# The Searl Effect & The Searl-Effect Generator

( Reconstruction of the experimental work carried out by John Searl between 1946 and 1952
concerning the claimed discovery of a new source of energy )
by

## S. Gunnar Sandberg
(17 June 1987)

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**Preface**

This report is based on a series of interviews given by John R.R. Searl on a number of occasions since 1982 and contains information and data concerning the experimental work on permanent magnets carried out by him between 1946 and 1952. The experiments resulted in the claimed discovery of a new source of energy, the so-called Searl-Effect (SE) and the invention of a new permanent magnet machine, the so-called Searl-Effect Generator (SEG) to utilize this effect. The report also contains data and information regarding important tests and measurements made on the SEG, or part thereof, by Searl in cooperation with other research workers after the aforementioned time period.

It must be stressed that all documentation describing the experimental procedures and the equipment used was destroyed by fire in 1983. It is therefore not possible to give a detailed and accurate account of Searl's work.

Nevertheless, the information gathered is believed to contain enough data to allow a successful repetition of the experiments to be made.

The reconstruction of the equipment used has been a joint effort between Searl and the author, in particular the magnetizing coil and the switching equipment.

S. Gunnar Sandberg
(June 1987)

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## Introduction

In 1946, at the age of fourteen, John Roy Robert Searl began his employment as a trainee at the Midland Electricity Board (MEB) in Birmingham to become an electrical and electronics fitter. The MEB produced their own permanent magnets to be used in the manufacturing of energy-meters and other electrical instruments. This work was carried out in the electronics workshop where Searl was a trainee. Soon, Searl became involved in the production of permanent magnets and gradually learned the manufacturing procedures and how to use tools and the necessary equipment. Also, the management gave him permission to use the research laboratory for his experiments which were considered to be part of his training. It was in this environment Searl began his experimental work on permanent magnets that eventually culminated with the discovery of a new magnetic effect.

Searl's original idea was that free electrons in spinning metal bodies may have a tendency to move in the radial direction due to inertial forces. If this hypothesis was correct then an electric potential difference should develop between the center and periphery of a rotating shaft and between the inner edge and the rim of a slip ring. He also held the view that the electromotive force induced in spinning bodies due to the earth's magnetic field could be used for generating electric energy. Accordingly, Searl's first series of experiments consisted of careful measurements on fast rotating steel shafts and slip rings made of brass and indeed he was able to show the existence of a minute electric voltage in the radial direction. If this voltage was due to the inertial properties of the electrons or induced by the magnetic field of the earth was never established. However, it soon became evident that this simple generator would only be practically useful if means could be found to increase the power output.

At this stage in the experimental work any person with a formal education in electrical engineering would have considered the principle unworkable and the effect an academic curiosity without practical applications. However, Searl was not so easily discouraged and began experiments with rotating permanent magnets manufactured by him using a magnetic material(l) made by Mullard UK and later using magnetic alloys imported from the USA. These alloys proved to be superior compared with the magnetic material manufactured by Mullard (Whether or not this material was a ferromagnetic alloy or a ferrite s not known). The use of permanent magnet material resulted in a considerable improvement and by now Searl was convinced that this simple principle could be used to generate electricity. Whether Searl's choice of magnetic materials was a deliberate experimental strategy or a coincidence is not known, but in due course the use of these materials did lead to unexpected effects.

## The Manufacturing Procedure of the Permanent Magnets Used by Searl

During the early part of his training period Searl manufactured a great number of permanent magnets in the shapes of cylindrical bars, hollow cylinders, annular rings and rectangular rods.

The magnets were moulded by pressing a mixture of magnetic powder and a bonding agent. For this operation a hydraulic press with appropriate press tools was used. The work was carried out inside a vacuum chamber to prevent explosion. Moulds made of bakelite were also used and the mixture of magnetic powder and binder was packed by hand into the bakelite mould and the whole assembly placed into the vacuum chamber with the intention of removing the air from the mixture and increasing the mass density of the magnets. However, this method was less efficient than using the hydraulic press which produced better and denser magnets. The curing of the moulded cores could sometimes take as long as three days. This suggests that curing took place at room temperature and a liquid binder was used. In later experiments Searl successfully used nylon (thermoplastic) with an excess of negative charges. These charges appear to have taken an active part in the production of the Searl effect.

Two types of magnetic alloys and bonding agents were imported from the USA by Searl. This material was paid for by George Haynes of Turner Street, West Bromwich, who financially supported Searl's experimental work between 1946 and 1948; the reason being that Mr. Haynes' son and Searl made the experiments together.

A magnet produced in 1946 by a mixture of the two alloys was analyzed qualitatively in 1984 and found to contain the following elements: Aluminium, Silicon, Sulphur, Titanium, Neodymium, Iron.

