# *Stimulus* Structure

## Summary of Fields:

|  |  |  |
| --- | --- | --- |
| **Variable Name** | **Variable Description** | **Variable Type** |
| AmplitudeL | L pk-pk amplitude (V) | [Nreps x 1 double] |
| AmplitudeR | R pk-pk amplitude (V) | [Nreps x 1 double] |
| AttenuationL | L attenuation (dB) | [Nreps x 1 double] |
| AttenuationR | R attenuation (dB) | [Nreps x 1 double] |
| BBNlowerFreqL | L noise lower frequency limit (Hz) | [Nreps x 1 double] |
| BBNlowerFreqR | R noise lower frequency limit (Hz) | [Nreps x 1 double] |
| BBNupperFreqL | L noise upper frequency limit (Hz) | [Nreps x 1 double] |
| BBNupperFreqR | R noise upper frequency limit (Hz) | [Nreps x 1 double] |
| Channel | Output channel (‘L’, ‘R’, ‘BOTH’} | char |
| FirstTimestamp | Time of first instance for this stimulus (sec) | double |
| FixedDelayL | L delay time for all signals (sec) | [Nreps x 1 double] |
| FixedDelayR | R delay time for all signals (sec) | [Nreps x 1 double] |
| HoldTimeL | L duration between onset/offset ramps (sec) | [Nreps x 1 double] |
| HoldTimeR | R duration between onset/offset ramps (sec) | [Nreps x 1 double] |
| Indices | Location(s) of stimulus presentation | [Nreps x 1 double] |
| LAttenIndices | Locations(s) for each of the LAttenVals | {} |
| LAttenVals | Unique L attenuation values, sorted (dB) | [] |
| Nreps | # of repetitions of this stimulus | double |
| OutputFilename | Path to which original raw data were written | [char] |
| OutputTimeWithDelayL | L time of signal onset + delay (sec) | [Nreps x 1 double] |
| OutputTimeWithDelayR | R time of signal onset + delay (sec) | [Nreps x 1 double] |
| OutputTimestampL | L time of signal onset (stim. timestamp) (sec) | [Nreps x 1 double] |
| OutputTimestampR | R time of signal onset (stim. timestamp) (sec) | [Nreps x 1 double] |
| PA5idL | Id # for L PA5 attenuator | [Nreps x 1 double] |
| PA5idR | Id # for R PA5 attenuator | [Nreps x 1 double] |
| PhaseDegL | L tone phase (degrees) | [Nreps x 1 double] |
| PhaseDegR | R tone phase (degrees) | [Nreps x 1 double] |
| RAttenIndices | Locations for each of the RAttenVals | {[Nreps x 1 double]} |
| RAttenVals | Unique R attenuation values, sorted (dB) | [Natt vals X 1 dbl] |
| RampDownL | L signal offset time (sec) | [Nreps x 1 double] |
| RampDownR | R signal offset time (sec) | [Nreps x 1 double] |
| RampUpL | L signal onset time (sec) | [Nreps x 1 double] |
| RampUpR | R signal onset time (sec) | [Nreps x 1 double] |
| Spiketimes | Spiketimes for all cells, all sweeps (sec) | {Nunits x Nreps cell} |
| Spiketimes\_PostStim | Spiketimes for next stimulus (sec) | {Nunits x Nreps cell} |
| Spiketimes\_PreStim | Spiketimes for prior stimulus (sec) | {Nunits x Nreps cell} |
| Sweepend | Time for end of sweep (sec) | [Nreps x 1 double] |
| Sweepstart | Time for start of sweep (sec) | [Nreps x 1 double] |
| Tagstring | Text tags for the marker for this stimulus type | [char] |
| TimeShiftL | Stimulus-specific delay for L channel (sec) | [Nreps x 1 double] |
| TimeShiftR | Stimulus-specific delay for R channel (sec) | [Nreps x 1 double] |
| Timestamp | Vector of timestamps for stimulus sweeps (sec) | [Nreps X 1 double] |
| ToneFreqL | L channel tone frequency (tone stim only) (Hz) | [Nreps x 1 double] |
| ToneFreqR | R channel tone frequency (Tone stim only) (Hz) | [Nreps x 1 double] |
| Type | 'NOISE' 'WAVFILE' 'TONE' ‘NO\_SOUND' 'BACKGROUND' 'UNKNOWN' | {char} |
| Var | Var structure | [1x2 struct] |
| **Variable Name** | **Variable Description** | **Variable Type** |
| WavFilenameL | .wav file played from L channel (wav stim only) | [char] |
| WavFilenameR | .wav file played from R channel (wav stim only) | [char] |
| id | DataWave ID code (?) | [Nreps x 1 double] |

