

AVS Technology

Advanced Cognitive Technology Series

Introduction

Audio Visual Stimulation (AVS) Technology plays a large role in the cognitive revolution that is sweeping through the 21st century. Although the use of sound and or light for healing, relaxation and achieving altered states of consciousness (ASC) has been used for centuries, it's only recently that the scientific community has reawakened to its phenomenal potential.

AVS Technology is related to EEG Neurofeedback and Biofeedback technology. While EEG Neurofeedback is more of a precise system of brainwave stimulation (BWS) reading and delivery, AVS provides a more general application of BWS. EEG Neurofeedback is also much more complicated of a system to work with and as a result it requires specialized, extensive training for usage. Not to mention EEG Neurofeedback is also a much more expensive system to work with. The good news is that you can achieve similar results, though more general with an AVS system and if you decide to go into the field of EEG Neurofeedback, you will have learned much of the information through your study and experience with AVS technology.

There is a difference between biofeedback and AVS. Biofeedback is used to condition the nervous system, while AVS stimulates specific patterns of activity in the brain. With biofeedback you become aware of processes normally unavailable to conscious inspection. The awareness includes understanding how it feels to increase or decrease the selected process (a state of relaxation or arousal). In the end, both will get you to the same destination but the journey differs.

In this module, we will focus on using AVS for brainwave entrainment.

Benefits of Using AVS (Audio Visual Stimulation)

Although results vary with the individual, the results on a whole have been favorable. Some of the benefits of sound and light brain entrainment reported are:

- Increases in I.Q. especially in children with ADD
- Improved memory and attention span
- Reduction of stress
- Better results in meditation (deeper trance achieved)
- Pain management and relief
- Addiction relief
- Replace lost sleep, reduce fatigue
- Higher scores on tests
- Improved cognitive ability
- Accelerated learning
- Easier access to hypnotic state

The more control you can acquire over your brain states, the more emotional and mental control you acquire over your life.

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Brainwave Entrainment

Our senses take in information which is processed by our brain, which in turn directs our thoughts and emotions. These states of being are reflected by our brainwaves. When you change your state of mind, you are also changing your brainwaves. Likewise, if you change your brainwaves, your state of mind will also change. It is this latter principle that Brainwave Entrainment is based on.

The Thalamus acts as a pacemaker of sorts, giving cues to the cortical neurons to fire in a particular pattern (or frequency). The neurons then synchronize with each other by what is known as the “**Frequency Following Response**” (FFR). The FFR is likened to a neurological game of follow the leader as the cortical neurons fall into harmony with each other. What is interesting about the FFR is that if an outside rhythm is introduced then the cortical neurons will synchronize themselves to that beat.

Audio Visual Stimulation (also known as Light and Sound Stimulation) is a tool that creates a FFR by exposing the brain to a set of desired frequencies. This is done by means of headphones which deliver the frequencies through sound and specialized light frames which deliver similar frequencies through pulsing lights. These external frequencies act as a neurological pied piper by coaxing the brainwaves to follow them into a desired state.

“The Frequency Following Response that the mind experiences through light and sound stimulation provides a focus for the brain. This focus safely quiets any internal dialogue or “brain chatter,” and enables the listener to reach more quickly and effectively the optimum state of mind targeted for the task at hand (i.e. energizing, learning, relaxing, etc.)”¹

Studies have shown light to be a more powerful method of delivery than sound, however, some people (especially those who are light sensitive) do respond more favorably to sound entrainment. Sound entrainment is also useful in situations where light entrainment isn't possible, such as if you want to work at your desk.

¹ Source: Mind States 2: An Introduction to Light and Sound Technology by Michael Landgraf

Brain Wave Frequencies

Brainwave Frequencies overview

- A brainwave is an electrochemical rhythm which occurs across the surface of the brain known as the cerebral cortex. This rhythm measures cortical arousal which reflects a corresponding state of mind.
- A brainwave is measured on the surface of the scalp where all the bioelectrical activity occurs. The cerebral cortex makes up 80% of the brain's mass.
- This biochemical electricity is produced in the brain through frequencies measured in hertz. "Hertz" is measured as beats per second.
- We categorize groups of these frequencies according to the range that is associated with various states of mind.
- These frequencies correspond to normally four measurable groups of frequencies – Beta, Alpha, Theta and Delta. Note: High Beta (24 – 70 Hz) is referred to as "Gamma". Low Beta (12 – 15 Hz) is referred to as "SMR".
- Even though all four frequencies are found in the brain at all times, there will always be one or two dominant frequencies. Through entrainment, our goal is to make the desired frequency a dominant frequency at the desired time.
- When creating a program, it's best to use the range of frequencies in the target area instead of producing segments focusing on one frequency because A) habituation easily occurs when you only use one frequency, thus making the treatment less effective, and B) not every person responds the same way to a frequency. For example, while 10 Hz may produce the desired result in one person, 11 Hz will produce the same in another person.

