

BioChip Inc.TM

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A Fullerton Design

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Testing confirmation tentatively **will be** designed and conducted by:
The Miami Project.

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Analog BioChip™

Robert L. Fullerton and Dr. Mehmet F. Yilmaz PhD.

Introduction

A BioChip™ is a device containing a micro-array of carbon nano-tubes, on a solid media; allowing many tests to be performed at the same time with ultrahigh level of sensitivity, speed, and accuracy.

Fig.1 illustrates the planar arrays of carbon nanotubes, which were grown in iron dots by chemical vapor deposition [1].

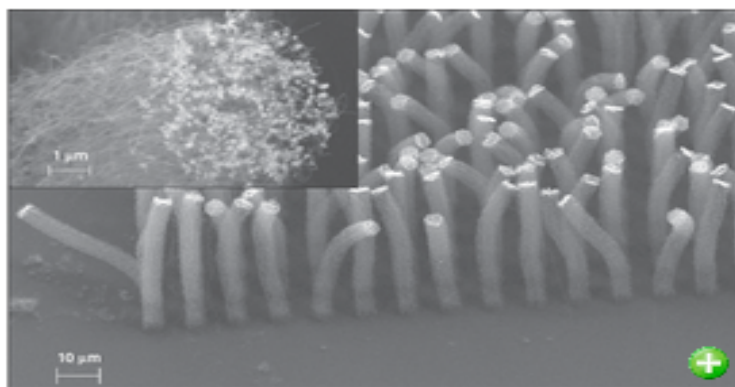


Fig.1

Biotechnologists are always interested in biochemical process occurring inside the cells and semiconductor technology has made significant progress in the micro-miniaturization. The emergence of these two fields, with careful observation to what nature has developed and proven, has led to the development of biochips. The developments of biochips were initiated by using sensor technology and the portable glass pH electrode. After the structure of DNA was solved, the DNA sensing was accomplished by the polymerized chain reaction, which amplified DNA concentrations are followed by the labeling of DNA with florescent tags. In the beginning of the nineties, biochip's are used investigate the mass production [2]. Nowadays, biochips are applied in computer, medical and military uses.

In this work, we have designed an Analog BioChip™, which is to be used similarly to that of a CPU utilized in computers, to assist the organic brain in decisions

and processes; example, at extreme speed; example to diagnose and circumvent the spinal cord injuries. The Analog BioChip™ can also (in an unrelated application) be similarly reprogrammed into being used as an interface between astronaut (changing thought to commands, while in the third level of REM sleep to reduce the food/air consumption on long duration special voyages) and spacecraft navigation and other computerized spacecraft subsystems during long duration voyages.

Section I. discusses the components of the Analog BioChip™. The details of applications are provided in section II and conclusions are given in section III.

(I.) Components of the Analog BioChip™

(a.) Buckey Ball Carbon Nanotubes

The Buckey Ball is a form of carbon in which the sixty carbon atoms form what is called “truncated icosahedrons”. In this form, the Buckey Ball literally looks like a soccer ball, consisting of 12 regular pentagons and 20 hexagons. The C-60 molecule does not bond readily to other atoms or molecules.

In Fig.2, the carbon-60 Buckey ball is shown [3].

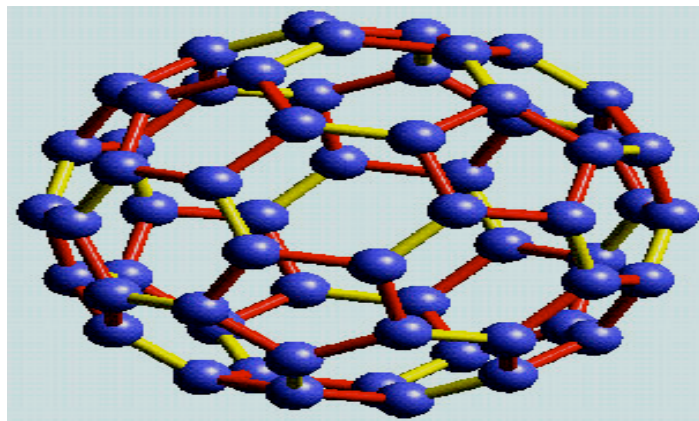


Fig.2

The Buckey Ball has special characteristics. A few of these characteristics are that the Buckey ball can act a conductor, an insulator, a semiconductor, or a superconductor; which is the main interest in this work. Another characteristic that the Buckey Ball reveals is that the strength of this natural construct, being the “roundest” of round

molecules, is that it is quite resistant to high-speed collisions. For example, the Buckey Ball can withstand colliding with stainless steel plate at 15,000 mph and when the Buckey ball is compressed to 70% of its original size, the Buckey ball becomes more than twice as “hard” relative to its cousin, the diamond. Besides, the most exciting characteristics of the Buckey Ball are that it is hollow. The Buckey ball exhibits ferromagnetic properties combining with a reactant that readily donates its electrons to the carbon molecules. By cooling and warming, to 16 Kelvin’s, the compound will become magnetic which was also observed in hostile space environment where the “hot-cold” cycles of the rotating sun.

When the Buckey ball is stretched or redesigned into the cylindrical geometric form [Fig.3], by adding ten carbon atoms, it can also be modified to larger diameter (similarly in construct, as if one weaves a larger basket), which allows smooth transition of the electron flow within the molecular matrix due to symmetrical geometry [4].

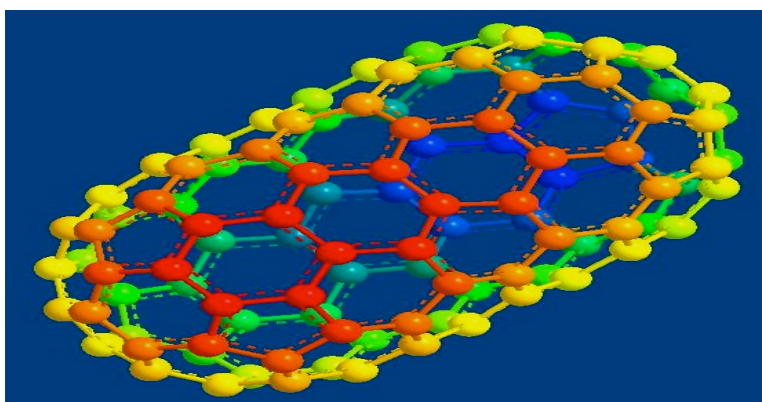


Fig.3

(b.) Carbon Enzymes

Enzymes have the characteristics of high performance on many chemical reactions as a catalyzer and can be used on a virtual never-ending production cycle (Fig.4). By genetic engineering, the enzymes can be active in selected (narrow) range of reaction conditions. So, selected group of enzymes can catalyze the production of only a single species and be able to either build molecules, or break down, by several orders of magnitude which also help us to control the degree of conductivity of the media [5].

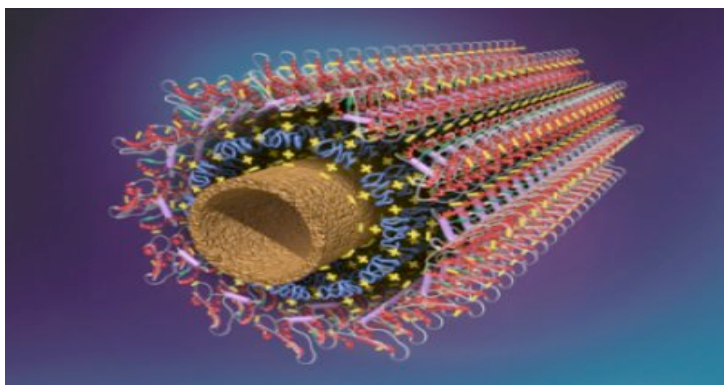


Fig.4

In these reactions, an enzyme forms with the carbon and produces an electron transfer during the natural geometric fit. The result is known as a “Super-Gen-enzyme”. These hybrid enzymes pathway is narrow and predictable, reacting with more specificity than a normal enzyme. The binding between the carbon atom and the enzyme results in covalent bonds, which poses no maintenance problem.

Besides, attaching synthetic proteins to these enzymes help to identify the interactions of proteins with the targets. For example, it can detect breaks (or potential problems) in the DNA of the genes. Moreover, in this mechanism BioChip’s™ diagnoses faulty circuits, switch them out, then activates reserve circuits to restore normal functionality.

In addition, the biosensors that transduce the enzyme behavior directly into photon signals will lack any strong positive or negative charges; eliminating any chance of charged separation media interfering with the photon separation sequence. The immobilized enzymes and cells are trapped in this “skeleton” structure causing them to react with the components to form the desired structures. Preservation of the enzyme is created through gene splicing. Neural networks [Fig.5] of this order have the enhanced capability to distinguish between different two dimensional patterns, to learn the pattern to be recognized, to notice and learn geometrical invariance within “gray scale”, brightness, vector, speed, letters of print, and two, and three dimensional objects including geometrical invariance’s [5]

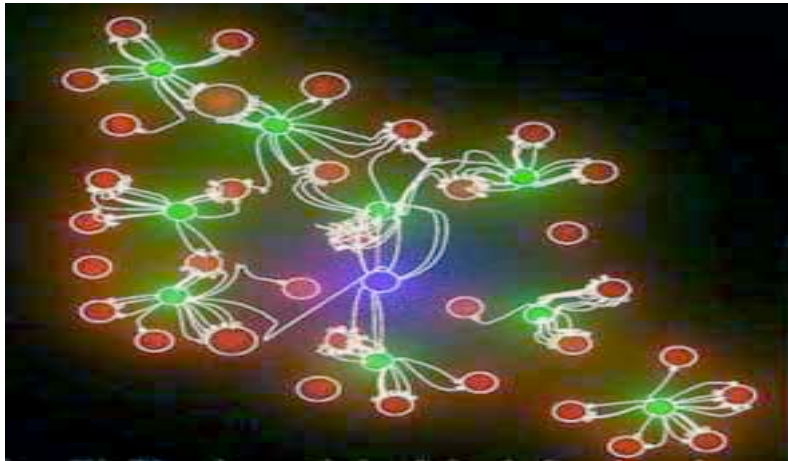


Fig.5

(c.) Nano Particles

The semi-metallic Nano particles (carbon fullerenes) in enzymes produce an optical activity from the ultraviolet to the infrared range, due to the helical structure at the core of Nano clusters. Thus, slower electronic circuits in biochips can replace telecommunication optics, for a specified wavelength range, and the structure will not be sensitive to disorder due to carbon structure of honeycomb. The nanocluster, within a temperature range of 86 to 110 F, produces no measurable resistance. Carbon fullerenes (nano particles) are illustrated in **Fig.6** [4].

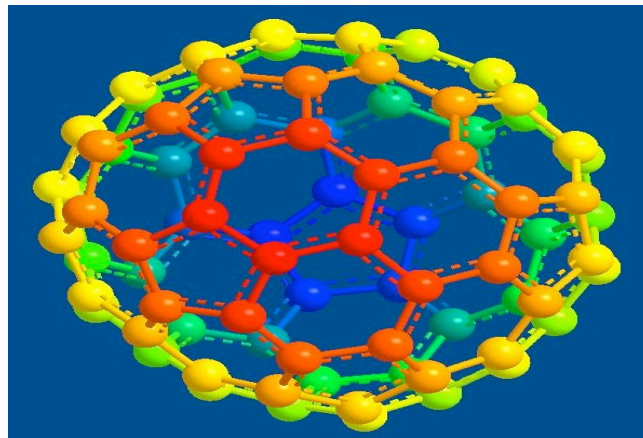


Fig.6

(d.) Quantum Light

First of all, nothing travels faster than the photons; the subatomic bits of electromagnetic radiation that make up light. Moreover, by using light to control electricity, it is possible to enter the world of quantum mechanics and quantum computing which can produce the kind of the data fusion, now being done in the human brain, to the computer chip.

When starting at the enzyme node the information is in an electrical form, in the milli-volt range, and the enzyme translates the impulse into photons, which is then flashed to the next node as small packets of light (in pattern groupings of wavelength and hue values). At the other end, the packet is reintroduced back into an electrical impulse. This will occur millions of times per second with the ability to manage millions of individual “conversations” enabling the human brain to transmit information to disconnect muscle group or mechanical equipment; a CPU type instruction set is established, and understood, between device and the brain. At the same time, different wavelengths of light, and the patterns of wavelength hues, transmit different data to the optical nodes; electrons can carry a computerized “on” and “off” potential within a photon based processes, drastically increasing the amount of information and quickening the complexity of computations. This component of the description of calculation is emphasized because the DNA construct carries, or conducts, instructions across, and throughout, the helical structure of the enzyme in three dimensions (both left hand twist and right hand twist, depending upon the construct of the molecule of the enzyme). The enzymes carry external signals to other enzymes by means of “luminous fibers” that connect and conduct between like entities. This provides a means where enzymes “communicate” with each other and other elements - each conductive fiber contact creating a node point (a type of optical capillary action, if you will).

(II.) Application of BioChips™

What has been previously described is currently accepted and conventionally utilized, however the overall field of this technology is still in its infancy and, as far as the total development, much is to be explored.

(a.) **Computer Use**

The BioChip™ is a system that uses these enzymes, effectively controlled by photon reaction or activation, at the atomic scale. Because of the systemic reaction of the charge state of the photon across the enzyme this makes the enzyme a type of muscle that is reactive to a particular wavelength that is emitted by the photon (Fig.7). The reaction (or not) to differing hues of light means that pattern selectivity, or aperture, of the enzyme and pattern recognition, can occur within a device. Because differing regions (or levels of hue control) control, or copy, other pattern recognition realms, which occur at the speed of light (passing through each synaptic junction group), an operation occurs, and is recognized, in waveform patterns, in three dimensions, through out this systems structure. There is, unlike the typical mechanical [ALU] arithmetic logic unit, no gating sequence to speak of within that occurs during the differing pattern shifting processes.

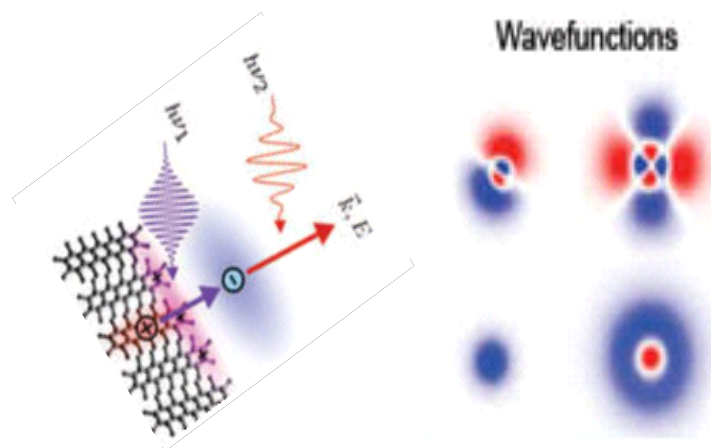


Fig.7

To clarify this conversation - there is no step which leads to the next operation function which is to get a piece of information which, in turn is gated to wait for an opening within an electronic gating sequence to put data into an address and then when the gate opens again, click, move another piece of data to the data bus switching mechanism, and then, bang, store the gated information into a switched memory location. This systems “engine” is not a gated (ALU) switch, where zeros and ones are shoved into a holding pen by the ancient loom cloth sequencing process, but instead this is a system

that recognizes and processes information relative to a natural “muscle” reaction, or non-action, pattern sequences through out the entire system within a three-dimensional matrix as a waveform group and each processes pattern shifts patterns as it decisively reacts to the collective pattern within the matrix in accordance to the waveform grouping to muscle reactions and residual charge state recollection within the differing pattern shift groupings and storage as they occur. Also, unlike the conventional computer processor, pattern shifting can also occur, at simultaneously the same shifting period, in the opposite or biased direction and share the same memory address at the same period. The conventional computer processors, as you know, can be configured to connect and retrieve data in parallel, however this process still has to share, or wait, for a “gate” sequence to open and then to shift or process that information to or from the bus for storage, processing, or retrieval. Basically, all engines have a four-step process; intake, computation, processing, and storage which takes place in accordance to the clocking (gating) type mechanism.

The BioChip™ uses a system of seven levels of enzyme control cell layers with which it controls the color wavelength information matrix recognition reaction cells; for the yellow, brown, blue, green, pink and red hew wavelengths (Fig.8). Underneath this grouping of expandable/contractible enzyme muscles is a layer of reflective cells that accepts or absorbs the white component of light. These cells effectively coalesce the rainbow spectrum of light into intelligible decipherable intelligence matrix mechanism.

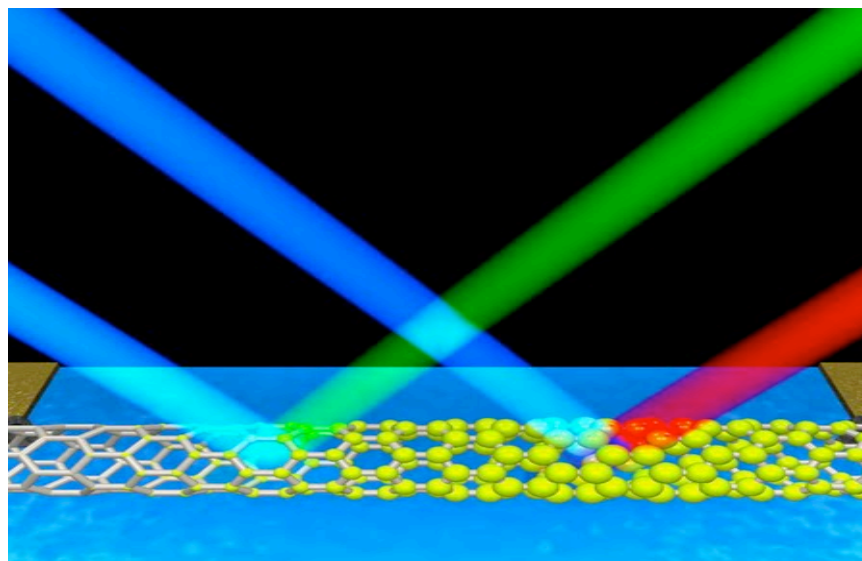


Fig.8

The first three layers control light acceptance, or not, of the remaining enzymes. As light hue is shifted from synapse to another pattern memory occurs, due to the residual energy impacting the enzyme. This action is comparatively much the same as the actions of electrons upon a selenium rod in the office printer during a printing operation except that photons cause the enzymes to react to the photon charge state at a specific light value hue as well as residually photograph the event within is color exposure to that part of the matrix or not. The enzyme effectively expands or contracts in reaction to this exposure contracting to almost no dimension under diminished photon charge values within the matrix as the exposure occurs which shades or allows illumination the other cells comparatively. These enzymes naturally, in theory, sport a lattice of cells constructed and connected at effectively six points controlling reactive expansion and contraction relations between like hued cells that produce a single synapse within a matrix. The matrix of exposure or illumination to photon charge, using the conduit between synapses to exchange charge states, comparatively changes relative to the previous synapse reaction enabling the information transmitted to change as required. The transmitter transmitting the information to the receptor (pattern establishment) controls the pattern flow (simple pattern recognition) as the hue values within the cone and rod reception shift the pattern to the enzyme control group; cache storage and processor by way of a direct pattern color matrix. Since light (in this case photons) travel faster than any electrically

activated mechanical switching apparatus the only delay within the light pattern recognition system and the ability of reaction of the enzyme switching system station, the contraction and/or release appears responsively immediate; effectively simultaneously in multiple directions at the same time period – as differing light values can share the same space at the same time.

Early on, during the development of the conventional computer, binary conventionality was established (after copying the functionality model of the loom weaving machine) turning one wire address on or off and then laying an array of wires into a matrix and switching these polarities to create an instruction pattern. The matrix, base two math, was limited in the amount of information to relative space per address. If one were to visualize a coconut shell as an address as a connection point between two wires, this is an establishment of an address, laid carefully in the same matrix formation, one coconut shell would either contain an on or an off property. In the base two language, of this type of machine, current flowing past the coconut shell is activation, or one count, in that system. Designers of that system overcame many conventionalities of counting, due to a fact that letters could not (or were very difficult) to utilize in a mechanical process, first before creating that machine. In the Roman counting method system letters were used, to a very limited degree, however complex math equations were almost impossible until the Hindu Indian method of counting came along and was further refined by the Arabic algebraic system. In a nutshell (in our new configuration), one address contains more information of finer detail. The more calculations per address point, the finer the detail and the less real estate is used for the same type of information. If one were to look at the computer screen, the screen resolution was very limited in dimension (800 x 600 pixels) and the graphics were very grainy in comparison to the much finer resolutions of 1600 x 1200 pixels where icons and graphics appear not as grainy as its predecessor. The Mayans had a system of counting using both hands and feet and using the individual as a count of twenty - base twenty mathematics. The Mayans system of counting could transform huge numbers utilizing very little real estate whereas a base two (binary system) would run out of numbers or create errors in the calculation due to the truncating process. In visualizing the coconut field again, each

coconut now represents a huge number (a residual pattern) instead of on or off.

Processing resolution becomes faster and more refined. Today, if one were to look at the computer screen, resolution was very limited in dimension (800 x 600 pixels) and the graphics were very grainy in comparison to the much finer resolutions of 1600 x 1200 pixels where icons and graphics appear not as grainy as its predecessor. However, the Mayan base twenty-pattern method is not used (or even understood conventionally). Yet, molecules appear to have adopted pattern recognition within their construct naturally.

