

AVS

Vol. 2, #2

Auditory / Visual Stimulation

Includes:

Andrzej Slawinski & Audiostrobe

Buyer's Guide: Part 3

The Chemistry of Thought

Surfing the Schumann Resonance

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AVS Journal Vol. 2, #2 / Spring '02

Thank you for your support of the AVS Journal. We hope you find the information contained within these pages to be useful and thought-provoking.

We have included quite a selection of topics for your reading enjoyment. There is Jeff Labno's third of four installments on the AVS Buyer's Guide, which when completed, will make an excellent guide for purchasing avs instrumentation and hopefully replace that superannuated guide that has been out there for far too long. Jeff has also provided us with an interesting story about how he became familiar with the Schumann Resonance and offers an easy to understand description of what it's all about.

Anyone associated with EEG/neurofeedback should be aware of the work by Tom Collura, Ph.D., and President of BrainMaster Technologies in Oakwood Village, Ohio. In The Chemistry of Thought, Dr. Collura outlines some general issues and presents some specific considerations relevant to the scientific understanding of the mind and brain, and how biofeedback can play a dynamic role.

It seems most avs users own at least one AudioStrobe CD. With musical compositions accompanied by synchronized lights, they are enjoyable and entertaining to experience. And now it is time to learn about the individual who created AudioStrobe technology, Andrzej Slawinski. His is a fascinating story about artistic exploration and the ability to create, and how this journey lead him to acquire the knowledge for developing AudioStrobe technology. Both Jeff and I thank Andrej very much for taking the time out of his incredibly hectic schedule to share his story with us.

I became aware of Todd Murphy and his Shakti helmet from the Mind-I list, which is an egroup on Yahoo. Like most of the members, I was fascinated, curious to learn more. Especially the feedback coming from Shakti users. What Todd has developed, what Shakti is, is beneficial. In Shakti - New technology for spiritual process, Todd will introduce you to Shakti.

For those of you who would enjoy turning your computer into a mind machine, and then some, the MindExplorer SW overview is a must read. Written by the developer, Tomas Cerny, you'll learn how a simple software program can meet the needs for custom session creations by even the most devout mind explorer. Inexpensively!

Do you ever wonder which avs instruments are preferred by intermediate and advanced users? A special thank you goes to Mark Chiang, avs user extraordinaire, for setting up the Mind-I Poll for voting for your favorite avs / light + sound machine. Check out the results so far, and be sure to cast your vote for the unit you use!

New products will soon be on the market. Michael Stevens gives us an in-depth look at the Welz Chi Generator, Photosonix introduces their new InnerPulse mind machine, and Syntetic Systems offers a personal approach to EEG instrumentation with their upcoming Thought-Stream Pro.

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Before closing, I have a question, well two questions, for manufacturers of avs equipment:
What exactly is a \$5 drop-ship charge? And whose brilliant idea was it?

-Michael Landgraf
Editor

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“For all of you who have children that enjoy coloring books, we have a free 49 page coloring book in pdf downloadable format. No personal information is needed to download. Just visit www.mindmachines.com and click on “Free Download” located on the entry page to our website. It is something we wanted to make available for kids. For those interested, we hope you find it enjoyable.” -Michael Landgraf

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The Fossil Phil Way

Dr. Schumann and Your AVS Machine: Surfing the Schumann Resonance

by Jeff Labno

About 20 years ago, I first became aware of atmospheric resonances, and boy was I stunned concerning their power and consequences.

Early one morning in the late seventies, I was having breakfast with my friend, Dr. Bob Beck. This conversation became the start of a whole new understanding for me.

He said that he had been asked by the U.S. Navy to check out and find the cause of some very strange happenings in Eugene, Oregon. People driving around town were falling asleep while behind the wheel. I remembered reading something about that in the newspaper, but never thought much about it.

At that time, Bob was making small and portable brainwave machines for NASA. The astronauts used them to prepare for the unusual brainwave states that occur when in zero gravity.

Using very sensitive equipment, Bob detected a very low frequency of 7.25Hz resonating in the atmosphere at Eugene. He said it was being transmitted from Russia.

Bob's story was like something you read about in science fiction. I needed someone else to convince me that an atmospheric frequency could affect brainwaves so dramatically.

A few months later, my dad joined us for breakfast to listen to Bob's story. My dad worked on Mach aircraft and spacecraft as a vibration specialist. After breakfast, my dad confirmed that the technology existed for such things to happen, and the Russians were using low frequencies to communicate with submarines. He was very impressed with Bob Beck's findings!

One day, Bob showed me an array of strobing magnetic devices developed to counter the atmospheric frequencies that were putting people to sleep. They were made in East Germany which then was being bombarded with low frequency Russian communication transmissions. These protection devices were in the shape of pens, or tiny metallic boxes which you could put in your front shirt pocket. The Max Stress Controller is an example of this type of technology.

In 1980, I set up a biofeedback workshop for Bob Beck where he mentioned that listening to an audio simulation of the Schumann Resonance Frequency, you could learn to match your brainwaves with that frequency while hooked up to a biofeedback machine. This would produce a state of mind where you could see things clearly with your mind - remote viewing.

So, what's up with the Schumann Resonance? What is it, and what does it really do?

In the early '50's physicist W.O. Schumann made known the existence of atmospheric resonances precipitated by the 300 lightning strikes per minute

and the resultant sonic booms called thunder. In the early '60's, magnetic transducers were developed to record these atmospheric resonances, now known as the Schumann Resonances.

These resonances consist of a base frequency of around 8.73 Hertz, and ten overtones; the main ones being 14, 20, 26, 33, 39, and 45 Hertz with a daily variation of plus/minus 0.5 Hertz. The frequency fluctuates depending on atmospheric factors such as tides, magnetosphere, and day time versus night time. This gets complicated, but if you want to research it, look on the web for Martin Fullekrug at the Institut fur Meteorologie and Geophysik, Univ. Of Frankfurt.

The source of this atmospheric activity is the sun converting hydrogen into helium which produces the solar wind. The solar wind carries highly charged particles through space, some of which collect in the Earth's magnetosphere. These ions traveling faster than the speed of sound ionize atmospheric gases producing the Northern Lights, plus feed into the moisture of thunderclouds from the ionosphere causing lightning.

UC Berkeley Seismological Laboratory pioneered the installation of two triaxial magnetic transducer measurement stations at Hollister and Parkfield, California, in order to measure and record the Schumann Resonances. Any increase in these frequencies would indicate increased activity on the sun, which is useful for forecasting seismic activity on Earth. They publish them daily at: <http://www.quake.geo.berkeley.edu>.

Two other monitoring sites are located in the Negev Desert, Israel, and another run by the University of Electro-Communications in Tokyo, Japan.

A site by Scott Fusare with details on building your own Schumann Resonance transducer is: <http://radio-research.bei.t-online.de/project5/zchumann1.pdf>. Building specialized transducers (Schumann Transducers) has many hidden challenges. My first job involved building transducers and data systems to measure vibration resulting from earthquakes on the containment vessels of nuclear power plants.

What makes the Schumann Resonance so interesting, is that so many AVS machines use it for meditation programs. Quite a number of other types of Schumann Resonance products have also appeared on the market.

The first Schumann Resonance product was developed in 1974 by Dr. Ludwig in Germany. It is a small box which emits this resonance in the form of magnetic strobe. He worked with NASA to install a Schumann device on manned spacecraft. Dr. Ludwig worked at the Institute of Frequency Technology, is a doctorate of Physics, and currently develops medical therapy devices.

Another researcher, Dr. Andrija Puharich developed the Teslar watch in 1986. Dr. Puharich and his friends were known as the "Round Table Foundation of Electrobiological". Some of the illuminaries were John Hammond, Nikola Tesla's only student, and Warren McCulloch (Cybernetics).

I first began doing detailed research on the resonance because of the many conflicting definitions that were out there. A popular geologist, Gregg

Braden, says for example, that the frequency for this resonance is rising. When you check out the published frequencies on Berkeley's website, you can see for yourself that there is no evidence of it rising, it remains at 7.83 Hertz!

In 1999, a product specialist paid a visit to Gregg Braden at a Sedona workshop to ask him about this discrepancy. Gregg admitted that it is not the Schumann Resonance (atmospheric frequency) that is rising, but instead, the frequency of the Earth itself. He said that transducers deep in the Earth at a secret location in Russia and Norway are the basis for his research. He says that increased activity of people, buildings, cities...are the cause of Earth's frequency rising.

When you look at the state of affairs of life in the city, it is easy to see how all the noises of the city take your brainwaves and body rhythms on a "wild ride". Then we have the invisible world of EMFs strobing at additional frequencies. It is interesting to note that people living in the country are much calmer than those living in the city.

So, what's the benefit of using a Schumann Resonance product? It works well for EMF protection because it keeps your body's rhythms in tune with those of nature, enhancing your ability to heal. This frequency is also at the transition point from consciousness to being unconscious; that is why it is used for meditation. The Yogis call this the point of bindu - conscious unconsciousness. Some people say that it helps them be more creative, do remote viewing and even sleep better.

The first AVS machine to use the Schumann Resonance was the Mind's Eye (1988) by Syntetic Systems. Now, Schumann Earth Frequency programs are common to most machines. The companies that use this resonance are Syntetic Systems, DAVID Paradise, MindGear and Photonix. There is a significant public response to using these programs, people really like them! These programs work by pulsing a sound tone at 7.83 cycles per second.

Other types of Schumann Resonance products (Magnetic Field Generator, Mini Harmonizer) strobe a magnetic field at 7.83 cycles per second.

The most popular Schumann product is the Teslar watch; wearing a watch is quite convenient. In his design, Dr. Puharich put a scalar 7.83 oscillator inside a watch shielding it from 60Hz alternating current with a copper plate with a mobius loop to cancel out the effects of alternating current. Wearing the watch, people report a greater sense of wellness, relief from jet lag, and greater overall energy.

This wraps up my story on the Schumann Resonances. Pending reader response to this story; there could be a follow-up piece. So, please write to us if you have anything to contribute.

Jeff Labno, 800/456-9887x125 or jeff@toolsforwellness.com

Just for fun, check out these research abstracts about the Schumann Resonance on "Pubmed" website.

Davydov B.I., Karpov V.N., Constant low-frequency electrical and electromagnetic fields (biological action and hygienic evaluation), *Kosm Biol Aviakosm Med* 1982 Sept-Oct; 16(5): 18 - 23.

Plagenhoef S., The measurement of extremely low environmental frequencies, *Neurosci Biobehav Rev* 1992 Winter; 16(4) 473-80.