The precautions taken by Searl when handling the highly flammable element neodymium and details concerning the moulding process have never been properly investigated. Likewise, the identities of the American suppliers of the magnetic alloys have not yet been established.

Further information regarding the magnet specimen is found in Appendix A.

### The Magnetising Equipment Used by Searl

The coil used by Searl to magnetise the moulded cores was originally intended for and used to demagnetise (degaussing) turbine shafts and generator shafts and consisted of approximately 200 turns of heavy electric copper wire normally used for connecting electric cookers to the mains. The magnetising current used was 180 amperes and supplied by a Westinghouse three-phase mercury rectifier. The on-off switching operation was carried out manually using a high current switch and the on-off duty cycle lasted for seconds rather than fractions of a second. More information regarding the coil can be found in the report SEG-002.

### A Novel Magnetising Method

Based on what can only be described as intuition, Searl suggested that a second winding should be added to the existing magnetizing DC-coil and connected to an AC-source. This proposition created heated discussions amongst his fellow workers as to the effect of such a magnetising method. The general view was that the magnetic field created by an alternating current would partly cancel the magnetic field created by the direct current and make the coil less efficient. However, Searl suggested that the existing RF-signal generator in the laboratory should be used as an AC-source; this would prevent cancellation of the DC-field. This idea was met with an

even greater scepticism as the current supplied by the signal generator would be minute and have insignificant effect on the magnetising process. Searl persisted, however, with his views and eventually succeeded in winning his manager's approval for the idea. Searl can remember his manager carrying out certain calculations concerning the design of the AC-winding. These calculations were at the time beyond Searl's comprehension and no information is any longer available regarding their nature. The exact number of turns in the AC-winding remains unknown despite a considerable effort on Searl's part to recall the details concerning the coil. However, based on fundamental electrical engineering it can be assumed that the calculations involved resonance (to maximize the number of ampere-turns in the AC winding, parallel resonance should be used) and characteristic impedance determinations with the intention of avoiding shorting out the signal generator. It is, therefore, reasonable to suggest that these calculations can be repeated and a reconstruction of the AC-winding can be made.

The switching equipment consisted of two hand-operated switches which had been mechanically interlocked; one switch for the DC-current and the other switch for the AC-current.

## Generator Geometry

Exactly when Searl decided to use the 'roller bearing' geometry as a model for his generators is not known and will require further investigation. However, it must have been very early in his career, probably as early as 1946. The inertial and the gyroscopic effects of a fast spinning ball-race intrigued him and Searl used to release fast rotating ball-races and study their behaviour when they dissipated the kinetic energy through collisions with surrounding objects. It was most certainly the result of these experiments that inspired him to use this configuration for his generators.

## The Discovery of the Searl-Effect and the Invention of the Searl-Effect Generator

Equipped with these new ideas concerning geometry and magnetizing methods, Searl started to make generators consisting of a single annular ring surrounded bya number of rollers. By keeping the ring stationary and forcing the rollers to spin about their own axis and simultaneously revolve around the ring by driving them with an electric motor, the generators produced voltages in excess of 30 kilovolts. However, it was not always that Searl was successful in producing such high voltages. Since he did not know the mechanism responsible for the effect, it was very much a matter of trial and error to reproduce the magnets. Sometimes the failure rate was very high, seventy percent or more; out of a batch of a hundred (100) magnets only thirty (30) would work. The reason for this was never established with certainty, but it is believed to have been caused by the primitive switching equipment used.

## The Searl-Effect

At a certain critical speed some of the generators would suddenly lock in to a mode of operation that appeared to be some kind of positive feedback and they would run spontaneously without any mechanical connection to the driving motor. In the beginning Searl could not control this effect at all.

Later, he found that by loading the generators electrically it was possible to reduce the speed, but once this state of operation had been reached the generators could not be stopped. However, it is possible that if appropriate test equipment had been available Searl would have been able to bring the generators to a halt by loading them either electrically or mechanically. It must be pointed out that Searl did not have the financial support required to carry out such comprehensive and dangerous tests and even if he had access to the workshops and the laboratory at the MEB, where such tests could have been made, he was certainly not allowed to carry out dangerous experiments on the MEB's premises.

As the experimental work progressed Searl succeeded in reducing the critical speed to a value close to zero by a careful design and by increasing the number of rollers, and eventually he was able to produce a generator that was self starting. Searl discovered that when the generators were running the air pressure decreased in the immediate vicinity of and inside the generators. At voltages above thirty kilovolts the air motion was directed away from the rim of the generators, and candle light that had been placed at the centre of the generator ring went out due to lack of oxygen. This decrease of the air pressure could explain the absence of flashover between the ring and the rollers. Searl also discovered that the temperature dropped considerably close to and in the interior of the generators, probably due to the transport of air away from the generator. Another interesting effect was that objects placed inside the generator ring lost their weight. The existence of these effects were later confirmed by use of proper measuring equipment.

