide Event Trend Graph. If you do not have the Event set to Visible, then you can still see that this is occurring through the Display Text Stat Panel.



Basic BrainMaster Setting Protocol through the Event Wizard**Alert**

Event 1 – THETA/TTHR is Greater than 1. This shows the ratio of the low “stop” inhibit to its threshold.

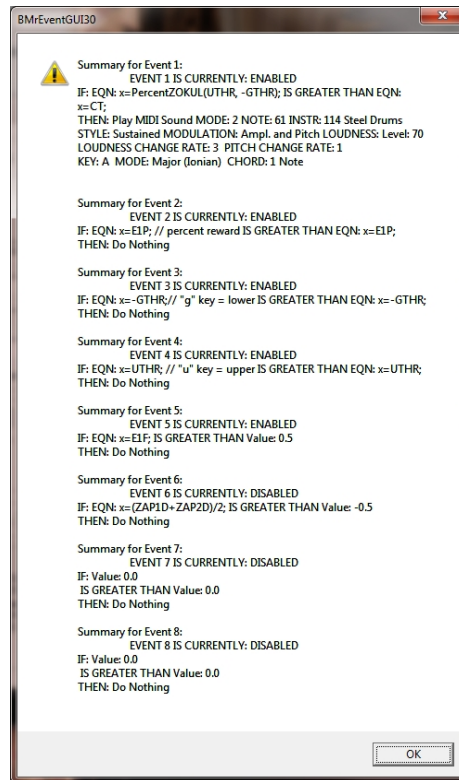
Event 2 – BETA/BTHR is Greater than 1. This shows the ratio of the “go” component to its threshold.

Event 3 – HIBETA/HTHR is Greater than 1. This shows the ratio of the hi “stop” inhibit to its threshold.

Event 4 – $x=POINTS/100$. This shows the points divided by 100. This is merely for the Flash Game indicator.

Event 5 – $x=ALLOK$. This indicates that all components meet criteria, and the Flash Game can “move” or proceed.

Z-Score PZOKUL



Event 1 – $x = \text{PercentZOKUL}(\text{UTHR}, -\text{GTHR})$ is Greater than CT. This rewards the Percentage of Z-Scores that are with-in the ranges of the U Threshold and G Threshold that are above the threshold that is defined by the C Key.

Event 2 – $x = \text{E1P}$. This shows the percentage of reward for Event 1.

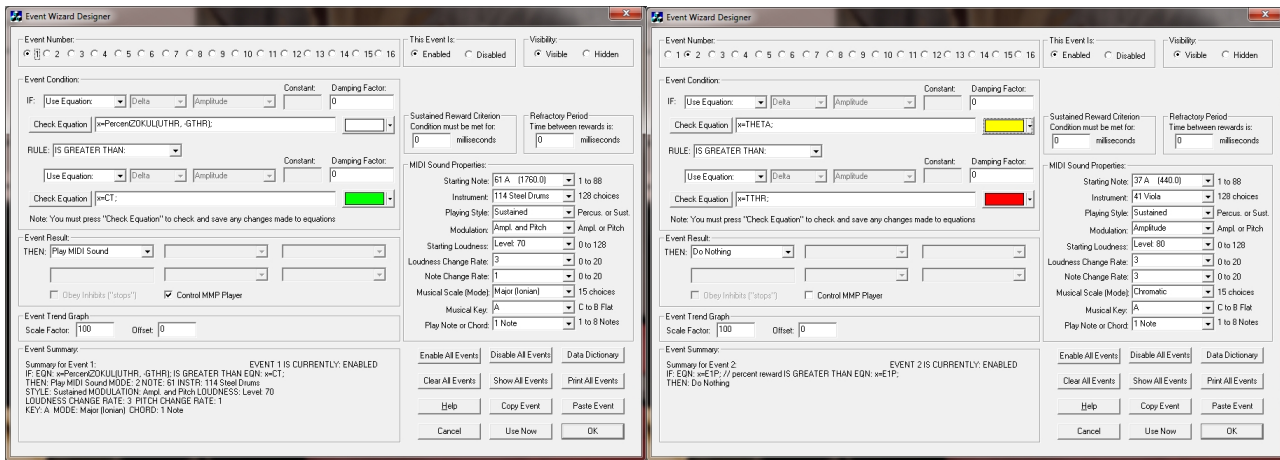
Event 3 – $x = -\text{GTHR}$ is greater than $x = -\text{GTHR}$. This gives a graphical representation for the Lower threshold for the Z-Score equation.