"There are studies which support the use of frequency "sweeps" vs. fixed frequencies; in fact this approach was included in a patent held by Dr. Harold Russell, Dan Vaughnn and myself (Robert Austin). One common misconception which has propagated in the LS field is that there are very precise frequencies which produce specific esoteric or medical effects. Though there is some basis for this (i.e., Tansey uses and touts 14 Hz neurofeedback for ADHD, though others more generally use the SMR range of which 14 Hz is a component), it is very unlikely that a fractional Hz will produce the same effect on everyone. That's why we made the Proteus (and Procyon) programmable – the included sessions are intended as much as examples as anything else."

Source: Robert Austin email 10/28/06

Frequency Correspondences

As you'll notice from the list below each group of frequencies has its benefits as well as detriments. Where people get into problems, and this is where AVS entrainment is most helpful, is when the brain gets stuck in an inappropriate state. The state is inappropriate because it is either excessive or deficient in a frequency range or it is producing a range of frequencies at an inappropriate time (for example, theta when a person is trying to concentrate).

One of the most important things to learn about AVS Technology is which states are associated with what conditions. Having a good working knowledge of this will make treatment decisions much easier.

The following frequencies are associated with the following states of mind.

Gamma (High Beta): 25 – 75 Hz

- ❑ Gamma is associated with conscious perception
- ❑ There hasn't been much research conducted in the area of Gamma waves as it was only recently that AVS machines were capable of generating frequencies in this range.
- ❑ Some claim that Gamma is associated with the deepest states of meditation relating to that which monks who train for years achieve.
- ❑ The only frequency group found in every part of the brain.
- ❑ If you are going to create a program that has Gamma in it, you'll want to keep the Gamma segments fairly brief as too long of a period of Gamma will create anxiety.

Excessive Beta

- Elevated in all stress-related disorders, some mood disorders, panic, anxiety, fear and chronic pain.

Beta (Mid Range): 16 – 24 Hz.

- ❑ Training can increase mental ability, focus, alertness and IQ.
- ❑ 18 Hz + - Mental activity, math, alertness
- ❑ Associated with psychological arousal & response to threat.
- ❑ Elevated in all stress-related disorders, some mood disorders as well.

SMR (Low Beta): 12 – 15 Hz.

- ❑ Your brain usually operates at about 13 Hertz when you are relatively calm.
- ❑ Attention, relaxed focus
- ❑ The dominant frequency is Beta when we are awake, alert and high Beta when anxious.

- ❑ The benefits of Beta training is improved concentration, cognitive ability and focus.
- ❑ People who have ADD are deficient in the Beta frequency – and that is why they cannot concentrate or remain focused. In fact, their brains tend to have Theta as the dominant frequency and you'd think that this would make them calmer people, not so. Things tend to work opposite with them; stimulants calm them – which are why doctors prescribe Ritalin (which is a stimulant). They respond very well to Sound and Light therapy!
- ❑ Some experiments found that SMR training can help people with epilepsy reduce seizures. NOTE: A practitioner should never attempt to treat epilepsy with AVS, unless working with the patient's doctor, because with some people AVS exposure induces seizures instead of curing them.

Deficient in SMR:

- ADD, stress-related disorders, chronic pain, depression, mood disorders, psychotic states, substance abuse, panic, anxiety and fear.

Alpha 8-13 Hz

- ❑ Alpha is the first bridge between the conscious and unconscious mind.
- ❑ Necessary for creativity and positive thinking.
- ❑ Associated with relaxation and visualization.
- ❑ Alpha waves are deficient in alcoholics, their children, individuals with a history of abuse (and their children) and those with depression and/or anxiety.
- ❑ A person low on Alpha tends to feel frustration. With no alpha, we lack the conscious ability to express ourselves because the information from the unconscious to conscious realization is blocked.
- ❑ The frequencies of Alpha are associated with harmonization with the Shuman Resonance – the frequency of the earth's electro-magnetic field (7.83 Hz. +/- 0.5 Hz.). This is where that feeling of being connected to the universe comes from because you are in synch with the universe (at least the earth) at that moment.
- ❑ Conditions that lower Alpha waves: Hypothyroidism, Hypoglycemia, renal & hepatic disorders.
- ❑ Drugs that increase Alpha waves: Antidepressants Hydergine and Oxiracetam.
- ❑ Drugs that lower Alpha waves: Anticonvulsants and Antipsychotics.
- ❑ Best for learning new information, facts and data. Material that the learner wants to remain in consciousness and have access to readily.