Special thanks to (for providing details for this story):

Dr. Robert Beck, Ken Chane, Michael Thau, Ray Wolfe, Edward Courtney and Robert Austin.

Conversations with Andrzej Slawinski: Creator and Developer of AudioStrobe Technology

So, how did AudioStrobe technology begin?

"Well actually, it really is about the story of my life.

At the age of 14 I had the chance to visit the Soviet Union and after two weeks recovery back in Poland, to leave for the USA. I think it must be a kind of a culture shock for me visiting so different systems in such short period of time. (Apparently Poland was not so much 'communistic' as it was supposed to be!)

Having the great luck of getting financial support for attending a private high school (Gilman) in Baltimore. There, I was computer spoiled for the first time in my life.

Almost every afternoon after the study hall, before gym, I disappeared in the computer room. And what a computer they did have! It must be one of the first solid state HPs with 64 K RAM and large as a wardrobe itself.

But anyway, at Gilman in the music class I heard for the first time in my life Tomita's electronic interpretation of Musorsky's 'Picture at an Exhibition' and then 'Switched on Bach'.

I was very fascinated by the possibilities of the electronic music and I made my first attempts with the school's HP. I did not bring it to sing like the HAL computer but still the tape puncher made several different rhythms. Also I used my parents hi-fi set for making recordings of sounds of falling books, clapping chairs and feedback tones between the speakers and the microphone. I played this piece to an American colleague of my Father and he just asked 'How did you generate this?' I believe he was disappointed to hear it was so simple.

In one of the mail order catalogs I found simple devices for relaxation using biofeedback techniques. I would love to order one but they were just

beyond my financial fantasies.

One day I read an article in one of the American magazines about synesthesia. I was fascinated by the descriptions of people who could see sound or smell visuals. Although the description was rather popular description of pathological state I felt that there must be much more about this 'symptom' in the art creation process. I did not imagine then that this phenomenon of synesthesia will be one of my main ideas in the role as a producer and director in my life.

After one year of stay in the USA I had to go back to Poland. There was a further electronic music fascination in me especially after watching in Kubrick's and Clarke's film '2001' the 'Tunnel Flight' scene.

In order to heal my depressions from the grey reality of the 'socialistic' society and the rigid school system I built a color organ and 'danced' with my hands throwing shadows on the wall to the rhythm of the hard rock music of the '70's.

Having just passed my 16 I read an article in an official 'Poland' magazine about a Polish artist, Stanislaw Ostoja-Kotkowski, living in Australia, who was doing experiments with music and visuals generated through modulation of laser light by the original audio signal. I have seen some of the photographs from his performances and I was very impressed. The editorial staff of 'Poland' magazine was kind enough to pass my letter to the artist and some weeks later I received a letter from him. I wrote him back and received an answer again. He was so kind to describe some of his next plans for his project and they dealt with controlling the laser lights with biofeedback in order to create visuals. This brought me back my interest on EEG and other biofeedback systems from the USA. I checked some of the electronic catalogs for operational amplifiers but they were not sensitive enough and not yet available in Poland. I moved to another city with my parents and then I lost contact to Mr. Ostoja-Kotkowski. Today through an internet search I learned that he has passed away. Some of his works are stored in the database of the Melbourne University.

I was able to try out one of the first 'moogs' on an international fair in Poznan. The keyboard was a kind of a touch panel. My girlfriend waited patiently for me but I was lost in the world of sounds, starting and stopping the simple sequencer, and playing with the effect patches. Some time later, maybe hours later I just heard a voice 'We have to close now. Man, you have to stop playing otherwise you will become crazy!'

Together with two of my high school friends we took apart a transistor-built Russian 'Minsk' computer, which was 'donated' to our school by the local university as they had to make place for a new integrated circuit model.

Using these parts and others we were building from optical pickups for guitars up to a simple polymoog system including a ring generator and some audio effects. With these equipment I did my first compositions.

This was time of many changes, in myself, as well as in the political climate in Poland. My inner outlets was reading modern literature, writing

poems and play scripts, short stories, experimenting with sound and I also started to paint again. This time I had a project in my mind where music and visuals would be united in a synesthetic experience. I planned to use air-brush technique and frame by frame recording film camera. The music was to be the first part of Beethoven's 9th.

In high school I began to study physics but soon noticed my artistic part taking over. I joined one of the experimental theater groups, 'Maya', first as doing lights for the running play, but soon I had the chance to receive professional training as actor. This was fascinating time working on plays, improvisation techniques, changing and growing. I visited many Polish and international theater festivals, workshops and other cultural events. These 3 years were so intensive for my personal growth process, intensive in the social changes culminating with the 'Solidarity', and in the interaction with the artists in the community that it is more proper to spare all this memories for a separate story.

'Tamas' Theater

In the friendly and international climate of the Heidelberg University I founded a new theater group 'Tamas Theater'. As starting script was my adaptation of Herman Hesse's tale 'A Message From Another Star'. We used black light (UV) and regular spots to change fast from one world to another. In this play dealing with the subject of war and peace we were using recordings of interviews from passers-by on the street and children talking about war. I was using language lab equipment for preparing the tracks.

Outside of Tamas, I rehearsed with a professional Argentinian artist Jorge Aquista. He saw one of my performances and asked me to work with him. His main activity was at this time conducting theater workshops and seminars. We learned much from each other through our meetings in the rehearsal room, where he taught me his techniques and I taught him mine.

We decided to do an audiovisual performance based on Carlos Castaneda's books, Polish poem writer and visionary Adam Mickiewicz, Wittgenstein's Philosophical Treaty and others. It was named 'The Power of the Other Reality'. I played Don Juan, and he, Castaneda and each of one of us was the other's director. We went on tour to many German cities, living from performances and conducting theater workshops.

My next play was about 'Birth, Life and Death', which I performed with my pregnant wife. This time it was a collage of our thoughts about this subject. For the first time I was using a piece of my own composed music, which I performed on a PolySix Korg synthesizer to a 4 Track recorder.

Then, we moved from Heidelberg to a small village, Krumbach, in southern part of Germany. Here I had adapted part of our house to a small theater and workshop room. I continued the 'Tomas Theater' doing workshops and seminars. One of our plays was a world premiere by a Russian playwright Vvedensky's 'Christmas at Ivanoves', a very absurd and poetic theater piece.

'Tomas Laboratorim'

My passions in Krumbach were music and photography (slide shows). First I adapted my PolySix's appregiator and my Amiga Commodore 64 so that I was able to 'program' single music sequences and synchronize it to my 4 track DBX recorder. Using ping-pong techniques I was able to get as many as 10 different tracks. I made my first tape for theater and meditation: 'Waves of Coincidence'. My next step was to control the single keys of the PolySix by computer. Then, the MIDI system became available.

I bought one of the first MIDI sequencers for Commodore 64 (C Lab?) And a MIDI interface. I sold my good old PolySix with all its extra cables and bought DX7 and Korg synthesizer. The sequencer was very primitive but enough to arrange a piece of Prokofiev.

When I received my new copy of the Scientific American, just looking at the fractals pictured inside, I had my first synesthetic experience which changed my life. Here's a quote from an article I wrote in 1993 for 'Chaos Magazine' out of Technical University Munich:

'My hand moved, attracted to the red, bursting flames, coming from the two connected circles. It was called Mandelbrot set, and I thought, what does it really mean, the 'almond-bread', and this strange picture. I opened the magazine and my eyes were pulled into a spiral, a tunnel, where you can fly further and further. My imagination was flooded with ideas for stage design, patterns of colors and sounds. For a short moment I was flying over a landscape, filled with moving, cycling but ever changing color lights and pulsing sounds.

I tried to understand how the pictures were made, and soon I knew, they had been generated by a computer: The Fascinating World of Fractals. The link was there, but no hardware to run it. Just several days ago I had soldiered a small interface to the Commodore 64 computer to run the appregiator of my Korg PolySix synthesizer. I asked our friend, disturbing his talk about the Spanish wine, for the copy of the magazine.

Still excited with the proceeding experience, I tried to transform it into musical patterns. The first composition, which included chaos and order in its structure, was done on 10 analogue tracks and I called it 'The Waves of Coincidence'. I have used it many times in my theater workshops for body relaxation exercises.

Some months later, again inspired by an article on iterative graphics in Scientific American, I began setting up my electronic sound studio. I bought some of the first MIDI synthesizers, a sampler, an 8 track recorder, a studio mixer, effect devices and two Atari ST computers.

The first computer was used to generate a sequence of midi events on the basis of fractal algorithms, to represent the events as a fractal graphic and finally to send it through the midi out to the second computer. There, the midi events were recorded by a sequencer program, edited, scaled to a chosen key, represented as a musical score, transposed, copied to different tracks, reversed, etc. It was possible to assign several different musical instruments to the same part and then store the whole setup on a disk. At this time there was a hardware limitation to 16 MIDI channels, and most of the current synthesizers had no MIDI-mode; they could play only one

instrument at the same time. The problem was solved by using the multi-track recording system. Some of the parts of the musical score were recorded one after another to the multi-track recorder, synchronized to the MIDI clock prerecorded on one of the tracks.

The recorded tracks were remixed, using electronic sound effect devices like reverb, delay, chorus, etc. to a master recorder. At this time I used the PCM video system, which was afterwards replaced by DAT recorder.'

As I was getting more and more into experimenting with fractal music, I have discovered that it was more than just fun and strange ideas.

The following text was written for Multi-Media Presentation about fractal music presented at international conferences and festivals:

Tamas Mandala Music

The newly developed Tamas Mandala Music did not grow out of the inspiration and sentiments of human kind, it is much rather meta- and perhaps transpersonal in its character. The often surprising, sometimes also very strange world of sounds of the Tamas Laboratory is a reflection of natural phenomena whose very structure has amazed mankind since immemorial time. How often as a child or perhaps as a grown- up person, have you observed the rising smoke of a fire, the flowing water of a little brook, or the clouds playing with the rays of the sun?

Just as the unknown plains of the desert with its undulating dunes, the sight of a chain of mountains with its rocks and valleys, or the gently moving surface of the sea, the sounds of the Tamas Mandala evoke emotions of longing for unity with the universe, of endlessly changing forms, and of infinity with its inexhaustible potential. Everything becomes relative. Evaluations have no meaning here, just as no snowflake is more beautiful than another.

Fractal View of the World

We speak of a fractal view of the world which means that forms in different scales of ordering are similar and infinite, that they are recursive (patterns within patterns), that growth processes imply feedback or resonance (are intertwined).

