Event Wizard

Event Wizard Control Menu Display

| 🔀 Event Wizard Designer | |
|--|---|
| 1 Event Number: • 1 ~ 2 ~ 3 ~ 4 ~ 5 ~ 6 ~ 7 ~ 8 ~ 9 ~ 10 ~ 11 ~ 12 ~ 13 ~ 14 ~ 15 ~ 16 | 5 This Event Is: © Enabled © Disabled © Visible © Hidden |
| Check Equation x=THETA/TTHR; | 7 Sustained Reward Criterion Condition must be met for: 0 milliseconds 9 MIDI Sound Properties: Starting Note: 1 A (55.0) ▼ 1 to 88 Instrument: 0 Piano 1 ▼ 128 choices Playing Style: Sustained ▼ Percus. or Sust. Modulation: Amplitude ▼ Ampl. or Pitch Starting Loudness: Level: 0 ▼ 0 to 128 Loudness Change Rate: 0 ▼ 0 to 20 |
| Control MMP Player Control MMP Player Event Trend Graph Scale Factor: Control MMP Player Event Summary: Event Summary: Summary for Event 1: IF: EQN: x=THETA/TTHR; IS GREATER THAN Value: 1.0 THEN: Do Nothing Event 1 is CURRENTLY: ENABLED | Note Change Rate: 0 0 0 to 20 Musical Scale (Mode): Chromatic 15 choices Musical Key: A C to B Flat Play Note or Chord: 1 Note 1 to 8 Notes 10Enable All Events 1Disable All Events 2 Data Dictionary 13 Clear All Events 1 4Show All Events Print All Events Help 15 Copy Event 16 Paste Event |
| | 17 Cancel 18 Use Now 19 OK |

- 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. Event Trend Graph Section Section where you set the size for the Graph.
- 5. This Event Is: Section Section where you set whether the chosen Event is enabled or not.
- 6. **Visibilty Section** Section where you set whether the chosen Event Graph will be visible or not, when the Trend Graphs are chosen for display.
- 7. **Sustained Reward Criterion Section** Section where you set how long the chosen Event Condition must be met to produce the selected Event Result.
- 8. **Refractory Period Section** Section where you set how long for a time before another reward is possible for the chosen event.
- 9. **MIDI Sound Properties Section** Section where you can set the properties for MIDI reward feedback for the chosen Event.
- 10. Enable All Events Button Click to enable all 16 Events.
- 11. Disable All Events Button Click to disable all 16 Events.
- 12. Data Dictionary Button Click to bring up the Data Dictionary.

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| Event Wizard Designer | | |
|--|---------------------------------|---|
| 1_Event Number: | 0 C 11 C 12 C 13 C 14 C 15 C 16 | 5 This Event Is: • Enabled O Disabled • Visibility: • Visibile O Hidden |
| 2Event Condition: IF: Use Equation: Delta Amplitude Check Equation x=THETA/TTHR; | Constant: Damping Factor: | 7 Sustained Reward Criterion 8 Refractory Period Condition must be met for: Time between rewards is: |
| RULE: IS GREATER THAN: Use Entered Value: Use Entered Value: Check Equation X=1; Note: You must press "Check Equation" to check and save any c 3 Event Result: THEN: Do Nothing | | 0 milliseconds 0 milliseconds 9 MIDI Sound Properties: |
| Control MMP Player Event Trend Graph Scale Factor: Control MMP Player Control MMP | Y | Note Change Rate: 0 • 0 to 20 Musical Scale (Mode): Chromatic • 15 choices Musical Key: A • C to B Flat Play Note or Chord: 1 Note • 1 to 8 Notes |
| Event Summary: Summary for Event 1: IF: EQN: x=THETA/TTHR; IS GREATER THAN Value: 1.0 THEN: Do Nothing | EVENT 1 IS CURRENTLY: ENABLED | 10Enable All Events 1Disable All Events 12 Data Dictionary 13 Clear All Events 14Show All Events Print All Events Help 15 Copy Event 16 Paste Event 17 Cancel 18 Use Now 19 |

Event Wizard Control Menu Display(Continued)