As photons of light have the property of sharing the same space time, without changing the values [quantum “mechanical spin” characteristics] of the occupiers value or charge at that instant for a specific location, and can process in multiple directions in that instant of time, the address is only changed by the reaction and residual charge as the wavelengths pass across the symbolic coconut shell; of which the enzyme is reactive. The complexity of this illustration is, now, the matrix of shells have a third dimensional component, which reveals its fourth dimensional property to that equation; and more, if analyzed deeper. The computation device now becomes more accurate, is less “grainy”, handling that much more information in a significantly less amount of real estate [6, 7].

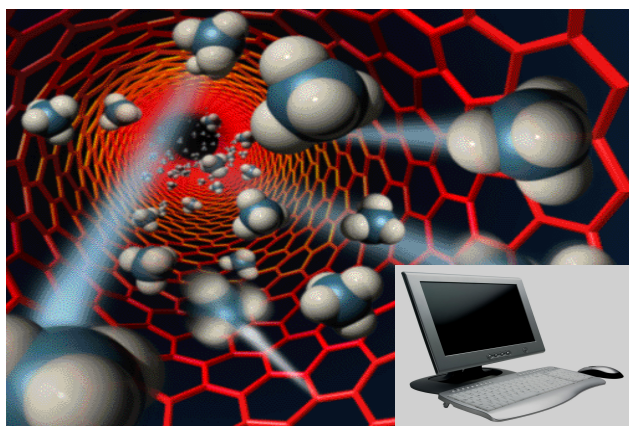


Fig.9

(b.) Military Use

Give the military a machine that can do more, faster, with more capability – there is always a use.

For example: after observing how nature solved a problem of defense for the horseshoe crab and turtle, Leonardo DaVinci once designed a human powered clam shelled crawler with cannons pointing in a 360-degree offense/defense direction – this became the predecessor to the modern tank. Leonardo also formulated and designed 3 groups of 10 cannons mounted on a pair of wheels – with the advent of gears (years) and levers and this, many years later, became the modern machine gun platform predecessor.

A machine that uses enzymes, instead of transistors, is almost immune to EMP generators and weapons (Fig. 10), which can break up objects in the size of kidney stones by using the electromagnetic or acoustic pulses [8]. An aircraft, proven and so equipped, would not simply fall out of the sky when attacked electronically and would have the capacity of thinking on its own (so to speak).

An aircraft, so equipped and proven, would not simply fall out of the sky, when attacked electronically. This type of aircraft would have the capacity of appearing as though it was reacting (so to speak) in conjunction with ground-based operators that would be “thinking” the aircraft through its operational maneuvers. Such attachments, remote pilot to aircraft, would also create an almost “instinctive reacting” aircraft, especially in a dogfight, capable of performing beyond normal human physical limitations without the danger of losing the pilot. In a combat environment, not only would the pilot be in contact with the aircraft but with ground support units as well, simultaneously, with an instantaneous relative understanding of the battle field, conditions, and reactive response speed. The aircraft would truly be able to expand and perform to the mechanical limits of aircraft design, opposed to the human limitations and response times.



Fig.10

(c.) Medical Use

The main design of this concept is that it is for medical parameters. Spinal chord injuries (Fig.11), where there is an interruption between the cerebral functions and the peripheral limbs could, in theory, be rerouted past the injury and allow normal function of the limbs to be re-established [9].

From the illustration, in Fig 11, one can see physically the spinal chord as if they were a bundle of wires and the wires are, clearly, short-circuited (or even cut), the issue of passing signals passed the fracture is that signals from the brain need to be interpreted and understood, single wire by matching wire, by the receiving muscle to perform a specific or desired function past the short or disconnection. The method of repair here is that the signals of each strand of selected wire, from the specific processor (in the computer model) needs to be established for any type of “normal” parametric function to be re-established. However, from another perspective the analogy here is that the brain, the processor in this conversation, is like the music concert hall and that the repair device (the enzyme) is outside the building, in fact, somewhere down the street, listening to the concert from that distance. To understand, or to hear, the music being played inside the concert hall one has to get inside the building to understand what music (instruction) is being played and how.



Fig.11

(d.) Space Use

For man to travel into space, especially where light years of traversing are required, demands that traversing from Earth to the nearest star would take decades of travel time. Space navigation (Fig.12) becomes tedious and mind numbingly difficult, as far as the logistics of maintaining conscious effort across such an expanse [10], a crucial element of safety that needs to be implemented for a safe journey to take place. Allowing one to navigate such vast distances, while asleep, becomes more feasible if the human brain, instead of the operator manually, manipulates and manages the systems. Navigation becomes the process of “seeing the systems”, as though they were an extension of the human system through out the voyage. The REM sleep system operation would appear to be a safer and much more manageable system than physically duty shifting 3 persons manually press button, visually watch dials operation. The REM sleep system operation would mean, that within a given twenty-four hours, two navigators would simply shift the same type responsibilities but in an “automated” environment while in deep REM sleep. An “automated” human activated and controlled system would allow the human factor to control and understand factorial parameters of the journey in (almost) an instinctual manner while, simultaneously, monitoring their own physical aspects during such a journey while telecasting every aspect of the journey in real time to mission control; a remote located black box system.

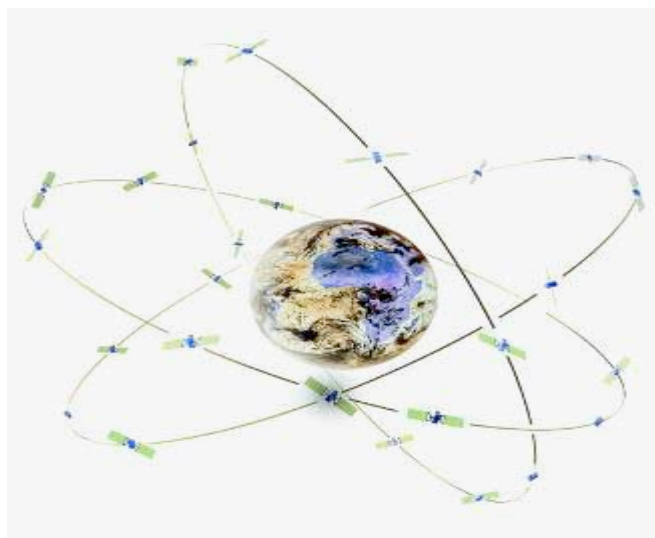


Fig.12

(III.) Conclusion

Analog biochips with ultrahigh level of sensitivity, speed, and accuracy will enable to bring innovative solutions with computer, military, medical and space benefits.

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Development of the BioChip™ / Reno

By Robert L. Fullerton

I met with Mr. William P. Lear, the designer of the Lear jet (as well as the inventor of the eight track cassette tape player), at Lear Reno in the summer of 1972.

The topic of the meeting was my patented automatic toroid transmission. Mr. Lear had been informed that the toroid, in the automotive scale, was in working prototype form and had been successfully tested by Stanford Research Institute in the spring of 1972. The resulting S.R.I. written test results said that the toroid exceeded eighty percent (80%) placing the toroid in the superior category.

Mr. Lear's interest was in the toroid's wide ratio relationship compatibility and therefore its ability to automatically maximize the turbine power plant that he was currently testing in a Chevrolet Monte Carlo as well as a standard size "Greyhound" type bus.

The turbine design develops high horsepower at a very narrow torque band. The ratio range of my toroid made for a proper power/torque range combination that would result in a high horsepower efficiency shifting automatically through infinite ranges producing a smooth shift pattern. Several meetings with Mr. Lear produced a test program and the beginning of a friendship.

Mr. Lear, once you proved yourself creative, was open and helpful. Upon discovering, that I had a background in sculpture as well as inventing Mr. Lear became interested in my other projects. Conversations that began in engineering would always end in the areas of photography and art. At this point, Mr. Lear began giving advice on the marketing of my other inventions. His advice was like the word of God to the inventor and I was no exception. The point to his advice was that, as an inventor, you would have an idea that you fall in love with. His was the jet. To finance that project without the controlling input of lawyers and accountants, he sold his tape deck to Motorola to enable him to bring his jet design to "proof of concept" thus he was able to control the early creative part of his Lear jet business and also maintain a large portion of his stock after the "business" types became involved. I told him that I also had a concept that I was in love with, the Bio-Chip, and that I had been working on it since 1957.

Mr. Lear's second piece of advice was, as the design concept was forming, to not limit creation to one area, as many engineers make no provision for the other areas that may and will come into play; something of an idiot savants concept resulting in the need to modulate a concept. I told him that I was familiar with this problem due to, while doing a wood carving relief of Claudius, I concentrated on the anatomy of his arm; carving it to a finished state prior to even roughing out the rest of the body. To this day, that arm looks out of place and not part of the overall finished product.

I then, with the help of some of his engineers, brought the toroid to a preproduction engineering stage, later modified it first to fit in the hub of a bicycle and then in the hub of a wheelchair. A prototype was then developed for testing in patents filed.

About this time, I invented the ZipNut™. The interest of NASA, and others interested in the ZipNut™, resulted in the shelving of the toroid for a while. Most of my creative energies would be spent bringing the ZipNut™ into production. With NASA's interest in the ZipNut™, coupled with the successful completion of the fire coupler version, I assembled a management team to take over the business of running the company, leaving me time to return to the Bio-Chip. My plan for the Bio-Chip was to, now that the concept was ready to be assembled and tested, find a willing subject to use the non-invasive testing. I found such a person in a Reno resident, Joe Bohl, who due to a back injury used a wheelchair. I felt that first I had to gain his confidence before placing a bunch of wires on his scalp so I told him about the toroid's use as an automatic transmission for a wheelchair. Since he uses wheelchairs in sport, he was interested. I felt that I could have a wheelchair operational in a matter of months and be in serious testing of the Bio-Chip in two years but this was not to be. Due to the unfortunate misinformation of regulations, all of these plans had to be placed on hold. Nevertheless thankfully that is now part of the past. The ZipNut™, as I had planned prior, will provide to finance is necessary to bring wheelchair and the Bio-Chip to market.

I recently met with Dr. Patrick Jacobs, Miami project, at the University of Miami, Miami Florida. The Miami project is researching to assist, or cure, spinal cord injuries and making great strides in this direction. After my initial conversation with Dr. Jacobs, I contacted the University of Nevada, Reno to seek assistance in my Bio-Chip program. My quandary, due to my leaving school before finishing the 10th grade, I often find

myself floundering at presentations, not from the lack of knowledge of the subject matter but with the academic presentation. In addition academia often has information and contacts to eliminate having to "reinvent the wheel".

After making contact with U.N.R. and reaching the beginning of an understanding, I went to Miami for a personal meeting with Dr. Jacobs (the first was by teleconference). After presenting my proposal on the Bio-Chip, we talked of my other inventions. When the toroid transmission and the other wheelchair came up, he became interested in the wheelchair use, as he was familiar with the recent reports of shoulder joint injuries developing in both young athletes and the elderly using wheelchairs; the shoulder joint was not designed to be used in this fashion producing trauma to the joint.

It was then decided that the Miami project would set the criteria for both the Bio-Chip and wheelchair program overseeing the actual testing of both and assist with gestation of development. We anticipate the wheelchair program beginning this December, the Bio-Chip in about eight weeks. The complete Bio-Chip program will take two years to be ready for formal invasive testing. Before that, we will do non-invasive testing using a light (bicycle type) helmet to contain contact points. Our first test will be controlling mechanical and electrical switches by brain pattern (thought), and then we will be controlling a motorized wheelchair. The concept that I am working on, at the moment, will do ten commands, five to the wheelchair and five outside (telephone, light switches, doors, etc.). See you can see things are exciting.

The nice part is that I will not have to go to the investment community as the ZipNut™ will provide funding up to "proof of concept", after that it is a business and I will step back. As you will see from the Bio-Chip document enclosed, the concept used is broad in its design to enable it, with the "proof of concept" achieved, to be used in many fields. The Miami project will open the medical field; the agriculture use begins with a "crop humidity detector" that will enable the farmer to cut and bail in one operation. The computer use surprisingly has more interest in China, Korea, and Europe than the United States, but then I had that same problem early in the life of the ZipNut™.

Complex thought is an idea formed and textured from simple expressions; yet to be explained.

It was once explained to me that, “a complex idea was an idea formed, or textured, by gathering, sorting, and culminating simple ideas. Complex ideas are simply, simple expressions not yet implemented but hypothetically expressed and explained”. Inventors design, and build, upon simple ideas while learning to use those ideas in different or many ways. Hopefully, these idea’s create other ideas.

The BioChip uses a carbon based, C-60 and/or C-70, three dimensional fullerene balls or nanotubes. The nanotube is made up of these largest known of all molecules, the carbon atom. These carbon atoms, arranged into hexagonal spheres or tubes, are about 1 nanometer thick and up to 1 millimeter in length for the nanotube configuration. Nanotubes can contain millions of carbon atoms and hold the promise of controlling gating properties when integrated with functioning logic circuits. Nanotube technology is currently being used in electrical logic circuit technology to control the voltage at the gate elements of MOSFETS and FET transistors; by placing the nanotube over an insulated gate electrode. Nanotubes typically are showing an inherent p-type substrate characteristic when not used in any physically shared electrical component application. Applying nanotubes to the gate leg of a p-type FET substrate circuit is no more difficult than a chemical wash creating a molecular self-assembly bonding to the substrate surface. These patterned, organized, carbon atoms are then configured into a multi-cell matrix. The patterning assemblage inherently reduces also the electron resistivity component within the circuit because there is no components for the electrons to move around or run into; creating less heat within the circuit of the electronic side of the logic circuit. Each framed carbon shell, of each individual cell, houses the memory and processor within the separate and individualized cell locations; lets for the sake of reference of logic call these locations – address nodes (similar to addresses in the conventional computer except these have a third to twelfth degree of special orientation [explained later] instead of a base two, two dimensional, configuration aspect).

The BioChip “memory” and processing complex matrix is very similar, for this discussion only, to a conventional electro-mechanical transistorized processor and memory system in a very general theory however, the Biochip memory utilizes bit bytes,

addresses, and nodal information a little differently. There is the third dimensional component to the equation, and the physical aspects, that is also to be calculated in this equation which reveals the true system capability, complexity, and uniqueness of this design. This construe should establish, for discussion only, how two differently processed bits, bytes, nodes and/or addresses of implemented data can be retrieved and/or returned to memory in both directions at the same time and how that retrieval/storage management can occur simultaneously at the same location.

The thought that two or more instructional operations can clearly be conceived, received, implemented, and/or that can even occur at a single instance in time was only thought possible within the confines of human gray matter and/or consciousness. Now, conceptualize a three dimensional celled matrix, simultaneous multitasking multifunctional processing and its possibilities, for the sake of this discussion, only within the bio enhanced mechanism. This concept should be considered fully, carefully, and worked out thoroughly.

Conventionality

Conventionally a logic processor utilizes transistor to transistor logic [TTL]. The Biochip's fullerene structure consists of sixty (60) points making up 12 or more surface pads, and with seventy points (70) more than 12 usable surface pads in the cylindrical format. Conceptualize, mentally, a soccer ball design in three dimension. This is a carbon matrix structure with all of the optical connections similarly attached to other fullerene structures (one soccer ball connected to other soccer balls in a matrix; all of like structure) establishing a three dimensional branched connection matrix, processors at each address location. Each individual "Soccer ball" is really a translucent lens that allows photons to be stored within the dielectric type shell of the structure. The photon color value is, for this concept in the conversation, a single value, or color, of wave length that is directed to the center of the shell directed angularly by the iridescent properties of the reflectors. There are five iridescent reflectors per pad, located between the junctions of two different pads, 12 pads per ball resulting in 60 reflectors per ball location. Each reflector denotes a bit and each pad denotes a byte location, or unique node address. Take into account (remember) that there are, for the sake of this conceptualization, now three wavelengths of light that are being reflected into each separate ball, and at one reflector side of each pad location per ball, simultaneously at the

speed of light. At this time we are not including hues of colors that are being processed simultaneously at this time. This must be considered carefully, fully, and worked out thoroughly as the rate of speed of processing for each instruction which for all intents and purposes is visually, at this rate, a wave regarding changes to instruction changes.

Base Counting

In the conventional computer there is the byte and the bit. The bit, in the conventional computer is calculated as having a zero or a logic one state; subsequently a base two count. The byte, in the conventional system, is calculated using base two. The buckey ball system has, using one wave length reflected into and out of each pad, uses logic one and logic zero however there is another component, neither or both at the same time. Five reflectors per pad per ball constitute a byte instruction. A node is this address location; just as in conventional computers. There are 12 – 5 point pads per luminous ball location, using binary logic this establishes a 2^5 (=32) times 12 (=384) possibilities per instruction or byte. Now compound this with three values of light, or 384^3 (=56,623,104) instructions bit bytes per ball at the speed of light. Conceptualize, now that each ball is its own processor tasking at the same frequencies at the same time. The capability of the machine now depends upon the number of cells within the matrix. This must be considered fully as to the potential, carefully as to its functionality, and thoroughly as to what instructions are implemented within.

Similar to having a multi axionumerical transistor when resembling the BioChip as a transistor, when relating to the Biochip's "TTL" logic functionality, hypothetically the transistor base, collector, and emitter are now configured as a three axis connection system. A cube type configuration with a ball at each of the six junctures just to illustrate a single three dimensional address location BioChip theory. The buckey ball is a translucent sphere, a lens, that has photon dielectric properties that allow the electron flow to the base by means of coupling to its base. The coupling similarly is roughly the same as electron flows when utilizing a frequency modulated (FM) signal transmitted inside a neon gas filled shell; this becomes electrically luminous in the synaptic firing allowing photons to flow in both directions at the same time.

The initial transmission of the input signal [a light wave length], at the base, would reveal an internally valid reflected signal angle, back and forth along the insertion

point, as if the signal was a valid non-regenerative and non-interfering feedback [light does not interfere with itself] signal. At the input, base, and output, collector and emitter, legs, along their respective axis of insertion and exit points, the charge remains at the site [at the junction of the base, emitter, and collector within the transistor; the ball remains charged] with the logic state implemented. This cannot happen in transistors, thyristors, rectifiers or any other type of semiconductor circuit because the conductance of electrons either produces or relinquishes holes within the substrate; a condition of conductance or not. This conventional transistorized methodology is a one byte in, one byte out system.

Logic States and reflectance

Conventional transistorized methodology system management of data recollection mechanically is performed by way of the ALU “clock” and utilizes the program counter with which steps, and updates after the fetch command, then counts incrementally the byte information stored, or accomplished. The process increments to what the next instructions call. If a step is missed, a location can become a command. In this case, mostly, the system crashes. Present technology is increasing the efficiency and systems are becoming rather fast however, this TTL type system still is time consuming in the terms of its implementation. The TTL system is, and still will be, limited by the data bus antenna reflection problem and clock implementation mechanisms.

TTL logic is either a logic zero (0) or logic one (1) type of generating mechanism. Input frequency changes as the input voltage signal limitation [induction of the base diode signal] is seen, within whatever the amplification limit parameter there is dictated by the transistor, as the variance of the output signal from that individual transistor. Then again, within the transistor, the logic would be seen as “in phase”, the same as, or as “out of phase”, as opposite of, the induction input. This is the resultant amplified signal at the output point. The enzyme reflected photon angularity, from the input and output signal, tell each cell enzyme point that the photon reflective enzyme sees the color wavelength signal, what the logic state is, and controls not only the logic of that location within the cell but also induces a reacting capacitance charge from the photons to that cell. The cell becomes a type of battery with multiple layered switches. Again transistors are either on or off, exclusively. Transistors are switched with current, at the base, or voltage, at the gate of a field effect transistor [FET], and signal logic is dependant upon the output configuration (collector-emitter or emitter-follow) functionality of the transistor to

determining the logic at the output stage. However the BioChip uses unique instructions, or addresses, and a unique feature. Within the BioChip fullerene cell there can be a reception of, or generation of, or both, both logic states, along with a maybe and all occurring within each cell simultaneously. The fullerene optic-capacitive wave angle can reveal, or emit all three, or just both because of the switching positions of the enzyme reflectors at the same time at each pad in a grouping of pads of that cell.

The BioChip system has no diode. No conventional semiconductor of electrons even when regarding the theory of transistors. The BioChip system has no electromotive field [EMF] effect from an antenna wire. The BioChip system uses light values, photon particles, to establish the charge state at the reflection point. Therefore, there is no electron reflectance, and/or interference of electromagnetic signals. There is no electrical resistance. The BioChip reads a photon charge value and wave length, its color, to determine the angularity and logic instruction. However, this does not determine overall cell logic state. Logic state is determined by the angularity of the reflective enzymes; determined by the color of the light received within the fullerene matrix at that cell pad location. The cells collective enzyme reflective element angularity determines the instruction and logic state at each point per cell. This is the language of that cell, at that location. The overall effect is collective. The conditions of all cells within the matrix.

Antennas

Conventional central processing units (commonly referred to as CPU) access a transistorized semi-conductive at an x, y address (old diode) location. The memory structure, or memory card, is accessed via a lengthy data bus lines by the ALU (commonly referred to as an ALU) via the accumulator. This data bus creates an antenna in which can create an “internally reflected feedback signal” at higher and higher frequencies. There is also a hysteresis problem because of the metallic properties, a reluctance with which the input signal must overcome when charging and discharging, due to the changing logic states from zero to one and back within the wire. Newer systems, Pentium IV and others, have resolved some of the inherent signal reflective problems at higher data recovery frequencies, to and from the ALU however, there is still a time (mille to mega hertz) lag from process and process clocking implementation. The ALU is only capable of biting off only 8, 16, 32 and 64 bit bytes of logic stated addresses. These locations, called bytes, are dependant upon single clock allowance

conditions. This causes, what is termed as, bottlenecking within the information retrieval and storage process. The “antenna” is located at the base within each ball and is tuned similarly to that of an FM type antenna. This antenna, however, is micron sized and isolated from interference from outside signal contamination such as cross feed.