An example: A cloud of steam has a form similar to that of clouds and these in turn have forms similar to clouds gathering on a satellite image. These qualities are very well portrayed in pictures of the Mandelbrot Set discovered by Benoit Mandelbrot, who coined the terms 'fractal' and 'fractal geometry'.

The Science of Chaos

The idea on the line of this kind of music has arisen out of a new view of a world which has been developed in recent years by biologists, physicists, astronomers, economists, and mathematicians.

Today this new kind of science which is gaining more and more importance is called chaos theory, because it enables us to find orderly structure underlying chaos. We speak of fractal geometry of nature, dissipative structures, determinist chaos, and strange attractors.

These theories of chaos are being confirmed more and more by different branches of science which have suddenly been reduced to a common denominator. They all enable us to see the evolution of the individual, of mankind, and of the universe in a new light, whereby a mechanistic and static view of a 'world of things' is being transformed into a world of 'growth'. This holds hope of a dynamic world in which everybody is unique and the same time interconnected with everything else 'by way of chaos'.

The Principle of Conversion

But let us return to the Tomas Mandala Music.

Here are two examples of 'chaotic' processes which can be heard by everyone: the dropping of rain and the sound of burning wood in the stove. Both have an effect which is relaxing, soothing, or exciting, because they reflect perpetual change or growth which is inherent in them. Simple simulations of these processes are represented by wind harps or freely dangling bells which convert the flow of the air into sound. The music of the Tomas Laboratory is also produced according to this principle of conversion, only here as in the case of fractal pictures- the data is computerized.

As today we can more clearly understand chaos, it is possible to convert data into sounds better than any bells can. The sequences of sound are no longer that chaotic and the very complex interrelations can be made audible and visual. And it is also possible to explore an infinite variety of processes, including those that do not stem from this world. Is this the beginning of the 'Glasperlenspiel' as described by Hermann Hesse?

The term 'Tamas' is derived from the name of the laboratory/theatre where the music originated. Here it was used in experimental theatre and in processes leading to an expansion of consciousness.

The music is called Mandala because the sounds can be simultaneously graphically illustrated on a computer screen: Colored fractal mandalas in an infinite variety of forms arise.

Specific mathematical systems on measuring data or physical research results underlay this kind of music. They are used to compute series of figures, these in turn are converted into musical scores and mostly interpreted in a meditative nature.

Out of this arises pieces ranging from 'The Wheel' which turns on its own, a voyage into the waves of breath or the ocean, exotic rhythms of the jungle, to an invitation by the universe.

The music is quite harmonious at times, but it can also become apocalyptic. The boundaries of chaos are most sensitive and here nothing can be foreseen. The data must be simply computed item by item, and even after the last item

has been computed, we do not know how the things are going to continue.

The Way to Self-Recognition

But gradually, after one has freed oneself from all expectations as to human-made music, a kind of intuition unfolds itself, a premonition as to how certain structures are going to behave. Here the meaning of the word 'Tamas' which has been derived from Sanskrit comes into play: The recognition of things in its own inherent dynamics and the turning back of the mind which has been searching in the outer world on its own consciousness.

New Dimensions

The Tamas Laboratory tapes and CDs which are available at the present time can be used for meditation, trance dance, deep relaxation, body and breath work, changed states of consciousness; the music can carry us along over a long period of time, the mind not being distracted by emotionally charged structures.

The music encourages us to accept and to trust the psychic processes taking place within ourselves. Thus we can enter into very new and unknown dimensions of the self. Probably this is only the beginning of this kind of music which tries to build up a bridge between art and science...

At this time my interests shifted very much from theater to therapy forms and meditation. I studied breath therapy and group leading for two years. One of the key events was again my visit to the United States, where I attended a week long seminar in Hemi-Sync at Monroe's Institute of Applied Sciences. Hemi-Sync is acoustic method of entraining the brain to specific states of consciousness. After another visit to the Institute I applied for a Professional Member status and was using this technology in my compositions. I released several tapes for concentration, relaxation, meditation and so on. I was spending most of my work time on creation of new formulas and arranging their output to new musical structures. It was fascinating work and the results were above my expectations.

I was a researcher and an artist at the same time. Soon I found enough audience for this kind of music and I could enlarge my studio with new equipment and employ two people to keep the label working.

Still fascinated of Castaneda's stories and encouraged by a German therapist I attended several workshops where very extreme methods were used. This gave me in the first run new insights to my artistic work.

I met Dr. Richard Yensen who was doing formal research in Baltimore. Out of his experience he worked out drug free methods for achievement of psychedelic experiences by audio visual stimulation and breath techniques. I was very much impressed by his slide shows using dissolve techniques with up to eight slide projectors. Inspired by his work I extended my studio with up to six projectors and my electronic engineer designed a control unit for

controlling them directly from computer. This way I was able to synchronize the show with the music. One of the first 'multi-media', as it was called at this time, was 'Living Structures'; a collage of slides from all over the world, dealing with the beauty of nature, religions, urbane poverty and man's destruction. I firmly believe that art can change the world.

This was time of radio and TV interviews. Without any of my own effort I was signed to an artist contract to IC/Digit Music, a CD label working together with DA Music. In 1990 my first CD 'Brain-Machine' was released. At the same time my label was selling thousands of copies of the tapes. From time to time I was doing joint projects with other musicians. As a Hemi-Sync specialist in Europe I received many invitations to perform seminars. I built a small biofeedback lab in my studio with EEG devices and mind machines.

But the experiences with the 'extreme forms' of self experience became disastrous. I believe now that it was a blind alley, spaced out, far away from the ground. It culminated in the fact that my wife went away with her therapist, who was my teacher at the same time. It took me years to recover from that shock. Here I want to thank Richard Yensen and his wife Donna for their support in these hard times.

Nevertheless, the bad experience had its positive aspects. I had to leave the whole 'therapeutic' and new age community not bearing any more their blind and idealistic beliefs. I have withdrawn into seclusion and was not able and not willing to give any workshops. But even in the time of personal crisis I was continuing my artistic work. As an expression of this time I realized a project called 'Requiem'. My father brought me a floppy disk with data containing a measurement of light emitted by a culture of dying yeast cells. After some mathematical processing I sent the midi data to my synthesizers and recorded the whole session. Weeks later I hired an academic choir from Poland and in one week of improvisations I recorded enough material for a mix-down. It was one of my dark and profound compositions. Combined with a visual composition of 6 slide projectors and quadraphonic technology it was performed many times. The highlights of this performance was an invitation to Audio Art International Festival in Krakow and to a 'Genetic Forum' organized by German State Radio.

Living on the bridge between art and science

After my withdrawal from the New Age scene, at least I pretended it, although I was mentioned in one of the academic handbooks about experimental New Age music, I discovered that I am in nobody's land. For 'academic' art I was 'commercial', for the New Age scene too experimental and scientific. And for the scientific community I was just a greasy artist. Except for some people, who themselves were not willing to accept one life attitude,

understanding the world in much complex terms. One of these people was Professor Popp. As my public and my sales diminished I asked him for a job in his lab again and I was glad to hear about a very interesting research project. Some kind of algae was emitting light flashes in intervals. Two photo- multipliers were registering activity of two algae cultures. The experimental arrangement allowed to switch the sight contact between the cultures on and off. My task was to find by means of mathematical transform (FFT+Correlation) of the data to tunes. It was a pity to terminate the project because of financial problems, after almost one year of the hard programming and experimenting. Once a week I was spending hours with headphones on in the lab, listening to the algae, programming. In the breaks I was talking to scientists from all over the world. Working in this environment recalled my interest for scientific work and love for mathematics.

I refreshed and expanded my knowledge of programming and mathematics by a correspondence degree course in informatics. I changed to SAE in Zurich to learn more about multimedia, now in the interactive meaning of this term. But before that I will return to the beginning of the nineties to catch up with my artistic and commercial projects.

AudioStrobe

In the late nineties I came across light and sound technology and even my company sold a simple L/S interface for PC and Atari, which has been used in research projects on ETH in Zurich. What I was missing all the time was the synchronization of soundtrack and the lights. First experiment to achieve this synchronicity was an adaptation of a 4 track tape player, but the results were not satisfactory enough. After the release of my second CD 'Living Structures', implementing fractal structures and Hemi-Sync, I realized that this medium is perfect for hiding extra information for controlling the lights. I called the system AudioStrobe and applied for patent and trademark registration in 1992. Also in this year was released first AudioStrobe CD 'Fractal Dance', accomplished together with several other artists and singers, which announced a change in Tamas Lab's music. Besides the fractal and algorithmic patterns there were 'classically' composed and arranged titles. Next CDs 'Light From the Ancient Dreams' and 'Doubling Scenario' continued this trend and 'Children of the Universe' was already completed. I came back to algorithmic composition for a new project called 'Polar Lights'.

These and my other CDs as well as productions of third parties were already AudioStrobe encoded. Today AudioStrobe is an industry standard for encoding CDs and the AS decoder is implemented in many L/S machines.

In my understanding the development of the AudioStrobe system was a try to come closer to the synesthetic experience, more from within the human mind (visit: www.audiostrobe.com).

Today, AudioStrobe system is for me like a grown up child, who will go his own way. Together with a Czech programmer I am working on a release of a comfortable, PC version of encoding software to the music community. Till today all of the 50 to 60 encoded CDs were encoded by me with custom made software running on NeXT computer. The AudioStrobe technology has developed to be one of my main accomplishments in business. I visited many exhibitions in Austria, Germany and Switzerland presenting the system to the public.

I was aware that the light patterns on the CD are static ones. Once recorded to a master, they were not variable anymore. I extended my original patent by an interactive version of the AudioStrobe system having in mind biofeedback technology.

Biofeedback and Multimedia

The biofeedback branch of my company started in 1992 with a Polish electronic engineer and German programmer. We released several machines with EEG /GSR /PULS channels and software. Today we have just two devices available. I am presently programming new biofeedback modules using multimedia technology.

One of the main reasons to go to SAE Multimedia Producer course was my discontentment with the software we had for our biofeedback devices. It was very time consuming to program audio and visual applications using C++ as programming language. My idea was that a kernel, carrying out communication and statistic functions should quickly program C++ codes, but the rest, using one of the authoring multimedia platforms. This strategy paid off, and I was able to present a year later my first multimedia biofeedback modules 'Mental Games' for diploma work at SAE. The software is being distributed in USA, UK and some European countries.