- 13. Clear All Events Button Click to clear the data from all 16 Events.
- 14. Show All Events Button Click to show the Event Summary information for all 16 Events.
- 15. **Copy Event Button** Click to copy the chosen Event.
- 16. **Paste Event Button** Click to paste an Event that has been selected from the Copy Event Button.
- 17. Cancel Button Click to cancel any changes made, and exit the Event Wizard.
- 18. Use Now Button Click to accept all changes.
- 19. 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 usi 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 autothresholder) | |
| 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 autothresholder) | |
| 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 variables for channel 3 | |
|--|--|
| D3, T3,DELTA3, THETA3,C3DA, C3TA,C3GV, C3UV | channel 3 repeats all channel 1 variables shown above that use a "1" e.g. D1, C1AF, etc., with the "1" replaced by "2" |
| Standard variables for channel 4 | |
| D4, T4,DELTA4, THETA4,C4DA, C4TA,C4GV, C4UV | channel 4 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 | |
| СТ | 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 (Sterman/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 nu flags, etc. etc. | umber or variable name, including other Event Values, |
| 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) | | |
|---|---|--|--|
| 3, | 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 moda 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 parame | eters are treated as double precision floating point values | | |
| +-*/ | add, subtract, multiply, divide | | |
| % | modulus returns the remainder after an integer division | | |
| ٨ | power: $y = x^2$ | | |
| () | parenthetical gropuing, unlimited, e.g. (2 + BETA) / THETA | | |
| . 3 | 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 | | |
| | Calculate cosine | | |
| Cos(x) | Calculate cosine | | |

| | calculate exponential function "e to the x" | |
|--|---|--|
| exp(x) | | |
| floor(x) | Find integer floor | |
| hypot(a,b) | calculate hypotenuse of right triangle | |
| | 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 Exten | sions for BrainMaster) | |
| With this option, the equation processor can | Note: With 2 channels, N Z scores = 26 * 2 + 24 = 76 | |
| access real-time z-score computations based | targets (24 are connectivity-related). With 4 channels, | |
| upon the NeuroGuide normative database. | N Z scores = 26 * 4 + 6 * 24 | |
| (www.appliedneuroscience.com) | = 248 targets (144 are connectivity-related). | |
| Available output values: (76 total targets) | | |
| ZAP1D, ZAP1T, ZAP1A, ZAP1B, ZAP11, | delta, theta, alpha, beta, beta1, beta2, beta3, gamma | |
| ZAP12, ZAP13, ZAP1G, ZAP2D, ZAP2T, | Absolute Power 2 channels / 8 bands | |
| ZAP2A, ZAP2B, ZAP21, ZAP22, ZAP23, ZAP2G | | |
| ZRP1D, ZRP1T, ZRP1A, ZRP1B, ZRP11, | delta, theta, alpha, beta, beta1, beta2, beta3, gamma | |
| ZRP12, ZRP13, ZRP1G, ZRP2D, ZRP2T, | Relative Power 2 channels / 8 bands | |
| ZRP2A, ZRP2B, ZRP21, ZRP22, ZRP23, | | |
| ZRP2G | | |
| ZPR1DT, ZPR1DA, ZPR1DB, ZPR1DG, | d/t, d/a, d/b, d/g, t/a, t/b, t/g, a/b, a/g, b/g | |
| ZPR1TA, ZPR1TB, ZPR1AB, ZPR1AG, | Power Ratios 2 channels / 10 ratios | |
| ZPR1BG, ZPR2DT, ZPR2DA, | | |
| ZAAD, ZAAT, ZAAA, ZAAB, ZAA1, ZAA2, ZAA3, | delta, theta, alpha, beta, beta1, beta2, beta3, gamma | |
| ZAAG | Amplitude Asymmetry 8 bands | |
| ZCOD, ZCOT, ZCOA, ZCOB, ZCO1, ZCO2, | delta, theta, alpha, beta, beta1, beta2, beta3, gamma | |
| ZCO3, ZCOG | Coherence 8 bands | |
| ZPHD, ZPHT, ZPHA, ZPHB, ZPH1, ZPH2, | delta, theta, alpha, beta, beta1, beta2, beta3, gamma | |
| ZPH3, ZPHG | Phase Difference 8 bands | |
| Additional Z Scores for 4-channel systems: (248 total ta | argets) | |
| ZAP3D, ZAP3T, ZAP4D, ZAP4T, | delta, etc. absolute power, channels 3 and 4 | |
| ZRP3D, ZRP3T, ZRP4D, ZRP4T, | delta, etc. relative power, channels 3 and 4 | |
| ZPR3DT, ZPR3DA, ZPR4DT, ZPR4DA, | d/t, d/a, etc. power ratios, channels 3 and 4 | |
| ZAA12D, ZAA12T, | asymmetry between chans 1 and 2 (same as ZAAD, | |
| 744120 744121 | ZAAT, etc) | |
| ZAA13D, ZAA13T, | asymmetry between chans 1 and 3 | |

