

# AVS

Auditory / Visual Stimulation

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AVE: Finding a Treatment for PTSD by David Siever  
The Atlantis by Dr. Tom Collura  
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## **An Interview with Larry Shultz**

**President of Integrative Motion Systems, Inc.  
and Creator of Symmetron Tactile Stimulation & Motion Technology**



**Please share with our readers a little about yourself.**

“From early childhood I have been fascinated with the way I related to different forms of movement. While there was no intellectual curiosity about this phenomenon, I was definitely drawn to experimenting with various forms of playground equipment that involved kinesthetic activity. There was also the usual childhood fascination with rolling down gentle hillsides covered with soft green grass and other childhood games that involved spinning -- activity that seemed to evoke a feeling of lightness and pleasure. It was not until I was in the Navy and spent one year aboard ship that I started connecting the phenomenon of movement with the brain. For reasons too complex to go into here, I had made a commitment to avoid going to the ship doctor for any reason other than a true medical emergency such as a fractured skull or something like that. So, during that year, I observed, with conscious curiosity, how my body responded to various wave forms. The responses were in general, delightful. While the rest of the crew was constantly moving their bodies to stay as perpendicular to the horizon as possible, I was going with the ship. I had taken enough physiology to know that we had some delicate mechanisms in the inner ear that were very responsive that any changes in our center of gravity, but I had no idea that activating those mechanisms could have anything to do with neurological development. I remember thinking at the time that something that could replicate the movement of the ship could be very beneficial.”

**So, is that what gave you the original idea to create the Symmetron technology that features tactile stimulation and motion?**

“No, that came much later. I joined the corporate world and pretty much forgot about my Navy experience. Working in middle management, I unwisely decided to consult the company doctor for relief of various physical symptoms. After taking a litany of prescription medications, I finally recognized that maybe the answers weren’t ‘out there’ but ‘in here.’ I do not recommend this for everyone. . . , but I decided to flush all the medications down the sewer and recommit myself to some of the relaxation techniques I had learned aboard ship long ago. I resigned my corporate job, obtained my degree to practice chiropractic, and started my quest of trying to find ways of communicating with the deeper structures of the brain – the part that Paul McLean described as the “reptilian brain.”

The idea to develop the Symmetron technology came as a result of discovering an exercise system that moved in such a way that I immediately associated it with the feelings I had previously experienced while aboard ship. For the first time, in 1980, I became aware that maybe there were some practical mechanical ways of tapping into that motion. Since then, I have been pursuing the development of equipment involving integrative motion, adding the tactile component to our systems in 1994.”

**How come your equipment lasts so long, and continues to run smoothly for so many years when others who try to imitate your products fail miserably?**

“Thanks for the compliment. I am pleased to confirm that we still have some of our original models in use. I was fortunate in that I was able to team up with a very talented fabricator whose guidance and expertise has been invaluable in the developmental process. We are currently using third generation technology in our systems and are constantly monitoring for areas of improvement. I really can’t comment on the success or failure of our “look alikes.” It is nice to know that others are recognizing the value of the comprehensive wave form that we have developed.”

**You work with so many medical professionals, what application have you found to be most rewarding? Is there a particular research study that utilized your technology that has given you the most satisfaction?**

“When I first started exploring this arena, there were only a handful of people who were working in this field and to say that I have worked with “so many medical professionals” may be a little misleading. However, there are a few luminaries I discovered, such as Jean Ayres, Moshe Feldenkrais, James Prescott, Thomas Hannah, Connie Jarvis, David Graham, and other early pioneers in this field. The one thing I didn’t understand was why no one else was working with the three dimensional wave forms that nature seems to use so effectively in the developmental process. It is very encouraging to see that one of the most fertile areas of current neuro-

logical research is centered on the basal ganglia as described by Dr. Ann Graybiel:

*“The field of basal ganglia research is exploding on every level — from discoveries at the molecular level to those based on human brain imaging. A remarkable series of new findings support the view that the basal ganglia are essential for some forms of learning-related plasticity. Other new findings are challenging some of the basic tenets of the field as it now stands. Combined with the new evidence on learning-related functions of the basal ganglia, these studies suggest that the basal ganglia are parts of a brain-wide set of adaptive neural systems promoting optimal motor and cognitive control.”*

One of my core beliefs, the driving force behind the development of our integrative motion equipment is that the organs of the inner ear (semi-circular canals, utricle and saccule) provide a rich portal of input to the basal ganglia via the vestibular branch of the VIII cranial nerve. It is also interesting to note the recent publication of a study from the University of Washington links early deficits with balance to subsequent onset of Alzheimer’s syndrome. I have been suggesting for several years that the use of our equipment could be very helpful in the prevention -- or at least the postponement of -- these disastrous degenerative brain stem maladies. I sincerely believe that if some definitive studies were made, collected data would support this idea.”

**When did you first combine light and sound stimulation with your Symmetron equipment? How about when you incorporated eeg/neurofeedback equipment with your systems?**

“Shortly after we developed the first adult sized integrative motion system, I was introduced to Rob Robinson of IQ International, one of the first individuals to successfully market light and sound systems. We both recognized the positive synergism that could be realized by combining the two technologies. It was through our relationship with them that we developed our first zero gravity lounge system. We introduced that system at the Whole Life Expo in 1991. This connection also resulted in working with Dr. Rayma Sommers, who has been effectively using our equipment as a part of her practice. While we had a couple of neurofeedback practitioners using our equipment in the early nineties, it wasn’t until I was invited by Chuck Davis (developer of the Roshi systems) to join him at Winterbrain and ISNR in 2005 that the neurofeedback community was more broadly introduced to our technology. We now have several eeg/neurofeedback practitioners who include the Symmetron as a part of their practice.”

**What type of people purchase your products? What are their main reasons for purchasing your products?**

“Over the years, we have delivered systems to a broad spectrum of customers including spas, psychologists, hypnotists, psychiatrists, chiropractors, coma patients, and individuals. With such a broad customer base, I think it’s safe to say that the motivating reasons for purchasing our products are equally varied. In general, I believe that the unique comprehensive stimulation

delivered by Symmetron/IMS products fills missing gaps in a variety of therapies and that is the primary and best reason for their use.”

**I understand you have created the Chi Lounge. Can you tell us a little about what this product achieves?**

“The Chi Lounge system is an active participatory system whereas the Symmetron is a passive system. It is still too early to be overly definitive about the Chi Lounge. Given time, and proper exposure, I believe that experienced users will be able to derive benefits that are different from, equal to, or even may exceed those of the Symmetron. More importantly, from a cost stand point; Chi Lounge technology will be much more affordable.”

The Chi Lounge creates an ever changing feed back-feed forward neurological loop that is very rewarding. Dr. Robert Dallas offers this observation:

*“It is an effortless dance that creates the epitome of brain-body balance. The motion-sensing and spatial orientation centers of the brain are in perfect concert with the flowing movement of the body. It teaches my body to connect with its own awareness of balance, bringing breath and motion more naturally into that state of flow.”*

**How do your products benefit people? What types of applications do they use your symmetron systems for?**

“Our products are definitely “broad spectrum” in their approach. When someone asks ‘just what will using the Symmetron do for me?,’ it is complicated because individual needs vary. From a purely physical point of view, it acts as an auxiliary pump relieving pressure on the heart, enhances lymphatic circulation, actively stimulates cerebral spinal fluid flow, and provides a gentle rhythmical massage of the intestinal organs. On a neurological level, it provides comprehensive proprioceptive and vestibular stimulation on levels that we are only just beginning to understand.

Years ago, a well known physiologist by the name of Walter Cannon introduced a term called ‘homeostasis’.

*Homeostasis is the property of an open system, especially living organisms, to regulate its internal environment to maintain a stable, constant condition, by means of multiple dynamic equilibrium adjustments, controlled by interrelated regulation mechanisms.*

I firmly believe that our products help promote this state of being. Anyone truly interested in an integrative approach to health can find invaluable ways of utilizing our equipment.”

**With so few people aware of the positive benefits and effectiveness of your creations, what would you say to people that would help them better understand how your equipment can improve the quality of their lives?**

“The distinguishing feature of our equipment is the three dimensional aspect of the motion we produce. This is a universal phenomenon vital to the development of life. By using our equipment, individuals are intimately experiencing some of the primal developmental principles that nature utilizes so very well. As you well know from your own experience with light and sound, it takes a while for people to get the idea, but once they experience it, they recognize it as a good feeling, even though they may not be able to accurately describe the experience.”

**In the future, what directions and applications do you see your Symmetron equipment taking?**

“I am curious about what insights we might realize if we combine our motion technology with cutting edge brain imaging technologies such as functional MRI’s. In the areas of spirituality and consciousness expansion, I also see ample potential for a marked increase in the utilization of our equipment.”

**What is the most important factor to be aware of when utilizing the motion aspect of your equipment?**

“I believe we must always be aware that each individual presents a unique neuro-emotional matrix. By that I mean that different people will process the same input in ways that are unique and will vary from individual to individual. Even the same individual may experience the Symmetron differently from time to time. Fortunately, most users report a pleasant and even sometimes euphoric experience. For these reasons, I encourage a brief explanation to potential users that what they experience on the Symmetron will be their unique experience. They should be encouraged to avoid trying to make anything happen, but to simply let go and observe without judgment what their body is experiencing.”

**I understand you are creating some new products, in particular an advanced version of your Chi Chair. Could you share with us a little about its potential benefits?**

“Yes, I just recently put together a system that we are calling the “Chi Light.” This system will be much more portable and affordable than the larger Chi Chair. Because of the lightness of the frame, it seems to be more interactive and responsive than the larger model. Like our other systems, the potential benefits that can be realized are without limits.... depending on our own creativity and imagination.”

**In the coming years, what are your hopes for Symmetron technology? Where do you think your products would best meet the biggest needs of the general population?**

“I have to agree with Dr. Sommers and others have said to me several times, “I think there should be several Symmetrons in every community.” While I realize, our systems may not meet the needs of everyone, it is gratifying to see a very gracious acceptance of our equipment by a large majority of those who have had the opportunity to feel the experience. I really believe, the highest and best use of our equipment is to help us regain our “birthright” of allowing the body to repair in a natural and beautiful way.”

**With light and sound instruments, and to a large degree eeg/neurofeedback equipment focusing mainly on the mind, do you think generating frequencies aimed at the various other parts of the body transmitted through the transducers of your Symmetron products would enhance the mind/body experience or detract from the reason for using various modalities in conjunction with a Symmetron session?**

“Since the primary purpose of using motion as a sensory input that engages the whole body, it seems quite logical that adding tactile stimulation coordinated with the sound frequencies will enhance the whole sensory experience.

When I first started using vibro-acoustics in our products, my primary motivation was to provide a distraction for the conscious part of the mind. Since then, the whole field of music therapy and tactile stimulation has grown considerably. Today, I consider the tactile aspects of the Symmetron an integral part of the experience.”

**For our readers who would like to learn more about the products you manufacture, what is the easiest way for them to contact you?**

“I hope those who are using audio visual stimulation personally and/or in your practice can visualize the close relationship that motion shares with AVS. Please feel free to email me at: [larry@motionforyou.com](mailto:larry@motionforyou.com). I am always interested in your thoughts.”