The electromechanical semi-conductive TTL current controlled devices, and the (Field Effect Transistors [FET]) voltage controlled devices, conventionally are used to control signal direction within processors and recover/store addresses, or nodes, within the memories location. This conventional electromechanical methodology is used to control on/off logic states and utilizes, and/or separates, address locations in which store single bits, bytes, addresses, or nodes into byte segments read by the ALU. Sometimes addresses are referred to, in programming circles, as a node. Nodes are the main controls from which selective logic is performed. Nodes are used, in higher level languages, such as Pascal, Unix, C and C++ etc, assist in locating a certain address location for the implemented program. This selective logic is referenced as if/else, for, and/or, and exclusive or instructions. For larger groups of data in this TTL type of system data is stored or referenced in sections also known as blocks, or pages. The number of blocks of memory used, dependant upon the program implemented, is calculated in binary, a function of base 2, and is limited to the availability of that hardware space [memory size] in a base 2 mathematical function scale.

In short to get the next instruction, and then the next data byte instruction, operationally the system must mechanically “water clock bucket” fill then dump. Where individual data bit bytes are processed in singular succession without error of input or output; otherwise this type system binds, gets confused, and/or simply crashes. Because the machine cannot recognize, or compensate, for unknown conditions/instructions any interruption in the mechanics or, electrical/electronic information transfer, causes a data or instruction corruption/mishandling. A crash occurs, followed by data corruption.

Though, initially in the theoretical application of BioChip complex, matrix memory is somewhat similar to the transistorized CPU/ALU system however, compared to conventional ALU/CPU systems, the BioChip complex is dramatically, and diametrically, unconventional. The difference in and of the operation, management, storage, and/or processing [compared to that of the conventional two dimensional transistorized memory logic state-address accessing processing and storage mechanism]

is that BioChip's complex memory is nonlinear and multi mathematical function base system; and not an exclusive function of base 2 processes. The memory is parallel processing. This system utilizes a multiple, and/or singular, iconic pattern recognition system that optically-mechanically step processes versus single and multiple bit bytes that are switch stepped in, not clocked or single byte out processed.

The unconventionality, and therefore the complex thought, is that the entire memory and processor system of the BioChip complex is multi-parallel, iconic recognizing using a three or multi-dimensional matrix structure with a multi mathematical dimension composition.

The BioChip complex processor/storage matrix uses multiple processor locations and uses the same memory location as the processor for each processor. Instead of a single processor with a separate memory, and remember that each location of memory is internal. The data bus is eliminated. The data bus is not required because the memory and the processor are the same connected to all of the other locations, processors, and hardware/locations and yet, truly parallel. Time used in calculation and implementation is greatly reduced, the case with which data must traverse to implementation; no longer by way of the data bus and memory address location.

Patterns

To express pattern recognition, formation, and iconic processing or pattern logic (in terms familiar to electrical engineers and computer experts), the Biochip uses a, [simple term – three] complex term - multi-axial, multi-dimensional addressed memory matrix within a matrix of cells. As a better description is that the cells form a backward operating group of transistors, optically, where the connections are in a tri-axial configuration. A box, or cube, of switches, if you will, with lenses at each corner within this cube. The addresses or icons are simultaneously stored and/or instruct as it processes iconic bit byte patterned data symbols. The initial instruction utilizes the same mechanism for processing and storage within a single “memory/processor” location. Addresses, or icons, are processed and re-stored at the same location, instantly for all intents and purposes, and are simultaneously updated throughout the entire memory matrix into a new pattern configuration along with its next “set” of instructions.

Color

The system analyzes for anomalies in the “what is to occur next” process. The pattern establishes the instruction and the flow of photons are released into the next configuration. The addresses or icons gathered, which forms and implements instructions to retrieve or store data, is configured and reconfigured into new pictorial icons at a specific color wavelength and enzyme angularity. The system reacts to overall differently configured instructional patterns. And in the next implementation process the symbol, or icon modified bit, byte, node, address [again] is reconfigured with new, or additional, iconically restructured instructions. The process then reformats the new formation, or pattern, for re-recognition by the means of setting, or reading, the “switching” enzymes at the intersection of the optical interconnection pads at each cell face. The pathway of information connections is formed by DNA type photon conduit tunnels. These DNA tunnels form a left and right twisting ladder lattice to control information direction at the face of each fullerene cell to other cells. Pattern instruction formation is “ignored” if a reflecting enzyme point fails to switch its value angularity instruction. If a reflection enzyme fails to receive a reactive color wavelength instruction from or to neighboring cells a re-sequencing instruction occurs within the cell becoming reactive and intuitively to correct by utilizing other cell segments to maintain a contiguous instruction signal implementation within the matrix.

Pictures

The BioChip memory complex uses, and processes, a form of complex “ideographic idea” within a three dimensional, or greater, multidirectional multi-axial optical operating, icon reading, not-arithmetic, multi-processing mechanism using the same space and hardware allotted. Within an optical signal reading, photon sensitive semi capacitive conductive cell conduit structure houses the multi-directional matrix to perform all of the self diagnostics, calculations, analysis, and instruction implementation in the form of pictures, characters, or icons.

It is more accurate to say that these “pictures” are ideograms similar to the Japanese or Chinese characters in form. Each cell extremity point has an associative cell pad which is a node or address of the cell pad connection and containing the instruction logic state at that point. Collectively these cell pads form an icon and are recognized as

the pictures from which instructions, or commands, are formulated and implemented. In some implementations, where the instructions are simplified to pictures similar to the Aztecs ideograms, the system recognizes these characters as if structured similarly to the methodology used within the Aztec calendar. The patterns and the location of the patterns form the instruction.

An analogy of this implementation would be the similarity of that contained within the nasal passage way receptors in the human or animal nose. My observations and deductions are from looking at the functionality of the mechanical properties and implementation of the signal receptors located within the human, or animal, nasal passageway. The nose carries specialized molecule receptors. At the ends of the chemical molecule sense follicles there exists hair follicle receptors formed uniquely to receive only those specifically shaped chemical molecules.

When a particular chemical molecule, of similar shape, settles onto a receptive follicle the chemical “circuit” is completed and an electrical signal is transmitted to a specific location of the brain. The specific neuron receptor in the brain receives this signal and a picture of the chemical is recognized. The nose “smells” because the brain “sees” the picture of the chemical.

The fullerene structured cells similarly receive specialized wavelengths of signals and in specific patterns and its processes, inherently, are also theoretically signal self correcting. The “memory” matrix performs an address location and data retrieval/storage management, along with the command implementation, within each fullerene cell during these operations. The design can account for a substantial operation rate of system speed and efficiency increase.

Memory

The BioChip addresses obviously differ from the conventional transistorized memory because transistorized memory must be supplied with a value of current and voltage at a clocked rate to give the machine “life” and its instructional functionality. Once electrical supply is removed, or is interrupted, within the matrix, the memory or instruction process is terminated and instructionally fails. Failure of an instruction may occur, even though an infinitesimal amount of electrical energy fails to be maintained or is misread as a logic zero causing the instruction to be misread or in a worse case the

instruction is totally interrupted within the circuit and the loss causes program failure. The common term is crash. However, in the BioChip matrix, memory now takes form in a collectable format, and can be recalled because the instructions are in the form of patterns of instructions of logic, instead of only on or off logic, photon light values stored, and accessed, within the buckyball, or fullerene's, three dimensional matrix.

No lack of speed here

An extremely low optical resistance characteristic, not electrical, also means a faster system. Resistance is defined as the interference, or reluctance, of an electron particle by another molecule at the atomic scale which impedes the electromotive or photon motive force. In the human body, electrical stimulation excites the muscles via the semi conductive properties of a dopamine junction within the synaptic nerves. Lack of an electron transferring and semi conductive chemical, dopamine, results in an "open circuit" or electrical interference of signals that activate a specific muscle; or a non-electrical stimulus signal to selected muscles or muscle groupings. In theory, muscle grouping circuitry, within the brain to the extremity, is electro-mechanically grouped in patterns. These speculations are from pattern usage suspected to be similar to that with which the brain utilizes to decipher patterns of chemical scent locations and signify what chemical signals are to a certain scent; in the later example the brain excites signals, as opposed to receives signals to implement a motor response vs. to "spark" a recollection respectively. Patterns are patterns. The brain is mechanically constructed to recognize and process patterns, no matter how complex.

Biochip memory addressing is also the processor? Eliminating the ALU and data bus inherently increases processing speed and means that there is no data time lag across the data bus while the data byte traverses to the ALU. This also means that there is no need for the clocking mechanism to wait for data transference. Turning the processor into a three dimensional logic analyzer makes the system capable of simultaneous and parallel calculations rather than singular, one instruction in, one out, instruction processing.

Imagine each fullerene sphere, with several layers of charge states, connected in multi layers with enzymes at each of the 60 or 70 points, within the structure of each address location. This forms a unique pattern address instruction within each address

cell pad and is the pattern recognized uniquely as a pattern within the matrix. A single address point issues a different pattern logic state to other fullerene's within a single dimension of the matrix or in three dimensions within a shaped fullerene matrix structure.

Imagining the electrical conductive structures at the molecular scale, the fullerene is a cylinder with many (60 to 70 points or 12 or more pad) connection surfaces for parallel neural synaptic connections to the other fullerene's. Electron/ photon logic charge state flow through each optic connection. Their mechanical fields of conductance, resistance, susceptance, and reluctance traverses to and through the molecular maze of material as the DNA controls the quantum directional spin and thus the recognition that completes a circuit. The fullerene is a small capacitive photon battery of sorts.

To escape some of the electromotive barriers an electron level "work function" must be achieved to overcome electron atom traps to exchange charge states to the next elements valence value. This interception, which causes heat and maintains entropy, causes energy or color wavelength value degradation within the molecular fabric. This is similar to electron resistance which impedes electron flow and impedes charge state logic within the transistor; the material element requires a larger work force from the electron to escape its quantum mechanical advantage. Changing the material or fabric matrix structure to a structure where the matrix is symmetrical allows the electron flow without impeding collisions and the impeding, or inherent, resistance. What I'm trying to describe is that utilizing different material structures is similar to lowering the temperature in a super conductive barium, yttrium, copper matrixes type material and mechanically increases the efficiency of electron flow through the matrixes. Carbon based structure provides a natural, very low resistance, conductive material.

Large satellites

A fullerene, carbon-based buckey ball, is a configured structure with enzymes photon reflective angularity properties controlling the bio mechanisms ability to manage data storage and processing within the three dimensional electro-optical matrix. The fullerene is a multi layered system. The simplest methodology to model this mechanical process is to envision a solar system type structure at each cell level. I described, earlier, to envision the cubic model, now envision the cubic model with stationary reflective satellites. Each cell has a space between the layers of satellites is capacitive, a type of

dielectric battery. A photon charged central system that is enveloped by concentric logic charge state controlling reflective junctions at the elliptical ring. Imagine each “planet within this system to be the enzymes which control the angularity and logic charge states of the other enzymes or “planets”. The pad is the connection of the reflection states of the enzymes. The quantum rotational relationship of reflected photons within this system dictates photon direction flow through a DNA conduit to the other cell pads. The enzyme angularity controls logic state and wave length logic pattern recognition. Language and structure are now revealed.

Each Biochip fullerene neural synaptic junction point connections appear electronically and optically semi-conductive across each neural junction. Because of the properties of the elemental semi-conductance and reflective angle of the switching enzymes at each connection the enzyme limits angles optically and charge the fullerene structure. The fullerene structure stores the patterned data byte within the matrix. This switching property causes the valued light signal to be internally “switched”, to a logic condition of on, off, and/or maybe (the “maybe” state will be explained later) at the “neural synaptic junction” into the internal address at the surface of the fullerene structure. Internally the internal make up of the buckey ball appears as if, after the switching and acceptance of the logic state of the optical signal. It is structurally similar to that of a logic battery having several layers of dialectical properties. The enzyme angles stipulate the logic states connected to the other memory locations within the matrix. In a matrix, the storage of light value charge states constitutes a pattern within memory, especially when recognized as shape, instruction or data patterns, and form other instructions instantaneously from other patterns or instructions. Memory “battery” charge retention constitutes a true memory mechanism. The enzyme angling at the edges of the processor determines the pattern of electrical charge recognition and logic states and simultaneous instructions.

Memory, with and without outside photonic influence, constitutes a single, or multiple instructions, or further, without the failure of electronic interruption, a maintained thought. The reason I expressed that the matrix address maintains a “thought” is because it appears to me that, within the fullerene, if an instruction location, or address, maintains its own logic pattern as a contiguous machine processes each pattern within a location and then logically a thought pattern is recognized by the overall

matrix as an expression without the assistance of clocking of signals mechanically. Is this a simple thought via the pattern recognition managed processes? Remember there is no mechanical clocking condition.

Positronic Central Processing Unit

“Analog Bio-Chip”

A neural transfer and response system using a secondary electroencephalograph processing unit to measure and utilize the electrical activity in the brain and central nervous systems to digitize and transmit neural impulses to and from the human body to an “In Body” computer to overcome neural disruptions.

AGREEMENT

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Analog Bio-Chip Information

Gestation:

I began working on the idea in 1957, while I was in electronics school for the U.S. Army. Later, as a member of the Technical Intelligence at White Sands Proving Ground, I was able to gain the assistance of some of the Germans in our V2 program.

Design:

The Bio-Chip is formed of carbon molecules, hybrid and assisted by both natural and synthetic enzymes, on a Positronic central processing unit (synaptic junction with a molecule thick structure containing neural network; forming an analog Bio-Chip mechanism.

Applications:

1. Computer use (C.P.U.). The need for extreme memory or complicated programs is eliminated. As a C.P.U., the Bio-Chip would be more than a glorified on/off switch. It will not only say yes/no but also maybe and in the process reason, recognize writing, spoken words, colors, and shapes, at one thousandth the size or, conversely, at one thousand times the computational power.
2. Military Use: A helmet could be fitted with the Bio-Chip to assist the brain in decisions at extreme speed. For example: a fighter pilot could make a decision, to affect control of an aircraft, and implement that decision faster than he could signal a finger to move, or not move, just the thought would be the signal of implementation.
3. Medical Use: The most interesting use of the Bio-Chip is that it could easily be placed in the human body (minimum size of that of a pea, maximum size of a marble) and with the assistance of fiber optics to jump around spinal cord injuries. This combination will pick up impulses from the membranes around the brain, convert them into photons, encode them naturally into and from the Bio-Chip which decodes what the brain wants to do, then the Bio-Chip transfers this task information by fiber optic to the normal muscle group which receives and

- implements the task. All of this is accomplished at light speed (considering the longest distance of travel would be about six feet – this would be quick).
4. Space Use: Space: The most far-reaching use of the Bio-Chip would be that of the interlinks between an astronaut and the control/navigation computers for a spacecraft on interstellar space travel. Due to the long duration of this type of endeavor, the astronaut would be placed in a state of “hibernation”, to reduce food/air consumption. By placing the astronaut in the third level dream state (R.E.M. [rapid eye movement] – would be the first level) the Bio-Chip could be used to:
 - a. Alert or revive the astronaut in cases of emergency or interval maintenance.
 - b. Consistent minivolt manipulation, by electro-magnetic stimulation, to the cardiovascular and muscle structure to eliminate atrophy.
 - c. By maintaining an electrical link with those areas of the brain, utilized in subconscious thought during the dream state, these connections could provide “conscious” type direction to the computer mainframe while in the “Third State” hibernation. This communication, though limited, would be of the same quality and reaction as conscious thought due to the constant input of the Bio-Chip. The astronaut, upon waking, would have none of the complications other than waking from a long nap.
 5. With all of the above under control, the next natural interaction would be to drive the computer through control. This would be possible with the speed and depth of the Bio-Chip.

Synaptic type Junction, with a molecule thick structure, contains the neural network and forms the analog BioChip mechanism.

Carbon – 60 Atom:

In this design, the carbon 60 atomic structure will contain the volume necessary to permit photons to be “pumped”, using the polarization of the carbon atom, magnetically, to contain the photon particles.

Carbon – 70 Atomic Structure:

By adding ten carbon atoms to the carbon – 60 architecture reveals a structure similar to a cylinder with spherical enclosure at each end. This structure will allow for left hand and right hand quantum electronic/photon rotation.

Basket Weaving:

By using the “basket weaving” methodology, a structure can be enclosed squarely using a cross-5 pattern. This will allow for a square closure of this cylinder. Then by using cross-6 pattern and then expanding to cross-7 pattern methods, a flair joint will result.

Cells: These cells of carbon can be grown, at the molecular level, with walls 1 molecule thick. These walls will be able to contain (lazing) fluid conduction in the carbon atom structure.

Color Photon:

Utilization of the Aztec calendar ideograms as symbolic inferences for the wavelengths of the individual light photons. The Aztec calendar, used two thousand years ago to calculate celestial positions, seasons, and other “calendar” events will provide, easily, identifiable ideograms and do away with the binary, trianary, or decimal type logic counting systems; now used for these type applications. An individual ideogram will represent numerals, one to one hundred, eliminating the vast memory hardware required to “store” the accountings used today. Each shade will be assigned an ideogram along with each hue, giving a full range to the color wavelength spectrum.

This system will form a process to which separate color wavelengths, of which intelligence may be categorized, produces a simplified mechanism of “control and

tracking” of the “channels”. A light wavelength will be pulsed by reflection, magnetically, directing the beam (see figure 1). This beam of intelligence will be considered the same as a wire. This “intelligence” utilizes 100% of the conductor, versus only nominal utilization of the conventional electronic data stream wire conduction transference by electrical “skin effect”, whereby more information may travel a single optic conductor than that of a computer or telephone transmission. An added bonus would be that at “sphere” connecting points information beams will be able to “cross” each other without contamination, or “cross-talk shorting”; this is not the case with nominal or normal electron flow data through wire data streaming – especially in the close proximity data line architectures. In the carbon “tube” or “vein” the ionic charge of the structure will produce a steering and focusing tunnel within this “vein”. The buckey ball, or “sphere” will produce a lens through which the photon charge state is encapsulated, steered (or pumped) much as lasing coherent light particles. (See diagrams 1 – 8).

METALLIC COATING OF BioChip PLATES USING MICROBE ENZYMES

Extremophiles, guided by synthetic bred enzymic coating, will inhale dissolved microscopic particles of gold and then convert it to an organized plate or chip. The enzymes dissolve the gold, not unlike the human use and metabolically processes oxygen; a simple process of metallic absorption through the enzyme that coats the microbe.

This enzyme will be conditioned to act, or react, to a photon signal thus producing a predescribed wavelength (color) photon. The target extremophile will be infinitely controllable to produce metal-coated plates of absolute micron accuracy. The metallic coatings deposited will be solid. This permits a small chip to be placed at each neuron junction that will produce an accurate rendition of signal transfer. This chip will be of micron size, easily accepted by the human body. This design will be able to withstand rapid and extreme temperatures changes on the body.

Buckey Ball Composition:

The buckey ball is a form of carbon unknown prior to the early 1980's. Prior to this discovery, there were two known forms of "pure" carbon to be found. The first would be graphite, the common material used in pencils. A radical contrast is the second form of carbon; the diamond, practically the antithesis of graphite. Carbon is an incredibly rigid crystal. Curiously both graphite and diamond are made up of pure carbon. Now, one can add a third "pure" carbon, the Buckey ball, consisting of a practically inconceivable 60 carbon atoms, all linked together to form a hollow spherical ball.

The sixty-carbon atoms form what is called truncated icosahedrons, which literally looks like a soccer ball, consisting of 12 regular pentagons and 20 hexagons. The C-60 molecule does not bond readily to other atoms or molecules, as all bonds are to another carbon atom.

The Buckey ball is the only molecule of a single atom to form a hollow spheroid capable of spinning at over one hundred revolutions per second.

Note: Since sixty is the largest number of proper rotation in the icosahedra group, that in turn is the largest point group; the largest group where symmetry operation, rotation, reflection, etc. leave one point unmoved. This makes the C-60 molecule the most symmetric possible molecule.

The Buckey ball, being the "roundest" of round molecules, is also quite resistant to high-speed collisions. In fact, the Buckey ball can withstand colliding with a stainless steel plate at 15,000 mph – merely recoiling unharmed. When compressed at 70% of its original size, the Buckey ball becomes more than twice as "hard" as its cousin, the diamond.

Depending upon the compound, the Buckey ball can serve as a conductor, insulator, semiconductor, or superconductor. The conductor is the point of interest in this design.

The most exciting characteristic of the Buckey ball is that it is hollow. The Buckey balls exhibit ferromagnetic properties combining with a reactant that readily donates its electrons to the carbon molecules. Now, by cooling and then warming, to 16

Kelvin's, the compounds will become magnetic. An interesting property to consider in the hostile space environment where the "hot-cold" the cycles of a rotating sun is present.

It was revealed by an astronomer, while investigating a nebula's chemical signature, that within the extreme thermal climate of the nebula that a carbon atom of 60 or 70 points (usually seen as accompanying pairs) was prevalent in the spiraling gaseous giant. This shape (of 60 points) revealed itself to be spherical, having several pentagonal and hexagonal junctions similar to the soccer ball or Buckmaster Fuller' geo structures; hence "Buckey Ball". The interest in this design is the geometric resilience and its abilities towards superconductivity and the electromechanical nature of its matrix. It has been noted that super-conductive elements were in its symmetrical geometry; such as a square type geometrical lattice matrix, or variations therein, that allows smooth transition of electron flow within the molecular matrix (i.e. through its valence rings).