| ZAA14D, ZAA14T, | asymmetry between chans 1 and 4 | |
|---|--|--|
| ZAA23D, ZAA23T, | asymmetry between chans 2 and 3 | |
| ZAA24D, ZAA24T, | asymmetry between chans 2 and 4 | |
| ZAA34D, ZAA34T, | asymmetry between chans 3 and 4 | |
| ZCO12D, ZCO12T, | coherence between chans 1 and 2 (same as ZCOD, ZCOT, etc) | |
| ZCO13D, ZCO13T, | coherence between chans 1 and 3 | |
| ZCO14D, ZCO14T, | coherence between chans 1 and 4 | |
| ZCO23D, ZCO23T, | coherence between chans 2 and 3 | |
| ZCO24D, ZCO24T, | coherence between chans 2 and 4 | |
| ZCO34D, ZCO34T, | coherence between chans 3 and 4 | |
| ZPH12D, ZPH12T, | phase between chans 1 and 2 (same as ZPHD, ZPHT, etc) | |
| ZPH13D, ZPH13T, | phase between chans 1 and 3 | |
| ZPH14D, ZPH14T, | phase between chans 1 and 4 | |
| ZPH23D, ZPH23T, | phase between chans 2 and 3 | |
| ZPH24D, ZPH24T, | phase between chans 2 and 4 | |
| ZPH34D, ZPH34T, | phase between chans 3 and 4 | |
| PercentZOK(range) or PZOK(range) | Percentage of Z scores that are within "range" of norr 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 betwee 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 betwee 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" o 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 | |
| | | |
| Controls for Atlantis Photic Output Controls | | |
| x=SetPhoticRate(rate) or x=SPR(rate) | sets rate of photic stimulation to value given by "rate" | |
| Controls for DC and Slow Cortical Potentials Atlantis o | r Discovery Training Channels | |
| x=DC1, DC2, | DC offset for channel 1, 2, 1 unit = 4 microvolts | |
| x=DCE1, DCE2, | Enhanced DC for channel 1, 2, 1 unit = 1 millivolt | |
| Controls for Discovery Acquired Channels DC and Slo x=DCA1, DCA2, | w Cortical Potentials DC Acquired channel 1, 2, 24 | |
| x=CA1DCP, CA2DCP, | DC Acquired channel 1, 2, 24 DC Acquired channel 1, 2, 24 | |
| x=DCALL | DC average of all 19 10-20 channels | |
| x=DCFR | Frontal DC: Fp1 F3 F7 Fz Fp2 F4 F8 | |
| x=DCBK | Back DC: P3 P4 Pz T5 T6 O1 O2 | |
| x=DOBIX x=DCLT | Left DC: Fp1 F3 F7 C3 T3 P3 T5 O1 | |
| x=DCRT | Right DC: Fp2 F4 F8 C4 T4 P4 T6 O2 | |
| x=DCFp1, DCFp2, DCF3, DCF4, | DC of any 10-20 site specified by name | |
| | | |

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).

```
Event Number:

• 1 C 2 C 3 C 4 C 5 C 6 C 7 C 8 C 9 C 10 C 11 C 12 C 13 C 14 C 15 C 16
```

Event Condition:

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, set the size of the Event Trend Graph. If you are not going to make your graph visible, you do not need to do anything with this (For this example, the graph will range from 0 to 20).
- 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.

Constant Damping Factor: IF: Use Equation: 👻 Delta - Amplitude -Check Equation x=THETA RULE: IS GREATER THAN: • Damping Factor: Constant: ▼ Delta → SKIL Comodulation → 1.0 Use Equation: Check Equation x=TTHR; -Note: You must press "Check Equation" to check and save any changes made to equations

Event Condition with Equations

Event Condition with Channels Event Condition: Constant Damping Factor: IF: Channel 1: ▼ Theta ▼ Amplitude 0 -Check Equation x=THETA; RULE: IS GREATER THAN: -Damping Factor: Constant ▼ 1.0 ▼ Threshold 0 ▼ Theta Channel 1: Check Equation x=TTHR; Note: You must press "Check Equation" to check and save any changes made to equation

| Event Result THEN: Play WAV Sound | | Ţ |
|--------------------------------------|--------------------|----------|
| | | _ |
| 🔲 Obey Inhibits ("stops") | Control MMP Player | |

| Event Trend G | raph | |
|---------------|------|-----------|
| Scale Factor: | 20 | Offset: 0 |

| This Event Is: | | Visibility: | |
|----------------|------------|-----------------------------|----------|
| ← Enabled | O Disabled | Visible | C Hidden |