Deficient in Alpha:

- People with addictions, chronic pain, stress disorders, fear, frustration and depression.

Theta: 4 – 7 Hz.

- ❑ Theta is an essential state for processing information. It is in this state where information is allowed to enter the long term memory.
- ❑ Alpha/Theta is associated with learning, creativity and memory.
- ❑ In Theta, the doorway to the unconscious is open and one is capable of achieving deep spiritual insight.
- ❑ The unconscious governs memories, sensations and emotions. Theta is the best state to do work in these areas.
- ❑ Theta is a useful state to use in working with people with PTSD.
- ❑ Childhood memories and repressed memories can resurface.
- ❑ "...the mind has an innate ability to release only the amount of information that can be handled and doesn't pour everything out all at once and overwhelm the person. And because they are in a quiet state, people don't have a flashback or re-experience the trauma, they become emotional, and they'll cry but they won't re-experience. They process it cortically. Once the memory is reprocessed cortically, in the conscious mind, the shock to the brain seems to be largely over." (A symphony in the Brain, pg. 171).
- ❑ In this state, the conscious mind can be re-scripted.
- ❑ It's the best state for hypnotic work.
- ❑ Mental fatigue occurs when the ratio between sodium and potassium are out of balance. 15 minutes in a theta program helps restore this balance and diminish mental fatigue.

Excessive Theta:

- People with head injuries and trauma, ADD, ADHD, delusion, poor reality testing, psychotic states and seizure disorders.

Delta: .5 – 3 Hz

- ❑ Associated with restorative sleep and healing.
- ❑ Body releases natural opiates. Good state for pain management.
- ❑ Pituitary releases growth hormone.
- ❑ Delta is predominant in children up to the age of 4.

Excessive Delta

- Head injury, coma, fetal alcohol syndrome, immune disorders, severe substance abuse, severe anxiety and major vegetative depression.
- Excessive slow wave activity indicates attention problems.

Lights

LED Colors

AVS machines come with different colored LEDs in the light frames. The Procyon's light frames contain LED colors: Red, Green and Blue. The Proteus comes with Red & Green LEDs in its light frames but other colors such as Blue/Red, White and Blue are available.

Certain colors are associated with particular states and while the LEDs that come with the machines can produce a combination of colors, it is still good to have a working knowledge of what colors are best for what circumstance – especially if you get into writing your own AVS programs.

The brightness of the lights will increase stimulation and making changes to the brightness of the lights can aid in increasing attention.

Blue

- ✓ Better for people with photosensitivity
- ✓ Enhances Alpha
- ✓ Increases relaxation
- ✓ Blocks the production of melatonin which means that blue is excellent for relaxation and hypnosis sessions but not good for sleep.

Red

- ✓ Produces optimal EEG in the band of 17-18 Hz (Beta)
- ✓ Can suppress Alpha
- ✓ Increases vigilance
- ✓ Beta stimulation

Green

- ✓ Increases SMR
- ✓ Increases relaxation

Amber

- ✓ Good for SMR
- ✓ Red & Green together produce Amber

“To the eye-brain system, there is no difference in physiological & psychological response to yellow light and a mixing of red/green light. The brain has no means of distinguishing between the two physical situations.”²

² Source: <http://www.glenbrook.k12.il.us/gbssci/phys/class/light/ut2l2b.html>

Why Light Brightness is varied in a program:

Source: Robert Austin, creator of Mindplace Products.

- Changing the color brightness can change the apparent color (Proteus and Procyon).
- Brightness is associated with stimulation, and if the lights are on full all the time, the session may become too stimulating and not relaxing enough.
- Changing brightness can help keep the subject from falling asleep during a session. You may want them to go into a deep trance but you do not want them to fall asleep.
- Users should always keep their eyes closed while running a session and if the light is too bright, they should turn it down.
- **Note: Some people are more light sensitive than others and the practitioner should always check with the client to insure that the light levels are comfortable before running the session.**

Sound

Types of Sounds

Our hearing is limited to 20 – 20,000 Hz. Notice that most of the important entrainment frequencies are below what we can actually hear. What is important to note is that it is the pulse of the tone which creates the frequency, not the pitch [sound]. So what you are actually hearing is the pitch of the pulsed tone or frequency, not the frequency itself.