This Buckey ball will be stretched to a cylindrical structure, having the thickness of one molecule, and yet be structurally reliant and can contain light photon particles. (See 19). The stretching is accomplished by the addition of ten additional atoms to the 60 atom structured sphere. This geometric shape can be molecularly modified so that one end of the cylinder may be stretched to a larger diameter as easily as weaving a basket. In fact, the weaving geometry will reveal advanced molecular junction connections to facilitate this closure of enlargement of the cylinder. This cylinder of carbon will provide a pathway for the photons, along the "inner walls", such as the electron flow in metal conductors. This carbon conductor would be more efficient if it were in the one molecule thick parameter.

The resultant electromotive force (E.M.F.), according to the left hand rule of electron flow, places a magnetic field within the conductor, which will be utilized to control photon energy, or particles, traveling within the carbon cylinder pathways (lattice fields). Electro-manipulation (lasing) of electron flow will attract, or repulse, photon flow within the carbon conduit. This will be similar to many of the current particle accelerators methodologies. This circuitry will be utilized to flow, or restrict, photon generation, allowing for "channeling" (a problem has been due the scale and changing the ratio's of electromotive force generation scale which affects the photon flow – I believe this is corrected in fig 9).

The assembly of the “cell centers” will establish the character, or skills, of the (CPU) Central Processing Unit (pattern manipulation and command generators), i.e. now called a simple Cell Center. The Cell Center is designed to perform a simple task and be of a minor number of simple “cells”. Conversely, such as a LCD wristwatch, a CPU requires many CPU functions and is constructed from many “Cells”. The “Super CPU Cell Center”, involving human assistance (correcting spinal cord transmission, or acceleration time) will have an especially large number of “cells”, specifically designed to accomplish the task required. The cell centers will “cross pattern talk” to each other, providing information in a similar fashion as to what occurs in the naturally developed human synaptic pathways and in the “learned” synaptic recognition “algorithms”. Similar to sections of human brain (i.e. the cell center), the cell centers are designed to be “light” sensitive and could assist several “cell centers”.

Example:

The “Cell Center”, designed to be light sensitive, could assist several “Cell Centers” at the same time adding its “expertise” to each individual requirement (See 20).

The Enzyme Portion of the Structure

The analog Bio-Chip mechanism would incorporate protein molecules, such as enzymes, as the operating elements. Since enzymes have a large numerical possibility of conformational states – a graded response would be possible. By using special-function subsystems attached to carbon molecules, a quantum leap in computational densities, of faster switching networks, would be achieved.

At this same time, about 500,000 transistors can be crammed into a 4-millimeter square area, with spacing between elements of about 1-1/2 microns. This seems to be the limit, (for now), due to the electrons ability to have a finite probability of “tunneling” between adjacent components. The secondary problem of element overheating would also arise.

By entering into the molecular hybrid world, it would be possible to produce circuit elements reduced by a magnitude of one thousand with transmittal speed increasing dramatically. Moreover, a molecular circuit would dissipate little waste heat due to the “photon” circuit and the hybrid Bio-chip can be built in 3D, increasing densities dramatically. It is possible to make micro-mini (or Nano) systems that will maintain their quantum-mechanical coherence. This would be due to using carbon-based molecules as switches and neural networks, and Photonics versus electronics.

Solution:

Carbon molecules can exist in two or more stable electron states, depending on the “charges within the molecules”. By applying a voltage to the molecule a reversing of polarity would result, as in a diode. The act of reversing will rearrange the bonding pattern of molecules. At this point one can select the desire action of the molecule selected.

For instance: light sensitive molecules (chromospheres) could be combined in the enzyme frame. By introducing a single photon, along the chain, a rearranging of the bonding patterns occurs within the assembled chromospheres switching them on or off by changing the responsiveness to light; making an effective sensitive switch to be used in optical character readers (OCR's).

The assembly base, or “molecular skeleton”, for this group of Bio-Chips is composed by exploiting the properties of the enzymes (See 21). These enzymes would be “manufactured” by the descendants of the synthetic enzymes mated to the natural enzymes (See 22). That would fuse as it multiplies ceaselessly. Since all the “offspring” of the original mutated pair are, now, genetically identical, the enzymes they produce will have precisely the same specificity, bonding by their corresponding proteins to form complexities designed to the desired orientation.

Enzymes:

Since there is no chemical reaction that couldn't be done better with enzymes, especially in the hybrid state such as this as immobilization, a tiny particle of enzymes could be used on a virtually never-ending production cycle. Next cycle would be to genetically engineer an enzyme combined with an artificial enzyme (synthetic non-protein molecules that would adopt the action of the natural enzyme). This enzyme would be highly active. Reactions would be catalyzed by a milliliter of enzyme solution per thousand liters of solution. This enzyme will be highly selective, and since it would have only a breakaway carbon – carbon double bond, it would be able to catalyze under mild conditions and at mild temperatures.

By genetic engineering, the enzymes will be active in a selected, narrow, range of reaction conditions. The result would be that a selected group of enzymes would catalyze the production of only a single species.

Since the enzyme, like all proteins, is a string of amino acids. This would be the building blocks, the structure and biochemical activity depending on its amino acid makeup. The enzyme will be highly selective. It will be able to either build molecules, or break them down by several orders of magnitude.

The activity that the enzyme will be engineered for will produce a natural geometric fit. At first, forming with the carbon, it will produce electron transfers during the “fitting process”. Producing a family of enzymes/carbon designed to perfect a particular function. The result would be known as a “Super-Gen-enzyme”. Its scope would be limited, but its function time would be extremely high. This hybrid enzymes pathway would be narrow and predictable, reacting with more specificity than a normal enzyme. The binding between the carbon atom and the enzyme would be by means of

strong covalent bonds between the carbon and a number of the enzymes amino acid groups (note, being a basic solid state device this combination will pose no maintenance problem).

Other biological structures that will provide suitability for organizing Bio-Chips by regularly space binding sites along their lengths to which switching proteins would be attached (See 21 – Note: These proteins, to be used, would be synthetic; having been “bred” for a specific structure and function – (See 22)).

Alteration of the protein would be in a directed and deliberate fashion initially by modifying the DNA sequence that specifies natural proteins while doing prototype investigations. Later, the alteration is by synthesizing an entirely new gene with purely novel properties for this design. This “engineered” protein will be as tough and durable as strong plastic and hence able to function under harsh conditions of that of a solid state device (See 24). This will result in an artificial breeding of a system that will be able to reproduce itself dramatically and then assemble spontaneously into functional complexes. This produces living cells that would employ several stages for ensuring the reliability of their genetic machinery. Multiple copies of genes, specialized enzymes that will “proof read” and repair damaged DNA, regenerate genetic code and an error tolerant translation system.

Thus, as living cells possess enzymes that can detect breaks or potential problems or mutations in the DNA of the genes and repair them, it will be possible, with this Bio-Chip, to diagnose faulty circuits, switch them out, then activate reserve circuits to restore normal functionality (See 25).

The biosensors that will transduce the enzyme behavior directly into photon signals (See 26) will lack of any strong positive or negative charges. This is of crucial importance to eliminate any chance of charged separation media interfering with the photon separation sequence. It is believed that the efficiency will be particularly high with little gravity interference with the electrical separation of the photon (See 26). The immobilized enzymes and cells will be trapped in this “skeleton” structure causing them to react with the components to form the desired structure (or structure changes). Preservation of the enzyme will be created though gene splicing.

Neural networks of this order will have the enhanced capability to distinguish between different two dimensional patterns (and recognize those patterns) to “learn” the patterns to be recognized to notice and learn geometrical invariance’ “gray scale”, brightness, vector, speed, letters of print, and two, and three dimensional objects including geometrical invariance’s.

Nanoparticles

The shifting of the Bio-Lens (three position possibility) angle incidence will modify wavelength.

The optical detector response will be equal to its quantum efficiency divided by 1.24 reducing the overall quantum efficiency of the resulting image by approximately 2% in a saturation level by approximately 20%.

The wavelength will refract when entering the carbon enzyme, reflect twice on the inner surface (bounce) than refract upon leaving the enzyme engaging the "diode response action".

Flip diode action (internal) will reduce or eliminate noise (unwanted signals) that would try to obscure the desired signal wavelength. This action will also select the desired wavelength and pulse generated by the light (color) accelerated electrons. The harmonic generation, produced by the short wavelength outside the normal tuning range, produces a nonlinear dependence of the output on the intensity of the input wavelength. The phase velocity of this action can be controlled by this index of refraction. The refracting field will, upon entering, pulsate on a sine curve along the beam. The maximum field (the crest of the sine curve) will appear to travel along the beam at phase velocity. That will depend upon the angle of the external plane (three possibilities).

This action will also be used as a beam splitter what engaged by the "moving mirrors" action of the outer skin or boundary condition. The chromatic dispersion will be absolutely controllable.

The semi metallic carbon fullereness will produce optical activity from the ultraviolet to the infrared range due to the helical structure at the core of the clusters or Nano-clusters. That will work with wavelengths applicable to those desired by telecommunications optics to replace slower electronic circuits in chips. Due to the carbon structure of the honeycomb, the structure will not be sensitive to disorder. The cluster will, a temperature range of 86° to 110° F, produce no measurable resistance.

Quantum Light

By using light, to control electricity, it is possible to enter the world of quantum mechanics bringing with this the “fuzzy” rules that prevail in the world of the Atom while also tapping into the DNA molecule. Nature, in the design and redesign process, has been calculating and perfecting these algorithms of life for billions of years.

Quantum computing will produce the kind of data fusion now done in the human brain to the computer chip. Optical computing will eliminate the mass involved in the conventional electron signal enabling this design to reach the speed of light and permitting this optical computer to operate at light speeds with no heat generation.

By using quantum mechanics particles can exist in high and low energy states simultaneously providing a stable concept from which to transition into a third dimension. Where the traditional computer relies on transistor, as its binary switching transitioning from on to off, this concept (using the centenary system) has the ability to be in many combinations of on or off, or both, at the same time. With the addition of the enzyme, the system will have the most sophisticated computer algorithm around, that being the DNA molecule and the famed double helix that carries genetic traits. Where silicon computers uses the ‘IS’ (input stream) and ‘OS’ (output stream) to represent data this DNA design will use nucleic acid, the chemical rung in the twisted DNA ladder.

The process will begin by using enzymes to cut and arrange particles of DNA in sets that describe the problem to be solved, similarly to the Is and Os being used conventionally. Then a second set of DNA will be cut to represent the potential solution. These two batches will be mixed. The answer will be determined by the way the problem and solution set pair up; similarly to conventional sides of a zipper coming together. By combining electro-optics the transfer of information between enzyme nodes is much faster than the physical limits of the conventional computer. Nothing travels faster than photons; the subatomic bits of electromagnetic radiation that make up light. By harnessing the photon to transmit data this design will be exponentially faster than conventional units today.

When starting at the enzyme node, the information will be in electrical form, in the mille-volt range, the enzyme will translate the impulse into photon which will then be

flashed to the next node as small packets of light. At the other the packet will be reintroduced back into an electrical impulse. This will occur millions of times per second with the ability to manage millions of individual "conversations" to enable the human brain to transmit information to a disconnected muscle groups or mechanical equipment.

At the same time different wavelengths of light, which produce color to the human eye, will transmit different data to the optical nodes. While an electron can carry a computerized "on" and "off" a photon based processor, using different wavelengths of light, will quickly generate parallel processes drastically increasing the amount of information quickening the complexity of computations.

To connect the nodes, tubes are constructed by the carbon enzymes and will be used to form the connection pathways between bucky balls. These devices will be approximately 1 to 2 nanometers in each dimension. The carbon nanotube will be synthesized in the creation process to contain a pentagon-heptagon packet. Possible defects in their normal hexagonal structure. The defects change in the helicity of the nanotube resulting in a mechanically resilient, small, robust and sensitive. In stiffness the individual carbon nanotube will exceed that of the strongest carbon fiber, yet structurally stable at high temperatures.

Bio-Chip Memory

Memory cells are a photon capacitive, light frequency resonance tuned buckyball cell matrix that accepts the segmented light values in which they are tuned and segmented by location within the body of memory. This frequency segmentation reveals patterns for which the logic unit can recognize as instructions or stored memory.

The memory node is an enzyme coated buckyball cell receptor that only accepts, and reflects, a light frequency of within its resonance value. The enzymes that are also matched within the frequency range, located at the outside of the buckyball cell matrix configuration, reflect the photon energy intelligence to other similarly tuned cells. This theoretical methodology of intelligence storage and transmittal is the same as grouped stainless steel balls suspended mechanically. One stainless ball is raised away from the collective grouping and then the potential is released into the grouped set. The potential energy is transmitted through the collected mass and the result is seen at the end ball, which flies away from the collected group. The memory location, in this case, is recognized because each of the charged balls is recognized as a pattern comparatively to those that are of a different frequency value, charged and not charged. The entropy effect is still the same, however there is no (or more precisely - appreciable or negligible) heat loss or gained because of the photon states of charge. The cells are either in a charged, not charged or grounding state. The logic states of the cells, because of the charging conditions, may make it possible for the logic state to position a logic 1, logic 0, and/or both conditions simultaneously. The simultaneous logic 1 and logic 0 would make the system inherently intuitive without mechanical instructive intervention.

The receptive system in the memory node sensors are really no more than, and are very similar to, a key and barrel lock that uses pins. The varied height of the pins within the barrel to prevent the rotation of a barrel mechanism without the correct height offset to allow the split locking pins unlatching the mated barrels. The blocking pins prevent barrel rotation without the correctly matching key height to locking pin configuration.

A singularly, now observed, specializing receptive cell has this same specialized enzyme receptor configuration (similar to that in the pre-described common key lock mechanism) where the only mechanical difference is that receptive cell configuration maintains a capacitive potential voltage and frequency value, or charged lock, which

maintains this capacitance until this charge has been discharged by grounding the potential through conductive current flow closed by the matched cell by a connectively closed memory pathway.

The memory cell is unlocked by the point-to-point matching which allows conductivity potential and current to flow through the memory addressing.

The location “addresses” or patterns gives the memory mechanism the particular address identification much the same manner as a conventional computer recognizes instructions from the instruction set. Location, location, location.

Bio-Chip Nomenclature

Speed

- Operation of Carbon Celled Memory and CPU is just above the quantum level.
- Faster, and different, in relation to a conventional ALU (Arithmetic Logic Unit) due to a shorter “data bus” with a resultant zero heat generation.
- Negligible CPU gating time (due to the Carbon Celled Memory matrix configuration and negligible CPU – ALU distance to allocation properties)
 - Light speed memory allocation and processing. (Molecule distance to cells)
 - Clock time is slightly below light speed. (Optical light processing ALU)
 - Femto hertz range [10^{-15}] or Atto hertz range [10^{-18}].
 - No resistance at 86 deg F – 110 deg F

.Memory Cells

- Structure designed at the atomic level resulting in molecular sized hardware.
- A formed carbon 60 (C-60) fabricated honeycombed capacitive cell matrix (Bubble Cells).
 - Are grown, and can be replaced by other Biochip sensors upon anomaly signals. (Producing an inherent and spontaneous self correcting mechanism.)
 - Are molecule sized. Signal/time is reduced, zero heat from photon entropy.
 - Accessing time is negligible due to minimum spacing between C.P.U., ALU, and Memory Cell matrix. (Molecule sized distances between hardware components).
- Hardware is doped Diode spherical carbon surfaces and multiple shifting mirrored surface matrix that establishes the pattern recognition within the celled memory system. (Wavelength patterned recognition).

- Triple wavelength light wave patterned allocation recognition. (Three major bands of wavelength light-shift photon absorption produce the three-dimensional quantum mechanical methodology of storing and accessing memory).

.Operating System

- Neural network access time is negligible; system operates close to the speed of light
 - Is an optical network gated system and compatible with the human neural synaptic system.
 - Is sensitive to light wavelength shifted spectrums and mathematical pattern algorithms (Ideograms).
- Combinational configuration usage of three conventional mathematical pattern recognition algorithms produces a three-dimensional pattern recognition function. [Dot degradation, gray scale pattern recognition algorithm and blue-red light value algorithm to produce a final three-dimensional pattern affirmation function].
 - Patterns make it easy for the human mind to recognize and to adapt to.
 - Algorithms based on pattern recognition rather than code. Neural net is self-correcting and intuitive; this systems processors recognizes patterned algorithms similarly to that of the human brains' analytical pattern processing. No losses due to a zero, or negligible, resistance to the signal.

Three dimensional memory locations rather than the familiar x, y address code in binary systems. Increased functional memory storage capacity.

Specialized Enzymes (1.6.80 RLF)

Active/inactive synthesized enzyme to reflect a change in a single DNA base enabling the synthesized enzyme, by reacting to a DNA sample device will "walk" along chromosomes pinpoint the faulty gates. The genes, consisting of hundreds or thousands of chemical units called neutide bases, come in four varieties and are aided by other cellular structures. The precise sequence of cases along the gene dictates the chemical nature of its protein.

If just one base is altered, disease will result. The restriction enzymes offer a simple remedy by reacting to a DNA sample wasn't enzyme that would be designed to act only to marker sequence, the DNA would be cut into fragments of characteristic size. If the restriction site is missing (as in the case of some genetic disorders) the pieces are larger than normal. Restriction enzymes that would be used the chip out the entire DNA segment. -See figures 4, 9, 21, 31, 32 and 33.

The genes that are otherwise normal would cause cancer when they become overactive, or mutant, would be found in normal and cancerous cells of nearly every organism research.

Some chromosome rearrangements associated with specific cancers transferred normally qui assets on **cone-genes** to abnormal chromosome locations. This could be resisted, or eliminated, with a properly engineered enzyme inhibitor.

This complex of proteins would, as a nonliving catalyst regulate the thousands of cellular reactions necessary for life and could, when genetically to specifically task the genetically engineered enzymes and artificial enzymes-synthetic, non-protein molecules that will closely mimic the actions of the natural enzymes.

If one looks to the simple plant, for the architectural example of the enzyme, you will find inside the cells the proteins that facilitate the thousands of chemical reactions to enable the plant to live, repair itself, and dispose of its waste products. (See figures 9-11)

As a catalyst, the enzyme is unique in four ways:

1. They are extremely active. In some cases reactions are enzymatic catalyzations of only a few milliliters of enzymes solution per thousands of liters of solution.

2. They catalyze reactions under relatively mild conditions rather than at the high temperatures and precious often necessary for other catalytic reactions.
(See figure 18, 19, 20)
3. They are highly selective. Unlike non-biological catalysts, such as metals, their efficiency is usually limited to only one reaction - the breaking of a particular carbon to carbon double-bond. For example...
 - a. A given enzyme is only active within a narrow range of reaction conditions, such as pH, temperature, and spectrum. Outside this range the protein is partially or totally deactivated.

Since the enzyme is a string of hundreds of amino acids the structure and biochemical activity of each enzyme is attended by its amino acid sequence. It is not surprising that with 20 natural amino acids from which to build the total number of bacteria, plant, and handle enzymes number in the hundreds of thousands, in some cases millions.

With the help of the enzyme structures it will soon be possible to map out the entire genetic makeup of plants providing a breakthrough in the basic science that will not only unlock the secrets of nature but would then assist in developing a better resistant product. (From this, a rough draft of the human genetic code will be unveiled once (see figure 3-5-9) stringing amino acids together in prearranged sequence. One may create a new enzyme. The creation of a new enzyme would then be within realm of the three-dimensional shapes required for a truly "BioChip" product. The shape or configuration would be required to determine how, or whether, the enzyme would act on a substrate. Prior to this, the features may be introduced on existing enzymes - with greater chemical stability or a higher activities elevated temperature by rearranging the gene code for the enzyme and amino acid sequences. (See figure 12)

This would be required to produce the synthetic enzyme sensitive to the narrow light wavelength with predictability and repeatability.

The synthetic enzyme will be tailored to absorb a prescribed nanometer wavelength of light as part of their chemical signature. When that specific wavelength is introduced a chemical reaction will result. This reaction is specific and predictable (See figure 28-30)

An interesting action of special genes would be that of an On/Off switch sending an instruction to other cell genes. This On/Off trigger is activated by the XY enzyme (See figure 302) –Note the activity will be used in the “BioChip”-

The first suspicion of the On/Off phenomenon came with the superheated enzyme study in Carson City, Nevada in 1979 (a temperature of 140°)

-Note: a weak enzyme will cause the gene to give a distorted signal.-

I believe, because of this research, that (un-natural) enzyme alterations within a (normal) gene will cause the Gene to switch On/Off causing cancer – this would start with the enzyme at the nucleus of a cell, sending additional, or inappropriate, instructions to the surrounding genes or, secondarily, when the abnormal gene “forgets” to address the genes that it should instruct. These altered (or forgotten) instructions will cause the other genes to order the production of cancer cells. These cells will then reproduce and invade other tissue.

A reproduction, or self-producing, molecule will promote the formation of new copies of itself. The DNA would be a strand forming the double helix structures, which would then separate. An enzyme will then create new strands, part by part, using each part of the original block as a guide for building the next block to add to the growing of these strands. The life expectancy of these new “Bio” units will be engineered to five long, perhaps, years, or eventually forever blocking the growth of the rogue enzyme and will prevent the uncontrollable growth of the un-natural gene. The rogue enzyme will respond to the “control” enzyme (See figure 26a and control enzyme memo)

Since I believe that an increase on the rogue enzyme will be the same sign that starts with the uncontrollable growth of other cells, if the “control” enzyme blocks this enzyme, the cells will not grow.