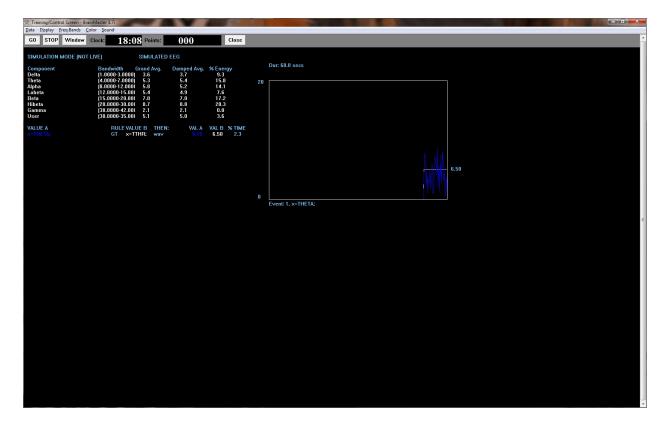
6. Next, set the Sustained Reward Criterion, Refractory Period and the properties of the MIDI Sound. If you are not utilizing a MIDI sound for a reward sound, you do not have to set this. The Sustained Reward Criterion and Refractory Period effect how often a reward can be give (For this example, the Sustained Reward Criterion and Refractory Period are both set for 500 milliseconds. This means, that a reward will not be given unless the client stays above the threshold for 500 milliseconds. Then, another reward is not possible for another 500 milliseconds).

| Sustained Reward Criter Condition must be met fo 500 millisecond | r: Time between | |
|--|-----------------|------------------|
| MIDI Sound Properties: - | | |
| Starting Note: | 1 A (55.0) 💌 | 1 to 88 |
| Instrument: | 0 Piano 1 🗾 👻 | 128 choices |
| Playing Style: | Sustained 🗾 | Percus, or Sust. |
| Modulation: | Amplitude 🗾 👻 | Ampl. or Pitch |
| Starting Loudness: | Level: 0 💌 | 0 to 128 |
| Loudness Change Rate: | 0 🗸 | 0 to 20 |
| Note Change Rate: | 0 🔹 | 0 to 20 |
| Musical Scale (Mode): | Chromatic 🗨 | 15 choices |
| Musical Key: | A | C to B Flat |
| Play Note or Chord: | 1 Note 💌 | 1 to 8 Notes |
| | | |

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

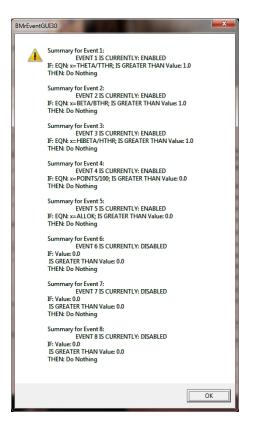
| Ever Condition Constant Damping Factor IF: Lise Equation Thethis Amplified Date Equation IFIELTA Constant Description Date Equation IFIELTA Image Base of the second of the secon | Event Number: © 1 0 2 0 3 0 4 0 5 0 6 0 7 0 8 0 9 0 10 0 11 0 12 0 13 0 14 0 150 16 | This Event Is: © Enabled C Disabled © Visible C Hidd |
|---|---|---|
| Event Tend Graph Image: Constraint in Section 2010 | IF. Use Equation: Theth _ prophilod: _ Point _ Prophilod: _ Point _ Prophilod: _ Point _ Poin | Condition must be ref for: [50] millisecer 500 millisecer [50] millisecer MDI Sound Propeter: [50] millisecer 1 to 80 Instante Mole [A (55,0) 1 to 80 1 to 80 Instante Mole [A (55,0) 1 to 80 1 to 80 Instante (CFArc) [Arc] (57,0) 1 to 80 1 to 90 Stating Model [Arc] [Arc] (76,0) 1 to 90 1 to 90 Stating Locaters: Level (0 0 to 1 28 Locaters: 0 to 1 28 1 to 90 Nate Charge Ref 0 0 to 20 0 to 20 1 to 90 1 to 90 |
| | Evert Trend Graph | Musical Key: A C to B Fla Play Note or Chord: T Note 11 to 8 Not Enable AI Events Dirable AI Events Data Dictions |

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



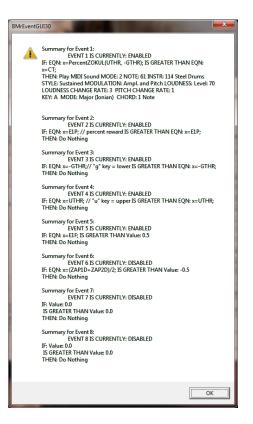
Event 1 – THETA/TTHR is Greater than 1. This shows the ratio of the low "stop" inhibit to its threshold.

