

# **History of the Distribution of Applied Neuroscience, Inc. Z Score Biofeedback DLL and “Z Tuning”**

**Robert W. Thatcher, Ph.D.**

- 1- Concept of Real-Time Z Score Biofeedback (1994). Decision not to patent the idea or implementation of real-time Z scores was made because of the fragile nature and small size of the biofeedback market.**
- 2- CDBioFeedBackDLL\_1.0.0 (6/1/04): 1<sup>st</sup> dll and beta version for testing.**
- 3- CDBioFeedBackDLL\_1.0.1 (9/1/04): Beta version distributed to BrainMaster to test and not distribute.**
- 4- CDBioFeedBackDLL\_1.0.2 (4/13/06): Beta distribution (Brainmaster & Thought Technology).**
- 5- CDBioFeedBackDLL\_1.0.3 (8/2/06): Distribution with improved documentation.**
- 6- CDBioFeedBackDLL\_1.0.5 (3/21/07): Improved access to the eyes open age 13-16 database. Distributed the DLL to BrainMaster, EEG Spectrum, Nexus, Deymed and Thought Technology.**
- 7- CDBioFeedBackDLL\_1.0.6 (6/2/07): Modified the dll for Thought Technology so that they can distribute the dll by CD and use their own installation program to install the dll.**
- 8- CDBioFeedBackDLL\_1.0.7 (10/5/07): 1- Replaced the database with the 21 ages as used in NeuroGuide, 2- added amplifier equilibration factors for Deymed, Nexus, BrainMaster (2); 3- Improved the key message so that it is easier to copy and paste the Key A to an email, 4- added two more functions specifying the vendor or OEM and the amplifier and, 5- added the ability to do “couples” biofeedback or to provide Z scores simultaneously from two different individuals.**
- 9- ANI-BioFeedBackDLL\_1.0.8 (3/5/10): 1- Expand to 19 channels, 2- Replace the database with 22 ages as used in Neuroguide (see Appendix F, figure 3 in the NeuroGuide Help), 3- Added a hi-pass filter of 0.5 Hz; 4- Add Alpha1 and Alpha2 for a total of ten frequency bands (Delta 1-4 Hz; Theta 4 – 8 Hz; Alpha1 8 – 10 Hz; Alpha2 10 – 12 Hz; Beta1 12 – 15 Hz; Beta2 15 – 18 Hz; Beta3 18 – 25 Hz; Hi-Beta 25 – 30 Hz; Alpha 8 – 12 Hz; Beta 12 – 25 Hz).**