The Chi Chair



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# Audio-Visual Entrainment: Finding a Treatment for Post-Traumatic Stress Disorder

By Dave Siever, CEO, Mind Alive, Inc.

*Abstract: Post-traumatic stress disorder (PTSD) is the aftermath of trauma. Trauma spans a diverse spectrum of unfortunate life experiences such as sexual abuse, assault, car accidents, and natural disasters. PTSD occurs when the inflicted are unable to cope. Following trauma, permanent changes occur within the brain that increases “racy-headedness,” guardedness, anxiety, depression, insomnia, plus memory and cognitive impairments. The behavioral aftermath of PTSD typically involves increased aggression and drug and alcohol abuse. Audio-visual entrainment (AVE) has been shown to reduce anxiety and insomnia and improve coping for police officers. AVE has also been shown to reduce depression and anxiety among vets with chronic fatigue syndrome and fibromyalgia.*

## Introduction

The American Psychiatric Association defines psychological trauma as *a threat to life, to yourself or someone close to you accompanied by intense fear, horror or helplessness*. The ensuing brain damage from severe and chronic stress further brings about a host of traumarelated psychiatric disorders or *trauma spectrum disorders*, which include impairments in learning, reasoning, rationalizing, impaired alertness and increased destructive behavior including smoking, alcoholism, drug abuse, family violence and reckless risk taking (Bremner, 2002). Psychological trauma affects about half of all Americans sometime in their lives. As described by Bremner, PTSD comes about from one acquiring the knowledge or “wisdom” that the world is not a safe place, as once believed.

Every year, in the USA, more than 1 million children are confirmed as victims of child abuse (Teicher, 2002) and close to 50 million American adults have suffered from childhood abuse. Somewhere between 25 and 50 % of all Americans are exposed to a psychological trauma related to a wide variety of incidents including child abuse, assault, rape, car accidents, natural disasters, etc., at some time in their lives (Acierno, et al, 1999). Of these, about 15% will develop post-traumatic stress disorder (PTSD), roughly comprising 5 to 8% of the American population, making it one of the most common illnesses in the USA. PTSD is twice as common in women as men (Kessler, et al, 1995). PTSD is 10 times more common than cancer, yet society dedicates only one tenth the funding in PTSD research as it does for cancer research (Bremner, 2002).

About one million young men experienced the stress of the Vietnam War between 1963 and 1971 and several hundred thousand were deployed in the Gulf War from 1990 to 1991 (Bremner, 2002). Currently, U.S. Service Members serving overseas in theaters of operation in Afghanistan and Iraq are continually subjected to direct and indirect traumatic effects of combat, which includes shelling, artillery, missile attacks, watching people die and dealing with burnt, charred bodies. Service members assigned to combat support and service support units

that are not on the front lines are just as exposed to the effects of PTSD, since rear echelon units no longer have the traditional distinction of being non-combatative. The individual service member's physical condition, training and experience for combat will certainly prepare him or her for these various traumatic experiences often encountered during military missions. However, no matter how much an individual is trained to deal with the tragedy of war, trauma is inevitable.

Other major contributing factors related to PTSD are combat casualties, such as those related to a permanent disability such as amputation. These soldiers not only experience the immediate trauma from the event and struggle to dissociate from its significance, but also must deal with a physical irreversible change in their life, where psychological therapy is required for adaptation. The effects of PTSD are not one-sided. It also affects the spousal relationship, and puts as much or more stress on the spouse with the burden and apprehension of deployment and feelings of abandonment. Upon returning home, the dysfunction of PTSD has an immediate effect on the relationship of the veteran, spouse and family. If not diagnosed and treated promptly, PTSD quickly manifests itself into a socio-economic burden on society. To exemplify the far-reaching aspects of PTSD, it has been reported that more veterans have died in motorcycle accidents at home in the USA from thrill seeking (350 deaths) than in Afghanistan (259 deaths) (Edmonton Journal).

With the exceeding numbers of civilian and military Americans that suffer from PTSD, research to develop a non-drug treatment/method of therapy for treating PTSD, and without adverse side effects, would be an asset to both the inflicted as well as society.

## **Physiology of the Fear Response**

The survival response rapidly activates via the hypothalamic-pituitary-adrenal (HPA) axis. The HPA axis is a "triangle" in which the hypothalamus and pituitary glands in the brain communicate with the adrenals. In response to stress, the hypothalamus releases corticotrophinreleasing factor (CRF), which causes the anterior pituitary gland to make adrenocorticotrophic hormone (ACTH). This in turn causes the adrenals to produce glucocorticoids such as cortisol and adrenalin which stimulates the spleen to increase red blood cells to send more oxygen to the muscles, dilates the pupils of the eyes for better vision, and releases endorphins to dull the sense of pain (Bremner, 2002). Cortisol also raises blood sugar concentrations, increases energy to the periphery and inhibits the immune system.

## **The Role of Serotonin in Behavior**

Serotonin acts as the brain's brakes, keeping basic emotions (such as sex, mood, appetite, sleep, arousal, pain, aggression, and suicide ideation) in check. Serotonin also influences dominance and has been shown to be high in dominant male vervet monkeys and also found in salesmen with high sales performance. These salesmen averaged 180 ng/ml levels of whole blood serotonin (WBS), whereas the poor performers had average WBS levels of 140 ng/ml of blood volume (Walton, et al., 1992). A study by Raleigh (Kotulak, 1997) found that when subordinate monkeys were given a serotonin uptake inhibitor like Prozac, they became dominant

through friendship and alliances with the females. Dominant monkeys deficient in serotonin ruled with aggression. Like the “Prozac” monkeys and salesmen, college students with the most friends had serotonin levels 20 to 40% above the norm. Females have 20 to 30% more serotonin than men, which contributes to their reduced aggression (Kotulak, 1997). Those with high levels of serotonin “connect” better socially with improved ability to read facial expressions (Harmer, et al., 2003).

In an experiment with normal young males, the task was to be the first person to push a button when a light flashed. The successful person could give their partner an electric shock in the range from 1 (mild) to 8 (strong). Normally, the shocks given were mild and relatively “tit-for-tat.”

However, when one of the pair was given a serotonin antagonist, that person would frequently deliver more severe shocks (above “4”) even if they received shocks that were mild. On the other hand, if one of the pair was given tryptophan, a pre-cursor to serotonin, that person would deliver milder shocks to his partner even if he received strong shocks from his partner, (Young and Pihl, 1988).

Low levels of serotonin are tied to loss of control (helplessness), which manifest this deficiency in temper and rage (Sapolsky, 2003). Reports from my clients indicate anxiety from traffic congestion, tight scheduling, computer problems, corporate “right sizing,” the oxymoron of “customer service” with many businesses, and other factors that have come with the “modern” age. All of these “highlighters of helplessness” contribute to highly increased frustration and aggression much like studies with mice that are given random electrical shocks beyond their control (Sapolsky, 2003). So it’s no wonder that even though the population of the USA has only increased by 40% from 1960 through 1991, aggravated assaults have increased by 600%, violent crime by 560%, rapes increased by 520%, and murders by 170%, according to FBI stats (Kotulak, 1997).

People low in serotonin (and 5HTP) have an increased risk of sexual deviance, alcoholism, fire-setting, obesity, and other impulse-control disorders (Kotulak, 1997). Conditions such as anxiety, depression and tendencies toward alcohol and drug abuse have been shown to run in families (Virkkunen, 1989), where a study of 114 male alcoholic and violent offenders and fire-setters showed that low levels of cerebral spinal fluid (CSF) 5-hydroxyindoleacetic acid (5-HIAA) and homovanillic acid (HVA) were strongly associated with a family history of paternal violence and alcoholism. A study by Linnoila (1983) of prisoners who were in jail for manslaughter, used serotonin levels as a basis in predicting with 84% accuracy, those who would recommit manslaughter after their release.

## **The Role of Norepinephrine in Behavior**

Noradrenalin or norepinephrine (NE), a close relative of adrenaline is also a player in vigilance (Bremner, 2002). Low levels of noradrenalin are associated with under-arousal including lethargy and mental fuzziness (Amen, 1998), while higher levels are related to peak performance, and high levels correlate to impulsive “hot-headed” violence (Kotulak, 1997). Norepinephrine is manufactured in the locus coeruleus (dorsal pons), a site in the brainstem.

Long neurons project to multiple sites throughout the brain for direct and immediate release. NE activates in response to both internal stressors such as a drop in blood pressure due to a lack of blood and external stressors such as threats (Aston-Jones, Chiang & Alexinsky, 1991). During rest, feeding and grooming in primates, the NE system is quiet, but activates rapidly with the perception of a threat, increasing heart rate and blood pressure and behaviors of aggression (Aston-Jones, Chiang & Alexinsky, 1991). NE increases on an as-needed basis. Monkeys taught to play a video game showed increased NE activation along with alertness and vigilance as the game increased in challenge. However, a threshold exists where past a certain point of challenge, the monkeys became more anxious and distracted and performance began to decline (Aston-Jones, Chiang & Alexinsky, 1991). Animal studies have shown that animals exposed to repeated stress and cannot escape leads to the emotion of *learned helplessness*, which correlates with the depletion of norepinephrine.

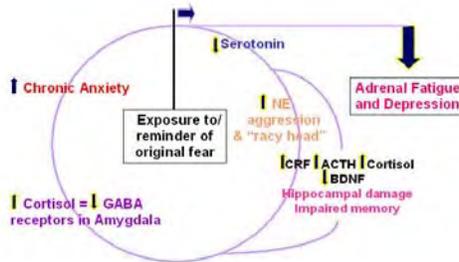
## The Sympathetic Loop

The aftermath of trauma results in a double-edged sword. With the experience of trauma comes a fall in serotonin as the mind prepares to protect itself from further assault by keeping its guard up. However this drop in serotonin lowers the threshold where a person perceives threats which then increases the number of non-life threatening or social threats. Unfortunately, the limbic system never evolved beyond the “reptilian” stage and given that humans are primarily “pack” animals, very basic socio-emotional perceptions such as a mere wrong look or sense of rejection from anyone encountered in the acute/posttraumatic stress disordered person’s travels (including family members or rejection from the individual him/herself) could constitute a threat and launch the PTSD survivor into aggression. Therefore, trauma poses a socio-economic toll, producing aggression and violence, family breakup, and lost productivity in the workplace, not to forget hundreds of millions spent annually on illicit and prescription drugs.