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=PercentZOKUL(UTHR, -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=E1P. This shows the percentage of reward for Event 1.

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

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

Event 5 – x=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)

| 20 Event Wizard Designer | | Event Wizard Designer | |
|--|--|---|--|
| Event Number: 「「夏」2 こ 3 こ 4 こ 5 こ 6 こ 7 こ 8 こ 9 こ 10 こ 11 こ 12 こ 13 こ 14 こ 15 ご 16 | C Enabled C Disabled | Event Number: C 1 G 2 C 3 C 4 C 5 C 6 C 7 C 8 C 9 C 10 C 11 C 12 C 13 C 14 C 15 C 16 | This Event Is: Visibility: © Enabled © Disabled |
| Forset Equation Forset Conduct Forset Conduct Forset Conduct Forset Conduct Forset Equation Forset | Statistical Beneral Different International Market Statistical Beneral Market Statistics | Even Condition Peter Condition Pe | Sutained Reward Citorion Condensa be metro In all second MICI Scott Provide Stating Neter 177 A - 1440 - 1 to 69 Instructure Page 596 Stating - 128 choices Page 596 Stating - 108 Stating Stating Loadware, Invest 80 - 9 Ois 20 Naciol Scale Mools Provide Chomes Rev - 15 choices Macial Rev / A - 1 Choi R M Page Nete or Chong Rate |
| Ever Juminy | Enable Al Events Data Dickinogy Dear Al Events Show Al Events Pint Al Events Heb Copy Event Pante Event Cancel Use Now DK | F two Summay: Summay for Swit 2 PEDN vec1P; // Served PEDN vec1P; // Served leward IS GREATER THAN EDN: vec1P; THEN, Do Nothing | Enable All Events Data Dottomary Disable All Events Data Dottomary Disar All Events Show All Events Pint All Events Heb Copy Event Paste Event Cancel Use Now DK |

 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).

| - Event Number | This Event Is | |
|---|---|--------|
| C 1 C 2 C 3 C 4 C 5 C 6 C 7 C 8 C 9 C 10 C 11 C 12C 13 C 14 C 15C 1 | | |
| CTC2 @3C4C5C6C7C6C5C10C11C12C13C14C15C1 | 6 Chabled C Disabled | ben |
| Event Condition: Constant: Damping Factor: | | |
| IF: Use Equation: V Deta V Amplitude V 0 | - | |
| | Sustained Reward Criterion Refractory Period | |
| [Dheck Equation] x=E1F + E2F; | Condition from the first for. This between tervards | |
| RULE: IS GREATER THAN: | 0 miliseconds 0 miliseco | nds |
| Constant: Damping Factor: | MIDI Sound Properties: | |
| Use Entered Value: V Deta V Amplitude V 1.5 0 | Starting Note: 37 A (440.0) • 1 to 88 | |
| Check Equation x=-GTHR; | Instrument: 41 Viola 💌 128 choi | ices |
| Note: You must press "Check Equation" to check and save any changes made to equations | Playing Style: Sustained Percus. e | or Sus |
| Event Result | Modulation: Amplitude Ampl. or | Pitch |
| THEN: Do Nothing | Starting Loudness: Level 80 • 0 to 128 | |
| | Loudness Change Rate: 3 • 0 to 20 | |
| | Note Change Rate: 3 • 0 to 20 | |
| Obey Inhibits ("stops") Control MMP Player | Musical Scale (Mode) Chromatic • 15 choic | |
| Event Trend Graph | Musical Key: A C to B FI | |
| Scale Factor: 100 Offset: 5 | Play Note or Chord: 1 Note • 1 to 8 No | otes |
| Event Summary. | | - |
| Summary for Event 3: EVENT 3 IS CURRENTLY: ENABLED | Enable All Events Disable All Events Data Diction | sary |
| IF: EDN ¹ x+E1F + E2F; IS GREATER THAN Value: 0.0 THEN: Do Nothing | Clear All Events Show All Events Print All Eve | ente |
| - | | _ |
| | Help Copy Event Paste Eve | nt |
| | Cancel Use Now OK | 1 |

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.