Event 4 – $x = \text{UTHR}$ is greater than $x = \text{UTHR}$. This gives a graphical representation for the Upper threshold for the Z-Score equation.

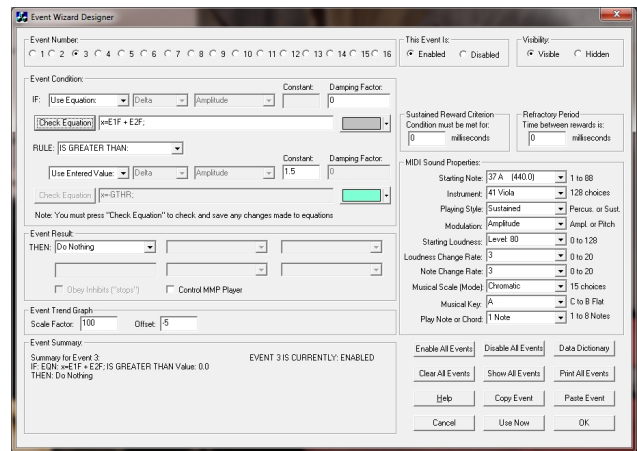
Event 5 – $x = \text{E1F}$ is greater than 0.5. This flags Event 1. When the Event 1 meets its Event Condition, Event 5 produces a 1, which indicates that this component has met criteria, and the Flash Game can “move” or proceed.

Advanced Event Wizard Controls

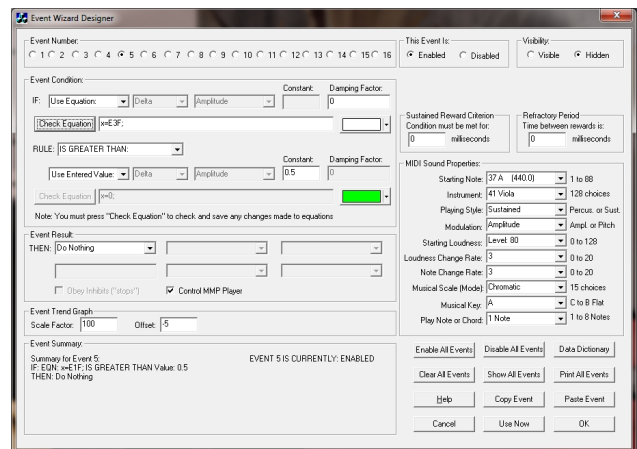
Enabling Multiple Events to control Flash Player (2 Event Example)



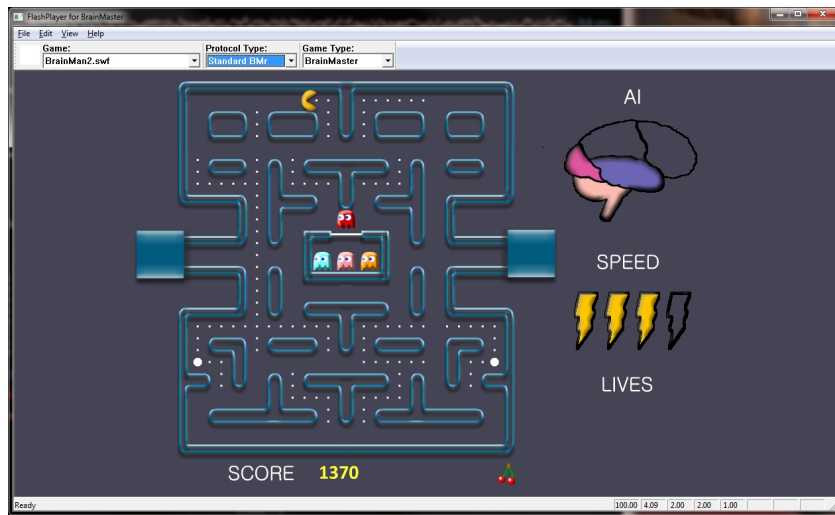
1. Create an Event (Event 3) that Flags these Events, and requires them to be greater than the possible combination with-out all being met (For this example, since there are two Events, we want the Event Condition to be greater than 1.5. This way, we are only successful when both Event 1 and Event 2 have been met).