Survivors of trauma, once crossing the serotonin/norepinephrine threshold, get locked into a *sympathetic loop* as shown in Figure 1. Assuming that the original trauma has come and gone, and in the case of PTSD, the loop maintains itself from simple thoughts, reminders of, and imagination of past threats (and/or new threats with the lowered fear threshold). This continues a drop in serotonin and increased norepinephrine, and in turn maintains increased aggression and endless rumination or “racy head,” which keeps the self-imagined fear going. (In part, this is caused by outgoing fibers feeding into the frontal cortex causing one to believe he/she is threatened, which in turn reinforces activation of the amygdala). As mentioned, this triggers the production of CRF, which, in turn, triggers ACTH, which then stimulates the adrenals as the body of the threatened individual prepares for battle. Cortisol antagonizes brain-derived neurotrophic factor (BDNF), ending in hippocampal neuronal necrosis (cell death) and impaired memory. The increased cortisol also causes GABA “stripping” within the amygdala, impairing the ability to relax, thus increasing tics, twitches and incidence of temporal-lobe seizures (Teicher, 2002). And as the PTSD survivor alienates and loses his/her support network of family and friends, he/she feels more isolated and rejected. This perceived barrage of threats to the livelihood of the inflicted keeps the serotonin low, the cortisol flowing, norepinephrine (and anger) high and continuing amygdala GABA receptor stripping, resulting in the inflicted being no longer able to “idle,” and in a constant “revving” state, constantly on guard and with this cycle feeding on itself. Eventually, the endocrine system exceeds its threshold, and “burns out,” in a

condition known as *hypoadrenia* or adrenal fatigue (Wilson, 2001). As the adrenals fatigue, so does the locus coeruleus resulting in reduced NE levels in the brain and increased suicide ideation.

**Figure 1**



### Somatic Damage from Chronic Fear and Trauma

Continuous bouts of activation of the hypothalamic-pituitary-adrenal-axis (HPA) exact a personal toll on the body. This results in irritable bowel syndrome, tension and migraine headache, neck and spine problems, temporo-mandibular dysfunction, heart disease, skin rashes, slow recovery from viral and bacterial infections, insomnia, alcoholism and drug abuse (Everly, 2002) and ulcers, diabetes and osteoporosis (Bremner, 2002). The eventual adrenal fatigue leads to low blood pressure, chronic fatigue, and fibromyalgia, frequent respiratory infections and difficulty recovering from them (Wilson, 2001). Behavioral components are extreme fatigue in the morning – leading to consumption of caffeine, and an energy surge in the late evening – leading to consumption of alcohol and drugs for sleep (Wilson, 2001).

### Cognitive Damage from Chronic Fear and Trauma

While acute (mild) stress seems to enhance mental function, chronic (severe) stress impairs hippocampal function, which in turn, may lead to multiple sclerosis, anxiety, depression, posttraumatic stress disorder, schizophrenia and Alzheimer's disease (Esch, et al., 2002). The most common structural changes from PTSD are reduced hippocampal volume (impaired experiential evaluation and memory), increased amygdalar activation (emotional activation) and decreased activity in Broca's area (impaired verbal expression), (Hull, 2002), and those going into combat with pre-existing smaller hippocampal volumes are predisposed to PTSD (Gilbertson, et al., 2002). Both Vietnam war-vets and women with abuse-related PTSD have reduced blood flow in the hippocampus and medial prefrontal cortex (Bremner, et al, 1999).

The medial aspects of the pre-frontal cortex are instrumental in extinguishing fear responses to conditioned stimuli (Ledoux, 1996). People with PTSD do not have normal activation of the prefrontal medial cortex and are not able to extinguish their own fear responses while watching a movie involving violence (Bremner, et al., 1997), whereas people without PTSD are able to rationalize that they are only watching a movie and do not show a trauma response to the movie. This means that people with PTSD have crossed the threshold of being able to return to

a relaxed homeostasis and therefore live in an irrational and constant state of fear. The U.S. Army is researching the use of *Virtual Reality (VR) Exposure Therapy* with biofeedback for Iraqi veterans diagnosed with PTSD (Rizzo, 2005), which suggests traumatic association for adaptation. This is unlike dissociation for treatment of PTSD that is achieved by audio-visual entrainment (AVE).

This continued state of fear also inflicts damage to the frontal and temporal regions, known as *frontotemporal dementia* (Bremner, 2002). Frontotemporal damage further impairs a person's ability to control fear and the ability to reason and understand the significance of events in his/her life (Bremner, 2002), leaving the inflicted in a generalized state of anxiety, fear and confusion. Anxiety and fear increases cortisol in the brain. Cortisol counteracts a brainnourishing hormone called *brain-derived neurotrophic factor* or BDNF (Bremner, 2002). Loss of BDNF leads to neuronal cell death within the hippocampus, which impairs declarative or explicit memory and the ability to recall details of events (Sapolsky, 2003). In fact, those with PTSD often cannot remember what they had for breakfast a few hours before and have extreme difficulty learning new things (Bremner, 2002). Unfortunately, PTSD inflicted dementia can affect persons as young as teenagers (Bremner, 2002). Dementia is a problem particularly for war veterans and is the reason why it is difficult to succeed in career retraining for civilian life (Bremner, 2002). The pre-frontal lobe damage and continued irrational fear continue to destroy the hippocampus. Hippocampal loss also plays a major role in the early onset of Dementia of the Alzheimer's Type, where the ability to form memories later in life is impaired. Those living in fear have further impairments in their memory and self-reliance in remembering, as they become seniors (Levy, 1996).

## **Affective Disorders Stemming from Trauma**

Most people, in the aftermath of trauma, also succumb to affective disorders. Affective disorders pertain to disorders of emotion, including depression and anxiety and mania. Depression is the most common psychiatric disorder by far. About 14% of the American population will experience clinical depression in their lifetime. Of these, an alarming 15% will unfortunately commit suicide (Rosenfeld, 1997). The helplessness of depression is not a quiet, passive state; rather it is an active, all-consuming dreadfulness! The reality of this situation in the military is exemplified in *The New England Journal of Medicine; Combat's Toll on a Soldier's Psyche* by COL Charles Hoge's, MD, Chief of Psychiatry and Behavioral Science, US Army (Hoge, 2004).

Shealy, et al, (1992) studied blood-serum levels of five neurochemicals (melatonin, norepinephrine, B-endorphin, serotonin, cholinesterase) in depressives. He found that 92% of depressives had abnormal levels in at least one of the five neurochemicals tested and 60% showed three or more abnormalities. In over half of the depressives he found either elevated or low levels of norepinephrine/cholinesterase ratios. He also found magnesium deficiencies in 80% of depressed patients and 100% of those with depression were deficient in taurine, an amino acid found in meat and fish, which is used to help absorb fats and fat-soluble vitamins. His work supports the notion of dietary supplements for the treatment of depression.

The nucleus accumbens within the forebrain is a primary reward and pleasure center and is

primarily sensitive to dopamine, serotonin and endorphins (Ratey, 2002). Recent research has shown that those with suicide ideation are also low in serotonin, dopamine and norepinephrine along with hippocampal shrinkage as the result of chronic sympathetic and adrenal (cortisol) activation (Ezzel, 2003). Stimulant drugs such as amphetamines and cocaine produce a sense of pleasure by changing the concentration of dopamine in the accumbens. Arango and Mann (Oquendo, et al., 2003) observed with positron emission tomography (PET) scans, a direct correlation between ventral pre-frontal hypofunction levels of serotonin, also in the pre-frontal cortex and the severity of violence of the chosen suicide method. Slightly lower levels may produce death by an overdose of sleeping pills while extreme deficits will lead to the person jumping off of a cliff or blowing his/her brains out.

Serotonin has been well implicated as a driving mechanism for suicide, where both genetic factors and a string of upsetting life events combine to trigger suicide (Ezzel, 2003). In sectioned brains it is clear that suicide victims have fewer than average neurons in the orbital pre-frontal cortex. A study by Chaouloff (2000) reinforced the hypothesis that the HPA axis, in reaction to stress, affects serotonin neurotransmission, partly through the actions of corticoids. Violence and suicide are related. Aggression is aimed at others when there is a combination of *low serotonin* and *high norepinephrine*, whereas aggression is aimed inward (increased suicidal ideation) when there is a combination of *low serotonin* and *low norepinephrine* (Kotulak, 1997).

## **Antidepressants and Electroconvulsive Therapy in the Treatment of Depression**

Several studies have examined cerebral blood flow (CBF) and metabolism using positron emission tomography (PET), single photon emission computerized tomography (SPECT) and functional magnetic resonance imaging (fMRI) analysis (Rubin, Saxeim, Nobler, & Moeller, 1994). Much controversy surrounds these studies. Functional imaging studies have shown confounding (both high and low) irregularities in metabolism, primarily in the basal ganglia, prefrontal and limbic areas that tend to normalize in those who respond to medication.

In some cases, sleep deprivation reduces depression and is tied to reductions in abnormally high CBF within the anterior cingulate gyrus (Wu, et al., 1992). PET scans of those with seasonal affective disorder (SAD) showed both hypo and hyper perfusion of CBF in various regions of the frontal cortex, which normalized following treatment (Cohen, et al., (1992). Antidepressant medication has been shown to affect capillary permeability and the brain-blood barrier (Preskorn, Raichle, & Hartman, 1982). With electroconvulsive therapy (ECT), the electrodes are placed for whole brain or right-side shocks. ECT has been widely used to treat depression. CBF reductions follow shortly after exposure to ECT, even with people who already have hypoperfusion of CBF. For depression, ECT is generally administered to the right side (Rubin, et al., 1994). Right-side CBF reduction would help offset the “alpha” asymmetry, recognized in the QEEG field to be associated with depression and disturbed mood (Rosenfeld, 1997; Siever, 2003) by shutting down right frontal lobe function rather than boosting left frontal lobe function. The rationale of using meds or ECT to impair the right hemisphere of the brain is akin to shooting a hole in the right tire of a car that is always pulling to the left because of a left flat tire. Even though this will make the car drive straight, it will be very slow. This explains why

those on anti-depressants have so much trouble with foggy-headedness and cognitive impairments. This is one of the reasons why pilots and special duty personnel (i.e., Nuclear Surety Program) are medically suspended from duty while on antidepressants. Rubin concluded that both antidepressants and ECT (even with clinical improvements) might further affect regions in the direction of further abnormality, not normalization.

## **Conclusion**

The fear response involves the reduction of serotonin and activation of cerebral norepinephrine and the adrenals as the threatened prepare for battle. However, severe traumas can cause a dysfunctional never-ending activation of the fear response, which fatigues key neurotransmitters and the adrenals as it manifests into PTSD. The implications of PTSD include a combination of family and societal violence, alcohol and drug abuse, loss of wages and increased suicide ideation. Often, pharmaceutical agents and electroconvulsive therapy may alleviate the depression, but drive the brain further into dysregulation, leaving the patient feeling emotionally “numb” and struggling with cognitive impairments. A new non-drug, non-ECT approach needs to be considered.

## **Audio-Visual Entrainment (AVE)**

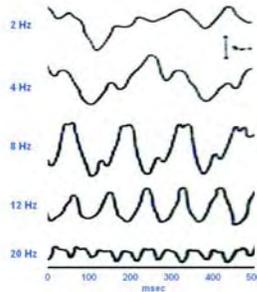
All sensory information, except for smell, must pass through the thalamus in order to gain access into other brain regions. Audio, visual and tactile stimulation all excite potentials within the thalamus and are loosely known as brain wave entrainment. AVE is the entrainment method using light and sound pulses only. Pulsed light is presented to the user via a pair of glasses (Tru-Vu Omniscreen™ Eyeset) with an array of flashing LEDs mounted within them. Pulsed tones are presented through a pair of headphones.