| Event Number: | | | This Event Is | Had C Visibility: | e 🛈 Hidden |
|--|----------------------|-----------------|------------------------------------|--------------------|---------------------------------|
| 01020304050607080901 | 0 C 11 C 12 C 13 | C 14 C 15 C 16 | Enabled C Disi | ebled C Visit | ole (• Hidden |
| Event Condition: | | | | | |
| IF: Use Equation: V Deta V Amplitude | - Constant | Damping Factor: | | | |
| | | lo. | - Sustained Reward Criter | ion Refracto | e Period |
| [Check Equation] x=E3F; | | · . | Condition must be met fi | ic Time bet | ween rewards is: |
| RULE: IS GREATER THAN: | | | 0 milisecon | 1s 0 | miliseconds |
| | Constant | Damping Factor: | MIDI Sound Properties: | | |
| Use Entered Value: Delta Amplitude | - 0.5 | 0 | | 37 A (440.0) | ▼ 1 to 88 |
| Check Equation x=0; | | | Instrument | | 128 choices |
| Note: You must press "Check Equation" to check and save any o | | | Playing Style: | | Percus. or Sus |
| | nanges made to equat | ons | Modulation | Amplitude | · Ampl or Pitch |
| Event Result THEN: Do Nothing | | | Starting Loudness: | Level 80 | • 0 to 128 |
| | <u> </u> | <u> </u> | Loudness Change Rate: | | ▼ 0 to 20 |
| | ¥. | Ψ | Note Change Rate: | 3 | ▼ 0 to 20 |
| Obey Inhibits ("stops") Control MMP Player | | | Musical Scale (Mode) | Chromatic | ▼ 15 choices |
| Event Trend Graph | | | Musical Key. | A | |
| Scale Factor: 100 Offset: -5 | | | Play Note or Chord: | 1 Note | ↓ 1 to 8 Notes |
| Event Summary. | | | Enable All Events | Disable All Events | Data Dictionary |
| Summary for Event 5: | EVENT 5 IS CURREN | TLY: ENABLED | Enable All Events | Disable All Events | Data Dictionary |
| IF: EQN: x=E1F: IS GREATER THAN Value: 0.5 THEN: Do Nothing | | | Clear All Events | Show All Events | Print All Events |
| | | | Help | Copy Event | Paste Event |
| | | | Cancel | Use Now | ОК |

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



| Event Wizard Designer | | Control Protocol and Threshold Values |
|--|---|---|
| Event Nutsand Designer Event Number: Event Number: Event Number: Event Condition: Event | The Event Is C Enabled Daubled Public Public Public Public Public Public Public Public Public Public Publ | Control Protocol and Threshold Values East PROTOCOL SETTINGS FOR CHANNEL I: ACTIVE: C3 REFERENCE: LE Beta Ga Stop Ignore 0.0 Theta Ga Stop Ignore 0.0 Hibeta Ga Stop Ignore 0.0 Alpha Ga Ga Stop Ignore 0.0 Go Stop Ignore 0.0 Gamma Gamma Go Stop Ignore 0.0 Gamma Gamma Stop Ignore 2.0 Sciect Channel to Adjust Use these controls to drins the protocol and starting threshold for each channel and component band. Global Sustained Reward Criterion (all channels) Training Conditions must be met for: to achive a reward point and sourd for 500 milliseconds |
| Copy Inhibits ("Inton") For Control MMP Player Form Thered Graph Scale Factor, 100 Officer, 0 | | (use value = 0 - 10000, default=500) Global Refractory Period (all channels) After a reward, system will wait (or: before another reward is possible (use value = 0 - 10000, default=0) (use value = 0 - 10000, default=0) |
| Event Summay: Summay/of Event 1. IF-EDN + More ZOULULTHR, GTHR; IS GREATER THAN EDN x=CT: THEN Pay-MOD Sound XMOC 2: NOTE 51 INSTR 114 Sound Tume STYLE Souther WOULDATION Level of PAPE LOUPRASE. Level 7.0 LOTA A MODE Mays floring CHORD. TNote | Enable Al Eventa Disable Al Eventa Data Dictionary Clear Al Eventa Show Al Eventa Print Al Eventa Helb Carge Event Paste Event Cancel Use Now DK | "Original" Sweet Spot Feedback Settings ON • OFF About Points Counting Method • Normal [1 Counter] • Split for 2 Players [2 Counters] Autothreshold Options Use the button at left to view and change Autothresholding Options |