# *Var* Structure

## Summary of Fields:

|  |  |  |
| --- | --- | --- |
| **Variable Name** | **Variable Description** | **Variable Type** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

# *Data* Structure

## Summary of Fields:

|  |  |  |
| --- | --- | --- |
| **Variable Name** | **Variable Description** | **Variable Type** |
| Info | Info structure | Struct |
| Marker | Marker structure | Struct |
| MarkerTimes | Vector of Marker timestamps (sec) | [1 X Nmarkers double] |
| Probe | Struct array of Probe structure for spikes | [1 X Nprobes struct] |
| UnitData | Struct array of *UnitData* structures. Contains information about sorted (or unsorted) units | [1 X Nunits struct] |

# *Info* Structure

## Summary of Fields:

|  |  |  |
| --- | --- | --- |
| **Variable Name** | **Variable Description** | **Variable Type** |
| MarkerCols | # of marker text columns in DataWave .txt file | 1 |
| MarkerTags | Marker tags from DataWave file | {NmarkerCols x 1} |
| NMarkerCols | # of marker columns | 33 |
| NSpikeCols | # of spike columns | 4 |
| NUnitCols | # of unit columns | 4 |
| Ncols | # of columns in DataWave .txt file | 45 |
| Ndatalines | # of lines with data in .txt file | 21800 |
| Nlines | Total # of lines in .txt file | 21801 |
| Nunits | Total # of units (includes junk, garbage, etc.) | 11 |
| SpikeCols | Columns in data file that contain spike data | [NSpikeCols X 1] |
| UnitCols | Columns that contain unit data | [NUnitCols X 1] |
| data1 | Parsed text array of 1st line of data | {NCols x 1 char} |
| file | DataWave .txt file name | [char] |
| filename | DataWave .txt file path and name | [char] |
| header | Header structure | struct |
| path | path to DataWave .txt file | [char] |

# *header* Structure (usually element in *Info* struct)

## Summary of Fields:

|  |  |  |
| --- | --- | --- |
| **Variable Name** | **Variable Description** | **Variable Type** |
| line | text of DataWave .txt file header line | {char} |
| fields | Field headers from DataWave .txt file | {nfields x 1 char} |
| nfields | # of header fields | double |

# *Marker* Structure

This is a master list of the marker “tags” that are read in from the DataWave .txt output file.