In order for entrainment to occur, a repetitive stimulus of the proper frequency and sufficient strength to “excite” the thalamus must be present. The transmission of energy from AVE excites retinal cells in the eyes and pressure sensitive cilia in the cochlea of the ears. The nerve pathways from the eyes and ears carry the *evoked* potentials into the thalamus. From there, the entrained electrical activity within the thalamus is “amplified” and distributed throughout other limbic areas and the cerebral cortexes via the *cortical-thalamic loop*. This is a loop between the cerebral cortex and the thalamus that generates the *alpha rhythm* at approximately 10 Hz during neuronal rest (Demos, 2005). In essence, audio-visual entrainment (AVE) *is the continuous electrical response of the brain in relation to the frequency of the stimuli plus the mathematical representation (harmonics) of the stimulus wave shape*. The device, which delivers the entraining light and sound pulse-stream is called the *Digital Audio Visual Integration Device*, or DAVID.

Because most maladies have an abnormal brain wave “signature”, the DAVID device can help treat stress and anxiety, depression, insomnia, impact of trauma, racy mindedness, attention disorders, fibromyalgia and cognitive decline. LEDs and xenon strobe lights contain much harmonic content due to the “squareness” or rapid turn-on and turn-off transitions of the stimuli and these harmonics are reflected within the EEG (Kinney et al., 1973). Entrainment occurs

best near the natural alpha frequency from 9 to 11Hz (Toman, 1941). Kinney’s study (Figure 2) shows strong and pure entrainment at 12 Hz. The harmonics (small wavelets) seen in the EEG are a reflection of the harmonics produced in the EEG from the Xenon strobe-light stimuli.

**Figure 2. EEG Showing Photic Entrainment at Various Frequencies**

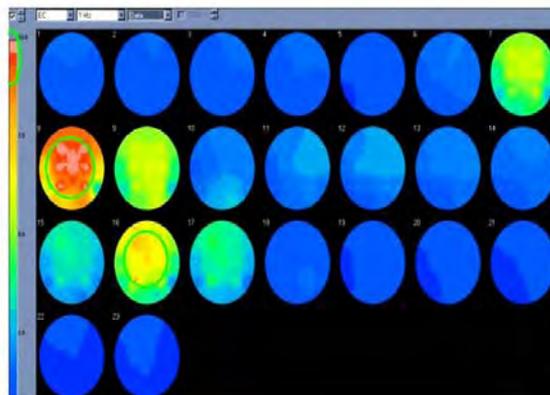


AVE at 18.5 Hz has also been shown to produce dramatic increases in EEG amplitude at the vertex (Frederick, Lubar, Rasey, Brim, & Blackburn, 1999). It was found that:

- a) eyes-closed 18.5 Hz. photic entrainment increased 18.5 Hz EEG activity by 49%.
- b) eyes-open auditory entrainment increased 18.5 Hz. EEG activity by 27%.
- c) eyes-closed auditory entrainment increased 18.5 Hz EEG activity by 21%.
- d) eyes-closed AVE increased 18.5 Hz. EEG activity by 38.3%.

Entrainment primarily shows itself in the frontal, central and parietal regions. (Siever, 2002). Figure 3 shows the results of a 19-channel quantitative EEG (QEEG), or "brainmap" (Demos, 2005) as processed through the Skil (Serman-Kaiser Imaging Labs) database in 1 Hz bins (sorted into 1 Hz groupings) showing the frequency distribution of AVE at 7.8 Hz. The area within the green circle at 8Hz shows maximal effects of AVE in central, frontal and parietal regions (at 10 microvolts, in this case) as referenced with the area in the oval on the legend. It is through these effects that AVE has proven effective in treating depression, anxiety and attentional disorders. A second harmonic is also present at 16 Hz. (the circled image), which is typical of *semi-sine* wave (part sine/part square wave) stimulation.

**Figure 3. Brain Map in 1Hz Bins -- During 7.8 Hz AVE (SKIL-Eyes Closed)**



## Body/Mind Effects of Audio-Visual Entrainment

We conceptualize AVE as achieving its effects through several mechanisms at once (Siever, 2000). These include:

- 1) dissociation / hypnotic induction,
- 2) increased neurotransmitter,
- 3) altered cerebral blood flow,
- 4) normalized EEG activity.

## Dissociation

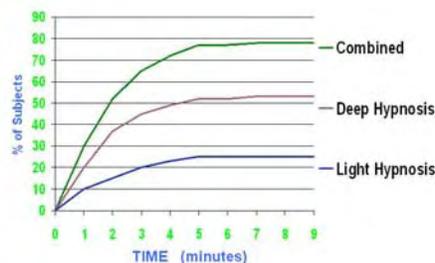
Dissociation, as a tool in psychotherapy, helps in diminishing the emotional component of disruptive memories. Dissociation, when referring to AVE, is a “disconnection” of self from thoughts and somatic awareness, as experienced during deep meditation (Figure 4). AVE induced dissociation is rapid, requires only 4 to 10 minutes in most cases and provides an excellent means for clearing the mind of destructive, fearful thoughts and allowing the person to relax and restabilize (Siever, 2000).

**Figure 4. Dissociating from Negative Thoughts using AVE.**



Visual entrainment alone, in the lower alpha frequency range (7-10 Hz), has been shown to easily induce hypnosis (a form of dissociation). It has been shown that nearly 80% of subjects enter into a hypnotic trance within six minutes during alpha photic entrainment (Kroger & Schneider, 1959), as shown in Figure 5.

**Figure 5. Photic Stimulation Induction of Hypnotic Trance**



Inducing dissociation using AVE delivered by the DAVID1 was found to be more effective than dot staring or stimulus deprivation (Leonard, et al., 1999). AVE using the DAVID Paradise demonstrated to be effective in clinically dissociating people with dissociative anxiety while simultaneously calming them down somatically and reducing their heart rate (Leonard, et al, 2000). As a result, AVE may be used as an effective desensitization tool for reducing dissociative anxiety that is sometimes seen in the PTSD population.

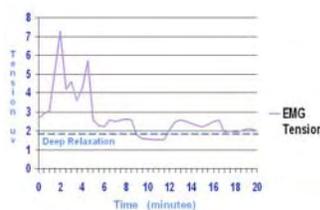
## Limbic Stabilization

As mentioned, the amygdala initiates the activation of the fight-or-flight response, which activates the hypothalamus, which in turn controls all autonomic functioning and is responsible for the “tensed up” feeling in the body (chest breathing, shortness of breath, racing heart, cold, clammy hands, tense muscles, etc.) that is experienced during a fear response. Anyone who has consumed too much coffee will be familiar with these feelings.

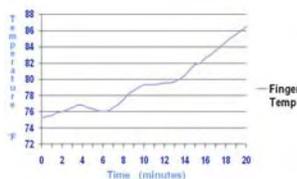
AVE produces a calming effect on limbic structures, such as the amygdala and hypothalamus because properly applied AVE produces a *restabilization* effect where muscles relax (Thomas & Siever, 1989), electrodermal activity settles down, peripheral blood flow stabilizes (hand temperature normalizes to 86-90 F), breathing becomes diaphragmatic and slow, and heart rate slows and becomes uniform (Siever 2000).

Figures 6 and 7 show the calming effect of AVE on the somatic functions of forearm EMG, finger temperature (Hawes, 2000). Heart rate and heart-rate variability (HRV) are sensitive measures of stress (Stein, P., Kleiger, R. (1999). Figure 8 shows graphs of the “FreezeFramer” HRV analysis system manufactured by Heartmath. It shows dramatic improvements in both heart rate and HRV in a woman with adult onset PTSD. Within 10 minutes, heart rate dropped by 22 bpm, and she showed dramatic reductions in both sympathetic and parasympathetic activity (“blue mountains”).

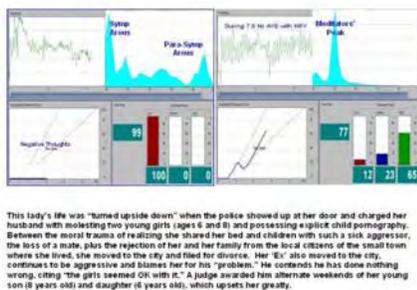
**Figure 6. Forearm EMG Levels During AVE (Hawes, 2000)**



**Figure 7. Peripheral Temperature Levels During AVE (Hawes, 2000)**



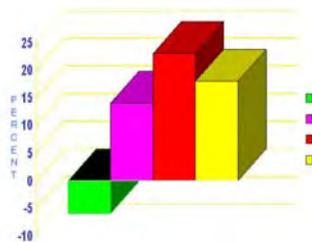
**Figure 8. Pre and Post HRV in a Woman with Adult PTSD.**



## Using AVE to Balance Neurotransmitters

As mentioned previously, people with clinical depression are low in serotonin, dopamine and norepinephrine. As shown in Figure 9, 30 minutes of white-light AVE at 10 Hz increased serotonin levels by approximately 23%, endorphin levels and norepinephrine by 18%, (Shealy, et al, 1989) leading to increased hopefulness, self-esteem, improved sleep, reduced pain and reduced anxiety.

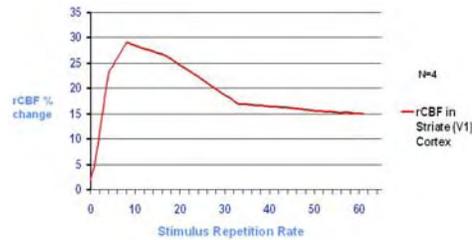
**Figure 9. The Affect of White Light AVE on Neurotransmitter Production**



## Cerebral Blood Flow and Metabolism

SPECT and FMRI imaging of CBF show that hypoperfusion of CBF is associated with many forms of mental disorders. There is even greater concern regarding conditions involving hypoperfusion of CBF in frontal regions such as with trauma and PTSD. Frontal disorders include: anxiety, depression, attentional and behavior disorders, and impaired cognitive function (Amen, 1998). Adequate cerebral blood flow (CBF) is essential for good mental health and function. AVE increases brain glucose metabolism and cerebral blood flow (Sappy-Marinier et al., 1992). A study by Fox and Raichle (1985) showed overall increases in cerebral oxygen consumption by 5% and increased CBF in the striate cortex, (a primary visual processing area within the occiput), peaking at 28% increase at 7.8 Hz as shown in Figure 10. Accomplished Zen meditators also show a peak frequency of 7.8 Hz during meditation (Cade, 1987), and is the most common frequency used for reducing anxiety in AVE therapy.

**Figure 10. Cerebral Blood Flow at Various AVE Repetition Rates**



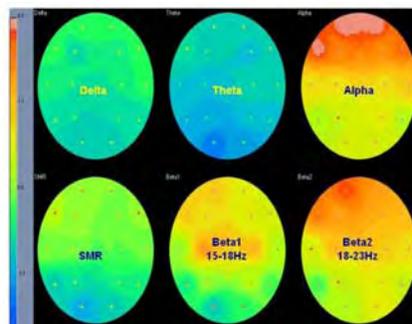
In addition, AVE has also been shown to increase CBF throughout various other brain regions including frontal areas (Mentis, et. al., 1997; Sappy-Marinier, et. al, 1992). A whole head PET analysis of visual entrainment at 0, 1, 2, 4, 7, and 14 Hz on 19 healthy, elderly (mean age=64 years) subjects (Mentis, et. al., 1997) found that regional cerebral blood flow (rCBF) was activated differentially with the:

- 1) left anterior cingulate showing maximal increases in rCBF at 4 Hz.
- 2) right anterior cingulate showing decreases in rCBF with frequency.
- 3) left middle temporal gyrus showing increases in rCBF at 1 Hz.
- 4) striate cortex showing maximal rCBF at 7.8 Hz.
- 5) lateral and inferior visual association areas showing increases in rCBF with frequency.