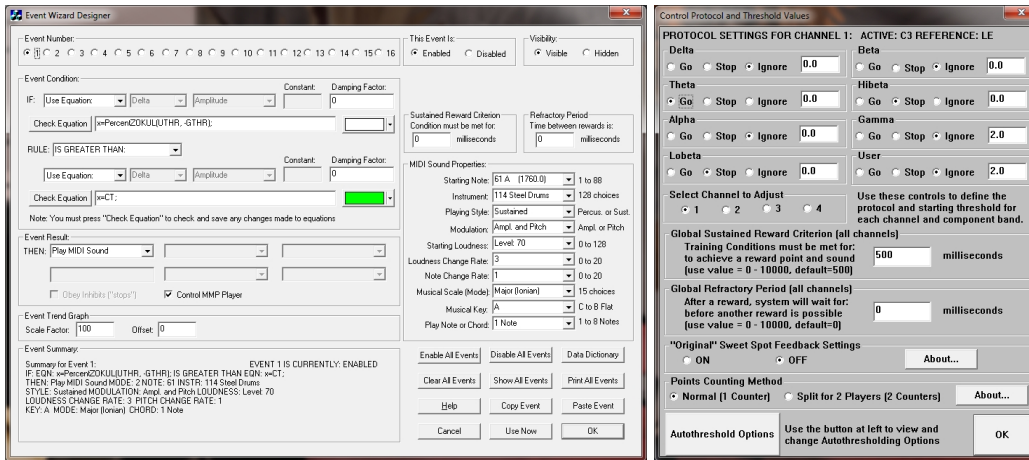
2. Next, we will need to flag the results of this last created Event into Event 5, so that the Flash Player can be controlled.



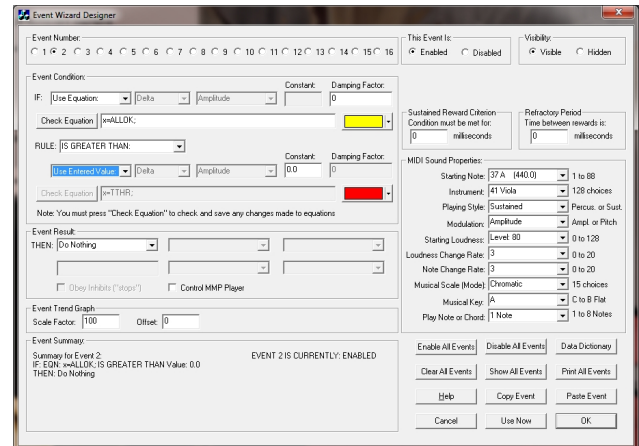
Your protocol will now be able to drive the Flash Player when all Event criteria has been met for the different Event Conditions. You will be able to tell, as you can see that the Flash Player will operate to Event 5