## Summary of Fields:

|  |  |  |
| --- | --- | --- |
| **Variable Name** | **Variable Description** | **Variable Type** |
| AmplitudeL | L channel output signal peak-peak amplitude (mV) | [Nmarkers x 1 double] |
| AmplitudeR | R channel output signal peak-peak amplitude (mV) | [Nmarkers x 1 double] |
| AttenuationL | L PA5 attenuation (dB) | [Nmarkers x 1 double] |
| AttenuationR | R PA5 attenuation (dB) | [Nmarkers x 1 double] |
| BBNlowerFreqL | Broadband Noise, lower freq limit (Hz) | [Nmarkers x 1 double] |
| BBNlowerFreqR | Broadband Noise, lower freq limit (Hz) | [Nmarkers x 1 double] |
| BBNupperFreqL | Broadband Noise, upper freq limit (Hz) | [Nmarkers x 1 double] |
| BBNupperFreqR | Broadband Noise, upper freq limit (Hz) | [Nmarkers x 1 double] |
| FixedDelayL | delay time for all signals, all channels (sec) | [Nmarkers x 1 double] |
| FixedDelayR | delay time for all signals, all channels (sec) | [Nmarkers x 1 double] |
| HoldTimeL | duration of signal between ramps (sec) | [Nmarkers x 1 double] |
| HoldTimeR | duration of signal between ramps (sec) | [Nmarkers x 1 double] |
| M | raw marker data (text) | [1 x Nmarkers struct] |
| Nmarkers | Total number of markers (# stimuli + 1) | double |
| OutputFilename | DataWave .ddf filename | {Nmarkers x 1 cell} |
| OutputTimeWithDelayL | Time of signal + delay (sec) | [Nmarkers x 1 double] |
| OutputTimeWithDelayR | Time of signal + delay (sec) | [Nmarkers x 1 double] |
| OutputTimestampL | Time of signal start (sec) | [Nmarkers x 1 double] |
| OutputTimestampR | Time of signal start (sec) | [Nmarkers x 1 double] |
| PA5idL | id # for PA5 attenuator (0 = Right 1 = Left) | [Nmarkers x 1 double] |
| PA5idR | id # for PA5 attenuator (0 = Right 1 = Left) | [Nmarkers x 1 double] |
| PhaseDegL | L Tone phase (Degrees) | [Nmarkers x 1 double] |
| PhaseDegR | R Tone phase (Degrees) | [Nmarkers x 1 double] |
| RampDownL | L signal offset ramp time (sec) | [Nmarkers x 1 double] |
| RampDownR | R signal offset ramp time (sec) | [Nmarkers x 1 double] |
| RampUpL | L signal onset ramp time (sec) | [Nmarkers x 1 double] |
| RampUpR | R signal onset ramp time (sec) | [Nmarkers x 1 double] |
| StimulusTypeL |  | {Nmarkers x 1 cell} |
| StimulusTypeR |  | {Nmarkers x 1 cell} |
| TimeShiftL | L Stimulus-specific delay for stimulus (sec) | [Nmarkers x 1 double] |
| TimeShiftR | R Stimulus-specific delay for stimulus (sec) | [Nmarkers x 1 double] |
| Timestamp |  | {Nmarkers x 1 cell} |
| ToneFreqL | L Tone frequency (Hz) | [Nmarkers x 1 double] |
| ToneFreqR | R Tone frequency (Hz) | [Nmarkers x 1 double] |
| WavFilenameL | L output .wav file name (with drive:\path) | {Nmarkers x 1 cell} |
| WavFilenameR | R output .wav file name (with drive:\path) | {Nmarkers x 1 cell} |
| id | ??? | [Nmarkers x 1 double] |
| string | 'NOISE' 'WAVFILE' 'TONE' ‘NO\_SOUND' 'BACKGROUND' 'UNKNOWN' | [Nmarkers x 1 cell} |
| wavFilesL | unique L output .wav file names | [# x 1 struct] |
| wavFilesR | unique R output .wav file names | [# x 1 struct] |

# *M* Structure (usually in *Marker* struct)

## Summary of Fields:

|  |  |  |
| --- | --- | --- |
| **Variable Name** | **Variable Description** | **Variable Type** |
| t | timestamp (sec) | double |
| string | text values of Marker information | {# marker fields x 1} |

# *wavFiles(L/R)* Structure

## Summary of Fields:

|  |  |  |
| --- | --- | --- |
| **Variable Name** | **Variable Description** | **Variable Type** |
| uniqueNames | unique .wav file name | [1 X N double] |
| uniqueIndices | indices (in master, Marker indices) of the unique stimuli | double |
| Nunique | # unique filenames | double |

# *Probe* Structure

## Summary of Fields:

|  |  |  |
| --- | --- | --- |
| **Variable Name** | **Variable Description** | **Variable Type** |
| cluster | cluster ID values (id number 0-nclusters, 0 corresponds to “junk” category) | [1 X N double] |
| nclusters | # of clusters for this probe (from Plexon) | double |
| t | timestamps for each spike (sec) | [1 X N double] |

# *MarkerTimes* Array

[1 X Nmarkers] array of marker timestamps (in microseconds)

# *UnitData* Structure array

[1 X # of units] struct array, containing information about spike timestamps, organized

by unit # (units from probe 1 are first, then probe 2, etc.)

## Summary of Fields:

|  |  |  |
| --- | --- | --- |
| **Variable Name** | **Variable Description** | **Variable Type** |
| indices | indices into *Probe* structure arrays | [1 x # spikes double] |
| probe | electrode/tetrode number | double |
| sorted | 0 if unsorted, 1 if sorted | double |
| timestamp | vector of timestamps for each spike | [1 x # spikes double] |
| unit | unit id value (0 = unsorted/junk, 1…n) | double |