### **Normalized EEG Activity**

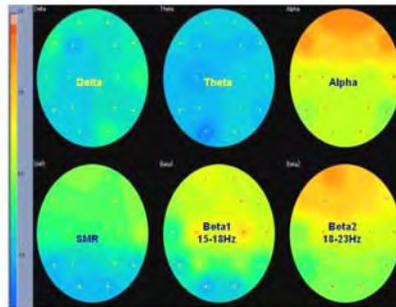
Figure 11 shows a fairly typical brain map in 1 Hz bins of a person with depression and anxiety from trauma as shown on the Skil database. The scale is 2.2 standard deviations (SD) and the pink area in the alpha view is actually 2.6 SD. Activity above 2 SD is considered a clinical abnormality. Notice that alpha activity is higher on the left side coincident with a personality based on withdrawal from negative stimuli. Also, the generalized red colored region is an indicator of generalized cognitive fatigue. The Beta2 activity is just approaching 2.2 SD (an indication of mild anxiety). Non-clinical persons have greater right frontal alpha associated with an attraction toward positive stimuli (Demos, 2005).

**Figure 11. Brain Map in brain wave Rhythms Individual with Depression and Anxiety (Skil-Eyes Closed)**



Approximately 10 minutes after a 30-minute AVE session designed to reduce the symptoms of depression, both alpha and beta activity are normalized as shown below in Figure 12. Notice that the frontal alpha activity, as well as the Beta2 activity, is roughly 1.2 SD above average. The participant was also subjectively aware of his elevated mood and energy.

**Figure 12. Brain Map Following a depression AVE Session (Skil-Eyes Closed)**



## Conclusion

AVE is a powerful technique for treating disorders emanating from chronic fear, be it real or perceived. Chronic rumination, hypoperfusion of cerebral blood flow, loss of neurotransmitters, altered brain wave activity, and adrenal fatigue all contribute to PTSD and the continuation of PTSD. These effects also play a part in anxiety, bodily ailments of all kinds, aggression toward family and civilians at large, depression, substance abuse, and loss of work productivity.

The Digital audio-visual entrainment device (DAVID) has the ability to dissociate the inflicted away from destructive distressing rumination, increases blood flow, normalizes neurotransmitter production, calms the limbic system, restores the adrenals, and produces somatic relaxation. Therefore, the subjective benefits of AVE are reduced anxiety, improved sleep, increased energy, improved relationships with family and civilians, reduced physical problems, improved productivity and reduced dependence for self-medicating on alcohol and drugs. No study has been done to date on the use of AVE in the treatment of PTSD. However, there are hundreds of anecdotal cases of childhood and adult trauma, including abused women, police and emergency personnel confirming the benefits of AVE as a treatment methodology. AVE has been shown to reduce depression and impulsiveness while improving sleep in war vets with either chronic fatigue syndrome or fibromyalgia syndrome (Trudeau, 1999). AVE also has a proven history in treating posttraumatic stress related disorders for the Royal Canadian Mounted Police (RCMP) in Kamloops, British Columbia, where 80% of the officers respond with improved sleep onset, improved quality of sleep and reduced daytime anxiety (Carmichael, 2006).

## About the Author

Dave Siever of Mind Alive, Inc. has lectured and assisted in workshops with leading psychological institutions including the Association of Applied Psychophysiology and Biofeedback, the International Society of Neuronal Regulation, the College of Syntonic Optometry, Walden University, the University of Alberta, A Chance to Grow Charter School, STENS Biofeedback

Training Programs and other venues. He has also recently been invited to lecture at the annual conference of the American College for the Advancement of Medicine in November 2006. Dave Siever has been designing and studying AVE since 1984 when he originally developed the DAVID1 to help performing arts students overcome stage fright.

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### **List of Relevant Publications**

*Does Stress Damage the Brain?* – John Demos  
*Change Your Brain, Change Your Life* – Daniel Amen  
*The Rediscovery of Audio-Visual Entrainment Technology* – Dave Siever  
*New Technology for Attention and Learning* – Dave Siever  
*Getting Started With Neurofeedback* – John Demos  
*The AVE Session & Protocol Guide for Professionals* – Dave Siever

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## The Atlantis Visual/Auditory/Tactile (V/A/T) Immersion System

Thomas F. Collura, Ph.D., P.E.  
BrainMaster Technologies, Inc.



The Atlantis system from BrainMaster Technologies is a new series of devices offering advanced neurofeedback and biofeedback applications. It evolves the BrainMaster products into the next level of technology, and continues our tradition of innovation. One of its more important capabilities is providing rapid, continuous phase-sensitive sensory immersion EEG biofeedback. It also supports conventional neurofeedback, is expandable for peripheral biofeedback, and also provides simultaneous impedance monitoring on EEG as well as peripheral channels. It is available in a new series of hardware, including a 4-channel (2x2) module and an 8-channel (4x4) module. The series employs state-of-the-art hardware sampling with 24-bit resolution at a maximum sampling rate of 10,000 samples per second, providing real-time response and stimulation. The system continuously monitors the trainee's EEG and produces output in the form of auditory, visual, and vibrotactile stimulation. All phase-sensitive feedback is generated entirely within the hardware, avoiding the need for an external PC. This prevents the delays associated with PC operating systems, and provides feedback with a response time of less than 1 millisecond (1/1000 of a second). This system response is essentially real time, comparable in physiological effect to an analog system.

The Atlantis system utilizes a new phase-sensitive feedback method in which every detail of the EEG signal is presented, in an unbiased and responsive manner, to the trainee's senses in the form of light, sound, and vibration. The intent of the system is to provide instantaneous, protocol-free feedback that allows the brain to become immersed in its own electrical activity through the three senses. Any learning or modification that occurs is based upon the brain's own interpretation of the information, and its own goal-seeking behavior relative to the new information presented. This is consistent with self-adaptive theory, and takes advantage of the brain's flexibility in establishing its own goals, and in creating strategies for their fulfillment.

Atlantis stands for "Advanced Technology Local Autonomous Training Immersion System". The system is self-contained, and all data acquisition, signal processing, and stimulation, are controlled within the pocket-sized hardware module. In addition, the module also controls the continuous impedance monitoring and LED indicators, event detection inputs, and control relay outputs. Finally, it is capable of sending data to a PC for processing using the BrainMaster software for Windows.

The Atlantis V/A/T system is integrated with a high quality 2 or 4 channel EEG encoder, sampling at 24-bit resolution, and a maximum sampling rate of up to 10,000 samples per second. The typical operating rate with all features enabled is 1024 samples per second. The amplifiers record DC (Direct Current) and SCP (Slow Cortical Potential) activity as well as conventional EEG. This system advances the existing BrainMaster products into new technology, while retaining compatibility with existing software and applications.

The system also includes real-time, continuous sensor impedance monitoring on all channels, to help ensure quality EEG recordings. The impedance monitors operate at all times throughout the feedback training, whether or not EEG data are being sent back to the PC. The PC runs standard BrainMaster EEG neurofeedback software (version 2.5SE or later), which can be run concurrently with, and independent of, the V/A/T sensory immersion feedback.

The system also supports a set of optional peripheral interfaces that are capable of monitoring variables such as skin conductance, skin potential, EKG, heart rate, temperature, nIR HEG, pIR HEG, and other biological signals. The interface includes a 5 volt supply to power peripherals when required. The EEG and the peripheral channels all include simultaneous potential and impedance recording, using a proprietary "Triamp" design. The system is capable of a maximum sampling rate of 10,000 samples per second, without continuous impedance sensing, but retaining the DC, SCP, and peripheral recording, and all immersion stimulation capabilities. (Note that full expandability to all of these operational features will require the forthcoming BrainMaster 3.0 software release).

The use of combined visual, auditory, and vibrotactile stimulation has a long history. Kahn (1954) implemented and reported on such a system, used to produce subjective states, as well as EEG responses. Variations in rhythms, particularly when made user-selectable based upon individual preference, were found to produce systematic changes in internal states. Evans (1972) applied a similar system to severely retarded children, and also reported clinically useful effects. Collura (1978) applied visual and auditory stimulation in a vigilance task, and reported evoked EEG changes associated with changes in attention.

EEG-controlled photostimulation has been reported by previous authors. There are a wide range of possible algorithms that can be used, and no individual "owns" the concept of EEG-driven sensory stimulation. Early studies that combined photic stimulation with studies of human psychophysical responses were done in the 1970's using entirely analog instruments (Collura, 1978, 1996). More recent methods depend on detecting the EEG dominant frequency, and adjusting the stimulation based upon this information (Carter et. al. 1999). Others employ protocol-based methods, used to selectively stimulate, based upon predefined amplitude-based EEG parameters (Collura 2002, 2005). Others have fed back rapid information based upon momentary information in the EEG, and have reported significant clinical efficacy (Srinivarsan 1988, Davis 1999, Hammond 2001).

The Atlantis "Local Autonomous" V/A/T system does not use any of these previously described methods. The basic phase-sensitive algorithm does not depend on any specific protocol or decision-making based upon the EEG conditions, and it does not use any previously reported algorithms. Its signal processing produces immediate, unbiased feedback intended to reflect the state of the EEG directly to the trainee, without any interventional processing or protocols. Both hemispheres are reflected in the two-channel control system. In addition to the phase-sensitive feedback, the hardware is also capable of interacting with the BrainMaster software (forthcoming version 3.0), to provide other protocols, including specific inhibit-based protocols, and related EEG-controlled methods (Collura 1999, 2002, 2005)

The Atlantis auditory stimulation algorithm utilizes a proprietary method that encodes the EEG waveform in the form of frequency and amplitude, producing a new type of feedback. The method produces a complex, aesthetic sound that yields an other-worldly, ethereal sound with rapid and engaging variations. Every detail of the EEG waveform is heard in the modulation of the sound output. There is no thresholding or synthetic signal generation per se, as is common with conventional auditory neurofeedback. Instead, the EEG signal is transformed into a sound that encodes the EEG information directly, for the brain to process. The brain seems to be able to process auditory information much more rapidly than visual material, and is acutely sensitive to subtle variations in timing and rhythm. The Atlantis sys-

tem thus produces “music” of the brain, in a form that is readily comprehended and understood, despite its subtlety. The two-channel auditory feedback controller provides stereo sound, for an immersive and engaging experience.