Meanwhile I founded another company 'VERIM' with a former customer from the University of Konstanz, Dr. Klockner. We are giving workshops for sports and energy management seminars. VERIM biofeedback modules use network technology and some of the solutions are subject to patent pending.

As this is my present activity I do not have still much retrospective thoughts at this stage, rather visions and ideas for the future. Some of them will be presented in my final work for BA in multimedia.

Back to the Roots?

The multimedia education and programming were one of my main activities in the last two years. I feel that my music and the audiovisual activities stayed in the background. I was just able to compose few new pieces or create some new graphics. Of course the design of the 'Mental Games' and VERIM is creative work. But still I am missing the contemplation of doing creative work. Several weeks ago I spent two days on recovering some ideas of fractal music generation combined with new possibilities of multimedia interactivity. I had to stop working further as I was overwhelmed by the first results and this would not be the right time for continuing intensively. I plan to combine it with already available system of generating quadraphonic sound from video frames. Somehow it reminds me of my dreams in Poland to create visuals to Beethoven's 9th. Although it is exactly the way around this time I hope this is just only a symmetry which will appear in my future activities, perhaps connected with the term of psycho- interactivity.

Sometimes, when I observe the sky full of stars I ask myself, how much was I able to realize of my dreams. I often must admit that it is already beyond my expectations. Really? Two days ago before finalizing the draft for our

patent attorney I accidentally opened a file containing a scan of my poem written as I was 16 or 17, called 'Thoughts'. Here is the part I looked at:

‘...
-Communication,
Interpersonal feedback
Vibrations seen in sound
In colors and feelings
Senses wrapped, connected
-Threads in a spider web
Separated mind being one”

Thank you for reading my story.

Andrzej Slawinski

The Chemistry of Thought

by T. F. Collura, Ph.D., P.E.

This essay outlines some general issues and introduces some specific considerations relevant to the scientific understanding of the mind and brain. It is intended to elevate critical issues with regard to the current state of this understanding, and to define some simple concepts that may help to move this understanding forward. This work is based on a synthesis of ideas derived from neuroscience and psychophysiology, combined with a novel approach to the understanding of the electroencephalogram (EEG). These ideas are presented in a very basic form, and should lead to specific approaches to the measurement and analysis of brain processes as revealed by the EEG. It should also lead to the development and improvement of methods for the diagnosis and treatment of mental conditions using EEG and neurofeedback, in conjunction with various forms of sensory stimulation.

What is needed is a scientific development that accomplishes for the mind what chemistry has done for the physical world. That is, a science that includes simple, terse models for the underpinnings of thought, and that can be used to derive the experiences of thought, both behavioral and introspective. The field that we call Psychology barely approaches this goal. It has a moderate ability to connect with our understanding of the physical brain, but it lacks rigorous and complete models that are based on neurophysiological principles. While we have the beginnings of some of this science, we do not have anything near what has been achieved in the physical sciences. There is little agreement on anything approaching a cohesive model of the substrates of conscious thought. The clinical effectiveness of conventional methods in psychology and psychiatry border on chance, further indicating that this field is still in the stage of being alchemy rather

than science. In particular, our ability to apply EEG recordings and methods to the study and development of the mind is in its infancy.

Nonetheless, recent progress using neurofeedback to treat conditions such as ADD, depression, autism, and other disorders, indicates that there is significant promise in this area. We have demonstrated the fundamental possibility of affecting the structure and function of the brain using biofeedback techniques, and even simple methods may be as effective as medication in treating a wide range of conditions. This underscores the remarkable plasticity of the brain, and its ability to learn. We may anticipate further conceptual breakthroughs in the near future that could revolutionize both our understanding and our ability to address the issues of the mind and brain in a constructive manner. It is hoped that this will help to sweep away much of the imprecision, bias, and parochialism that currently dominate theoretical and clinical approaches to the mind.

Whereas we are very good at describing the world around us, we are very poor at describing the world of our thoughts. Tibetan Buddhists are perhaps the masters of this. Nonetheless, we should look to create a vocabulary and set of paradigms that penetrates the layers beneath what we commonly think of as thought. To extend the analogy with the physical world, we have had our "biology of thought" defined. Freud, Jung, James, and others have been our Lamarke, Darwin, Linneaus, and Mendel. What we need now are the Pauling, the Watson and Crick, and the Krebs to take us the next level down. We know what the "organisms" of thought are. They are the ideas, thoughts, impressions, perceptions, opinions, moods and other major entities that are the realm of psychology. What we know of them we know from behavioral studies, and a first level of introspection. What they are comprised of, we do not know. That is what we are looking for. What are the "organs" and "molecules" of thought? How does the brain produce them? What is their "molecular biology"? From the work of Damasio, Calvin, Crick, Freeman, Edelman, and others, we have some rudimentary, basic concepts about brain dynamics relative to thought. We know that the brain contains neural subsystems that receive trains of stimulation, and that reverberate in a complex way, in accordance with the laws of nonlinear chaos, to achieve states and state transitions that lead to recognition, memory, and other primitive processes.

What we would like to do is to find a connection with the EEG signal in a way that explains what we know about EEG dynamics in connection with moods, states of mind, and behavior. This connection should also have bearing on the observed effects of light and sound stimulation, which can cause a variety of affective states, depending on the frequency and structure of the stimulation. Our basic model is this: The response of a given cortical sub-circuit to an incoming burst of stimulation (whether from the outside world or from a lower brain center) produces what we will call (for now) a "process burst". This burst is a short (250-300 millisecond) pattern of reverberation that is determined by the resonant properties of the sub-circuit. Although we only see a simple burst of EEG activity, we know that there is a complex pattern of information processing underlying the burst. It is the underlying processing that we wish to understand. It is as if we have a scale, a thermometer, a barometer, and we wish to begin to develop the science of chemistry. Instead, we have an EEG instrument, some lights, sounds, and the introspective and behavioral reports from our subject.

The brain takes in experience in chunks. We call them "process bursts". Chunks come in raw, cooked and stale.

The "process burst" takes in the "experience" that feeds it, and it has a life of its own. It is initially "raw", being only aware that something has happened. Shortly later, it "ripens", and contains information regarding the details of the input. Still later, it relaxes, and "chews on" the data, and reaches a stable plateau of "understanding". Still later, it introspects, ponders the information, produces intuitive and deeper interpretation. Finally, it dies away. The "process burst" is like a bubble that starts out small, grows, pauses, grows some more, and finally disappears either by bursting or by collapsing. These bursts occur in parallel. There may be thousands of them at once, in different parts of the brain, processing different types of information, different modalities, different views. They are also coordinated by cross-communication with each other, using combinations of feedback, feed-forward, and collateral connections. This provides the spatio-temporal binding that fuses thousands of responses into the cohesive experiences that we interpret as perception, conscious awareness, and the sense of identity.

Chunks of reality can be homemade or can come out of a box.

Amidst the cacophony of signals recorded in the EEG, we can see these bursts coming and going. The key to the brain's function is in processing these bursts in trains, one after another. The intrinsic EEG is built of these bursts as produced by lower brain centers creating rhythms via the reticular formation, ascending brain tracts, and thalamus, as well as intracortical reverberatory activity. The EEG waves produced by light and sound stimulation are of course temporally and casually related to the incoming trains of stimulation. In fact, these bursts are in this case what we call "evoked potentials", and that have been studied for many years, albeit with limited insight and few conceptual breakthroughs. The common ground in both is that process bursts are produced at a certain rate. When a neural sub-circuit in mid-burst is hit with another incoming stimulus, the burst that is in process is interrupted, and the sub-circuit now begins processing, using the state that was produced by the preceding burst. This is why the rate at which the bursts are produced is important. We can think of the next stimulus as "opening" or "cracking" the existing burst. It "probes" the neural sub-circuit by stimulating it when it is in the state produced by the previous burst. This state can be the state of being in a "raw" burst, a "cooked" burst, a "stale" burst or, if long enough, no burst. These bursts are the "chunks" of experience that the brain uses to create reality. By using these bursts as stepping stones on a vast pool of possible thoughts, the brain navigates its way on the sea of mind, and thus go where it will go, based on the progress from one stone to the next.

You feed on the chunks of reality that you create.

If bursts are produced at a certain rate, then the process of brain states will take a certain path. For example, if the bursts are processed at the "alpha" rate, 10 per second, then successive bursts are produced while the sub-circuits are in a relaxed state, hence each burst finds itself built upon a relaxed sub-circuit. The relaxed state of the brain is thus created and reinforced. This also explains why 10 Hz stimulation is relaxing. It in essence "puts" the brain from stone to stone, as though the brain were a marionette on strings, and were being walked along by guidance. Now if the

bursts are produced at a very slow rate, say 5 per second, then each new burst is built upon a sub-circuit that is in a deeper, introspective state. This can lead to an intuitive state of mind, but it can also lead to a distracted, understimulated one. This is why kids with ADD typically show a lot of theta waves. Their brains are processing bursts at a slow rate, and the resulting brain state is in accordance with that. If the bursts are produced at a rapid rate, say 15 per second, each stimulus finds the neural substrate in a stimulated, alert state. It is aware of its input, but has not had a lot of time to ponder it, relax, or find the deeper meaning. Kids with ADD typically have a low level of beta, so they do not have enough of this going on.

L/S stimulation primes the pump, giving you a taste of another reality.

What happens with photic stimulation is that you give the brain practice with creating and "opening up" the bursts at a given rate. It is like training wheels, or pushing a child along on his bicycle. The brain gets to experience it. It is spoon feeding the cortex with the experience of processing information in a certain way, without the brain having to produce the rhythms on its own. This also explains why external stimulation can produce a temporary effect, but generally little or learning. The cortex gets to experience the state produced by the burst processing, but it has not learned how to keep that state going. It has not learned to produce the rhythm on its own. Light/sound stimulation can be fun, invigorating, deepening, tiring or even agitating. What it is doing is force-feeding your cortex with bursts, and then forcing you to process the trains at a given rate. You get to practice processing information at a certain pace, but you have not learned to pace yourself using internal mechanisms. This is why auditory and visual stimulation cannot replace EEG neurofeedback. EEG neurofeedback rewards the brain for producing (or inhibiting) the driving stimulation at the desired rate. This is in addition to allowing the brain to learn the experience of processing the bursts at the given rate.