High levels of rogue enzymes will always be evident with “abnormal” cell growth. The rogue enzyme will allow cells to reproduce without limits and will be found in an area of cancer. Due to this, I believe, that the “control” enzyme envisioned will, if introduced to this area, seek and destroy the rogue enzyme preventing them from dividing (See figure 19, 27, and 33)

In the rogue enzyme cell division will, due to the lack of DNA degradation. The DNA is slightly reduced each time the cell divides – after a number of divisions, or

generations, the DNA disappears causing the cells to stop dividing and eventually die (aging). In this rogue enzyme, the DNA action does not erode with each generation enabling “abnormal” cells the ability to be “immortal” due to the rogue enzyme protecting, and even renewing, the DNA.

BioChip (Medical)

Connecting of the carbon nanotubes to the human neural systems

The connecting of the BioChip electroencephalograph processing unit to the human neural system will be accomplished by the formation of crystals (see ____). At the atomic scale the result will be a strong connection joint in the mechanical version. The substance of this connection, or joint, will have the strength of steel yet the connecting joint will be composed of “nanocrystals” of _____ measuring a mere 100 nanometers (billionths of a meter) across. These connecting joints will be the same size and structure in the third dimension. This will give the connecting material strength, as there are fewer places for stress to build up and fractures to form.

The process of dissolving the substances while controlling the acidity temperature and timing of the process is explained in diagram and footnote _____. The result however will produce a precipitate of nanocrystals of a predetermined size, shape, and purity. An additional advantage of these nanocrystals is that they are small enough for the cells of the neural system to engulf the crystals and break them down to remodel to a compatible state.

Working at the atomic scale has other advantages. Primarily one advantage is the ability to tweak the component ratios. Other advantages are to alter not only the strength and rigidity of the connection but also the rate at which it is absorbed and the ease with which it combines with the neural system. This will be important, in the medical field, to produce suitable connections for patients of different ages compared to the elderly. Young people will require implants that can be absorbed rapidly.

Fig 34 shows the process for storing hydrogen for the minivolt batteries, as a component of the structure. The concept will be to store the hydrogen in the carbon nanotubes selected, like diamond and graphite. These are crystalline forms of carbon (see fig 35). The attraction is their ability to store and release large quantities of hydrogen gas (see fig 36). By the combining of this fuel cell adapted to a planar configuration for the fuel cell similarly to that used by Motorola on its micro-machined fuel cell. This gas storage of a fuel cell will complete the mechanical structure and minivolt power combination. Due to the “Buckey ball” architecture and its inherent

strength, to both the structure and carbon material, the problem of the hydrogen gas having such a low density, compromising meaning full quantities of it within a given volume is estimated, producing reversible storage (see fig 37).

Fig 38 shows discharge capacities of graphite (95%) and carbon black (5%).

Two photon-initiated polymerization molecule that control processes by donating by the groups of molecules contributing to the molecules ability to transfer electrons from within, resulting in a “two photon absorption” for 3-D storage.

DNA (living cells) manufacturing enzymes with distinct amino acid sequence and overall physical shape (fig 39 shows this process).

Mutation process –

Extra cellular Enzyme (fig 40, 41, 42, 43,) fig 44 shows cell concentration, beginning, reaching desired point to, then separate from other cell products and other enzymes). Then, by lazing, purifying the enzyme by reaction when the molecule’s broken down by the synthetic enzyme it’s then binds to the amino acid group near the enzymes active site.

The fit will be induced in which the substitute will force itself into the active site.

Fig 45 shows the creation of an enzyme by stringing selected amino acids together in a prearranged sequence. This will show the 3-dimensional shape that will determine how the enzyme will act.

DNA

Show nucleotides

EXAMPLE:

Fig 46 shows the chemical rungs of the DNA ladder represented by the C, G, A and T sequenced chemicals as data instead of digital language.

Fig 47 shows the

Fig 48 shows the energized and relaxed states if individual atoms (hydrogen) that will switch on and off by moving from a low energy state (off) to a high-energy state (on). The low energy state will place the hydrogen’s atom’s single electron in a close

orbit to the nucleus. When excited to high energy the electron will jump into the pre-described wider orbit. A photon pulse regulates these high and low energy states.

Fig 49, 50, 51, 52, 53, 54.

Fig 55 shows examples of the above in high (on) energy state, in low (off) energy state; one pair in high/low state and one pair in hi/hi state.

Fig 56 show photon path that will excite atoms.

Fig 57 shows two photon paths crossing each other to excite two atoms side by side

Fig 58 shows the Hydrogen atoms being controlled by photon

Fig 59 shows the Oxygen atom being controlled by photon.

Fig 60, 61, 62 shows enzyme processes of arranging snippets of DNA in sets that describe the first state (on) shows the change of snippets that represents change (off) and mid (on/off simultaneously). This will show the photon-based circuit using different wavelengths (colors) quickly generating parallel processes.

Fig 63 shows pathways between buckey balls (organic enzymes). This pathway will be “grown” to eliminate polymer aggregates or clumps.

Tonical Referencing

MEMO FOR RECORD:

Subject: Tonical Referencing (Buckey Ball)

The brain, or mind, processes many addressing locations along the synaptic junction pathways within a three dimensional cellular matrix and formulates memory, movement, or ideas. It appears that the brain naturally processes values, or algorithms, from the different states of various photon charge values. The values of these charge states determine, per memory location, a type of pattern. These locations, formed in a colored and tonal set of memory patterns, are the expressions which can be tentatively patterns for the recollection of an idea much the same as the processing algorithms within the conventional computer however without cross talk problems or the bulk from massive wire, components, and the distances of wire to hardware connections.

Much of the memory mechanics seems the same as that manifested in the chemical sensor switches within the nose to brain connection. These connections utilize the individual chemical pattern location to switch to an address within the brain as a result of the closed initial circuit within the nose, which in turn can spark a memory location or address pattern. This pattern from the initial referencing of several address locations identify not only the smell sectors within the brain once the circuit is activated but can in many cases trigger a memory of an event, or an idea, associated with, or related, from the activation of the chemical sensor sequence. Due to the relation of the memory patterns that are formulated from this switch activation, the pattern relation identification not only identifies a smell but an idea.

As in the conventional computer, the different current language methodologies, in as much as what is the same as normal computer program implementation, it is rational to foresee that each node address must be addressed as, and in, each unique parameterized state to be useful within the Buckey matrix and that each location must be addressable at the conceived processor level and later outputted to a device or another location within the matrix.

Also in conventional computers, hardwire connections have problems with inter wire cross talk. Because of the proximity of data bit streaming inductance to the parallel

lines in the data bus lines, signal interference or signal transference may occur with the concept being addressed in this document. There is no interference, or cross talk, from multiple light value influences within a ball node location in the matrix even though several photons share the same location. Cross talk interference cannot be induced from separate light wave particles crossing other light particles values and there is no interference at the intersection junction yet the charge state values in each of the nodes addressed are changed within each the individual location. This photon particle-charging event changes the capacitance and charge value of each ball addressed giving the node a multiple bit change status. The complexity is that each node can contain three logic states per location addressed simultaneously.

The thought that 60 individual points are referenced at a C-60 carbon atom constructed Buckey ball configuration pictorially became a focus of the addressable node within the matrix and raised the question – how does one ball, or Buckey matrix, address location allow a processor the physical ability of selective location to a single address? A second question raised was towards making each address individualized in its triple charge state per ball and per given node location and yet allowing each location to remain unique in the addressable address, each bit accessed, and also what type of “program”, or what methodology can be utilized and formulated to later be considered a usable language yet remain understandable by both man and machine easily facilitated to form a functional memory allocation or addressing algorithm?

Access of these charge state values contained within each address had to be stored and made available for each value changed to a processor. Each address, or addressed node, must be programmable and utilized, by a programmer, program, or logic unit. The final result is this type of device will lead to be a more dynamic, densely compacted, faster thinking computer that mimicked what nature had already developed naturally. This also addressed the resolution that nature has already worked out many of the bugs that we may never come across in the human version of this design.

Regarding the parameters of a C-60 Buckey ball configuration node, each node, containing 60 junction points per ball node within a three dimensional matrix, there are individual address locations which lends itself to the thought of an x, y, z – x, y address allocation just to locate a junction point on a given node to store or access each node point with a data bit charge state. This seems to be the same as the instructional

formulation within the conventional computer. Address a KERNAL command and it performs the operation sequentially until it is told that it is finished or to go to the next instruction command.

Developed languages for computational machines to programmer interface must be simple enough so that the user may understand parameter problem solving implementation and yet the efficiency of the addressed matrix still requires a compiler to readdress the implemented program into a machine language, or as yet a machine recognizable algorithm in which to utilize the implemented algorithms in an efficient mechanical computational manner. Which still results in a need to development a machine language. The iconic symbolism, utilizing the $x, y, z - x, y$ location addressing referencing tonal (photon frequency) changes within the locations three dimensionally (x, y, z) forms a picture of that address location within the matrix; and possibly can be considered much the same as ideograms of the Chinese or Japanese characters utilized within their established language. But for this illustration these ideograms are individual address location parameters referencing pictograms now in a quantum electro-mechanical format.

Dolphins use, and have developed over several million years of evolution, the ability to resolve their series of high pitch reflected tones into a complex and highly adapted language; a methodology called echo location for which they can not only locate but render a mental image of a three dimensional object and deduce an accurate picture to the point of an 'x-ray' of an object within a fluidic medium – (a simple – complex image processing algorithm development). To these dolphins, their language is in picture images of which their brains have evolved to reduce tone values into pictures and they have evolved further to taking picture ideas and transforming them into transmittable images in tone to others within their species. Their language is an evolved, calculated, and mathematically deduced recollection of memories.

The answer to pattern configuration is, itself, in the form of a single or complex expression of harmonic note notation. Yes, music. Music, that has a three dimensional iconic identifier providing a photo electronic pattern establishment within the circuitry.

Resonance, or the Tonical (light) expression, within this idea of the memory matrix, is a quantum mechanical movement of calculations performed from the three dimensional algorithm implemented expression. These are high and low tonal values of

light frequencies stored into, or flying around, a particular addressed node location. Electronically the different frequency, from each of the different light values, is the same as having a tone and thus the potential for an algorithmic expression. However, with the photons there is no cross talk interference. The photon charge state also can be in different light wavelength values and charge conditions – thus different states occupy an individual location with different reportable value states simultaneously.

Within the context of a C-60 Buckey ball memory enzyme, this thought of an x, y, z – x, y (three dimensional) single location within the matrix, to locate a single 60 point ball, memory location, there are actually 32 “lens” points and, mathematically, 32 addresses that are addressable per ball location, 12 pentagonal and 20 hexagonal.

12 pentagon shaped locations per ball node is the same number used in music notation and 12 is used in the mathematical formulation used in most musical scales, which can be expressions in octaves, and thus a three-dimensional patterned scale.

Human thought is often in the form of light pictograph type memories, pictured sequences, in tonal variation sequences, and in chemically switched thought triggers, and music, for humans, is written in a form of Tonical algorithmic expression much the same as a program for computers is written in on’s and off’s.

The thought that each locatable ball address, and inherent connecting patterns produced by connecting the consecutive locations together, with separate light (photon charge) values around a single node location is in effect a patterned iconic address within the three dimensional matrix and is instructionally complete with a location instruction identifier for that location, or pattern.

This gives the programmer a methodology towards utilizing the tonal algorithm to initiate patterned sequences for logical implementation of a desired effect or instruction command – a musical mathematical algorithm pattern. Thus giving the programmer a MAP and sequences to work with within this three dimensional matrix for which to address each ball containing separate light values within a single node location and with tone resonance symbolically to locate each address within the three dimensional matrix. The separate frequencies form high and low values with the addition of an intermediate value within each node expression value much the same as a transistorized memory location except that a conventional computer addressing sequences is stored in a two

dimensional format and in a binary algorithm. The typical computer utilizes voltage, or current, values triggering the transistor logic to determine logic state conditions along with clock states for individually determining sequential operational values and parametric evaluations. Protein functions are instructionally independent of the ALU processor problems as they derive their functionality from the enzyme sequencing, at the quantum level, which gets its initial formation instructions from the simple DNA ladder sequence building blocks. The electronic (quantum level electronic-electron work function) mechanics within the enzyme, at the time of the enzymes formulation determines patterned pathways for which protons are channeled. The traveling protons and the stored protons form the internal connected patterns within the matrix. The matrix changes its patterns in reaction to the charge pattern states of each individual node pattern connection in the chain. Producing a self-correcting, electro-mechanical alignment mechanism within the three dimensional matrix that operates in a wave pattern independent of conventional electronic chip clocked time referencing and/or gating.

Again, within the held thought of the $x, y, z - x, y$ (three dimensional) location of a 60 point Buckey ball, there was the problem that each ball is addressed with a charged (ionized) light particle (a columnated light [laser], wave and wavelengths). The light frequency ionization rotates the carbon atoms within the enzyme and the ball node in the matrix and charges that location addressed. These frequencies are in individual color bands, three for now, and the separate photons occupy the same space charge yet with differing frequencies within the individual ball location at that address. The charge state is stored via the node point angle addressed and reflected internally within the node from the original entrance location point and then is bounced internally at that reflected angle within the ball which (ionize) charges that locations capacitance initializing the polarity state. Each location is semi conductive and determines the direction of the photon travel outside to inside the node. This incident entrance angle and of exit angle in a similar node determines a connection pattern. The connection, linearly, is similar to the pictorial representations made by the Japanese or Chinese type icons and the similarity is that they are an ideogram symbolically, however for the matrix, now in a three dimensional format.

The natural brain mechanism has a greater processing ability in a much smaller package. The ability to process multiple variable data parameters and data analysis, with

expandability and inherent self-corrective development with asset utilization (referencing the photons and their charge states analysis) leaves the question of data initialization and retrieval.

An EEG apparatus can read brain patterns. These patterns are in electromagnetic flux or wave patterns along the current trace of the sensed signal pathway. These pathway patterns (electromagnetic and voltage) are developed, linearly, from the original brain pattern sequencing parameters. The three dimensional instruction is given, or read, in the currents waveform values in three dimension and is a result of the pattern fluctuation of electromotive or voltage changes along this signals waveform.

The brains natural photon pathways are developed, and integrated, only by their electron pair bonding ties formulated at their creation from the enzymes reaction to the DNA instruction sequencing. If the electronic analysis of the DNA sequence is analyzed the same as the capacitance, inductance, resistance, and semi conductance characteristics of a normally human designated designs, it will be evident that nature has beaten us to the ultimate in circuitry designing and miniaturization. In the natural process the synaptic junction pathways form themselves and form mathematically correct resonant – capacitive-semi-conductive-inductive resonant circuits. The pathways are instructed to form in a particular pattern and then in a manner established by the DNA which designates functionality. Or more simply, the DNA forms functionality of an organ.

Combing the organ functionality and electro-mechanical instruction, the photon light value can now be used in expressing a feeling, mechanically, utilizing this patterned tonal music. Tonal expressions make picture sense. Light and tonal language can be contemporarily expressed in the form of a written or read, receptive and transmittable language, logically calculated and expressed in the program expression, hence a programming language utilized within the three dimensional array.

The logical tone value expressions allow for the differing light-tone values, or in this case tone charge, and the charge state changes the logic picture within the matrix; or in this case the pattern development occurrence along the different pathways. These musical algorithmic notation expressions, addressed into these individual node locations through a reverse of now induced current wave form signal format, are node address referenced for the type of pattern format induced, or stored, producing three dimensional

pattern resulting in a written and recognizable icon instruction; similarly to that of the KERNAL commands for the conventional computer.

The result is a picture (ideogram) symbol where the language of the expression computation is now much the same as the KERNAL command, where location now expresses methodology and in a mathematical, logical format, from which the photon to cell reaction constitutes a recognition of form and function. This is a complex problem of quantum electro-chemical mechanics yet simple in its basic electro-mechanical operation.

Now, that this discussion has given a generalized picture of events, what are the actual mechanics of switching in which the ball “recognizes” each pattern or charge state configuration or what is the logic state cipher?

Think of a multiphase positive placement identifier, in micro, connected to an extremely small algorithmic computer matrix array. The multiphased “radar” array has multiple semi spherically shaped shells that are tone receptive with an array of tuned capacitive/inductive/transistorized circuits in complement. The tone to these receptors is received at the focus of the individual lenses and logically analyzed to perform a function within the arrayed circuitry. The Buckey ball memory matrix is much the same thing, but in a molecular sized format.

Each ball node, or address, is a tuned spherical receptor and at its focus, tuned to receive the different photon frequencies. Each of the spirally shaped enzyme connections, that lead to each of the node points, form the inductive and capacitive and semi-conductive circuitry logic deducing the individual cells of the three dimensional matrix. In short the DNA is not of blood and flesh, but silicon/carbon and is the electronic backbone to this system.

Basic Bio-Chip System Testing

The primary goal is to produce a simulator based on a biologically realistic neocortical neural network.

Parallel processing will be of major importance when approaching the real-time activity of the synaptic and neocortical network dynamics.

There will be clustering algorithms applied to the dense cell connection matrix to enable load balancing and data parallelism. Within this device, the computational topology of the cortical simulator will be based on a mammalian neocortex, organized into organized clusters, highly connected by groups of various cell types making up columns and layers, performing various functions. An example would be cell types containing excitatory synapses to stimulate connected cells to raise the cell voltage level, bringing it to firing and action potential. Other cells of the same group will have a dampening effect on the connected cells, lowering the voltage of the connected cell, thus resisting the voltage rise to action potential. A sort of yang to the pre-mentioned yin.

Cells:

Each cell type will consist of compartments designed to accomplish predetermined tasks.

There will be eight areas of responsibility:

1. Bringing input signals into the compartment or buckyball.
2. Selecting signal designation and destination.
3. Selecting and sorting light wavelength.
4. Categorizing wavelength (color hue value)
5. Converting the photon wavelengths of the signal potential to a resulting analog post synaptic current.
6. Clarifying the synapses as excitatory or inhibitory.
(The excitatory is a positive waveform, and inhibitory is a negative waveform)
7. The cell portion responsible for affecting the membrane voltage by accepting or rejecting input ions.

(Note: these ion fluxes are triggered by the release of neurotransmitters from connecting synapses)

8. Cell portion that will,
 - a. Help a cell reach threshold and fire.
 - b. Dampen this response.

All of the above are responsible for affecting the membrane voltage by accepting or rejecting certain ions. These fixed ion fluxes are triggered by the release of neurotransmitters from a connecting synapses.

The activity of the "select and fire" processes are such that any given "compartment" within a cell agitates all of its inputs, calculates the input sine wave to the resulting membrane voltage and, depending on the voltage being higher or lower than the threshold required for that particular compartment, output a resulting voltage spike as the action potential.

The spike shape of the voltage will be in short burst durations, in the order of 5 milliseconds to 10 milliseconds, ranging from the base threshold value to above positive 50 millivolts. This spike will trigger the synapses on the connecting cells to release neurotransmitters. This release will result in a synaptic waveform on the connecting compartments membrane, thereby starting a fresh. The spiking action cycle triggering the event desired, and that, in turn, will start the cycle again.

A profile of the spike shape will be specified for each segment with biological requirements specified. The cell/compartment to cell/compartment connection profile will be specified by the natural biological need within the parameters of a probabilistic function due to the requirements of the centenary* action requirements where only compartments within a given cell are connected absolutely. If no connectivity is specified, the program will run but with no communication between cell clusters.

Due to the human brain being segmented into compartments with individual parts as synapses, dendrites, and channels each object encapsulates functionality that is specified to that object. Thus the synapses object handles synaptic learning, production of synaptic current waveforms, redistribution of synaptic circulation requirements of channel currents, and outputs of these currents to the parent compartment. The brain is a container for the virtual cells, the stimulus objects and the report objects. The brain

therefore, is responsible for ensuring that the stimulus objects are exposed to send data to the cells to ensure message passing and that each cell compartment has the opportunity, if directed, to respond. The brain will also be responsible for the calculation of how many time ticks are required to maintain consistent message transfer to the mechanical, or muscle, groups requiring that the membrane voltage and is calculated and updated at each time step due to the fact that it is the heart of the activity location.

With that, all the integrate-and-fire routines will originate here along with all action potentials being fire from, and to, compartments within or outside of the cells. If there is no input from the contained, or external, sources the compartment clusters will change state. Membrane voltage degrades by a preset amount towards resting potential.

The compartments, or clusters, is the generic object that is the switch based on given input parameter requirements to each cell. Compartments are sending and receiving action spikes in the matrix which forms the heart of the inner cell / compartments.

A given voltage, or current stimulus, would be based on the defined uses ranging from a linear function to a pulsed function to a sine function to mimic signals generated from the brain. This data processing of the cell / compartment receiving the information, the frequency of the data while registering the most detailed processing on the light signal frequency at each step.

The message data collection between all bucky balls passes from the sender to the receiver, being the responsibility of the sending unit to allocate memory and then de-allocate the memory once used.

In the human brain, there is a high degree of connectivity between groups of highly clustered cells. The input data clusters mimics the biological realism of the brain by stipulating connectivity on multiple levels and within different cell compartments, only the cell connectivity is not probabilistic, that is a cell either has a specific compartment location or it doesn't.

The working of the enzyme cluster for the cortical network will consist of several steps. The first step is deciphering the input data. Once all of the data input is complete, the second enzyme cluster will error-check for biological accuracy. The information signal then begins the data distribution makes a connection matrix based on the

connectivity specified in the input information, a clustering algorithm is then brought into play to secure groups of high connectivity. At this point in the cluster activity, a cell will be considered empty if not connected to the other cells in the activity link the cluster will ignore the inactive cell causing it to be temporarily deleted or disconnected from the connectivity matrix which then modifies the activity link to reflect this change.