The vibrotactile stimulation algorithm is similar to the visual and auditory methods, except that it encodes the EEG signal into a vibratory stimulation, rather than a light or sound signal. Again, the detailed EEG signal can be felt in the vibration, providing detailed information that can be sensed by the back, hands, arm, or any other suitable part of the body. The Aura Interactor Cushion technology is available in the form of a cushion, as well as variations such as a vibrotactile backpack, a “dolphin,” a “bear,” and other forms. The vibrotactile feedback is a single-channel, and is produced by combining (summing) both channels of the EEG into a single vibratory signal. By providing a built-in “sum channel” mode, it automatically provides phase-sensitive “synchrony” training when, for example, homologous sites are used. For example, if sensors are placed at P3 and P4, or O1 and O2, then the vibratory signal will be largest when the brain produces synchronous bursts of alpha or theta, wherein the two channels are reinforced in the signal sent to the cushion.

Atlantis is also an ideal platform for virtual reality, sensory immersion, and other systems. Because it integrates event control inputs and relay control outputs along with the EEG and biological monitoring, it can be used for a variety of physiologically controlled systems. It can control a wide range of devices, through the two-channel external relay output controls. The PC interface to the BrainMaster software provides flexible data processing, monitoring, and storage, plus the ability to program custom applications in many Windows-based languages (C++, Visual Basic, Delphi/Pascal, Flash, etc).

It is capable of monitoring EEG, EKG, EMG, and other biological signals, and integrating them into the feedback and control system for a wide range of applications. For example, Mrklas et. al. (1994) describe a stress reduction system that incorporates visual, sound, tactile, and environmental feedback, including a laser delivering complex visual feedback, to represent the target and actual stress level.

The Atlantis V/A/T system offers approaches to neurofeedback and biofeedback in addition to updated capabilities for conventional neurofeedback. The new autonomous capabilities are intended to be used as adjuncts or precursors to conventional feedback training. Since V/A/T does not include specific targeting, it is more of a conditioning or general method, and less of a targeted training program. Depending on the trainees’ brain state and intentions, the system can produce profound relaxation, activation, or general change. It is suitable for use by practitioners and trainees who are looking for improved brain flexibility, and who can benefit from methods that provide the brain with profound new information. When used in conjunction with other forms of neurofeedback or biofeedback, it offers new approaches to revitalizing brain function and potentiating brain learning and adaptation.

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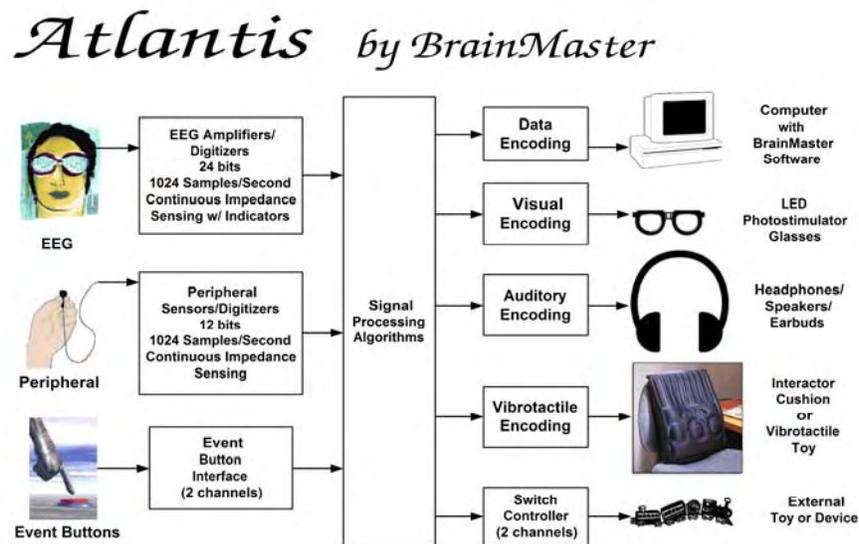
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**Atlantis Visual/Auditory/Tactile Neurofeedback System**

## “Applying Life Force in your Garden”

### A simple observation that convinced me plants respond positively to the Welz Chi Generator.

By Michael Landgraf



Chi Energy is Life Force. Many scientists, including Wilhelm Reich, demonstrated that Life Force (Chi Energy) is a universal energy that most people can feel while others can actually see. To measure Chi Energy, Reich utilized an electroscope and thermometer. He called this energy orgone. You may have heard it referred to as tachyon energy, animal magnetism (Mesmer) or Od (von Reichenbach). Chi Energy was used by the Chinese to balance the body (Chi Kung) and in martial arts (Tai Chi).

In 1991, Karl Hans Welz built the first Chi generator for producing Life Force. He created this generator to enable you to have an unlimited supply of Chi Energy. This Life Force producing Chi generator is intended to increase energy and improve well being. It is free of chemical stimulants so no substances will enter your body. It is for achieving balance and peace of mind.

After learning about this unusual device, and experiencing it's positive effects on humans, I thought it would be interesting to see how this generator would affect the growth of some of my plants.

I find raising plants a great way to relieve stress. Inspecting my plants for buds, finding Praying Mantis and Lady Bugs making my garden their home, and especially in Spring, when growth turns into a blooming array of color, it is most enjoyable to sit out back and focus on this special gift from Nature.

Most plants found in my garden are indigenous. Others are found in more tropical climates. Still others are most likely found in the colder regions. This diversity, where plants from so many different climates grow together in harmony, gives me great enjoyment. We have Mesquite, Saguaro, Joshua Trees and several varieties of cactus. Roses, Jasmines, hybrid poppies and a myriad of flowering plants. Succulents and shade plants abound. And you will find over forty varieties of Orchids and Bromeliads that make up the majority of our tropical selections.

And I detest pesticides!

So after much thinking about how beneficial the Chi generator is for people, I thought: why not see if it can benefit plants as well?

Deciding which plants to choose in my little experiment proved hardest. Not being a botanist nor possessing a 'green thumb' has caused me to often learn the hard way about how best to keep the plants in my garden alive.

So I chose two varieties, both completely different. One variety is indigenous to the Great Plains while the other is common to Central America and the Caribbean.

The plant found wild in the states that make up the Great Plains is known as the Sego Lily. There are sixty-four different varieties of the Sego and of course the variety I wanted was the most difficult to find. It is known as the state flower of Utah (due to its historical value) but it took me years to finally obtain a few bulbs and roots. It has been well worth the searching.

I planted an equal amount of bulbs and roots in three large pots and one dedicated area in my ground garden. I mixed in the exact amount of soil for each area, consisting of soil procured from the desert in Eastern California together with a cactus mix bought locally at a nursery. All plants received an equal amount of water, sunlight and attention.

The accompanying pictures will show you how each plant responded. Plants having the smaller growth received only water (twice per week). The plants with the larger growth, which to remind you were planted at the same time, received exactly the same amount of sun light and water, but also were given two fifteen minute treatments of the Chi Generator. All these treatments consisted of was setting the Chi Generator next to the plants, setting a timer for 15 minutes and walking away. After the treatment session ended, I simply unplugged the ac adapter, removed the Chi Generator and left them to enjoy their day.

The following three pictures show the Sego Lilies that received Chi Generator treatment:



The following three pictures show the Sego Lilies that did not receive Chi Generator treatment:



When comparing the pictures, it became quite obvious to me that the Sego Lilies receiving the Chi Generator treatment have grown to be healthier plants.

My second little experiment involved utilizing the Chi Generator with Orchids. Every Orchid received the same mixture of soil, amount of sun light and water. Three received 20-20-20 Orchid fertilizer every other week and three Orchids also received 2 fifteen minute treatments using the Chi Generator. Just as with the Sego Lily pictures, the results and pictures of these Orchids will make it apparent that the Chi Generator does have a positive impact on their growth and health.

The three Orchids that received the Chi generator treatments:



These next three Orchids did not receive the Chi generation treatment, instead being fed 20-20-20 Orchid fertilizer:



These final three pictures show Orchids that received the same amount of sun light and water, but no Chi generation treatment or 20-20-20 fertilizer:



After completing my amateur experiment, and seeing the differences in growth and hardiness between the plants that were given Chi generation treatments to those who did not, it became apparent that life force through the utilization of the Chi Energizer does have a positive affect.

In conclusion, the plants receiving the Chi Energizer treatment responded positively and appeared to mature faster, in terms of growth (Sego Lily) and coming into bloom (Orchids). The plants that did not receive the special Chi treatment will also continue to go, and the Orchids will eventually grow spikes that turn into blossoms. But the process will be slower. I have found using the Welz Chi Energizer a fascinating tool for enabling my plants to mature faster, appear healthier and prolong the beauty associated with plants during the Spring growing season.

For those of you who enjoy maintaining a garden, incorporating the Chi Energizer is a time and cost-effective method for improving the health of your plants.

To learn more about the Welz Chi Energizer, please visit the following quality websites: [www.MindMachines.com](http://www.MindMachines.com) and [www.BrainMachines.com](http://www.BrainMachines.com).

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For complete information visit: [www.brycetrails.com](http://www.brycetrails.com).

# **The Transformational Power of Storytelling**

**By Lloyd Glauberman, Ph.D.**

Human beings are storytellers. Perhaps more than anything else, it's our love for storytelling and story listening - that makes us human. Whether it's the archetypal myths described by Joseph Campbell, the events of the day on the local 11:00 news, or the personal chronicles of our lives, stories are the fabric of our existence.

Over the past few decades the use of stories, specifically metaphors, has become part of the landscape of modern psychotherapeutic technology. In therapy a metaphor is structured so that learning occurs on the unconscious level of experience. In other words, the listener "peripherally" processes meaning by perceiving information outside of awareness.

As a practicing psychologist and hypnotic storytelling therapist for the past two decades, I can vouch for the power of stories as a vehicle for therapeutic growth and healing. During this period of time I've explored ways to combine elements of myth, metaphors, and adult fairy tales into a unique and effective personal development audio technology.

The technology is called Hypno-peripheral Processing (HPP). Combining the metaphoric strategies of Dr. Milton Erickson within the framework of The Myth Of The Hero as described by Joseph Campbell, the programs take the listener on fantastic journeys that are engaging, relaxing and therapeutic. The protagonists in the stories interact with magical characters like wizards, sorcerers and fortunetellers. These characters, which possess knowledge and wisdom, help the protagonists tap into their internal resources to foster change. Recent research in neuropsychology support the idea that the human mind/brain is "wired" at its core to understand metaphor and specifically metaphors surrounding deep concepts such as journey and transformation.

## **FINDING THE HERO WITHIN**

In terms of pure emotional depth and resonance, myths are the most powerful of stories. The Myth of the Hero clearly reflects this power. In the book *The Power of Myth*, Joseph Campbell describes the theme of The Myth Of The Hero in the following way: "The person takes off on a series of adventures beyond the ordinary...it's usually a cycle of going and returning."

I chose the structure of The Myth Of The Hero for my HPP programs because I believe it resonates deeply within all of us. A person experiencing some difficulty in life is briefly removed from reality, goes through a profound transformational experience, which brings out the best in them, and then returns to everyday life a changed person. Combining adventure and heroics, the Myth of the Hero is a theme universally admired. Aren't we all looking for the heroic within ourselves? And aren't we all looking for ways to overcome internal or external obstacles and maximize our potential?