There are basically three types of beats you will hear about: Monaural, Binaural & Isochronic.

A **Monaural** beat is a simple beat like that produced by a drum. Monaural beats are usually what you'll find with any music.

An **Isochronic** beat is a monaural beat that is evenly spaced. Although, there have been studies that show binaural beats to be superior to Monaural or Isochronic, there are many people who favor Isochronic beats and claim to achieve favorable results using them.

If you hear a series of frequencies, let's say through your stereo, your brain will group the frequencies together or choose a mid point between the frequencies to entrain to.

Binaural Beats

A **Binaural** beat is a perceived beat which is created by exposing one ear to one frequency and the other ear to a different frequency. The frequency perceived by the brain is the difference between the two frequencies. So for example, if you expose one ear to 110 Hz and the other ear to 100 Hz, the frequency that the brain perceives will be 10 Hz. You can only perceive a binaural beat if you are wearing headphones or have speakers placed by each ear. If your left ear can hear what is going into your right ear, you will perceive the frequency as a monaural or isochronic beat. In order for your brain to create a binaural beat, it must hear different frequencies in each ear.

"The binaural beat is perceived as a fluctuating rhythm at the frequency of the difference between the two auditory inputs. Evidence suggests that the binaural beats are generated in the brainstem's superior olivary nucleus, the first site of contralateral integration in the auditory system [Oster, 1973]. Studies suggest that the frequency – following response originates from the inferior colliculus. This activity is conducted to the cortex where it can be recorded by scalp electrodes."³

In one study at the University of Wisconsin-Madison findings indicated that people with depression had a less active left hemisphere. Given this information, a possible treatment for depression would be to use an Alpha based program that uses binaural beats since the nature of binaural beats is to get both hemispheres working together⁴.

³ The Science of Audio Based Brainwave Entrainment, <http://brain.web-us.com/thescience.htm>

⁴ Scientific American Article: Train Your Brain. [See reference section]

“Dual BBs will often (but not always) produce monoaural beats as well, since two tones are present in both ears. One exception is to keep the frequency relationships set to harmonics, for example, 200 & 400 Hz left and 206 & 412 Hz right.

When T.B. {Budzynski} was running SynchroMed, we tested several kinds of beats: binaural, dual binaural and monoaural. The BB's were the only ones which could cause discernable EEG activation. We were surprised that dual BB's did not appear to do so – but the experiment was small.

Dr. Len Ochs once measured the effect of a constant BB and ramping lights; both induced EEG activation at their set frequencies. Light produced a stronger effect than sound.”⁵

Re: Pitch variance

Source: Robert Austin

The pitch of the pulsed tone doesn't have much (if anything) to do with entrainment – only the pulse rate. The real reason for varying the pitch for normal pulsed sound is to provide variety and prevent (or reduce) sensory habituation, which can occur when the same stimulus proceeds for too long.

⁵ Source: email – Robert Austin, May 30/06

Seizures and Medical Warnings

Who shouldn't use AVS machines?

People who have a history of seizures. People who tend to get headaches from bright lights. Anyone who has a concern should check with their doctor first.

Products which incorporate flickering light should not be used by individuals with epilepsy or seizure disorders unless so directed by a medical doctor. They may also be unsuitable for use by those taking many forms of psychoactive drugs and those who have suffered from head injuries.

Photosensitive Epilepsy

PSE is fairly rare. It affects approximately 1 out of every 14,000 people. Watching TV or playing video games tends to set off these seizures. Discos with strobe lights are definitely out. The longer the exposure to the source, the more likely a seizure will occur.

People who are light sensitive or sensitive to certain visual patterns do not have PSE.

Red is the most provocative color, while blue is the least.

Not all epileptics are photosensitive, which means not all epileptics will have a seizure when using AVS.

Note: It is still important to take caution when working with epileptics and make sure you do so under the guidance of their physician.

Reference: L&S Systems & Seizures by Ray Wolfe. AVS Journal.com. http://www.mindmachines.com/AVS_Journal/article-lightandsoundssystemsseizures.htm

RE: Children and Seizures

"Children are more likely to have both epileptic and non-epileptic seizures. Dr. Russell has treated hundreds without a problem (pre-teen to early teens, mainly), but he's trained to evaluate the likelihood of such an event.