Ultimately, these bursts are taken in a very long sequence. After thousands and thousands of such stepping stones, the brain learns to find its steady-state points. These points may be locations of alertness, focus, distractedness, agitation, depression, joy, whatever. The brain tends to recover and find its equilibrium, which is presumably some state of rest or relaxation. But processing information and "lifting" itself out of the equilibrium point, the brain uses energy to reach a more excited state. This is what the bursts do. They "push" the brain into a higher state. Where that state is, and what its attributes are, depend on the trajectories of the processing of each burst. It is hoped that these considerations may motivate methods that combine auditory and visual stimulation with EEG, to produce useful and objectively designed protocols for training the individual.

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developed systems for invasive EEG recording and analysis for epilepsy diagnosis and surgical planning and monitoring. He has also served as a consultant to industry in the areas of computerized tomography, digital signal processing, automated radiometry, and electrophysiological telemetry. His current interests focus on the neurophysics of the mind/brain boundary, development of EEG feedback systems, and the use of volitional and nonvolitional techniques for brain modification with applications in neurotherapy, consciousness development, and personal improvement. Thomas F. Collura, Ph.D., P.E. / BrainMaster Technologies, Inc. 24490 Broadway Ave. / Oakwood Village, OH 44146 440 232-6000 / fax 440 232-7171

Shakti - New technology for spiritual process.

Todd Murphy Researching

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When I was a child, I had temporal lobe epilepsy (TLE). TLE is a form of epilepsy that does not cause convulsions. What it does cause is altered states of consciousness. In most cases, TLE causes events that we're really not very interested in here. It's symptomology is dominated by things like lip-smacking, staring off into space, repeated movements, and repeated recurring memories. In some cases, TLE can cause distinctly Spiritual Experiences, and this is what it did in my case. I had strange sensations in my body, incredibly intense moments of fear, and a very, very compelling visual experience. It had two Manifestations. One of them was when my eyes were open. Then, I would see things as though they were larger than they actually were, and farther away. An object that was 1 foot from me, and 1 foot tall would seem as if it were 10 feet away and 10 feet tall. The room I was in seemed huge. This illusion is called macropsia. Lewis Carroll, author of "Alice in Wonderland" may have experienced something similar. The magic mushroom of his story made Alice grow larger and smaller, and that's almost the same as feeling the world grow smaller and larger. When I closed my eyes during this experience, my sense of the room being larger expanded so that what I saw behind my eyelids was infinite space, broken only by a single point of light. It seemed to be both infinitely bright and infinitely far away. Like most childhood TLE, mine ended as puberty began.

I stopped being concerned with experiences in consciousness, and became very interested in women. For years, I gave no thought to these experiences at all. Later, I became interested in spirituality, like most people who have childhood altered state experiences. I did meditation, some Yoga practices, and began reading spiritual teachings, mostly Eastern philosophy and a little bit of Western mysticism. I also started remembering my childhood night time TLE Seizures

(also called Complex partial seizures). it was obvious to me that although the spiritual path was very pleasant, at least usually, and my seizures were unpleasant, even terrifying, they were far more powerful events than anything I was getting through spiritual practice.

As a child, I thought that I was the only one having these experiences, should and I had a feeling that something terrible would happen if I ever told the adults, so I didn't. As an adult, I was pretty sure that I was not the only one, but as I kept reading spiritual books and scriptures, I felt sure that I had seen things that were quite beyond any guru or mystic tradition. Now let me backtrack a bit. Earlier, I'd spend some time doing more disciplined studies in a completely different area. The history of science. I was deeply influenced by T. S. Kuhn, author of "The Structure of Scientific Revolutions" and "The Copernican Revolution". One of Kuhn's points was that scientific theories guide researchers as they choose which experiments to perform. The popular misconception is that researchers perform experiments and then build their theories out of the results. Instead, new theories come first, and the experimentalists are concerned with either validating them or falsifying them. It's impossible to do an experiment without having a theory. Perhaps the experiment is designed to confirm the theory or perhaps to falsify it. In either case, experiment and observation, even facts, are described in the vocabulary used in a scientific theory. And so I had some experience with spirituality, TLE Seizures, and the history, methodology and philosophy of science.

Some years later, while reading about near-death experiences (NDEs), I read an account of an NDE that included a story of being in an infinite, black the void with a tiny, brilliant point of light in the center. At last, I had some point of reference for the experience that had so shattered me as a child. Whatever it was, it could appear during the human death process. I was very excited, and of course I wanted to know more. I found a couple of fragmentary reports that were similar in the works of Wilder Penfield, the Canadian neurosurgeon who first mapped the brain's surface by stimulating it with an electrode, and then observing the patient's response. I wasn't really looking to understand my own experiences so much as to understand what science had to say about death and dying in the human species. NDEs seemed to offer the best evidence about that. And so it seemed a simple enough thing to do to watch television documentaries on the subject. One of them was to completely change my life. I was staying at a friend's house for the week end, watching a program that featured near-death experiencers telling their stories. It featured a segment filmed in a Canadian Neuroscience Laboratory. A man was shown wearing a motorcycle helmet and a blindfold. to describe experienced by saying that he felt himself to be in infinite black space with a tiny point of light, very very bright, at the center. Now, I was really excited. I knew that I was being shown an experiment, and that all experiments are guided by theories. Beside myself with excitement, I stood up and kept watching the documentary. Then, someone entered the room and told me to turn off the television because it was going to keep them awake. I ask to be allowed to keep watching it long enough to find out the name of the Researcher, but I was told that I was being "too attached". To my vast disappointment, they shut off the television. I walked away from the TV thinking: "THAT'S what I want to do with the rest of my life. Whatever that man is using to create such experiences reflects a whole science, not just the specific experiment I saw."

A couple of months later, I read a book that mentioned this line of research, and gave me the name of the Researcher. Dr. Michael A. Persinger.

30 minutes later, I was in a medical library reading a list of Persinger's Publications. I was amazed by two things. The first of them was the subjects mentioned in the titles. Out-of-body experiences. Paranormal phenomena. Precognition and precognitive dreams. Meditation. The other amazing thing was that his methodology was completely conservative. He wasn't explaining anything in terms of orgone energy, kundalini, Chi, Prana, or parts of the brain labeled 'God-module' or "The circuit Boards of Mysticism."

Some of these concepts are totally valid, but they're still controversial. Ordinarily, that can be a good thing. But nothing seems to inspire scepticism and ridicule from scientists like efforts towards the integration of science with spirituality. But Persinger had found a way out. He published quite a lot of papers correlating religious and mystic experiences with patterns of neural activity. Now, by itself, this might have created a certain amount of hostile criticism. Except for one thing. He didn't study religious and psychic experiences. He studied the "propensity to report" them. And that's sound methodology. Talking about religious and spiritual experiences is one of the most common human behaviors known. Everybody does it at some point in their lives, if only to express disbelief, and all human cultures (excepting a few communist regimes) support it. A statistical study of the people who make such reports is totally sound science. On reflection, it seems strange that nobody thought of it before. What he concluded was that religious experiences were more likely to happen for people whose brains put them on the high end of a spectrum; one that includes TLE at one of its extreme ends. Now, it was beginning to make sense.

Mystic experiences share a lot in common with seizures and NDEs because the human death process requires the human brain to be pre-wired for certain experiences. When a seizure recruits one of these areas, it includes whatever phenomena that area supports. In one place, it might be an OBE. In another, it might be a being made of light. This explains why only some TLE seizures elicit mystic and religious experiences.

Only a few of the "matrices of neurons" that TLE can recruit support altered-state experiences. Others, more available, support the more common seizural experiences, like lip-smacking and simple 'spacing out'. But we should remember that seizures activate the brain in non-functional ways. There are patterns of electrical activity that 'belong' to specific brain parts and specific neural jobs. These patterns ARE functional, and seizures create all sorts of patterns, including a lot of meaningless noise. The 'spiking' pattern of epilepsy is a useful diagnostic marker because it usually only appears during seizures. And that brings us to Persinger's other line of research. The one that led me to develop Shakti. He had begun to apply magnetic signals to the brain using patterns derived from EEG signatures. And these were creating spiritual experiences for some people. Some of them were quite phenomenal, too. He tried quite a few basic frequencies, but the clear winner was the 'burst-firing' pattern. The reason it was so successful was that it approximated the amygdala's own firing pattern. The principle is simple. The brain produces electrical activity. Electric activity produces magnetic fields. If a magnetic signal has the same patterns as a neural electrical signal, it can elicit the same phenomena that normal activation would, within the person's own habituated patterns.

I read a few of his papers, and then I called him on the phone. I had some small credentials to offer as a Buddhist theologian, working on

death and dying issues. I had tried to learn the vocabulary he used, and I succeeded enough to manage conversation with him. We discussed a couple of applications for his principles, including applying his questionnaires to groups of Thai Buddhist meditators. It was at that point that Dr. Persinger provided me with a prototype digital-to-analog (DAC) converter. The one that produces the electrical signals that are converted into magnetic signals. My early sessions with it were interesting and highly visual at times, but they weren't the correct signals, due to a computer problem that was eventually solved by Stan Koren, who developed the Koren Helmet as well as the DAC. He also developed the computer files for the signals themselves. Later, these were to become the templates for the Shakti signals, too. After I had my computer (a 386 laptop) setup correctly, I was able to duplicate the signals used in the documentary I had seen two years earlier. In the meantime, I'd been studying. Of course. Almost immediately, I began making mistakes. The first of these was doing too many sessions, too close together. After about 8 days, doing about 45 minutes a day, I had a psychotic episode. In retrospect, it was most likely a recurrence of the "Schizophrenia-like psychosis of temporal lobe epilepsy" as one researcher called it. It only lasted a few days. And it had a trigger. A romantic disappointment. Ouch. So sad. But my response to it was EXTREME, to say the least. I knew, at the time, that it was not like other such moments in my life, and I knew that it had to do with the DAC.

Now the studying paid off. I looked at my own neural history, and I knew that my right amygdala, specialized for fear, was involved and a bit of introspecting let me see that this disappointment had a strong component of anxiety. Other such times in the past, anxiety hadn't been there. The excess 'connectivity' of my right amygdala, created during my TLE seizures, had gotten it active even when I was not having a seizure. Like most TLE in children, Mine stopped with the onset of puberty. But until that happened, I had an 'interictal' (between seizure) epileptic psychosis. These same AMYGDALOID pathways were awakened when I used the amygdala's signal. I'd used it over both side at once (Not a standard Shakti presentation). But, my own neural history had made the one on the right more sensitive. At some point in the long-week-of-my-dumb-sessions, I had crossed a crucial threshold, and the same pathways that had once made me a "disturbed child" now made me crazy one again, after all those years. So, to move away from insanity, I did the first intelligently designed session of my career. A corrective one. Based on a person's unique neural history. I applied the amygdala's signal to my LEFT temporal lobe. And what I got was not simply an end to the episode. It ended, yes. Very definitely. But what came next was not a return to normal consciousness. Rather, it was a demonstration of the 'interhemispheric intrusion' hypothesis. Interhemispheric means, in this case, crossing between the two hemispheres of the brain. An Intrusion refers to a higher-than-normal load/level of activity.