## **UNIQUE MULTIPLE STORY FORMAT**

Along with The Myth Of The Hero theme, another defining characteristic of the HPP format is its original multiple-story format. Each story (one in the left channel, a different one on the right) incorporates delightful imagery with mytho-metaphoric narratives. The overlapping stories contain a variety of positive messages for change that are targeted for the unconscious. The HPP programs tap into the adaptive unconscious's ability to process information outside of awareness. No subliminal messages are used in this process. Rather, at strategic points on each program the two stories intersect creating positive suggestions for changes in thinking, feeling, sensing and behaving. By utilizing both hemispheres of the brain, a powerful synergistic process is created.

This "dual induction", as it is called in the hypnotic literature, shuts down the logical processing that accompanies our waking state, resulting in a very relaxed, receptive state of mind that researchers call the theta or twilight state. It is called theta because of the dominance of theta waves in the brain, waves which indicate a state in between waking and sleep. In addition, it is often accompanied by dreamlike imagery and vivid memories. Lastly, and perhaps most importantly, this state enhances our ability to learn and absorb information quickly and easily.

## **PROVEN RESULTS OF HPP**

Julian Isaacs, Ph.D., researched the initial series of HPP tapes, Myths, Metaphors & Messages. Dr. Isaacs said the following about the HPP programs: "The HPP programs did produce strong and robustly consistent positive findings. In addition to consistently producing the theta state, subjects reported improvements in mood state, self-esteem, confidence and well-being. I can unhesitatingly recommend HPP programs for their effectiveness."

There are now 17 HPP life enhancement programs that include: The Edge of the Metaphor series, a Body, Mind, Spirit, Relationships program that is structured around renewal and balance. Also available are business-oriented programs such as Money, Wealth & Prosperity, Time Management and Sales Mastery as well as peak performance, creativity, resilience and healing. The range of content areas is broad and reflects the issues that are most relevant to our lives.

At any moment in time we have an opportunity to change the trajectory of our life and have the next chapter in our own personal story be better, brighter, and more productive. Stories, whether in the form of myths or metaphors, can provide the pathway to initiate these life changes. Throughout the ages adults have told children stories at times when they need guidance in order to cope with a difficult life situation. Wisdom and insight are much more easily absorbed when presented within the context of a story. So lie back and close your eyes. It's story time.

Complete HPP series is available at [www.BrainMachines.com](http://www.BrainMachines.com) and [www.MindMachines.com](http://www.MindMachines.com).

# **Computerized Muscle Strength Testing with Introduction of Electromagnetic Radiation and the BioElectric Shield**

**By**  
**Charles W. Brown, D.C., D.A.B.C.N.**  
**Melinda Lee Payne, M.D.**

## **OBJECTIVE**

There is growing awareness among clinicians and the lay population that the increase in the number and strength of electromagnetic fields (EMFs) from computers, microwaves, cellular phones, satellites, etc., is contributing to the decline in health of our population. The objective of this study was to determine if an electromagnetic field (EMF) weakens an indicator muscle and if using a BioElectric Shield™ (BES) could strengthen that muscle while the human body is in the presence of a moderate EMF.

## **METHOD**

This study was designed to use computerized muscle strength testing as a measure of the effectiveness of the Shield. 25 subjects were tested for supraspinatus muscle strength using Hoggan's Compufet transducer with computerized muscle strength readings. The supraspinatus muscle was used because it is associated in Applied Kinesiology with brain and nervous system function. (1) G2 submax or patient initiated submaximal concentric contraction muscle testing was used. (2)

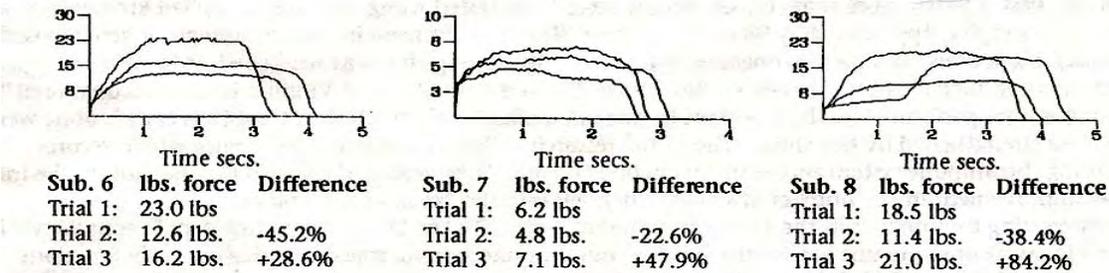
A baseline strength reading was determined with no detectable EMF. Each test subject then sat for five minutes in front of a computer with a reading of 5 milligauss. After this time interval, a second strength reading was recorded. A Shield was hung around subject's neck so that it rested over their lower sternal region. This corresponds to the neurolymphatic point (1) for the diaphragm or the acupuncture point conception vessel 18. After five minutes of using the Shield and still sitting in front of the computer a third muscle strength reading was taken.

## **DISCUSSION**

These were G2 submax muscle tests. G2 testing involves polysynaptic relays through higher brain centers and not G1 (doctor initiated) muscle testing which only involves two/three neuron relays through the spinal cord. By increasing muscle strength in polysynaptic pathways involving the VIII cranial nerve, thalamus, cortex and descending motor pathways, we know that the BES has beneficial affects on varied aspects of the human nervous system including the higher brain centers.

## RESULTS

The results were that each of the test subjects had reduced muscle strength readings after being in the EMF for five minutes. The average amount of decreased strength was 17%. After using the BES for five minutes while in the EMF the average subject's muscle strength readings increased by 44%. Of particular interest was the finding that for 21 (84%) of the test subjects the readings with the BES while in the EMF were greater than those muscle strength readings in the absence of an EMF.



## CONCLUSION

The BioElectric Shield increases muscle strength even in the presence of electromagnetic fields. Using muscle strength as an indicator, the BES negates much of the effect of EMFs and actually increases it in 84 % of the test subjects.

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## The Bioelectric Shield: Unique Deterrent to Computer Related Muscle Weakness and Fatigue

**Charles W. Brown, D.C. and Melinda Payne, M.D. respond to questions regarding a new device called the Bioelectric Shield.**

Charles W. Brown D.C., Melinda Payne, M.D. and Stanley H. Kornhauser, PH.D.

**Dr. Kornhauser: What is electromagnetic radiation?**

Dr. Brown and Dr. Payne: Electromagnetic field radiation, or EMF, refers to certain types of electromagnetic fields surrounding any area where current is produced. Any device powered by electricity (including batteries) will produce varying amounts of EMF. Computers, cell phones, appliances, autos, airplanes, and remote controls all produce EMF.

**Dr. Kornhauser: In the Literature, what has been reported as possible side effects to-EMF?**

Dr. Brown: Worldwide research has reported a range of reactions to exposure to EMF. In some studies, no statistically significant effect was noted. In many other studies effects included headaches, fatigue, hormonal abnormalities, and miscarriages, reduced immune system function including several different types of cancer.

**Dr. Kornhauser: What do you notice in your own practice?**

Dr. Brown: I notice that patients who worked long hours in front of a computer monitor report fatigue, headaches, and feelings of stress far more frequently than the rest of my patient population. In addition, my other chiropractic patients who do not work around computers and other office equipment or cell phones seem to need treatments much less frequently.

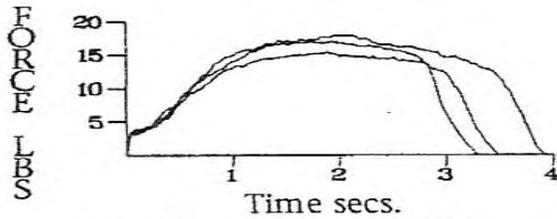
Dr. Payne: Many of my patients who spend four consecutive hours or more at their computers complain of headaches and increased depression.

**Dr. Kornhauser: Is there any known intervention to exposure to certain kinds of electromagnetic fields?**

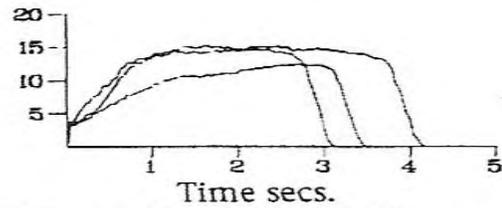
Dr. Brown and Dr. Payne: Max von Laue won a Nobel Prize in Physics in 1914 by showing that x-rays could be reflected and redirected with a zinc-sulfide crystal (ZnS), in much the same way as mirrors are used to reflect and redirect visible light. William Bragg won the Nobel Prize in 1915 for establishing “Bragg’s Law” which determines the specific crystal spacing (i.e. the specific lattice spacing) needed to reflect and redirect any type of electromagnetic energy. Since then, scientists have used natural crystals to reflect and redirect other types of electromagnetic radiation (like gamma rays) distances for exactly 5 minutes per trial as calculated with a stopwatch with an alarm when the time was finished.

**Dr. Kornhauser: What were the results?**

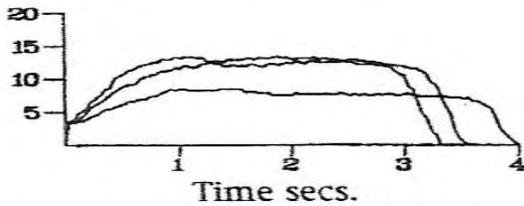
Dr. Brown and Dr. Payne: Twenty-four of the 25 subjects had reduced muscle strength readings after being in the EMF for five minutes (testing condition #2). The average amount of decreased muscle strength was 16.52%. After wearing the BioElectric Shield for 5 minutes, all 25 subjects showed an increase in muscle strength. The average increase in strength was 25.75%. Below are readings from 4 subjects:



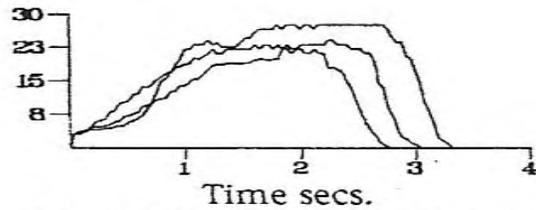
Sub. 9	lbs. force	Difference
Trial 1:	17.0 lbs	
Trial 2:	15.4 lbs.	-9.4%
Trial 3	17.9 lbs.	+16.2%



Sub. 10	lbs. force	Difference
Trial 1:	15.2 lbs	
Trial 2:	12.4 lbs.	-18.4%
Trial 3	15.2 lbs.	+22.6%



Sub. 11	lbs. force	Difference
Trial 1:	13.3 lbs	
Trial 2:	8.5 lbs.	-36.1%
Trial 3	13.5 lbs.	+58.8%



Sub. 12	lbs. force	Difference
Trial 1:	24.0 lbs	
Trial 2:	23.0 lbs.	-4.2%
Trial 3	27.5 lbs.	+19.6%

**Dr. Kornhauser: What Preliminary conclusions did you draw from this study?**

Dr. Brown and Dr. Payne: For many people, exposure to EMF's contributes to a weakening of muscles, specifically the supraspinatus muscle. The Bioelectric Shield increased muscle strength even in the presence of an EMF. If we are using muscle strength as an indicator, the Bioelectric Shield negates much of the effect of EMF's. A more general conclusion is that is that exposure to EMF can produce stress and fatigue in certain people. The Shield could negate much of these effects in certain people.