When dealing with Teens or Children, it is suggested to have a licensed practitioner supervise the process; screen for family history of epilepsy, etc.

Children's EEGs are slower than adults, and I would make the assumption that unless there is some aberration which could be possibly treated (a medical decision), it's best to find an alternative treatment. (Source: R. Austin, email: May 22, 2006)

Note: It should be noted that many children have had seizures from video games and sometimes watching TV (because of the flicker rate of the screen).

Any information in these pages is a result of a collection of knowledge from various sources. This information is not a substitute for medical advice or treatment. If you are planning to use AVS to treat any medical conditions, please check with your physician first. Due to FDA regulations we make no medical claims regarding any Mindplace Products. The information in these pages can refer to medical procedures such as EEG Neurofeedback and not necessarily AVS.

Appendix 1

Noteworthy Quotes:

- “They [mind devices] are being used by scientists, educators, physicians and psychologists for everything from accelerated learning & athletic peak performance training to remediation of chronic medical and psychological problems. And all of these applications are based on the simple premise of making the brain more mentally fit – promoting awareness and control of the basic cycle of cortical relaxation and activation and the flexibility to move within the cycle at will. *Source: Exercising Your Brain for Peak Performance by Dennis Campbell: Total Health, Aug 96, Vol. 18, Issue 4, pg. 34.*
- “Harold Russell, Ph.D. – reported research that showed L/S at Beta frequencies 18-21 Hz appeared to improve the cognitive functioning of ADHD children.” Reported at the Association of Applied psychophysiology & biofeedback annual meeting in Dallas, Texas – 1991. *Source: The Clinical Guide to Sound & Light by Thomas Budzynski (see reference).*
- Brain wave training has been found to yield excellent results in facilitation of human memory, attention span, and relaxation (Hutchinson, 1994). Furthermore, this research has been demonstrating brain-wave training as an effective intervention in impaired levels of functioning due to ADHD, learning disabilities, physical brain trauma, & psychological trauma (Ochs, 1993). *Source: An Empirical Investigation into the Effect of Beta Frequency Binaural Beat Audio Signals on 4 Measures of Human Memory by Richard Kennerly. <http://brain.web-us.com/bbmemoryindex.htm>*
- Entrainment is the process of synchronization, where vibrations of one object will cause the vibrations of another object to oscillate at the same rate. External rhythms can have a direct effect on the psychology and physiology of the listener. *Source: www.peyote.com/jonstef/brain.htm*
- Brain waves do not “determine” your state of mind – they are caused by it.” *Source: Steven Novella, M.D. <http://www.theness.com/neurologicalblog>*
- “The device [mind machine], with appropriately selected stimulation protocols has been observed by us to be an excellent neuropathway exerciser. ... Furthermore, the long-term effects of regular use of the device on maintaining and improving cerebral performance throughout life and possibly delaying for decades the deterioration of the brain. Robert Cosgrave Jr. Ph.D., M.D. *Source: Time Flashes: A Short History of Sound & Light Technology by Michael Hutchison, pg. 6.*

Appendix 2

Misc. Information about AVS, Brain Entrainment etc.

Studying and using AVS:

- ✓ Study information that you want stored in long term memory before your AVS session.
- ✓ After studying, select a Theta based program that is between 30 to 60 minutes. Ideally you want to give your brain enough time to process the new information thus allowing it to become committed to long term memory

The Schumann Resonance⁶

- ✓ Dr. Schumann was a physicist in the 50s who discovered that there was an atmospheric resonance caused by lightening storms.
- ✓ This resonance is at the frequency of 7.83 Hz and it fluctuates daily +/- 0.5 Hz.
- ✓ People associate this "resonance" with being in balance with the earth. Some call it the "Earth's Frequency".

Wave Forms

- **Sine Waves** have no harmonic content and tend to elicit following responses at their frequency alone (though this is not always the case, as there appear to be "resonant modes in the brain). [R.Austin]
- **Pulse waves** tend to produce harmonics in the EEG, and in fact, both the rising and falling edges of the light produce visual evoked potentials, which could either add or interfere with one another (enhancing or reducing the effective harmonic content). Pulse waves also evoke crisper visual imagery than Sine. Pulse waveforms are best for energizing programs and Sine for relaxation. [R. Austin]

Cortical Evoked Response (CER) – when stimulus is repeated (above 4 Hz) the brain begins to synchronize to the stimulus.