This modification will improve the load of computation by ignoring those cells that do not contribute to the overall network of the cells being informed by the brain pattern information. These cells will still be part of the network. Each cluster is partitioned so that each node in the cluster performs separately and yet is still part of the inter-nodal group of highly connected cells within each group.

The node permits the program to begin the neocortical simulation consisting of a brain route. This functions as a pathway for delivering information and owns the individual cells matrix. This is handled by each node when the node fills the connection matrix for the given cell compartment in synchronization to create a stop barrier so that the brain, on different nodes, reach the control node at the same time to process messages in the same order resulting in sequential implementation. Thus, by using a clustering of algorithms in dense cell/compartment connected matrix, resulting in compartment of cell dendrites – soma, axioms – channels (5) synapses. A new form of enzyme based random access memory could then replace most current memory and data storage solutions. While at the same time revolutionizing the speed of operation for the medical industry as well as the “smart” electronics industry.

From desktop computers to new consumer products, to unmanned mind controlled space travel to medical and neural repairs to humans.

Testing

Wheel Chair (Transmission) Fy-2000

- Update Engineering
- Production Prototype
- Mechanical Evaluation
- Testing
- Test Marketing
- Manufacturing Design
- Outsourcing Evaluation

Dec__ Jan
Jan__ Feb
Jan__ Feb
Jan__ Mar
Mar__ May
Jun__ Jul
Jun__ Jul

Motorized Wheel Chair (Bio-Chip Control) Fy-2001

- Interface Study
- Mechanical/Chemical Evaluation
- Pre-Production Assembly
- Enzyme Evaluation
- Production (Limited number)
- Testing
- Test Marketing

Aug__ Nov
Oct__ Jan
Jan__ Mar
Feb__ Mar
Dec__ Jan
Jan__
Jan__

Bio-Chip Medical (non-invasive) Fy-2001

- Consolidation of Papers
- Condense for Presentation
- Update Enzyme Structure
- Update Photonics
- Construction of Helmet
- Construction of Receivers
- Preparation of Test
- Testing (non-invasive)

Jan__ Feb
Feb__ Mar
Feb__ Jun
Apr__ Aug
Jun__ Jan
Jun__ Jan
May__ Jun
Jan__ Mar

Bio-Chip (invasive) Fy-2002

- Pig Testing
- Redesign
- Go-No-Go
- Medical Evaluation
- Component Evaluation
- Medical Testing
- Modification of Mylan Chemistry

Jan__ Jun
Mar__ Jun
June
Jun__ Jul
Jun__ Jul
Sep__ Dec
Sep__ Dec

(Non-Medical) Bio-Chip – Agriculture Fy-2001

- Update Concept to Sonics
- Interface Study
- Update Moisture Control
- Mechanical Transceiver
- Production Prototype
- Field Testing
- Market Testing

Mar__ May
Aug__ Sep
Mar__ May
Jun__ Aug
Sep__ Feb
Apr__ May
Jul__ Aug

Exhibits

MUTANT BODY EXTRACTOR
INVENTOR ROBERT L. FULLERTON

MUTANT BODY EXTRACTION

The purpose of this design is to locate, isolate and extract mutant cells from the living tissue, both fat and muscle.

1. The mutant cells by giving a high heat image would be located using standard X Ray heat image film. This location would have to be in the third deminsion to give an accurate target as to depth, ^{width} ~~with~~ and breath.
2. After locating the mutant cells, a pad would be placed on the surface skin, four long needles, mounted to this pad, would be programmed as to depth and angle of penetration.
3. Since the target mutant cell is of a rogue enzyme composition that is of a basic protein structure, acting in an iratic manner after speeding up chemical reaction, stability will result upon cooling.
4. This cooling isolation will be accompolished by high speed, medium pressure gas injection, accuracy accompolished by angle and depth of needle.
5. The target area will be saturated by rapid multi injections each leaving a small frozen mass. These masses will interlock forming the nucleus of the mutant body. Small perificial cells, because of their higher heat will aslo freeze quicker than the normal cell, eliminating mutant residue.
6. When the mutant mass reaches the frozen state, because of the rapid chemical and physical change the body will start it's natural rejection chemistry, further isolating the mass, now dormant.

7. When this condition occurs, the mass would be surgically removed. If the mass is large enough to leave a disfigurement an implant of like material (fat, muscle, nerve) could be transplanted from another location of the same body.
8. Because of the rapid entry/exit of the gas needle and the short duration of the gas injection, the needle shaft would reach the 0' C. temperature, a small freezing of the needle corridor would result. This would be corrected by having a second larger diameter insulated needle sliding over the gas needle to clean frozen residue from the corridor. This will now close and heal the area of the injection.

Witness *Robert L. Fullerton* Date 9/29/79

Witness _____ Date _____

I Robert L. Fullerton *Robert L. Fullerton* Dated 4-15-79
do declare that this Mutant Body Extraction devise is my sole
idea. It was invented by me on the date above written.

Robert Fullerton
P.O. Box 4110
Incline Village
Nevada 89450-4110
Ph (775) 828-1153 (Home)
Ph (775) 828-9399 (FAX)

Dr. Patrick Jacobs
C/o Miami Project
1611 North West 12th Avenue, Rm. 48
Miami, Florida 33136

July 28, 2000

Dear Dr. Jacobs,

Enclosed you will find documentation of my "BioChip" invention. I do understand that Mr. Grenier had made arrangements with you for a phone conversation to take place between the two of us on Monday, August 1st. I am sorry that I will be out of town that day and unable to complete this arrangement but, I do feel that the delay will, perhaps, work to both of our benefits in that you will be able to become familiar with both the "BioChip" by way of the information enclosed.

My interest in talking to you is not to raise funds, I have accomplished that with the licensing of another of my inventions, the "ZipNut™" used by N.A.S.A. on the Hubble Telescope and the "Space Station". My interest is in having you, and your group, establish a testing criteria and overseeing the testing as an unbiased observer.

I have been working on this concept for many years, financing provided by my personal funds to eliminate the normal "investor input" resulting in a concept that was able to stay pure from the concept.

I am now ready to start preliminary testing on a local man (Joe Bowl) that has a lower spinal injury.

Since I am not medically trained I do not have the background to lay out a testing procedure that would be acceptable by the medical community, thus my interest in your involvement.

With respect to the document provided, it was written to acquaint a person with the concept in question and not show them how to make it. Until all patents have been granted, I prefer to have the component actions known to as few as possible.

I look forward to talking to you as soon as you are ready.

Respectfully,

Robert L. Fullerton

Ph (775) 828-1153 (Home)
Ph (775) 828-9399 (FAX)

Corinne Bennett

From: Jacobs, Patrick <PJacobs@miamiproject.med.miami.edu>
To: 'Corinne Bennett' <c-bennett@dellnet.com>
Sent: Thursday, October 19, 2000 8:58 AM
Subject: RE: Meeting request (Re: Fullerton Bio-chip)

Mr. Fullerton,
I would be pleased to meet with you when convenient for you. The week you mentioned (Oct 30 - Nov 3) is relatively open at this point. I am interested in your overall perspective of these projects and any specifics which came out of your discussions with the Reno group.
Patrick Jacobs

-----Original Message-----

From: Corinne Bennett [mailto:c-bennett@dellnet.com]
Sent: Tuesday, October 17, 2000 12:07 PM
To: Patrick Jacobs
Subject: Meeting request (Re: Fullerton Bio-chip)

Request of Meeting Letter attached...

You are here: [Home](#) > Netscape WebMail

Netscape WebMail

Move message to

Date: Wed, 15 Nov 00 05:23AM PST

From: "Jacobs, Patrick" <PJacobs@miamiproject.med.miami.edu> [Add To Address Book](#) [Add To Junk Mail Blocker List](#)

To: "Michael Fullerton" <FullertonDesign@netscape.net>

Subject: RE: Miami Project

[More Details](#)

Robert,

I am pleased to see your testing schedule. The wheelchair transmission study seems to be an excellent initial project for our group to begin working with you. Please keep me informed as these projects develop.
Patrick

-----Original Message-----

From: Michael Fullerton [mailto:FullertonDesign@netscape.net]
Sent: Thursday, November 09, 2000 6:00 PM
To: PJacobs@miamiproject.med.miami.edu
Subject: Miami Project

Dear Dr. Jacobs,

I am updating my file with this testing schedule.
(see Attachment - Word for Windows document)

This is the first draft and I am sure it will be modified but, this gives all some idea as to when things will occur.

Sincerely,
Robert Fullerton

Get your own FREE, personal Netscape WebMail account today at
<http://home.netscape.com/webmail>

Move message to

Robert Fullerton

From: "Jacobs, Patrick" <PJacobs@miamiproject.med.miami.edu>
To: "Robert Fullerton" <fullertondesign@msn.com>
Sent: Thursday, October 18, 2001 11:00 AM
Subject: RE: Meeting Request

Mr Fullerton,
Either the morning of the 25th or the 26th would work fine on this end. We can certainly discuss the Biochip and hopefully the wheelchair transmission system.
Patrick Jacobs

-----Original Message-----

From: Robert Fullerton [mailto:fullertondesign@msn.com]
Sent: Monday, October 15, 2001 9:29 PM
To: Patrick Jacobs
Subject: Meeting Request

Meeting Request (Re: Bio-Chip)...
Bob

Get more from the Web. FREE MSN Explorer download : <http://explorer.msn.com>

10/19/01

Mr. Fullerton,
If it would work out OK with you, lets just get started with the wheelchair transmission studies ASAP. We can handle other issues as we can.
So as soon as the wheels, etc are available just ship and I will get started pronto.
PJ

-----Original Message-----

From: Robert Fullerton [mailto:fullertondesign@msn.com]
Sent: Wednesday, November 28, 2001 1:46 PM
To: Patrick Jacobs
Subject: Re: oversight and correcting

I am correcting this oversight, right now, and bringing it into the structure that you wish.
I will send you a copy of the revisions for your redline.
Please forgive my over enthuesiasm and lack of legalese regarding the University and the Miami Project.
I was trying present a complete, and total, disclosure.

----- Original Message -----

From: Jacobs, Patrick
Sent: Tuesday, November 27, 2001 12:44 PM
To: 'Robert Fullerton'
Subject:

Mr. Fullerton,
I have some comments regarding the documents which I received this past week. I do not think the present documents are appropriate in the way that the Miami Project is mentioned. The Miami Project as part of an University cannot be mentioned as part of a presentation to investors, etc. I cannot promise ongoing research studies particularly invasive studies which are not under my control.
I have the ability to directly supervise the wheelchair transmission studies and possibly the head cap bio chip studies without requiring significant assistance from others.
The document regarding my responsibilities in relation to stock, etc. is a bit uncomfortable as such a document is questionable.
Perhaps It would be appropriate to separate the wheelchair transmission and biochip projects into different items.
Do not confuse my concerns for lack of interest of my part to be involved in research projects, particularly the wheelchair transmission as soon as possible, but rather wanting to do the right thing.
Patrick

-----Original Message-----

From: Robert Fullerton [mailto:fullertondesign@msn.com]
Sent: Saturday, November 17, 2001 12:07 PM
To: Patrick Jacobs
Subject: Reply: "We are a go"

Attached letter,
We, too, are a go.

Get more from the Web. FREE MSN Explorer download : <http://explorer.msn.com>

mime://0x0306ED20/

12/Dec/2001



THE MIAMI PROJECT TO CURE PARALYSIS
AN INTERNATIONAL CENTER FOR SPINAL CORD INJURY RESEARCH

August 15, 2000

Robert Fullerton
Fullerton Design
Incline Village
Nevada

Mr. Fullerton,

I am sorry that this correspondence is late in reaching you. As I mentioned, we are in the process of moving into a new facility which has introduced numerous challenges.

Regarding your biochip:

Prior to invasive human studies, it would be necessary to complete several non-invasive studies to demonstrate several items. Such studies might demonstrate:

- 1) That surface EEG signals can be used to direct control systems
- 2) That surface EEG signals, in conjunction with specific control systems, are reliable in a variety of settings

It would be necessary to submit a protocol of each study with a respective informed consent document to an approved Institutional Review Board (IRB). As I mentioned, it is quite possible that we could complete these steps here with the University of Miami. However, I will need to become much more familiar with the specifics of the biochip and what method(s) would be proposed to control muscle activity below the point of spinal lesion.

If you are interested, we need to continue our conversations regarding these topics.

I look forward to your response.

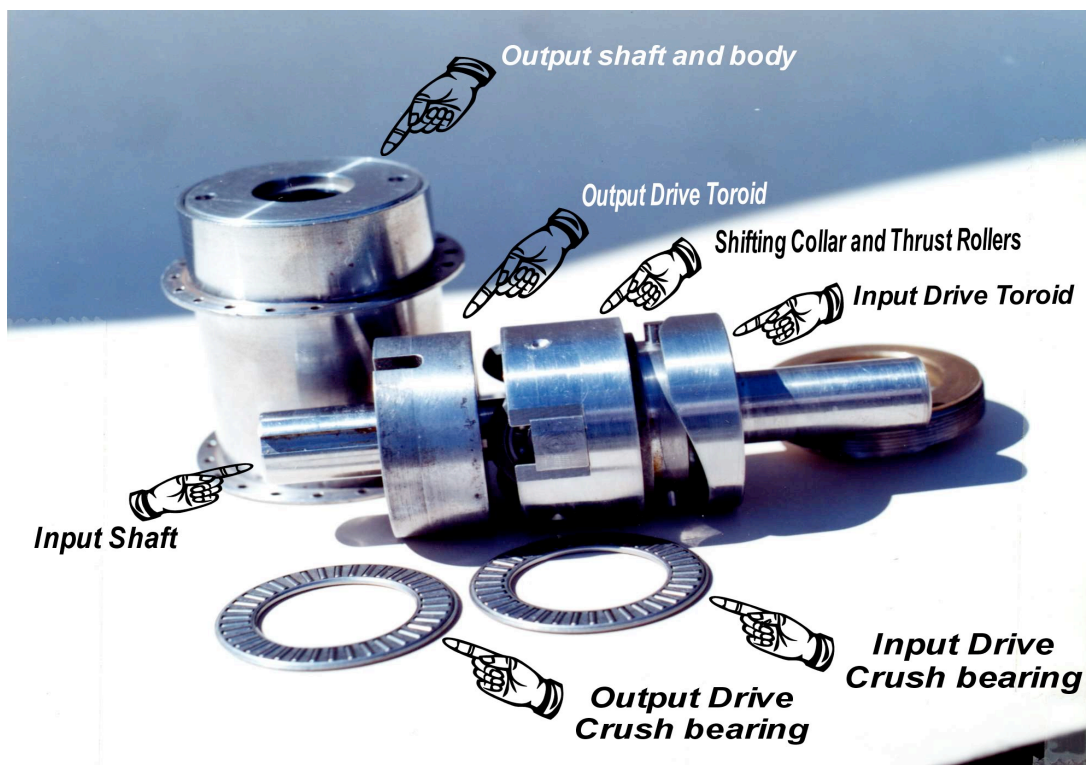
Patrick Jacobs
PJACOBS@miami.edu



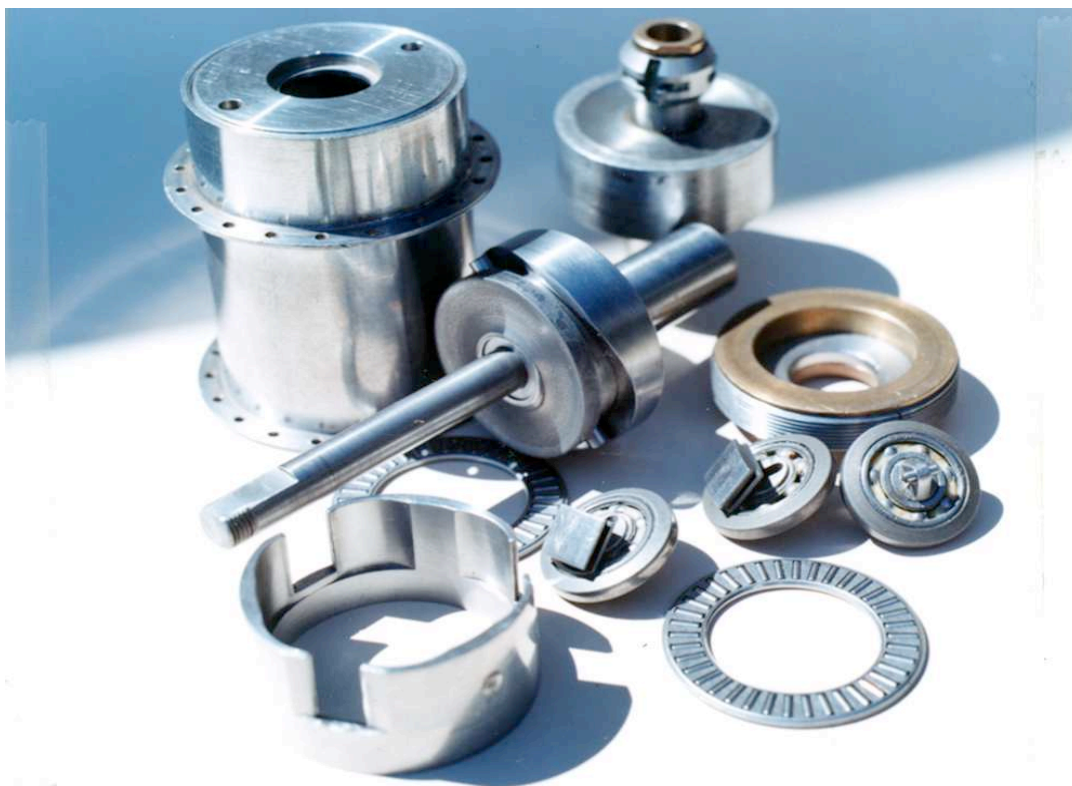
Mailing Address: Post Office Box 018860, Mail Locator R-48, Miami, Florida 33101
Administration (305) 243-6001 Fax 243-6017 • Basic Science (305) 243-6226 Fax 243-4427 • Health Care

Fullerton Design

Toroid (Automatic Bicycle) Transmission









Stanford Research Report

– Dated 9 November 1971

Stanford Research Report – dated 9 November 1971

Final Report

SRI Project No. ISC-1494

ANALYSIS AND REFINEMENT OF THE
FULERTON AUTOMATIC TRANSMISSION – PHASE I

Prepared for:
Fullerton Design

Prepared by:

Steven H. Johnson
Research Engineer
Engineering Sciences Laboratory

INTRODUCTION

This document contains the pertinent results and conclusions reached during SRI Project No. ISC-1494, "Analysis and Refinement of the Fullerton Automatic Transmission -- Phase I." The project, which dealt with an existing transmission design, was started on 15 September 1971 and was essentially completed on 4 November 1971.

Accompanying this report is one copy of a data package for the project. The data package contains the details of the mechanical analysis of the transmission, copies of relevant articles on the subject of traction drives, details of some fundamental tests, and manufacturer's literature on a candidate roller material. Although some comments are given in the data package, it should not be regarded as a separate document. Rather, it should be reviewed as a supplement to this report. Everything that SRI considers important is contained in this report; the data package gives the scientific basis for the statements made here.

Consistent with SRI's Proposal No. ISC 71-108, five general areas, were considered in the course of the project. Progress in each of these areas was reviewed with personnel of the Fullerton Transmission Company on 6 October 1971, midway through the project. Each area is treated below. Following these discussions, some general comments and recommendations for future work are presented.

II MECHANICAL ANALYSIS

The mechanical analysis in detail makes up the first section of the data package. Since it is quite technical, it will be most easily reviewed by those with a background in mechanical engineering. The analysis is broken into ten sections, labeled A through J, dealing with different aspects of the device. Transmission components are named in the first two drawings in the data package.

The purpose of the mechanical analysis was to gain detailed understanding of the operation of the transmission. The following points of interest were uncovered.

A. Preload Force and Spring Selection

To transmit the maximum input torque (35 ft-lbf, at a high gear ratio) without slip between the input or output disc and the rollers, a preload force of 80 lbf (assuming a static coefficient of friction of 0.6) between disc and roller at each point of contact will be required (Section E*). This force will act to keep the transmission in a ratio as far from 1:1 (either lower high) as possible. This situation can be corrected by incorporating two springs in opposition into the device, provided that the preload force is constant. The springs must balance the shifting moment due to the preload force and provide a squeezing force on the speed-governing balls. Note that the latter function is now accomplished by the main coil spring in the transmission. (A means for selecting the two springs to be used is given in Section A.)

The magnitude of the spring constants for two opposing springs for use in the prototype is quite large (~600 lbf/inch). The spring constant is a direct function of the roller preload force. Springs of this capacity should be available from commercial sources.

B. Transmission Speed Ratios

Since, for most materials, the static coefficient of friction is greater than the sliding (dynamic) coefficient of friction, the outward motion of the speed-governing balls will be stepwise rather than continuous. This means that a theoretical transmission will have a finite number of roller positions and hence speed ratios (Section B). Applying this analysis to the prototype transmission results in a predicted four-speed operation.

It is possible to increase the number of steps or transmission ratios significantly. This can be done by selecting material for use on the sliding disc and input disc such that the static coefficient of friction between that material and a steel ball is the same as (or approaches) the sliding coefficient of friction. Further, by intentionally making one of the ball contact surfaces steeper than the other, it would be possible to ensure that the ball will always roll on the steeper surface and slide on the other. Thus, frictional consideration would have to be given to only one contact surface.