Enabling Amplitude and Events to control Flash Player

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

| Event Number: C 1 © 2 C 3 C 4 C 5 C 6 C 7 C 8 C 9 C 10 C 11 C 12C 13C 14C 15C 16 | This Event Is Visibility: Enabled C Disabled Visible C Hidden |
|---|--|
| Ever Condition: | Sutained Reveal Criterion Condition run 18 tenef for Diminisconds HIDI Sound Propertie: Starting Note [7.2 (440.0) 1 to 60 Instrumert, 61 Vida 132 to close Project Starting Note [7.2 (440.0) 1 to 60 Instrumert, 61 Vida 132 to close Project Starting Note [7.2 (440.0) 1 to 60 Instrumert, 61 Vida 132 to close Project Starting Note [7.2 (440.0) 1 to 60 Instrumert, 61 Vida 132 to close Note Drouge Rate [3 0 0 to 20 Note Drouge Rate [3 0 0 to 20 Note Drouge Rate [3 0 0 to 20 |
| Event Tierd Graph Scale Factor. 100 Offset 0 | Musical Key: A C to B Flat Play Note or Chord: 1 Note 1 to 8 Notes |
| Event Summay: Even 2 Summay is Even 2 EVENT 2 IS OURRENTLY: ENABLED FOR IN USE GREATER THAN Value: 0.0 THEN LIGHTARYS | Enable AIE Vents Disable AI Events Disable AIE Vents Disable AIE Vents Disable AIE Vents Pint AIE Vents Events Lebe Copy Event Paste Event Cancel Use Nov OK |

 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).

| Event Wizard Designer | |
|---|---|
| Event Number. - 1 - 2 - F 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 12 - 13 - 14 - 15 - 16 | C Disabled C Disabled Visibility: ✓ Visibility: ✓ Visibility: ✓ Visibility: |
| Event Condition | |
| Constant: Damping Factor. IF: Use Equation: Deta Deta Amplitude 0 | |
| (Check Equation) x=E1F + E2F: | Sustained Reward Criterion Refractory Period |
| [Lheck Equation] WE IF + Car, | Condition must be met for: Time between rewards is: 0 milliseconds 0 milliseconds |
| RULE: IS GREATER THAN: | |
| Constant: Damping Factor: | MIDI Sound Properties: |
| | Starting Note: 37 A (440.0) • 1 to 88 |
| Check Equation x=GTHR; | Instrument: 41 Viola • 128 choices |
| Note: You must press "Check Equation" to check and save any changes made to equations | Playing Style: Sustained Percus: or Sustained |
| Event Result | Modulation: Amplitude Ampl. or Pito Station Loudness: Level 30 O to 128 |
| THEN: Do Nothing 💌 🔍 | Starting Loudness: Level 80 O to 128 Loudness Change Rate: 3 O to 20 |
| | Loudness Change Rate: 3 U to 20 Note Change Rate: 3 U to 20 |
| Obey Inhibits ("stops") Control MMP Player | Musical Scale (Mode): Chromatic • 15 choices |
| | Musical Key: A C to B Flat |
| Event Trend Graph Scale Factor: 100 Offset 5 | Play Note or Chord: 1 Note 1 to 8 Notes |
| Event Summay. | Enable All Events Disable All Events Data Dictionary |
| Summary for Event 3 S EVENT 3 IS CURRENTLY: ENABLED IF: CDN: secT + E27: IS GREATER: THAN Value: 0.0 THEN: Do Nothing | Clear All Events Show All Events Print All Events |
| | Help Copy Event Paste Event |
| | Cancel Use Now DK |

Event Wizard User Manual

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

| Event Wizard Designer | | le de la constance de la consta |
|--|----------------------------|--|
| Event Number: C 1 C 2 C 3 C 4 G 5 C 6 C 7 C 8 C 9 | C 10 C 11 C 12 C 13 C 14 C | 15 16 First Visibility. 15 16 First Visibility. Visibility. Visibility. Visibility. |
| Ever Condian: IF: Use Equation: | Constant Damping | Sustained Reward Criterion Condition must be met for 0 milliseconds |
| Event Trend Graph Scale Factor: 100 Offset -5 Event Summary. | | Musical Key. A C to B Flat Play Note or Chord: 1 Note 1 to 8 Note |
| Even is volume as the second s | EVENT 5 IS CURRENTLY: ENAB | BLED Endble All Events Disable All Events Data Dictiona Clear All Events Show All Events Print All Event Help Copy Event Paste Event |
| | | Cancel Use Now OK |

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 Events to control Third-Party Games

1. First, the BrainMaster Software has to be set into Emulation Mode. This is accomplished in the Display Options Menu under the DLL Memory Mapping Mode.