Brain Wave Entrainment is sometimes referred to as: flicker stimulation, photic driving, cortical evoked response, visual evoked response, variable frequency photo stimulation, brain wave synchronization, Neurofeedback.

Berger Effect – When people open their eyes, alpha decreases.

⁶ Source: <http://www.mindmachines.com/AVSJJournal/article>, "Dr. Schumann & Your AVS Machine: Surfing the Schumann Resonance" by Jeff Labno

Appendix 3

Qualifying Research

The internet can be a good source of information but it can also be a source of false or misleading information. Many companies that sell products produce their own research, which can be biased, especially if their “research” concludes superiority in their product. Their product may very well be a good product but the research is questionable because there is a conflict of interest between the research conducted and the company’s interest in promoting their product.

If the research has been conducted by an independent party who doesn’t stand to gain financially from the findings (through sales of machines) it is likely that you will get more valid research. It is acceptable for a company to post those kinds of results on their web site or in their literature.

Another thing that often happens is that the research may be valid but the author of the article has misinterpreted the findings of the research.

Do not believe everything you see. Look at all research with a skeptical eye and question anything that doesn’t make sense. My rule of thumb is to look for more than one (unrelated) source for the information. Make sure that science, not philosophy or belief, backs the claim made. Finally, testimonials are not valid research. They have their place, which is in advertising and sometimes change work, but they are not accepted in the scientific community as a scientific method of producing evidence.

Appendix 4

Sleep⁷

REM Sleep

- ✓ Dreaming
- ✓ EEG looks more awake
- ✓ 25% of sleep spent in this stage

Non REM Sleep

- ✓ Slow wave sleep
- ✓ Designed for rest
- ✓ 75% of sleep spent in this stage

Non REM Sleep is divided into **4 Stages** which occur in a 90 minute cycle.

Stage 1: Transitional sleep. Alpha begins to slow. This stage is fleeting, lasting only a few minutes.

Stage 2: Five to fifteen minutes, 12 – 14 Hz, occasional 8 – 14 Hz.

Stage 3: Delta – EEG = 3Hz

Stage 3 and 4 last around 20 to 40 minutes.

Stage 4: Delta – EEG = 2Hz or less

The First sleep cycle = Stage 4 = 20 - 40 minutes.

Lightens to Stage 2 = 10 - 15 minutes

There is then a brief period of REM - Beta

The rest of the night each REM cycle is followed by at least 30 minutes of non-REM.

⁷ Neuroscience: Exploring the Brain, Second Edition, by Mark Bear, Barry Connors, Michael Paradisco

Appendix 5

Marisa Broughton – AACT History

Marisa Broughton took NLP Practitioners and Master Practitioners Certifications in 2000 through the Canadian Training Centers. She opened her own private practice later that year and worked with clients for the next five years.

In 2003, Marisa completed her Basic, Advanced and Master Hypnotherapy Certifications through the Excel Center: Hypnotherapy Training College. Later that year, Marisa also became an Authorized Dealer for Synetic Systems products.

In 2006, Marisa became the Canadian Distributor for Mindplace (formerly Synetic Systems) and subsequently shut down her private practice and focused her attention on AVS Technology.

Prior to 2000, Marisa worked in the field of crime prevention. She gave lectures to retailers on retail crime prevention, worked with the International Foundation for Protection Officers creating certification exams for the officers, wrote and published articles on security & loss prevention and worked as a VIP/Event Security Coordinator.

For more information on Marisa or AACT, please visit her website at:

<http://www.ayrmetes.com>

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Book: Introduction to Quantitative EEG and Neurofeedback by James R. Evans and Andrew Abarbanel, 1999, ISBN - 13:978-0-12-243790-8

Book: Symphony in the Brain by Jim Robbins, 2000. ISBN - 0-8021-3819-5

Text: Biofeedback (Third Edition) by Mark Schwartz and Frank Andrasik, 2003. ISBN-13: 978-1-59385-233-7

Text: Neuroscience: Exploring the Brain (Second Edition) by Mark F. Bear, Barry W. Connors & Michael A. Paradisco, 2001. ISBN: 0-7817-3944-6

The Clinical Guide to Sound and Light by Thomas Budzynski, Ph.d. (e-book)
www.mindplacesupport.com [reference]

Accessing Alternity: Neruotechnology and Alternate States of Consciousness by Bruce Harrah-Conforth, Ph.D. (e-book), www.mindplacesupport.com [reference].

Various emails from Robert Austin, creator of Mindplace and Mindplace Products.
<http://www.mindplace.com>