What the hypothesis says is that when activity in a given brain part on one side of the brain (or an entire hemisphere more generally) becomes active enough, crossing a threshold, the activity can spill over into the same structure on the opposite side of the brain. Given that most brain parts have symmetrically opposite functions ('functional homologues on the two sides of the brain, the phenomena that accompanies this is a dramatic shift in the person's experience. My fear and anxiety didn't just stop. It turned into the opposite. Bliss. Joy. So wonderful to be alive. Just to see the sky is ecstasy. Each person is beautiful. My right amygdala had been active. Now it was quiet, after applying the amygdala's signal only over the left side. I had been in anxiety and pessimism, living in a storm of awful thoughts for a few days.

Now, I was in bliss.

Other things had happened. My week with an active right amygdala seems to have recruited my right hippocampus, too. And many of its associated phenomena only emerged when my right amygdala was told to shut up. I could heal by laying on hands. I tested it many times. That's tapered off a bit in four years since all this happened, but not without many ups and downs as my own Shakti session designs change. I could also do remote viewing, but like many who've had the experience, I chose not to practice it, because I found myself uncomfortable at some of the things I saw. I did confirm some of these perceptions, though. I saw auras, too, but not in the brilliant colors some psychics describe. Just faint glows around people when I looked for them. I experienced quite a lot of hypnogogic phenomena, too. Brief perceptions, clearly from within, that happened while I was falling asleep.

I continued doing sessions, but I didn't really experience anything new using the DAC, with its single signal, until I got a new wave form from Dr. Persinger. It belonged to the hippocampus, a cognitive structure. One that deals in words on the left and in non-verbal cognition on the right. Soon, I knew what it would do on both sides of the brain. On the right, it quieted mental chatter and enhanced visualization skills. It also enhances what's called 'positive thinking'; the expectation of positive outcomes for ongoing events. On the left, it encouraged mental chatter, and negative expectations for the outcomes of ongoing events. Over both sides, it reduced the intensity of emotions overall. Shakti results continue to support these generalizations, although they have yet to be published. So, now I could apply the amygdaloid signal over the left - OR - the hippocampal signal over the right.

The trouble was that left amygdaloid activation tended to spill over to the right amygdala (via the anterior commissure), and right hippocampal activation tended to spill into the right amygdala, too (via their extensive connections). I wanted to do both at once. And for that I need two signals at once. I wanted a stereo DAC. But none existed. I'd have to go without it or invent it myself. So that's what I did. The only audio equipment I had to work with was a computer sound card, so that's what I worked with. I recorded the sounds the DAC made, as though the signals were common sounds. I saw instantly that it wasn't the same. Not even close. I set out to find a software that would let me create sound files for a PC, using the wave forms provided by Dr. Persinger as templates. Seven drafts, and scores of audio softwares later, I had files that worked. A bit further along, I had a CD that played the sound files. Designing the Shakti helmet was another matter. Unlike the Koren helmet, it had to have safety as its first concern. That meant, of course, that it had to have separate output to the two sides of the brain. It also had to omit all signals not specifically derived from neural brain structures.

Knowing that a given effect emerges from a structure on one side allows one to stop the effect by applying the same signal to the other side. Anything Shakti can do, it can undo, if the person uses their tech support and follows the procedures. Also, the helmet had to have coils outside the temporal lobes, so that repeated use would not quieten the parietal and especially the frontal lobes. Further, the rotating coils used in some Koren helmets needed to be omitted. They recruit larger areas of the brain, more than what is needed to elicit experiences. It's also less well-tested in Persinger's labs for repeated use. Once I had the invention, it needed to be tested on

more people than just myself if it was ever going to be more than only my own plaything. And, in spite of the many studies done at Laurentian University, it could be argued that the safety of the sessions found there did not apply to self-administration of two signals at once.

When I ran the first successful Shakti session, using a sound card and an impromptu headset improvised from two sets of DAC coils, I was satisfied. I won't go into the details, because, as its inventor I have a stake in what's said about it. Once others began using it, those with more dispassion than I, began to speak. They also have more typical brains than I have. Mine has TLE in its past. Others don't. I offered prototypes of Shakti from my website at www.spiritualbrain.com and right away I began to get applications to participate in a safety study. I had to start with a safety study, of course. I had to begin saying that we didn't know how safe it was for individuals to use it themselves. But that didn't stop a lot of people, mostly men, from applying to participate.

After about a year, it became apparent that Shakti was safe. There were a couple of incidents. One man, using the standard helmet and CD, found himself having too many moments when he had a word on the tip of his tongue that he couldn't get out, and a growing sense of detachment that interfered with his work in sales. I knew that these were moments when the right hippocampus was more active than the left. He had been using Shakti for weeks, experiencing this, but not availing himself of tech support. In the end, he corrected things using the left side signal only, applied over the left side. In spite of his experience, he later wrote that he'd give up his Shakti when it was pried from his "cold, dead fingers." A few people have had passing headaches. These are also associated with the hippocampal signal, and they seem to stop using the left channel alone, or using common headache pills. They really aren't headaches, actually. They're better described as feelings of pressure. They tend to happen for a few sessions (when they happen at all), and then to stop. Less than 15% of Shakti users get them at all. Those are the two most unpleasant and common side effects of Shakti, now with over a hundred users.

On the other hand, things get a bit more interesting when we look at Shakti's positive effects. First of all, there are two primary ways to use Shakti. In one, the person is looking for lasting after-effects. In the other, the person is looking for more dramatic experiences. Like what they may have seen in documentaries featuring Persinger's work. There's a safety precaution, though. These sessions should last an hour, and should be done more than once in three weeks, following a successful session. In looking for lasting positive effects, the person needs to repeat the sessions once a week, in normal states of consciousness. These sessions last 30 minutes. Even though most people became interested in this technology because of the more dramatic things possible with longer sessions, most Shakti users are opting for the shorter session, done more often. Enough suspense.

Here's some of the effects produced during or after repeated sessions. - calm - a reduction of depression - enhanced introspective skills - lucid dreaming - out-of-body experiences - a greater sense of self - a sharp reduction in anger - enhanced visual acuity - pleasant detachment - floating sensations - "a sense good spiritual balance and general sense of being centered and optimistic" - "During my session it was as if I were seeing through the mask" - "wonderful vivid dreams" - "I had

the strong feeling of sitting just reversed in my room and facing the opposite wall (eyes closed). This was a strong visual impression. - "I saw a black board with several words written on it. It seemed like I understood these words but when tried to look closer I noticed that they were written in a language unknown to me" - "relief from something that always seems to be there. "

These vary from one person to the next. Each brain is different. Some fight back, trying to re-establish the old neural settings in a process called metabolic snapback. Visit the website for more information. www.spiritualbrain.com Longer sessions have produced visions of many kinds, mostly brief, and only a couple of people had truly episodic visions. I mean the kind that happen in NDEs or the native American vision quest. So far, it seems that being totally relaxed, still, and in a silent place help a great deal, and not everyone is able to manage the complete silence. One user tried white noise as a background, but that only interferes. A lot of the temporal lobes are involved in monitoring ambient noise, and white noise only adds to this activity, which must be quieted to allow Shakti to recruit the same area fully. Most people who are interested in this technology will prefer to read the testimonials taken from reports by participants. <http://www.innerworlds.50megs.com/Shakti/testimonials.htm> Now that Shakti is past the safety phase, the next goal emerges. Shakti still isn't covered by any insurance, so the same disclaimers, etc. are still in place. Read them. But the goal is now to find whatever procedures are necessary to guarantee each person a spiritual process, even dramatic visions.

So far, most Shakti users (over 90 %) have had something to report, and the remaining few are working through a variety of procedures and new wave forms. One of them, "Shakti 5" is available to all participants on request, and it has elicited experiences when the standard one didn't. I feel sure Shakti is on the right track. One day, we may find, partly thanks to the present Shakti participants, that the spiritual process, different for each person, can be engaged with a helmet and a few CDs. The spiritual process, as it's understood traditionally, has a lot in common with Shakti. Both take time. Both can involve a 'dark night of the soul' both are different for each person. Both offer no promises to any one individual. But I can and do make one promise. That I will go on working out procedures for each person, until a session design appears for that person that works. And so on. Until each person has the same chance at spiritual transformation, no matter what their history or background.

www.spiritualbrain.com

The Mind-I Poll

The intention behind this poll was simply to see which machines are the favorites of light and sound consumers, and the results are pretty clear. The Proteus and the Nova Pro 100 were the obvious choice, the two combined making up nearly half of all machines owned by those polled. It's also interesting to note that these are top of the line models which are fairly new to the mind machine market. Perhaps the big surprise was that there was such a small number for an affordable unit such as the Orion. Evidently advanced features are a top priority for those who seek to purchase light and sound machines. Here are the results as of this moment, but you might

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want to check Yahoo groups for the latest numbers at the time it goes to print:

>> The Orion 1 3.12%
>> The Proteus 8 25.00%
>> PR-2X 0 0.00%
>> XCELR8R II 3 9.38%
>> Turbosonix CD System 1 3.12%
>> Zen Master CD player 0 0.00%
>> Nova Pro 100 7 21.88%
>> Nova Pro 4 12.50%
>> Muse # (sharp) 2 6.25%
>> Halcyon 0 0.00%
>> Pro Tutor 0 0.00%
>> DAVID Paradise Jr. 0 0.00%
>> DAVID Paradise 0 0.00%
>> DAVID Paradise TC 0 0.00%
>> DAVID Paradise XL 0 0.00%
>> DAVID Paradise XL+ 0 0.00%
>> DAVID 2001 0 0.00%
>> The Futuremind 3 9.38%
>> Sportslink Focus Trainer 0 0.00%
>> Home made (PCM Mindwave etc) 0 0.00%
>> Discontinued/unlisted model 2 6.25%
>> Fire and drumming 1 3.12%

Welz Chi Generator Review

by Michael Stevens

The purpose of this article "Powerful Magic at the flip of a switch" is what the catalog containing the Welz Chi Generator claims to offer...sweet! I'm here to give you my run down on it, and let some of my experiences give you an idea of that this machine is about.