**Dr. Kornhauser: Can Physicians easily test patients for EMF sensitivity?**

Dr. Brown and Dr. Payne: Patients who report specific symptoms that they link to computer exposure, office work, and cell phones can be tested for EMF sensitivity. Any physician familiar with applied kinesiology can test patients for their sensitivity to electromagnetic fields. For those who aren't, the Bioelectric Company can provide licensed physicians with testing procedure information. The testing takes less than one minute.

**Dr. Kornhauser: What benefit could the Bioelectric Shield technology provide computer and cell phone users?**

Dr. Brown and Dr. Payne: Patients who have worn the Bioelectric Shield have reported benefits that vary with the individual. Patients who have worn the Bioelectric Shield have reported benefits consistent with less fatigue, i.e. greater energy and concentration throughout the day.

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For Specific Product information, and testing procedures, you can contact: The Bioelectric Company, 645 Dean Creek Rd Lavina, Mt. 59046, by phone 1-406-575-4464 or 1-866-567-8909, by email [info@bioelectricshield.com](mailto:info@bioelectricshield.com) or visit [www.MindMachines.com](http://www.MindMachines.com) or [www.BrainMachines.com](http://www.BrainMachines.com).

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## **New Product Review:**

### **The Electric Lodestone MP 150: 220v Model**

Pulsed Magnetism: The Electric Lodestone for Personal Pain Relief. The Electric Lodestone is a personal health appliance that targets pain relief and chronic medical conditions. Anecdotally, it relaxes muscles, eases tension, promotes restful sleep and may provide relief for arthritis, tendonitis, bursitis, headache and pain associated with pinched nerves, repetitive motion, joint trauma, varicose veins, bone spurs and other heel or toe discomforts. It works as a pulsed electromagnet stimulating electrochemistry deep within the body. With the success of the 110v Electric Lodestone models, the manufacturer now offers this easy-to-use system in 220v format, enabling those of you who reside in regions utilizing 220v as the electrical standard to experience the positive benefits of the Electric Lodestone MP 150.



The MP 150 is a custom-built system that you can special order by contacting: [store@mindmachines.com](mailto:store@mindmachines.com). The special introductory price for the MP 150 is: \$298.00.

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An Amazing Stand-Alone Color Therapy Device  
That Also Works with ANY Light and Sound Machine

Hemispheric



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The Purest



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## Product Updates:

### The **ALLcolor** Visual System® AVAILABLE NOW FOR \$199.

The ALLcolor Visual System is a color producing generator that delivers both constant and pulsed color stimulation. Constant color for color therapy, pulsed color for use with your light and sound system. Whichever mode you select, you will have over 4,000 shades, mixtures or pure colors to choose from. You choose the color you wish and change the color when you want, at anytime during your session, without having to fumble with lightframes for moving switches or pressing buttons in order to change the color. The ALLcolor Visual System includes lightframes that possess the latest in RGB-LEDchip technology, a color control console that enables you to easily select the color of your choice (with left eye / right eye independent control), ac adapter, stereo patch cord (for connecting the ACVS color console to the light-frame port of your light and sound instrument), and an easy-to-understand Owners Guide on CD (that even contains an RGB color chart for illustrating exactly where to place the color console sliders for achieving the exact color you desire). You also receive several small peel-on/peel off lightframe diffusers that enable you to either experience direct, focused color stimulation or stimulation that illuminates your entire lightframe field of vision.



Since its inception, the ALLcolor Visual System has been the popular choice of professionals and personal users for experiencing every pure color or mixture of colors imaginable.

The ALLcolor Visual System is a true bargain. Check the prices you have to pay for lightframes that deliver just one or two colors. Consider how much it would cost to enjoy a variety of colors. Even owning dozens of different colored lightframes could not give you the selection available with the ACVS as LEDs come in just a few, select colors. But with the ALLcolor Visual System you get every color and at a very cost-effective price. **The complete ALLcolor Visual System is available to you for only \$199!** To learn more or to order the ALLcolor Visual System, please visit: [www.Mindmachines.com](http://www.Mindmachines.com) and [www.Brainmachines.com](http://www.Brainmachines.com).

## Introducing the Latest in AV3X Digital Technology on DVD:

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**ALL NEW: "AV3X Vol. 2"**. Here is the long-awaited sequel to the initial AV3X on DVD. Featuring five new, visually captivating sessions with an incredible soundtrack, you are gently guided into a variety of unique and completely relaxed states of mental and physical sensations. This newest creation by Christopher Oliver contains 60 minutes of totally synchronized visual images, music, highly entraining (yet barely audible beat frequencies) in Widescreen 16:9 format. And like AV3X Vol. 1, the light stimulation is optional. The "AV3X Vol. 2" is a Region Free DVD. For more info visit [www.av3x.com](http://www.av3x.com) and [www.mindmachines.com](http://www.mindmachines.com)



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-Nicholas Soffron, Ph.D., A.M, Psychotherapist



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WIDESCREEN 16:9

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# **The Chroma Light Activator**

## ***Powerful Light Frequencies For Use At Home!***

**By Jeff Labno**

The Chroma Light Activator is a state-of-the-art device that delivers quality colored light absorbed through the eyes. The field of light and color is actually in its infancy and has a huge potential future to look forward to. Using light and color is an extremely cost effective method towards preventive healthcare maintenance for use in the home.

The Chroma Light Activator (CLA) balances the central nervous system by bringing into greater balance the body's sympathetic and parasympathetic reactions, resulting in reducing the fright-flight response. This balances one's emotions leaving one calmer, more clear minded, and better able to cope with life's daily stresses.

Exposure to natural sunlight and the rhythms of sunrise-sunset used to play a critical role in hormonal health; until people moved indoors relying on artificial light. The CLA brings color light treatment back into your home working for you, protecting your health because it calms the mind, and balances hormonal activity. A calm mind is good to have, it means a resourceful mind.

We are proud to offer the Chroma Light Activator for use in the privacy of your home, or for use in your professional office.

What you get: solid steel powder painted hand crafted unit made in the U.S.A. (13" tall x 12" wide x 11" deep, weighs 13 pounds), 6' cable plug (12 Volt AC Adapter, 120 Volt U.S. power), manual depicting different light applications, 1 year warranty (void if damaged by spillage or neglectful dropping of equipment, or mistreatment of equipment, or using it in countries not configured to U.S power requirements without a proper power converter).

The Chroma Light Activator has a very professional look, and the components are designed by a gifted electronics engineer. For use in other than the U.S.A., consult with your electronics store to purchase a power converter.

The control panel has 2 features 1. single colors, 2. bi-colors. The single colors consist of your choice of (dark red, red, red/orange, orange, yellow, yellow/green, green, blue/green, blue, violet, and white). The bi-color feature allows you to mix the colors, creating virtually any color you can image that exists in nature occurring from sunrise to sunset. In the bi-color mode, there is light intensity independent control for mixing and blending colors, adding depth of hues to your color selection.

Most people use the unit several times a week for 20 minute sessions, particularly during the winter months to ward off SAD (seasonal affective disorder). Seasonal affective disorder occurs during the winter months when the warmer light frequencies (red, orange, and yellow) are filtered out by the atmosphere in greater amounts due to the increased angle of the sun to the earth's surface. SAD leads to disrupted sleep, irritability, and fatigue.

Use in a dark room, 20 minutes several times a week. Turn off phones, loosen clothes, make yourself comfortable and tell others in your home not to disturb you.

The Chroma Light Activator has been beta tested and reviewed by world-renown light therapy specialists since 2000; and is now available for use by anyone from housewives to students, and for businesses who are serious about using light and color for healing the body and for stabilizing moods. This is a veritable ColorSpa of-the-future that will make a difference in the quality of your life.

Documents from the dawn of mankind's history dating back thousands of years, b.c.e. (Before the Common Era) in China and in Egypt chronicle how light and color is essential to wellness.

Some of the first documented uses of light as therapy were recorded in Europe during the Middle Ages, when people climbed high up into the Alps during the summer months where the thinner atmosphere exposed their skin to greater amounts of ultra violet light, helping heal skin disorders.

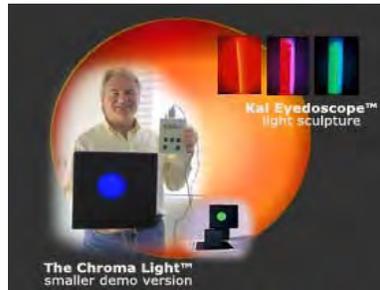
In Medieval times, cathedrals adorned their windows with masterfully crafted stained glass panels. When the sun's rays filter through these beautiful stained glass panels, it had the effect of stabilizing moods.

Much later in the 1800's; the science of light captivated an audience of people using light frequencies to heal specific medical distresses. This development came about due to new discoveries studying light and color emissions from distant planets and stars in space. Edwin Babbitt wrote a book called Principles of Light and Color that inspired Garibaldi Dinshah to write his maverick book entitled, Let There Be Light.

NASA uses red light onboard space craft, and the U.S. Navy on submarines to accelerate wound healing in oxygen-deprived environments. Blue light has long been used in hospitals for babies with jaundice. Blue and red light has been found effective to alleviate acne.

The Chroma Light Activator is the latest technology delivering healing light in the privacy of your home, and at an affordable price.

Using the Chroma Light Activator is as simple as plugging it in and pushing a button to change colors. Put the Chroma Light Activator on a table top, sit in a chair 3 to 5 feet away, and gaze at each color for just 1 - 2 minutes. Color gazing has the effect of "unfreezing" hidden pent-up emotions within the body-brain's neurochemistry. An emotional release results causing a domino effect impacting neurochemistry, hormones, and positively impacting physical health.



When you get your Chroma Light Activator, minimal assembly is required (details provided). The durable metal frame is attached using 8 screws (included) to two rectangular mid sections which slide into one another. Assembly time is just 10 – 15 minutes and requires nothing more than a Phillips screw driver. If you don't deal well with simple assembly instructions, just ask a friend to help you!

### **The Control Panel**



The keypad on the controller has ten buttons:

Channel 1: The left row (four buttons) is channel 1 producing monochromatic, single frequency LED light colors, with forward and back buttons at the top of the keypad and two arrows for light Intensity (0-9 level) on the bottom.

Channel 2: right row of buttons is channel 2 Multichromatic colors (two LEDs frequencies combine to produce a blended color for example magenta, scarlet, pink etc.) with light intensity control buttons on the bottom.

The Chroma Light Activator has made a difference in the quality of life for users from Europe to the U.S.A. Use it for general health maintenance, mood disorders, hormonal wellness, and more.

Price \$5,499.95 + Shipping and Handling. The Chroma Light Activator is a custom made-to-order Professional Non Returnable / Non Refundable Item.

Shipping is by an insured carrier and is based upon destination. Call ahead for shipping charges; dependant on destination.

Each Chroma Light Activator is custom manufactured per order, so allow 5-6 weeks delivery time.

Warranty covers parts and labor, not shipping; unless the unit arrives damaged.

For orders and information please contact Michael Landgraf at 818-831-7931 or [store@mindmachines.com](mailto:store@mindmachines.com).

For technical support please contact Jeff Labno / [Labnoconsulting.com](http://Labnoconsulting.com) at 323-644-2997 or [jefflabno@adelphia.com](mailto:jefflabno@adelphia.com).



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