| Display Options | and the state of the state of the | |
|---|-----------------------------------|--------------------|
| Viewed Panels: | | Viewed Components: |
| Raw Waveform | | 🗆 Delta |
| 🗆 Filtered Waveform | Text Stat Line with each Waveform | Theta |
| Phase-Space Trajectory | Text Stats Panel (Live) | 🗹 Alpha |
| Thermometers | Component Trend Graphs | 🔽 Lobeta |
| 🗆 FFT Frequency Spectrum | Event Trend Graphs | 🗆 Beta |
| 🗖 Brain Mirror (FFT) | Wide Event Trend Graphs | ✓ Hibeta |
| 🗖 Brain Mirror (Filters) | Z Score Text Display | 🗆 Gamma |
| 🗌 🗌 Coherence / Phase Display | Z Score Scatter Plot | 🗆 User |
| Dll Memory Mapping Mode © Standard • Emula Use Emulation Mode to use ext games (Somatic Vision, CIS, etc | ternal | ОК |
| Ěvent Ŵizard Events 9-16 | , | |

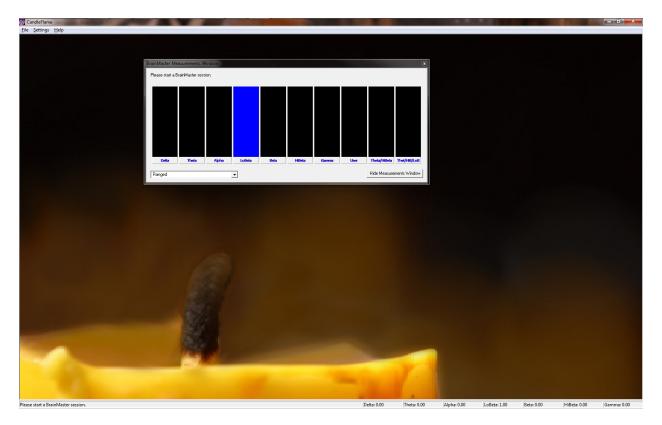
2. Next we have to set the Events so that they will properly operate. This is accomplished, by utilizing Events 9-16 to emulate the Filtered Waveforms. A list of the Events to what band they are referring to, see below (For this example, we are going to want the game to react to training done on the Lobeta band. Because of this, we will use Event 12). For proper reaction, the Event Condition must be Event must be greater than its condition (For this example, we want the training reaction from Event 1. So, because of this

| Event Number: C 1 C 2 C 3 C 4 C 5 C 6 C 7 C 8 C 9 C 11 | 0 C 11 @ [[2] C 13 | ○ 14 ○ 15 ○ 16 | This Event Is: | abled Visibility | ble C Hidden |
|--|--------------------|-----------------|--|---------------------------------------|---|
| Event Condition: | Constant | Damping Factor: | Sustained Reward Criter Condition must be met fo 0 millisecore | x: Time bet | ty Period ween rewards is: milliseconds |
| Use Equation Use Equation Check Equation Note: You must press "Check Equation" to check and save any cl | Constant | Damping Factor: | Instrument: Playing Style: | Sustained | ▼ 1 to 88 ▼ 128 choices ▼ Percus. or Sur |
| Event Result | y y | ¥ ¥ | Modulation: Starting Loudness: Loudness Change Rate: Note Change Rate: Musical Scale (Mode); | Level: 80 3 3 | Ampl. or Pitch O to 128 O to 20 O to 20 |
| Event Trend Graph Scale Factor: 100 Offset: 0 | | | Musical Kay: Play Note or Chord: | | ♥ C to B Flat ♥ 1 to 8 Notes ♥ |
| Event Summay: Summay for Event 12: IF: CON: x=FLA;IS GREATER THAN EQN: x=E18; THEN: Do Nothing | EVENT 12 IS CURRE | NTLY: ENABLED | Enable All Events Clear All Events | Disable All Events Show All Events | Data Dictionary Print All Events |
| | | | Help Cancel | Copy Event | Paste Event |

the Event Condition is "IF Equation: x=E1A, is GREATER THAN Equation x=E1B"). You can do this for up to all 8 Events.

| Event Number | Third-Party "Filtered band |
|--------------|----------------------------|
| 9 | Delta |
| 10 | Theta |
| 11 | Alpha |
| 12 | Lobeta |
| 13 | Beta |
| 14 | Hibeta |
| 15 | Gamma |
| 16 | User |

You have now enabled the BrainMaster protocol to have its Events be seen as a Filtered waveband in the third-party game. You will be able to see this, by starting the third-party game, and seeing the band that you chose to affect the games reward. If this is not working, please make sure that you have set the reward for the game to the bands that you have chosen.



Event Wizard User Manual



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