About the maker of the machine

Carl Hanz Welz is the proud manufacturer of these machines. Originally from Europe, he invented the Chi Generator in 1991. He has studied a variety of magical systems including Kabbalah, Rune Magic, Talismanology, Hermetics, and much more. He rounded out his education studying general semantics, Reichian psychology, orgone physics, and radionics.

About the machine

The machine I am reviewing, the RAD 2400 HD, is the perfect marriage between

orgone energy and radionics (there are less expensive machines that are designed to simply generate orgone). On the outside, the device looks like a large black plastic box that measures 10.5"x11.5"x3". On one side it has a small silver pipe coming out of the unit (about .5" in diameter and about 2" long) which is the tube from the orgone generator.

On top of the box are a couple of interesting things you don't see everyday. First, are the two input plates (about 3" squared) lined up next to each other. One input plate is designed to affect the "target" and one is designed to influence the "trend". Both of the input plates have 3 dials that are used to focus on a desired "target" and "trend". The other features are a stick pad (used to locate a setting), and the orgone pulse dials. More on the function and meaning of these in the following section.

If you're new to radionics, here is a brief explanation of these terms. First, "target" and "trend". Simply think of these terms in the context of sentence structures, "subject" and "predicate". The "subject" is usually a noun (e.g. person, place, thing, or idea), and the "predicate" usually has a verb (usually describing some sort of action). In terms of "target" and "trend", think of the "target" as a metaphor for a subject (e.g., your self, a pet, your car, your house, etc.) Think of "trend" as a metaphor for the predicate(is getting good luck, has plenty of money, has great relationships).

If you are a bit confused, remember that the target and trend begin in your mind, so they are intangible in the beginning. What you wish to do is bring them into a tangible form.

This intangible form is based out of your internal representation of the desired outcome.

Now for a little NLP explanation....what is an "internal representation"? The best way to describe it is "your individual perspective". Let me explain. As you exist on this wild planet, you are perpetually bombarded with information...more than you can consciously process. Your "IR" is essentially what you are conscious of. This includes the sights you see, the sounds you hear, and the things you feel.

So as a sample:

Target Trend

I (me) have plenty of money

This is a very simple example and was used to illustrate the concept. Usually, the more precise and direct you have the outcome, the better the results...but ALWAYS keep it simple, just keep it as specific as possible. The dials are used to create a "signal" or a "symbol" for the desired target and/or trend. Most people tend to think of symbols in terms of visual representations. If we can expand out concept of symbols a bit, we may allow "combinations" (similar to a combination lock) to become symbols.

The stick pad is interesting in that when used with the dials, the user usually experience a "magnetic" sticking sensation when they are close to

dialing in their desired outcome.

The orgone generator is another part of this system, and can be used on it's own, or in conjunction with the radionic features.

It is based on the research and technology of Dr. Wilhelm Reich, and has layers of steel wool blended with Organite™, a special, powerful, organic epoxy blend invented and developed by Welz which greatly enhances the orgone generation capabilities of the unit.

Essentially, the "orgone generator" itself is about 8 inches long about about an 1.5" squared, with the silver tube coming out of of one end. It has wires coming out of the epoxy shell, one set of wires goes to the dials for radionic settings. The other set goes to the orgone pulse generator, a device built by Welz to pulse out the etheric current designed to entrain the mind in much the same way pulses of sound create brain wave entrainment. If you're new to orgone energy, the following brief explanation should be helpful. It works, in theory, through structural links. A structural link is the link through which the life force energy is connected to the target from the source of energy (the orgone generator in this case).

The Usage

In theory, this machine may be used several ways, depending on which school(s) of thought you subscribe to.

The first use is simply as a generator of orgone energy or chi. Let me start out by saying that usually producing any of this phenomenon is a LOT easier than explaining it. The reason for this is that most of us experience reality through our 3rd dimensional concepts. Learning to utilize this phenomenon seems to come much faster if one begins to play with the experiments in the instruction manual first, and THEN analyze those, rather than try to intellectually dissect it before gaining personal experience because you won't have the foundation to do a complete analysis otherwise.

If you wish a more technical description, read the paragraph below..if not, skip it.

A Brief History of Orgone Energy With Equations to Objectively Measure the Orgone Phenomenon

I feel that a brief history of Dr. Reich's work is necessary to begin to develop the concept of the relationships being assumed because we will soon begin exploring the relationships behind the chemistry of this orgone energy and metabolic and energetic dissipations of the human body. First, I feel it is paramount to point out that an understanding of Reich's

work on orgone energy must be preceded by an understanding of the function of the orgasm. In his first book written for distribution in the United States, "The Function of the Orgasm", Reich explains this function. In a nutshell, it is "the biological function of tension and release". In other words, a pulsation of sorts. He later went on to describe the process of this function as a 4 beat rhythm of mechanical tension > bio-energetic charge > bio-energetic charge > mechanical relaxation, or the 'T-C Function' for short. This concept will be explored further, as Reich believed it is this basic law that governs all the processes within the organism, and thus, life itself (so if you are looking for the meaning of life...that could be it too!).

Now that we have this first concept down, you may be wondering what this has to do with anything about heat and metabolism, and I feel that now is the time to tell you. In his first experiments to determine the existence of orgone energy, Reich needed a way to prove that this "invisible" energy existed by demonstrating its effects on things that we as humans can consciously notice with our senses. Now, you may ask what I mean by "consciously notice". Well, my friends, there are forms of energy you can perceive consciously, for example, wind, various sounds and colors of light. Then there are forms of energy you cannot consciously perceive, such as radio, television, and radar waves, unless you have the instruments or machines that do the perception for you.

To do this little magic, Reich needed to find what forms of energy that we can perceive consciously are or have the propensity to be affected by this orgone energy.

The two factors he found that helped to manifest this orgone phenomenon were differences in temperature, and variations in speed of electroscopic discharge in the orgone accumulator.

He was able to postulate some basic information for quantitative measurement of orgone off his initial experiments. This included the following information.

A single unit of orgone energy is 1 org.

Electroscopically, 1 org is equal to 120volts.

An org may be defined as the quantity of orgone energy that takes up 1 cubic foot of space, which corresponds to the maintenance of a difference in temperature of $T(o) - T$ of 1 degree C, for 1 hour, according to the formula: $1 \text{ org} = (T(o) - T)(t)(f\text{-cubed})$

The breakdown is as follows, $T(o) - T$ is the temperature difference, in degrees Centigrade, "t", is the time in hours, and "f-cubed" is the volume in cubic feet.

All right, here's the next part. The quantity of orgone energy per unit of space must be distinguished from the orgone tension (op). Reich defined 1op as "that atmospheric orgone charge which in the time unit of one hour (T, 60t', and 3600t'') decreases the charge of the static electroscope by one unit ($E_o - R_e = 1$)."

So then, Reich points out, that if $lop(atm)$ designates the unit of atmospheric orgone tension, E_o the charge of the electroscope, E_r the remaining electroscope charge after the reading, ($E_o - E_r$), then the amount of discharge, and t the time in hours, then the magic formula shows the atmospheric orgone tension in open air.

$$op = t / (E_o - E_r)$$

To use just the orgone generator, simply flip the power switch, and the unit will begin to pulse orgone energy. When I did this, I noticed a very discernable "cool" sensation. Oddly enough, the best description I can come up with to describe it is "a windless wind", and the most comparable experience I can compare it with is a "chill" you may experience when you hear a piece of music that has a slight emotional effect on you. It's important to remember that every person's nervous system will process this energy a little bit differently.

You can supposedly direct the energy with your mind (there are lots of good books on this subject), much the same way Taoist direct chi mentally (it's really just manipulating your IR). Now for a little of my famous "NLP stuff you can do anytime, anywhere, without the \$*#&* machine when you're in a pinch....I'm going to let you all in on a little secret. In Reich's book, "The Cancer Biopathy", he kinda makes the inference that we're all orgone generators to some extent... cool, huh! What does that mean? If you play with an orgone generator, you'll may realize something amazing. You may realize that by playing with the IR may induce much of the phenomenon that get generator does. There have been several documented cases of energy generation happening based on human thought or volition alone. How do you change the internal representation? Through a tool called "submodalities".

Submodalities are what gives the internal representation meaning. For example, is the picture you have in your mind black and white or color? That simple distinction can have a profound effect on your perception of the picture in your mind! Try it really quick right now. Get a picture in your mind, then change it back and forth from color to black & white. When you're done, leave it in the context most comfortable to you. For more information on submodalities, or for further assistance, contact Mind EFX at the number at the end of this article. Now that you realize the significance of the context, begin using that to play with the energy flow from the unit. And remember, you can use submodalities to change your IR anytime and anyplace.

Other Possibilities

Another possibility is to all the orgone energy to water. Usually, when orgone energy is added to the water, it usually feels smoother and more silky. This is probably because the surface tension (dynes) is lowered. The physical body also has interesting responses to orgone. I've found that by holding a transfer disk (supplied with this unit- it is a physical structural link between the generator and a person) over various parts of the body (eg. muscles, organs, etc.) I was able to get a clear sensation of relaxation and relief from the fatigue that was there.

I'm also on of those odd people who drinks raw milk. I accidentally let the milk get about a week old, and it began to sour. When I took a drink, it was just a little better than vinegar. After that first taste, I absent mindedly

sat it down in front of the orgone generator. Not realizing I had done this, I was a bit surprised when the milk tasted sweeter. I was amazed until I realized that I had set the thing right down next to my orgone generator...apparently it can freshen things up a bit.

The Radionics Part

Now for how to use the radionic settings. The purpose of using the radionic setting is to maintain the focus of conscious energy. By getting an internal representation in your mind of your desired outcome, you adjust the dials on the box until you feel an attraction when rubbing the stick pad. Now, the attraction feels like a weak magnet and can easily be broken. Samples of symbols are included with the unit that can be put on the input trays. These symbols mix with the orgone energy to help produce the desired outcome. That is the basics....the possibilities are endless. If you are interested in learning more, this energy may be sent over distances, if you would like to try to experiment and experience the energy live yourself, call the number for Mind EFX at the end of this article to get a free sample experiment experience of orgone energy.

About the Author

Michael Stevens is the owner of Mind EFX. He is a certified trainer of NLP, Hypnosis, and Time Line Technology. He can be contacted by calling (818) 367-8447 or out of the Los Angeles area, toll free at (866) MIND EFX(646-3339) for a free sample experience of orgone energy or to answer any questions about it. He may also be contacted via email through www.mindefx.com.