* The sections referred to in parenthesis are sections in the data package.

To realize static and sliding friction coefficients that are nearly the same, the critical surface or surfaces can be coated with one of several low-friction materials. Among these are molybdenum disulfide dry lubricant or a grease coating. Under these conditions, the transmission can approach an infinitely variable unit between its speed limits.

C. Output Speed

The output speed range available from the transmission is a function of both input speed range and geometry. Minimum output speed is dependent on the input speed required to shift the device out of neutral. Maximum output speed depends upon the extreme angular position of the rollers and upon maximum input speed. Once the unit is in its highest gear, output speed will continue to rise as long as input speed can be increased.

As an example, consider the prototype transmission. At an input speed of 1320 rpm, the unit will shift out of neutral and provide an output speed of 700 rpm. At an input speed of 1700 rpm, the device will move to its highest gear position, with an output speed of 3610 rpm. From these outputs speeds, an output speed ratio of 5.16:1 results. However, if the engine that delivers power to the transmission can continue to do so at higher input speeds, output speed will rise proportionately. If input speed reached 3500 rpm, for example, output speed would rise to 6920 rpm, yielding an output speed ratio of 9:1

D. Roller Contour and Elastic Modulus

In the initial prototype design, the contour of the roller was made to match the contour of the input and output discs at the point of contact. This will lead to significant slip within the contact area (Section D). The slip, in turn, will result in a power loss and heating at the interface and may also be the cause of the observed roller wobble. The magnitude of the power loss will be on the order of 1.9 hp for a nominal operating point of the prototype, provided that the required preload on the rollers is applied.

This loss can be greatly reduced by two means. First, the curvature of the roller should be greater than that of the toroidal surface of the input and output discs, so that only "point" contact will result when the preload is light. Second, a roller material with a high modulus of elasticity should be used, so that, under the required preload force, the width of the roller "footprint" (area of contact) will remain small in comparison to the roller width.

E. Roller Deformation

On the basis of a stress analysis of the transmission roller, the deformation of the roller (due to the preload force) at the point of contact is substantial (Section E). The deformation figure was obtained by assuming use of a urethane roller with a modulus of elasticity of $E \approx 10^4$ psi. The roller deformation can lead to large amounts of relative slip, as reported above, plus hysteresis losses in the urethane. These problems can be minimized through use of a roller material with a high modulus of elasticity.

F. Contact Stress

The contact stress between the governing balls and the sliding and input discs is likely to exceed the yield point of aluminum, which would cause local yielding of the material until the contact area was sufficiently enlarged (Section F). Some evidence of this was observable on the prototype unit; shiny scratches in the ball paths appeared. This problem can be alleviated in several ways. One solution is to make both discs of steel, which can support the contact stress. A second possibility is to make the curvature of the ball groove (a radial path), match that of the ball, so that a greater area exists to support the contact force.

G. Disc Loading

Due to the preload force on the rollers and outward force on the speed-governing balls, there is a tendency for the three discs (input, output, and sliding) to bend (Section G). Measurements taken on the prototype unit show that excessive deflection (≈ 13 mils) will occur at the input disc. This deflection can be greatly reduced either by using steel for the input disc or by making it thicker. The equations in Section G reflect the sensitivity of deflection to thickness and material. The other two discs will not deform appreciably, given the present design. When the deflection of the input disc has been reduced, no bending stress levels are expected to be high enough for concern.

H. Roller Center Pin

The bearing and the center pin at the center of the rollers were considered (Section. H). The load on this bearing, which is also transmitted to the pin, is about 180 lbf. By treating the center pin as a cantilever beam and using the dimensions that resulted from a design change during the project, it was found that at worst the center pin will deflect about 7 mils. This deflection is undesirable, because it will result in displacement of the rollers with respect to the input and output discs. Since room to strengthen the center shaft is available, this approach should be used.

I. Sliding Collar Bearing

A bearing surface exists between the sliding collar (which controls roller tilt angle and turns at input speed) and the pivoted arms that extend to the rollers. Because of the presence of the preload force on the rollers and the resulting moment, a thrust force must pass through this bearing surface to the sliding collar. From the sliding collar, the force will be balanced by the proposed dual-spring arrangement. The maximum magnitude of the thrust force is 450 lbf, and the force can be applied in either direction, depending on the angle of the rollers. Thus, at this location a thrust bearing is required that can support a bi-directional load up to 450 lbf.

J. Bearings

A maximum load and a maximum speed for all the transmission bearings were determined, including those just discussed (Section 1). These data were compared with data showing the support capacity of inexpensive oil-impregnated bearing material (Oilite). In all cases, the capacity of Oilite was exceeded, indicating that rolling element bearings should be used. None of the imposed loads or speeds is too great for readily available commercial bearings.

There is one location where a bushing might be used: the space behind the neutral ring. However, a bushing could be used here only if the surface of the neutral ring were at a slightly greater radius than the toroidal surface. This would relieve some of the preload force on the roller, so that the thrust load that must be supported would be reduced. This might also be advantageous in that it would partially unload one of the two opposing preload forces on the roller when the device was in neutral. The other preload force, applied to the roller by the output disc can be reduced when the transmission is in neutral by increasing the radius of the toroidal cross section at the outer diameter of the output-disc.

K. Power Loss and Efficiency

The transmission was also considered from the standpoint of power loss and efficiency (Section J). Since all the critical bearings are likely to be rolling element bearings, they can be treated in a straightforward manner. Such bearings are typically quite efficient, and the power they consume increases in proportion to the transmitted power. There are two losses associated with the roller/disc contact area, however, that are much more difficult to analyze. The first of these is the loss due to slipping within the contact area, discussed above. This loss is not a function of the transmitted power, but

only of the input and output disc speeds and the roller materials. Thus, to derive efficiency for the roller that accounts for slipping loss, one must assume an input power, a roller material, and a transmission operating point. This was done, with an input of 30 hp assumed. If a lower input power were assumed, the efficiency would be less, since the magnitude of the slipping loss remains constant. The second roller-associated loss is that resulting from rolling resistance. This power loss is a function of transmitted power, which facilitates the efficiency calculation. However, accurate determination of the efficiency is dependent on accurate knowledge of the coefficient of rolling resistance under actual operating conditions. Only a crude estimate of this coefficient can be made; an actual value would have to be determined experimentally. A conversation with the chief engineer at AEROL, Inc., in Los Angeles revealed that they had never determined the value of such a coefficient for any of their urethanes. Nevertheless, a value of this coefficient was assumed, on the basis of a subjective comparison of a rigid urethane rolling on metal with other material combinations.

Given this background, an overall transmission efficiency of 80 percent is predicted. Efficiency will be lower if the power input is lower since slipping loss is not a function to input power, as discussed above. In the computation of this figure, it was assumed that many of the suggestions contained in this report will be incorporated. Thus, the predicted efficiency should be considered an approachable goal. Given careful development and construction of the device the 80-percent figure may be reached or even be exceeded by a few points. At the same time, the assumptions concerning roller losses must be kept in mind. In particular is the coefficient of rolling resistance is higher than that assumed, or if the modulus of elasticity cannot be made high enough the total efficiency will drop. Further, cumulative errors in machine work, insufficient bearing lubrication, and numerous other details can erode the overall efficiency. Thus, it should be possible to fall short of the predicted efficiency figure.

L. Thermal Problems

Accompanying the power loss calculations was the prediction of the heat that will be produced by the rollers turning on the discs. This figure, again admittedly crude, is 500 watts per roller. Since the heat will be generated at the point of contact between roller and disc, and because the thermal conductivity and thermal mass of the discs are greater than those of the rollers, most of the heat generated may go into the discs. Whether this will happen is dependent on the heat transfer across the contact area. Unfortunately, prediction of thermal behavior in such a case as this is extremely difficult.

The best approach to the thermal problem appears to be an empirical one. If the unit is tested in a dynamometer, the actual total power loss can be determined. From this, the power loss associated with the rollers can be estimated. Simultaneously, temperature rise measurements, as can be made with Tempilac indicating lacquer, should be conducted. In this manner, the true nature of any heat rise problem can be defined.

III TRACTIVE FRICTION INVESTIGATION

The concept of using the traction of rolling elements for power transmission is not new. Numerous schemes have been tried with varying degrees of success; some of these have resulted in commercial products. The reason for using traction drives rather than gears, belts, and so forth are the infinitely variable speed ratios (within a range), high efficiency power transmission, and quiet operation.

A literature search was conducted as part of this project to gain familiarity with what has been done in the field of traction drives for power transmission. Both manufacturers' literature and technical article were surveyed. The second part of the data package contains a sampling of these articles. The results of this search can be summarized quite briefly. Basically, all the traction arrives that have met with reasonable success use all-metal components for power transmission. The actual working components are usually hardened steel finish ground to close tolerance. High quality bearings are used throughout. Several units provide high efficiency and reliable operation over acceptable lifetimes.

Use of all-metal traction elements requires that the power transmission be run wet, i.e., partially filled with a special fluid. This is necessary to prevent trauma to the metal surfaces, which would result if metal-to-metal contact were ever made. An important point here is that in all of the so-called metal-to-metal drives, metal-to-metal contact is ideally never made. Instead, power transmission takes place through the development of shear forces in extremely thin fluid layers.

The fact that these power transmission units are run wet has an important implication. The coefficient of traction (analogous to a coefficient of friction) for two metal surfaces separated by a fluid layer is very small. Even with special "high-traction" fluids, developed for these devices, a coefficient of ≈ 0.06 is usually all that is obtainable. Thus requires, then, that extremely high loading forces be used between the adjacent metal power-transmission elements.

Another characteristic of most commercial units is the incorporation of a load-sensing feedback mechanism, which serves to increase the loading forces between adjacent elements in response to increased torque load on the transmission. Thus, the preload is increased as required. The load feedback mechanism usually consists of a number of balls on inclined planes near the output element. When output torque increases, the balls move up on the ramps, thereby increasing the contact force between the output and its adjacent element.

Thus, existing traction drives are characterized by metal power transmission elements, immersion in special tractive fluids, load sensitivity, and high normal loads between elements. Usually they are expensive, because of the close tolerances required. Although there are departures from this general description, there appear to be no successful units available in the multiple-horsepower range that run dry and/or with nonmetal elements.

The Fullerton Transmission design, then, is a departure from existing traction drives, in that it is to run dry and is to rely on metal-plastic (or plastic-plastic) contact for

power transmission. This means that a fluid film no longer plays a role, so the normal forces between adjacent elements can be drastically reduced. Further, problems of wet operation are eliminated such as sealing the unit against package and keeping the fluid clean.

At the same time several new considerations arise. For example: the power losses and heat generation due to the plastic-metal contact will probably be greater than in all-metal units. Further, the wear and lifetime of the plastic parts must be contended with. (Note that, in the all-metal units, as long as the power-transmitting fluid film is never broken, metal-to-metal contact does not occur hence no wear occurs in the ideal case). As discussed above, accurate prediction of power losses and heat generation is difficult. The crude estimates of these that have been made indicate that neither will present an intolerable burden on transmission design or performance, it is even more difficult to predict how well the plastic will wear and consequently what the roller lifetime will be. So many variables are involved that suggestions as to how the roller might fail first and under what conditions would be groundless. A more realistic approach is to choose several roller materials on the basis of their quantitative and qualitative characteristics and to run them in a test transmission. Then, the basis of actual operating conditions and observations, power loss and lifetime figures can be predicted with some accuracy.

IV MATERIAL RECOMMENDATIONS

On the basis of the mechanical analysis and a general knowledge of operating conditions, the critical transmission components were identified. By far the most critical component is the roller itself; effort went into identifying candidate materials that would be most likely to meet the roller design requirements. It is understood that the roller material will be mounted on a metallic hub. The second component that received attention with respect to material selection is the disc (both input and output) against which the roller will turn.

The approach taken was first to specify the roller design requirements. Given these, general categories of plastic materials were examined to identify those of possible use. When these categories had been identified, manufacturers were contacted for specific physical data. These representative data are reflected in the accompanying table, which includes data on both unfilled and filled plastics. It should be understood, however, that physical data for plastics can vary, owing to small differences in formulation or manufacturing techniques, so the figures given should be considered mean rather than exact values. Data pertaining to one specific material are included in the data package,

The design requirements specified for the roller material were:

- High friction coefficient, greater than 0.6
- High elastic modulus, greater than 10,000 psi
- High compressive strength, greater than 2,000 psi
- High abrasion resistance
- High tear strength (elastomers)
- Minimum creep, minimum compression set

- Low elastic hysteresis (to minimize heat generation)
- Low water absorption
- Usability over temperature range of -50 to 150°F
- Low cost and ease of manufacture.

Generally, in any type of plastic, the harder material, the lower the coefficient of friction. Frictional properties are markedly dependent upon surface finish and to some extent upon temperature. Many plastic materials are noted for their low coefficient of friction; examples are fluorocarbons, polyethylene's, and nylons. The frictional properties of plastics can be altered by adding either lubricating materials to reduce friction or friction particles to increase friction. Usually, the highest coefficient of friction is obtained with the plastic against itself. Therefore, facing the input and output discs with the plastic used on the roller rim should be considered.

The specified temperature range necessitates use of materials having a high heat distortion temperature and a very low brittle point. It is well known that the mechanical properties of plastics are much more dependent upon temperature than those of metals. Furthermore, all plastic materials exhibit some creep and compression set, particularly at elevated temperatures.

Considering all these factors, some filled plastics and other materials were identified as good candidates for use in the rollers. It became evident that no unfilled plastic would be a highly desirable roller material, primarily because a high coefficient of friction does not accompany an unfilled plastic with high elastic modulus. Several materials were also identified as seeming to satisfy all the criteria except the coefficient of friction.

The polyphenylene oxides satisfy nearly all the requirements for the particular application, but they are somewhat deficient in the friction property. Their excellent creep resistance and dimensional stability over a wide temperature range, together with cost considerations, make these materials a possible candidate for the roller application. The mechanical properties of the phenylene oxide polymers can be improved by reinforcement. Data on increasing the friction coefficient were not available.

The hard-cast polyurethane's are a second possibility among the unfilled plastics. Their friction coefficient is somewhat low. They also exhibit some hysteresis, which can lead to local heating. However, under the amount of deflection anticipated, the heat buildup should not be excessive for rigid polyurethane. The wear and abrasion resistance of these materials are very good.

The acetyl copolymers appear to be a third possibility in the unfilled plastic category. The friction coefficient is again deficient. These polymers have good creep resistance and excellent low-temperature strength. Glass reinforcement can enhance some of the properties of the acetyls.

The polyamides are also deficient in the friction property creep resistance of these materials (unfilled) may be excessive reinforcement can improve the creep resistance as well as some of the parties.

The polyamides again are deficient in the friction property. Also, these materials sometimes fail at low temperatures when subjected to high mechanical stress or cyclic fatigue.

The materials often classified as filled plastics, because certain polymeric resins are used as bonding agents, are mainly composed of other materials. The resins usually represent only a small percentage of their total volume (15 to 30 percent). The fillers may be cork, asbestos, metals, inorganic oxides, hard rubbers, fibers and so forth. Brake linings and clutch facings are some typical uses of filled plastics.

Among the materials falling in this category are the filled phenolics, which can be formulated to possess excellent mechanical properties and good friction coefficients. An example is given in the table. It is very likely that such materials could meet all the requirements specified for the transmission rollers. Basic resin suppliers (such as Union Carbide) do not prepare these materials. Specific information would be available from large manufacturers of brakes and clutches.

Other materials belonging to the resin-bonded category are the proprietary friction materials manufactured by Johns-Manville. Representative properties are included in the Table. These materials have the best friction coefficient of the materials studied, and their mechanical properties are excellent. Although their wear resistance is somewhat lower than that of the other materials listed, and they may abrade the contact surface more than the other materials, these materials appear to be the best selection for the roller application, on the basis of their desirable properties and their general past performance.

Bonding of the plastics to the metallic hub can be accomplished with all the materials listed. However, in the case of the Johns-Manville friction materials, it is recommended that attachment to the hub be made by flange bolting (compression of the material between two flanges).

The input and output discs must be of metal, because of the preload force they must impart to the rollers. Either aluminum or steel can be used. With steel, a thinner disc could be used for comparable strength, since its elastic modulus is three times as great as that of aluminum. Aluminum has a tendency to abrade more readily than steel. If the transmission tests show abrasion of aluminum discs, the contact surface should be anodized. Steel is likely to be the better choice for the disc material, because of its greater strength, stiffness, and abrasion resistance. However, a corrosion-resistant alloy or some means of surface protection would have to be used, since moisture may enter the transmission case.

Greater contact friction might be achieved by facing the discs with the same material used in the rollers. However, this step would be unjustifiable at this time, since successful operation appears to be achievable without it.

To summarize the results of the materials study, the candidate roller materials are, in the order of preference:

- (1) Johns-Manville friction material No. 160, or an equivalent. Due to the proprietary composition, this may be just & filled plastic similar to one of, the following categories.
- (2) Resin-bonded filled phenolics.
- (3) Polyphenylene oxide, filled if Possible.
- (4) Hard-cast polyurethane.
- (5) Acetyl polymers.
- (6) Reinforced polyamides, if the friction coefficient can be increased through additives.

Steel input and output discs are recommended as superior to aluminum, on the basis of the information available at this time.

It is recommended that several of the roller materials be evaluated in a comprehensive test program. This is the only satisfactory way in which a final material selection can be made. The manufacturers of the described plastics provide design assistance services, which should be used to arrive at the roller design for a production transmission.

They can offer specific information on physical properties, manufacturing and bonding techniques, cost estimates, and design constraints.

V DESIGN CRITIQUE

At the beginning of the research effort, aspects of the transmission design would come worthy of comment. Many of these points have already been treated. Comments on additional topics of interest are now presented.

A. Roller Preload

In the prototype transmission, preload of the rollers is achieved via jam nuts on both the input and the output discs. The Fullerton Transmission Company and SRI agree that this preload method should be improved in future models. Two methods of supplying the preload force stand out as being simple and better than the jam nut technique. First, the discs could be spring-loaded against the rollers, thus maintaining a constant preload force. This scheme is simple, practical, easily implemented, and would permit roller wear to be automatically compensated for. However, constant preload would mean that roller-associated power losses (due to slippage within the contact area) would be constant, regardless of the power transmitted. This would decrease the efficiency at low power levels. Second, the preload force could be applied in proportion to the power transmitted, as by the ball and inclined plane technique described earlier. This would have the advantage of keeping efficiency high when power transmitted is low. Unfortunately, this scheme implies that the moment tending to tilt the roller would vary with torque load. This, in turn, would rule out the use of springs to balance this moment, and a much more elaborate moment-balancing solution would be required. Therefore, it is recommended

that a constant preload be applied to the rollers via springs. Belleville washers could be used for this purpose. Although this would cause some loss of efficiency at low power levels, this solution is superior from an overall design point of view.

B. Disc Wear

It has been mentioned earlier that smooth transmission operation is desirable and can be attained by ensuring that many (or an infinite number of) shifting steps are realized; ways to achieve this have been given. If the roller is hard, as it must be, preferential grooves could be worn in the input and output discs if discrete speed ratios exist. Smooth operation via an increased number of shifting steps should minimize the possibility of this happening.

C. Roller Centering

When this project began, the magnitude of the loads to be applied to the bearing and shaft at the roller center was not realized. After these loads had been estimated, two conclusions could be drawn. First, the center pin supporting the bearing must be strengthened. One step in this direction has already been taken. Second, the center of the rollers must not be permitted to "float," as had been suggested earlier. Instead, the rollers must be fixed in place at the center of the toroidal cross section.

D. Other

In the prototype shown to SRI at the start of this project, the speed-governing balls often left the radial paths they were to run in. Further, the neutral ring turned with the input disc and did not idle properly. Both of these situations were remedied.

VI PRETESTING ASSISTANCE

The final area considered under this research effort was testing. Which is obviously crucial to further development of the device. In this case, SRI's primary purpose was to describe a practical test setup for the transmission, utilizing available equipment. Whenever possible. Two simple tests of no-load transmission losses were also conducted.

A trip to South Lake Tahoe revealed that a Hartzell Industries, Inc. Mark II Dynamometer is available to Fullerton Transmission Company. This unit is capable of absorbing up to 40 hp and so can be used as the output load on the transmission. Curves are supplied with the dynamometer, indicating delivered horsepower as a function of hydraulic pressure and shaft speed. No accuracy figures are given for the unit, but it is probably sufficiently accurate to be very useful in most development tests. The manufacturer should be should consulted to determine more clearly the accuracy of the

dynamometer. Several possibilities for power absorption were considered, but since the Hartzell unit is available, apparently at no cost, it should be used.

The only required modification to the Mark II Dynamometer will be to put a chain sprocket on one of the shafts, which now carry rubber tires. Initially, this sprocket should have the same number of teeth as the output sprocket on the transmission. Sprockets with more teeth on the dynamometer shaft may be required if the input disc speed is much greater than 2000 rpm.

It is understood that engines are available that could supply power to the transmission. An engine that could supply up to 30 hp to the transmission would be useful. The engine and transmission input could be connected either via chain and sprockets or directly through the transmission shaft. The measure of transmission efficiency is not dependent upon the input or output connection.