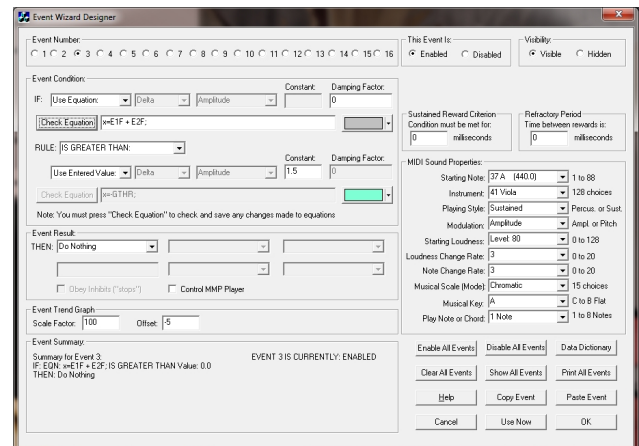
Enabling Amplitude and Events to control Flash Player



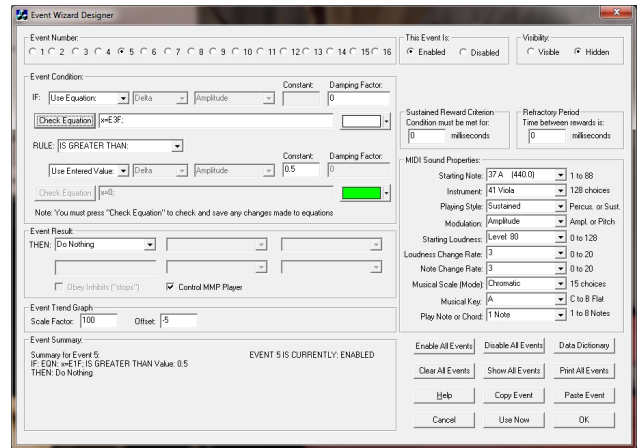
1. Create an Event to indicate that all amplitude components have met their criteria.



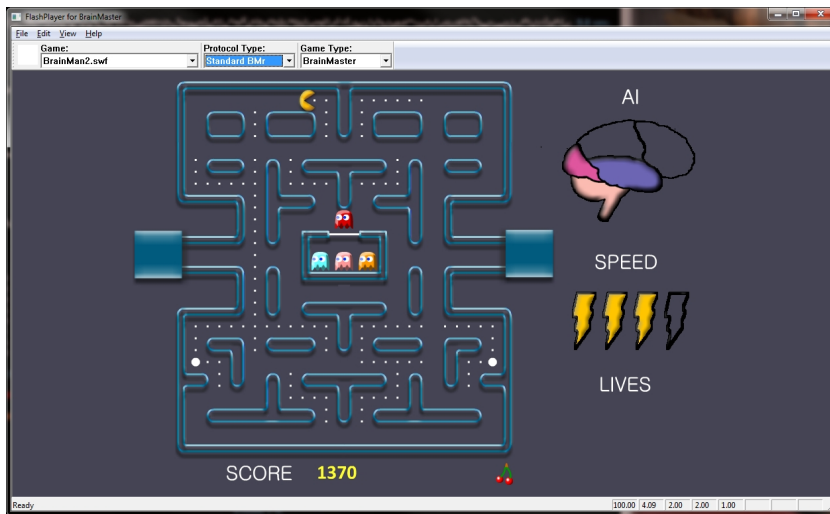
2. Create an Event (Event 3) that Flags these Events, and requires them to be greater than the possible combination with-out all being met (For this example, since there are two Events, we want the Event Condition to be greater than 1.5. This way, we are only successful when both Event 1 and Event 2 have been met).



- Next, we will need to flag the results of this last created Event into Event 5, so that the Flash Player can be controlled.



Your protocol will now be able to drive the Flash Player when all Event criteria has been met for the different Event Conditions. You will be able to tell, as you can see that the Flash Player will operate to Event 5





BrainMaster Products are manufactured by:

BrainMaster Technologies Inc.

195 Willis St.

Bedford, OH 44146

United States

1-440-232-6000



European Representative:

mdi Europa GmbH

Langenhagener Straße 71

D-30855 Langenhagen

Phone: +49-511-39 08 95 30

Fax: +49-511-39 08 95 39

Email: info@mdi-europa.com

Internet: www.mdi-europa.com