MindExplorer SW is an audio visual stimulation software, intended for the same purpose as mind machines, i.e. it can induce altered states of consciousness using light and sound pulses. It allows to create, import (3rd party sessions), modify and play audio visual sessions on a PC or record the sessions as digital audio to wav files which can be burned to CD and played using any CD player, or converted to MP3 and played using MP3 players....

It uses an ordinary PC with a sound card for generating the sound part of the stimulation. For the light part of stimulation, it uses the AudioStrobe technology - special unaudible signals intended for driving the light goggles are encoded into the sound. This system allows a perfect synchronization between light and sound pulses. To be able to use also the light part of the stimulation, you need light goggles and AudioStrobe decoder which is a part of some light and sound units and will be also available as a stand alone unit soon. Originally, I started to develop Mindexplorer SW as a cheap alternative to mind machines. Later I realized it can go far beyond....

The most important features of MindExplorer SW are:

- * Many types of the stimulation - pulsing simple sound or chord, binaural and dual binaural beats, amplitude and frequency modulated sound, modulated or pulsing sound playing from a wav file, etc. Combinations of above mentioned types of the stimulation are also possible.
- * Many adjustable parameters of the stimulation - duty cycle, programmable changes of phase shift of the pulses, user editable sound waveforms - to mention only some of them.
- * Ability to import 3rd party sessions - there are more than one hundred freely downloadable sessions on the internet. These sessions can be imported into MindExplorer SW and then treated as any native MindExplorer session.
- * Comfortable editing of the sessions - MindExplorer SW integrates two session editors - spreadsheet and graphic editor. All changes made in one of them are immediately brought into the other one. All changes can be verified by starting to play the session from any segment.
- * Adjustable length of the session - any session of the given length can be played with different time duration.
- * Two wav files as sound sources can be used simultaneously in the session - for example one wav file with pink noise as a sound source for amplitude modulated stimulation and another one with natural sounds or relaxation music as a backing sound.

Written by Tomas Cerny, the author of MindExplorer SW.

The AVS Buyer's Guide: Part 3

by Jeff Labno

Most Important Features to Customers

	Price	Programs	Carrying Case	Power	AC Adapter	Audio Strobe	Beat Frequencies
Orion	129.95	23	Yes	3AA	Can Buy	Yes	No

Proteus	199.95	50	Yes	3AA	Yes	Yes	Binaural + Dual Binaural
Muse Sharp	179.95	30	No	4AA	Can Buy	No	Binaural + Dual Binaural
Inner- Pulse	199.95	50	Yes	4AA	Yes	Yes	Binaural + Dual Binaural
Nova Pro 100	399.95	100	Yes	Internal Battery	Yes	Yes	Binaural + Dual Binaural+ Dual Monaural
PR-2X	269.95	50	Yes		Yes	No	Binaural + Dual Binaural
XCELR8R	349.95	50	Yes		Yes	No	Binaural + Dual Binaural
Paradise Jr	335.95	18	Yes		Yes	No	No
Paradise	435.95	30	Yes		Yes	No	No
Paradise XL	495.95	30	Yes		Yes	No	Binaural
Paradise XL+	629.95		Yes		Yes	No	Binaural
MC2 Pro	230.95	4	Yes	2AAA	No	No	No
MC2 Study	280.95	6	Yes	4AAA	Yes	No	No

Secondary Features of Importance

	Programmable Sessions	Hz Range	Session Time Adjust	Sounds	Computer Link	Manual Mode
Orion	0	.1 - 40 micro Hz	Yes		No	Yes
Proteus	150	.1 - 50	Yes		No	Yes

		micro Hz				
Muse Sharp	25	1-42 Hz	No	6	Yes	Yes
InnerPulse	25	1-42 Hz	Yes	6	Yes	Yes
Nova Pro 100	100	.25-42 micro Hz	Yes	8	Yes	Yes
PR-2X	25	.1-40 micro Hz	Yes	4	No	Yes
XCELR8R	25	.1-40 micro Hz	Yes	4	Yes	Yes
Paradise Jr	0	1-25 Hz	No	2	No	Yes
Paradise	9	1-25 Hz	No	2	No	Yes
Paradise XL	24	1-25 Hz	No	5	Yes	Yes
Paradise XL+	24	1-25 Hz	No	5	Yes	Yes
MC2 Pro	0	Unknown	No	1	No	No
MC2 Study	0	Unknown	No	1	No	No

Unique Features

Orion	Great price, extremely easy to use, ColorPulse, MicroPulse
Proteus	Produces very colorful light show with red/green glasses, software has waveform design (sine, square, triangle, sawtooth)
Muse Sharp	179.95
InnerPulse	Programs correlate light and sound with breathing
Nova Pro 100	Separate left/right hemisphere stimulation, 2 octaves lower pitches
PR-2X	Lifetime warranty
XCELR8R	Lifetime warranty
Paradise Jr	Omniscreen glasses
Paradise	Omniscreen glasses
Paradise XL	Omniscreen glasses, digital heartbeat, separate left/right hemisphere stimulation
Paradise XL+	Omniscreen glasses, digital heartbeat, internal CES, separate left/right hemisphere stimulation
MC2 Pro	Ocean sound, internal voice recorder

MC2 Study Ocean and brook sounds, detailed manual showing its use for learning

The InnerPulse

The PHOTOSONIX product line just got bigger. Introducing the InnerPulse, a new and revolutionary light and sound machine. The first portable light and sound machine with breath pacing included. The InnerPulse feature allows the user to enjoy the mind-expanding effects of breath/mind control. You adjust this new light/sound machine to match your natural breathing rate. then, the lights and pink sound increase and decrease in intensity to guide your breathing in a breath meditation exercise. There are ten rhythmic breathing patterns to choose from, including gradual breath slowdown, a easy and gentle way to enjoy light and sound and control your breathing into meditative relaxation. Breath meditation instructors have long relied on "counting" to control breath timing, the InnerPulse does it for you in patterns from traditional breathing techniques. With this feature, you are just a few breaths away from deep meditation, relaxation and an overall stress free experience. Light/sound machines have always been able to encourage a brain wave frequency through entrainment. EEG biofeedback therapists often want to discourage a troublesome frequency, the Random Phase Intermittent Disentrainment (RAPID) pulse feature for the first time allow this in a light/sound machine. Choose from 50 sessions, 10 revolutionary breath meditation sessions and 25 downloadable sessions. There are six tone selections including dual binaural beats and binaural beats with surf, and four octaves of pitch control. The InnerPulse also includes AudioStrobe, RAPID Pulse (Random Phase Intermittent Disentrainment) and Pause features. It comes with a choice of light glasses, high quality headphones, stereo patch cord, computer link cable and session design software. This is a machine that is packed with high quality relaxation features, not gimmicks and a great value. InnerPulse with Standard color glasses \$199.00.

The ThoughtStream Pro: a low-cost biosignal processing system

The availability of biofeedback equipment for personal use has for some time been quite limited, mostly consisting in GSR feedback "toys". Two factors may help change this in the near future: the FDA has recently discreetly liberalized their regulation of biofeedback devices (provided that they are battery powered, are listed with the FDA, and do not make medical claims beyond assisting with simple relaxation, a category which seems to include personal growth, peak performance, etc.), and microelectronic component (and personal computers) price/performance continues to improve dramatically.

Most manufacturers of biofeedback systems have been in the business for a long time, and it is in their interest to keep prices relatively high, which is one of the reasons why the price of "professional" equipment hasn't changed much over time, costing typically several thousand dollars for a system with several input channels and processing software. And because of the fairly strict FDA regulation, their primary target market has been clinical biofeedback practitioners rather than individuals.

Even such innovative, lower-cost products as the Waverider and Brainmaster are in the thou-

sand dollar range. Certainly sales volume is a factor: if you wish to remain in business and you can only sell a hundred units a year, then you need to set your price high enough to pay your bills. We've decided to take a slightly different approach: make a powerful and accurate low-cost biosignal monitor, price it well below our competition, and hope that demand will increase to justify this approach.

The system we will soon introduce is called ThoughtStream Pro. Available in two and four channel versions, each channel can be configured as EEG, EMG or EKG. We can offer such flexibility because we are using 24 bit analog-to-digital converters instead of the 8 bit converters used in most other systems, which means that we can sample a huge dynamic range without sacrificing sensitivity (8 bit systems offer 256 discrete measurement levels, while 24 bit offers over 16 million). The typical neurofeedback system with 8 bit converters is unable to monitor all three biosignals due to differences in frequency range and signal amplitude.

Sampling rate will be programmable as well: up to 1000 Hz for one or two channels. Higher sampling rates are useful for EMG (electromyography) as well as investigating gamma oscillations and the like.

The ThoughtStream Pro includes an automatic impedance check circuit, which verifies that skin resistance is at the desired level.

The real power of this system lies in its modular, flexible software paradigm (called BioExplorer). You simply select objects from a menu, connect them together on-screen, and run them. There are three object types: source, transform, and display the results. The source would typically be the ThoughtStream Pro, but other systems are expected to be supported in the near future as well. Here's a quick list of Transform objects:

Averager - averages the input signal for some period of time.

Bandpass - selects a filter frequency range.

Coherence - calculates the coherence between two signals.

Dominant Frequency - evaluates a range of frequencies and outputs the dominant one.

Expression Evaluator - use a mathematical formula to analyze the signal.

Pulse Detector - object for extracting heart rate.

Threshold - determines whether a signal exceeds a preset level.

And Display objects:

3D Object Graph - allows biofeedback-controlled manipulation of 3D objects.

Bar Graph - traditional bargraph display.

Media Player - for control of media via biofeedback.

Meter - digital display object.

MIDI - control a MIDI synthesizer, such as the one included in Microsoft Windows.

Oscilloscope - traditional oscilloscope display.

Spectrum Analyzer - various algorithms for displaying the spectrum in real-time.

As an example, two EEG channels are first filtered for alpha, then the

coherence between the two signals is calculated. Finally, the result is sent to the bargraph.

You can assemble objects in a wide variety of ways and nearly arbitrary complexity. You can record your session's data for further analysis as well.

ThoughtStream Pro is scheduled for June release; exact pricing has not yet been determined.

Workshops & Seminars

The following organizations offer seminars and workshops. For a schedule of their upcoming events, please feel free to contact them directly:

David Siever / Comptronic Devices LTD.
9008 - 51 Avenue
Edmonton, Alberta Canada T6E 5X4
800/661-6463 / info@comptronic.com

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