The fourth part of the data package contains the detailed basis for making transmission efficiency measurements. Four measurements must be taken at any given operating point to permit an efficiency figure to be calculated: output power, input and output shaft speeds, and reaction torque on the transmission case. Output power can be determined from the dynamometer. Input and output shaft speeds can be measured by several means, including a stroboscope, mechanical indicator, or electric generator. The data package contains product information on three possible tachometers. The Metron Model 29 is the least expensive (\$50) but requires access to the end of each shaft whose speed is to be measured. The Metron Model 27 (\$100) uses remote sensing of shaft speed, which is desirable if the shaft ends cannot be reached. This may be the case with the output shaft. The most versatile unit is the Strobotac, but it is also the most expensive (\$275). In addition to measuring shaft speeds accurately, it could also be used for stroboscopic observation of the rollers and speed-governing balls, which might be quite useful. If budget permits, this unit is the most desirable. These three possibilities are only a few of the commercial tachometers available.

Reaction torque is determined by measuring reaction force at a known distance from the transmission axis. At a radius of 1 foot from the axis the reaction force should not exceed 100 lbf. A search of available force gages turned up one candidate instrument, the Dillon Model X (\$200). This unit is sufficiently accurate. To eliminate most tendencies toward jerky motion of the gage indicator, a block of firm rubber could be put between the transmission arm and the gage. This would damp out high-frequency force variations. Product literature on this is included in the data package.

Measurement of no-load losses in the prototype transmission was conducted on two different occasions. This was done simply by driving the input shaft, measuring the reaction torque, and letting the output sprocket turn free. On the first occasion, the rollers were in a minimum-ratio position; in the second, a 1:1 ratio was used. In the second test, the prototype transmission had been upgraded by replacing several bushings with ball bearings; some parts had been strengthened; and new roller materials were used. Details and numerical results are presented in the data package.

Basically, the tests showed that no-load losses were relatively low for the given condition of the prototype. The maximum loss, for an input speed of 1370 rpm was 1.1 hp in the first test and 0.65 hp in the second. Losses increased in an expected fashion with increasing speed. It should be realized that losses will also increase with output load, which was zero in the tests. In both tests, the preload on the rollers was considerably less than that required; using the recommended preload will increase the losses. However, no evidence was found to alter the overall efficiency predictions resulting from the mechanical analysis.

In each test, a local hot spot was found, but in both cases this was a readily correctable bearing problem. The roller surfaces became slightly warm to the touch.

One observation worthy of mention was that in both tests the rollers wobbled somewhat. This should be prevented by minimizing the bearing clearance at the roller center. Also, in both cases, the reaction force varied widely and rapidly with time at a given operating point. This variation in the reaction force is now thought to be associated with the wobble of the roller.

When the second test was conducted, the transmission was run once to demonstrate shifting via the governing balls. When the input shaft reached a speed between 775 and 1370 rpm, the rollers moved away from the neutral ring and brought the unit into "gear." The rollers seemed to shift quickly to a ratio greater than 1:1, and then slowly increase the ratio. It is believed that this slow shifting to higher ratios is a result of the unbalanced moment caused by even the light preload force. This is consistent with predictions. If a pair of compensating springs had been included, as they must be in future models, the

Page missing at the end of this SRI report.

Toroid Transmission Patents

154: AUTOMOTIVE TRANSMISSION

[75] Inventor: Robert L. Fullerton, South Lake
Tahoe, Calif.

[73] Assignee: Fullerton Transmission Company,
Sacramento, Calif.

[22] Filed: Oct. 4, 1971

[21] Appl. No.: 186,273

[52] U.S. Cl.: 74/200, 74/740

[51] Int. Cl.: F16h 15/06, F16h 37/12

[58] Field of Search: 74/200, 740

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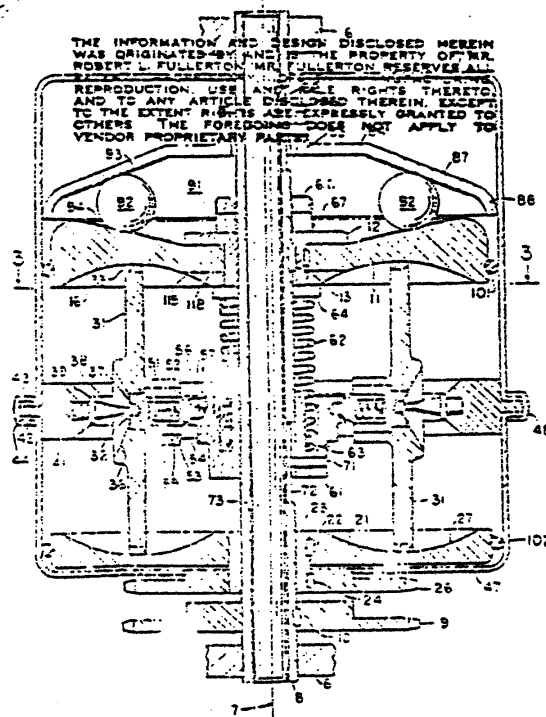
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Primary Examiner—Leonard H. Gerin
Attorney—Marcus Lathrop

[57] ABSTRACT

An automotive transmission has a drive tube rotatably mounted on a frame and carrying a drive disc having a first half-toroidal friction surface and a free-running neutral disc having a friction surface continuing the first friction surface. A driven tube is also rotatably mounted on the frame and carries a driven disc having a second half-toroidal friction surface facing the first friction surface. Tiltable and rotatably mounted between the discs are transmission discs frictionally engageable with the friction surfaces. The transmission discs are tiltable to afford various speed ratios and a neutral position. The tilting device is either manual or centrifugal. The output is either direct or through a planetary reversing gear.

14 Claims, 11 Drawing Figures



PATENTED APR 17 1973

3,727,474

SHEET 1 OF 7

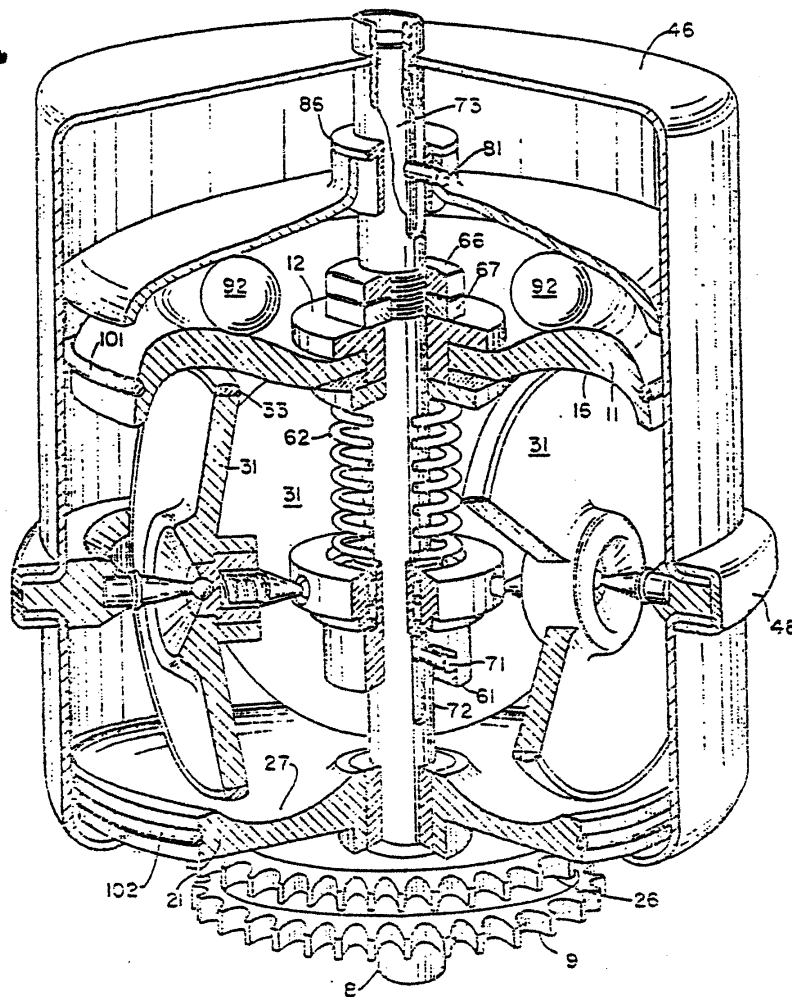
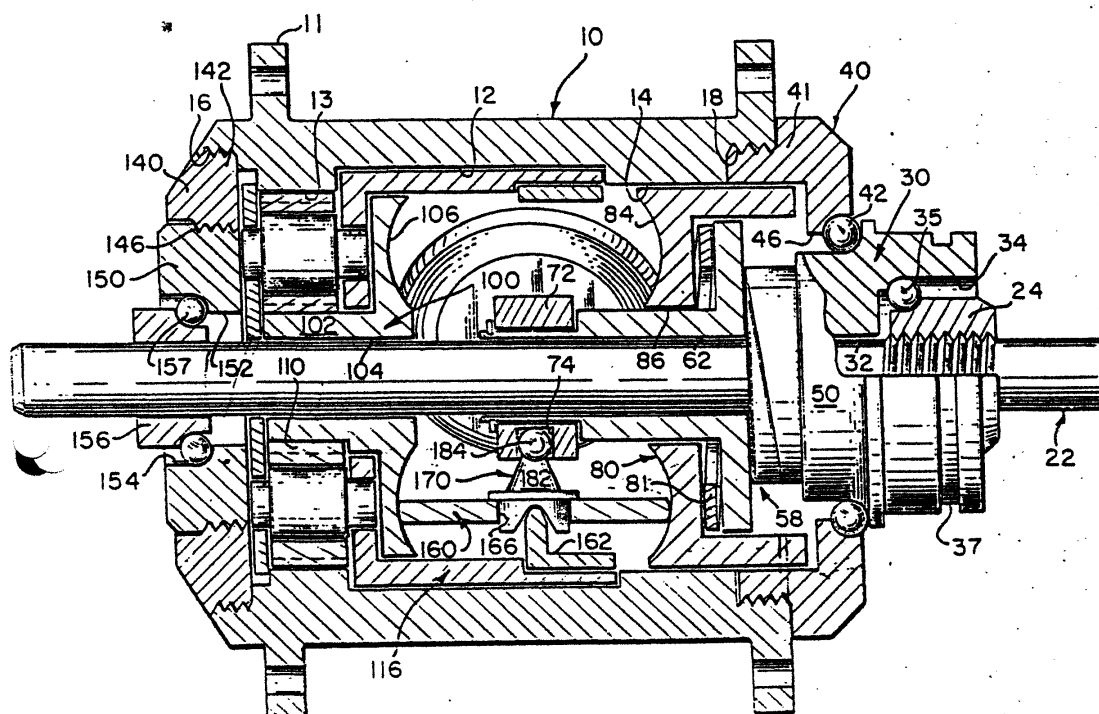


FIG. 1

INVENTOR
ROBERT L. FULLERTON
BY *Lotter & West*
ATTORNEYS



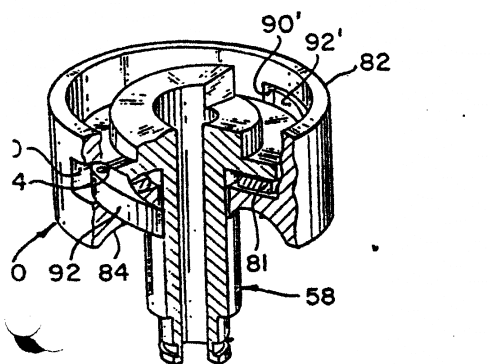


FIG. 8

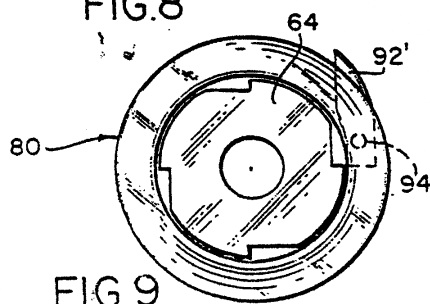


FIG. 9

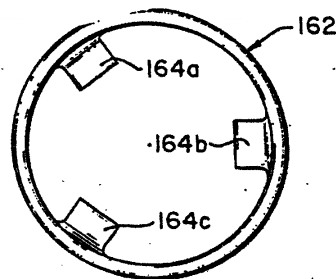


FIG. 11

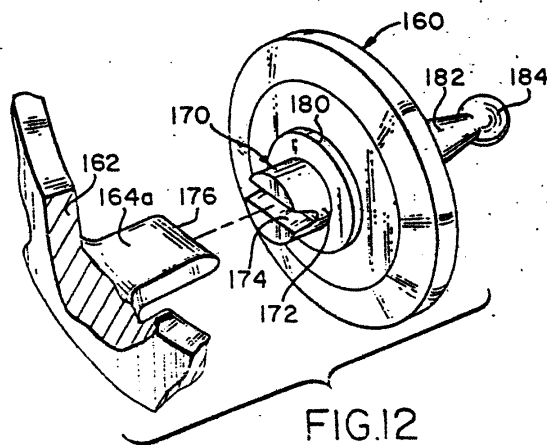


FIG. 12

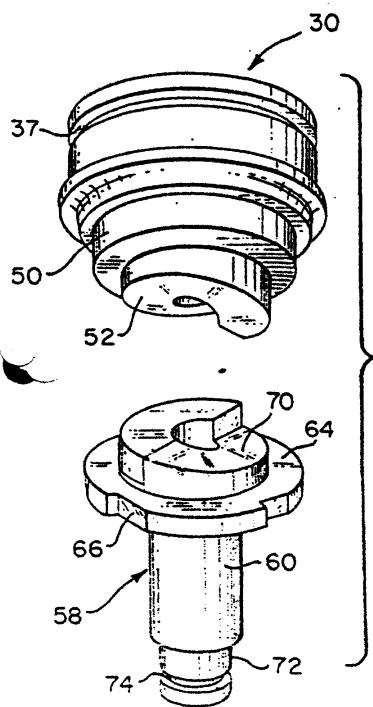


FIG. 7

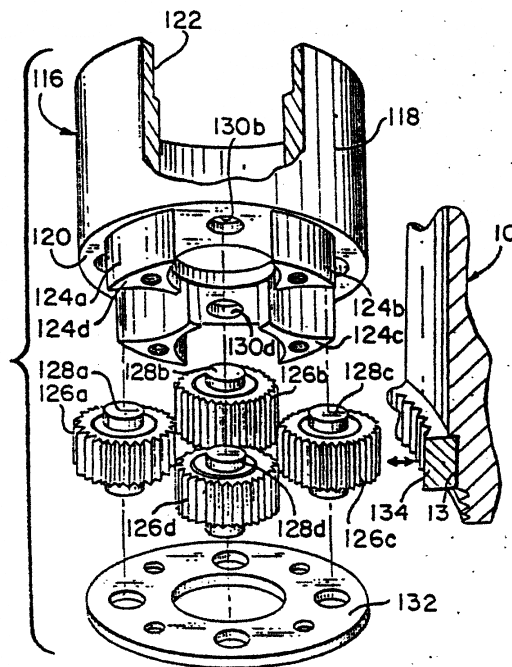


FIG. 10

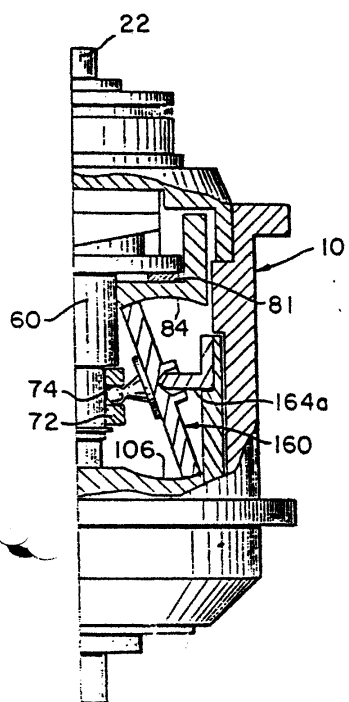


FIG. 4

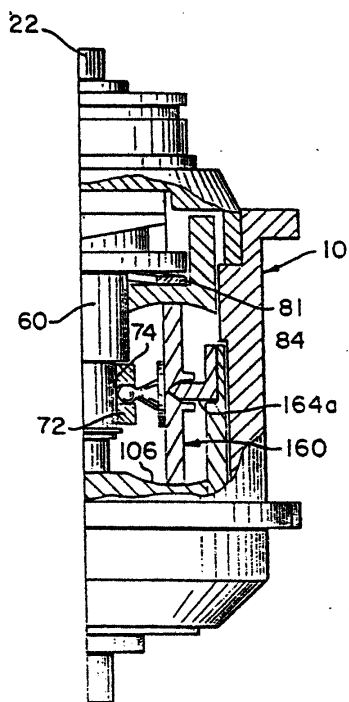


FIG. 5

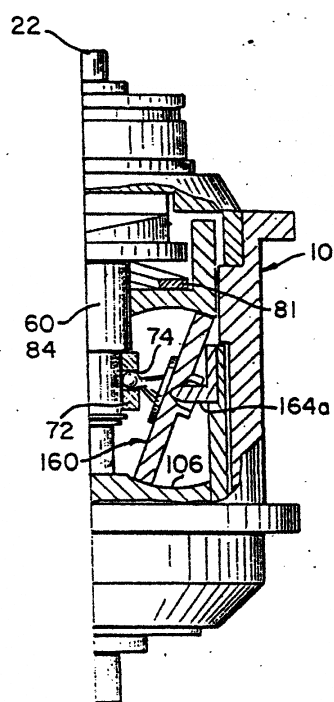


FIG. 6

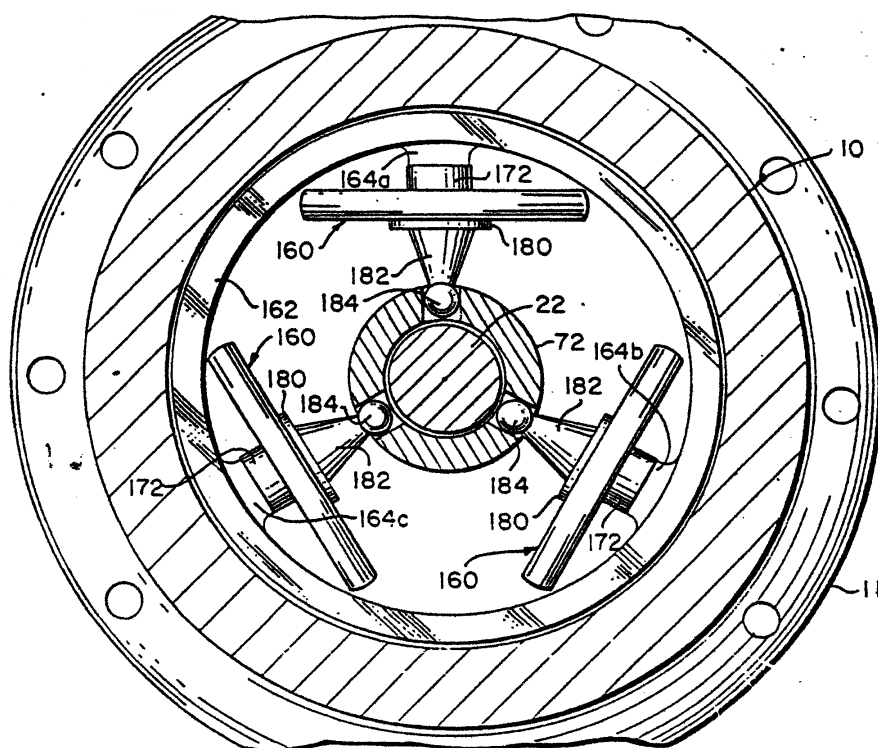


FIG.3

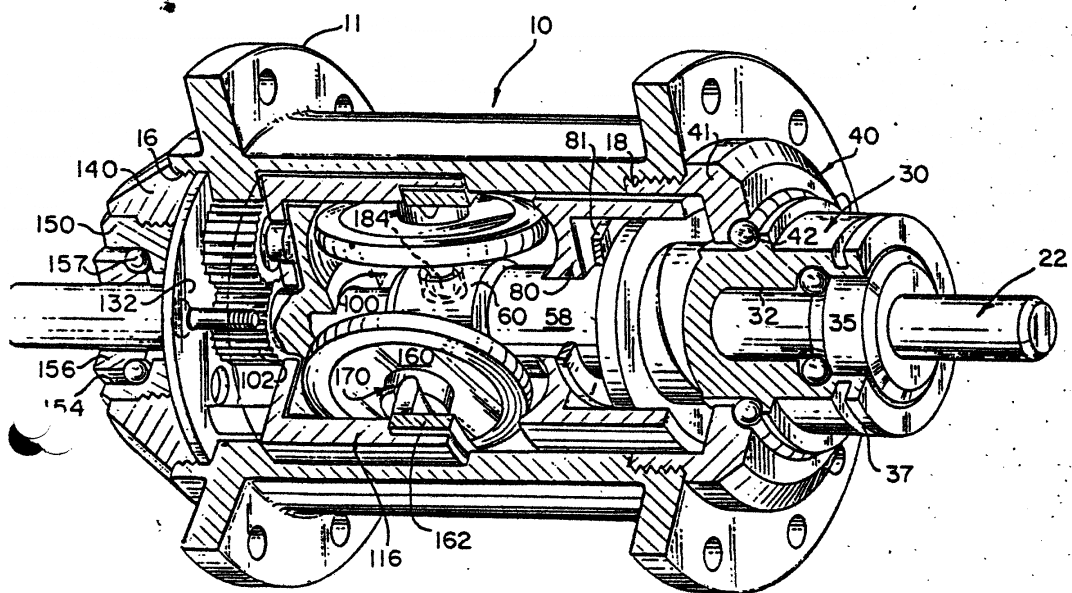


FIG.2

Reserved for further additions