**The Searl-Effect Generator**

Three different systems were developed to extract the energy produced by the SEG; one mechanical system and two electrical:

(1) The mechanical system: The details concerning the mechanical drive system are not known and are yet to be investigated.

(2) The high voltage system: This system was originally developed for measuring the electric potential difference generated between the stationary ring and the moving rollers. The positive generator terminal was fitted to the ring and the negative terminal consisted of a number of parallel-connected comb-shaped electrodes mounted around the generator periphery and in close proximity to the rollers, as shown in Figure 1.

(3) The low voltage system: By fitting a number of stationary c-shaped induction coils around the rim of the generator, as shown in Figure 2, and connecting them in series or parallel, or a combination of both, the SEG produced electric power of its own ( $\sim 10^2$ watts).

Several small generators of this type were manufactured and by 1952 Searl had built the first multi-ring generator.

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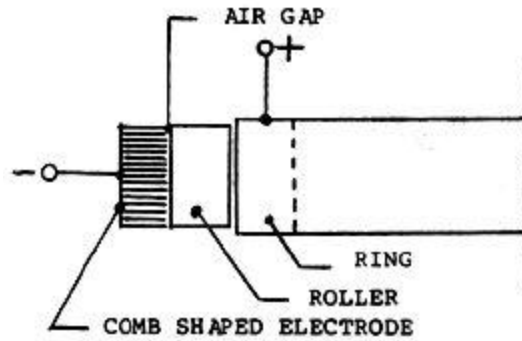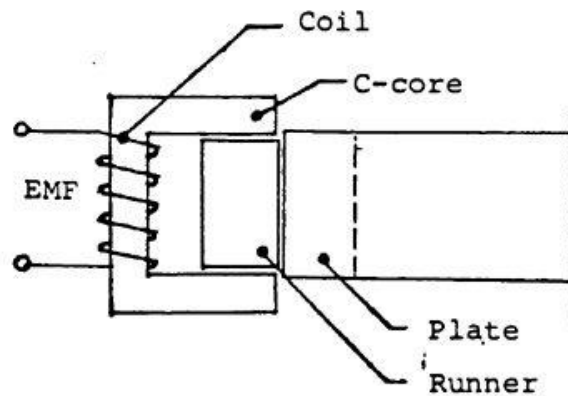**Figure 1**

AIR GAP

RING

ROLLER

COMB SHAPED ELECTRODE

**Figure 2**



Coil

C-core

EMF

Plate

Runner

**The 3-Ring Generator & the Searl-Levity Disc**

This device was about three feet in diameter and consisted of three segmented rings in the same plane, with a number of induction coils at its periphery (Details regarding this device can be found in the report SEG-001, October 1982). Each ring consisted of a number of magnetic segments with insulating spacers between each such magnet. Due to high cost, this generator did not contain enough roller-magnets to be self-starting.

The generator was tested by Searl and a friend of his in the open and the armature was set in motion by a small engine. The device produced an unexpectedly high electrostatic potential in the radial direction. At relatively low armature speeds a very high voltage was produced and indicated by static effects on nearby objects. Characteristic crackling and the smell of ozone supported the conclusion.

The unexpected then occurred. The generator lifted while still speeding up, broke the union between itself and the engine, and rose to an altitude of about 50 feet. Here it stayed for a while, still speeding up and surrounded itself in a pink halo. This indicated ionization of the air at a much-reduced pressure.

Another interesting side effect caused local radio receivers to go on of their own accord. This could have been due to ionizing discharge or electromagnetic induction. Finally, the whole generator accelerated at a fantastic rate and is believed to have gone off into space.

Since 1952, Searl and his co-workers have manufactured and tested more than 10 generators, the largest being a 10-meter disc-shaped craft, the so-called Searl-Levity Disc (SLD). Figure 3 shows a smaller version of the SLD.

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**Figure 3: Searl Levity Disc  [Not available]**

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**Appendix A: Analysis of the Searl-Magnet**

The magnet specimen supplied by Searl was analyzed by Roger Cheese (a material science technician at the School of Engineering & Applied Sciences, Univ. of Sussex)) on April 16, 1984, using Energy Dispersive X-Ray Analysis, the so-called EDAX-spectrum, and found to contain the following constituent elements, as shown in Figure Al.

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**Figure A1: EDAX-Spectrum**
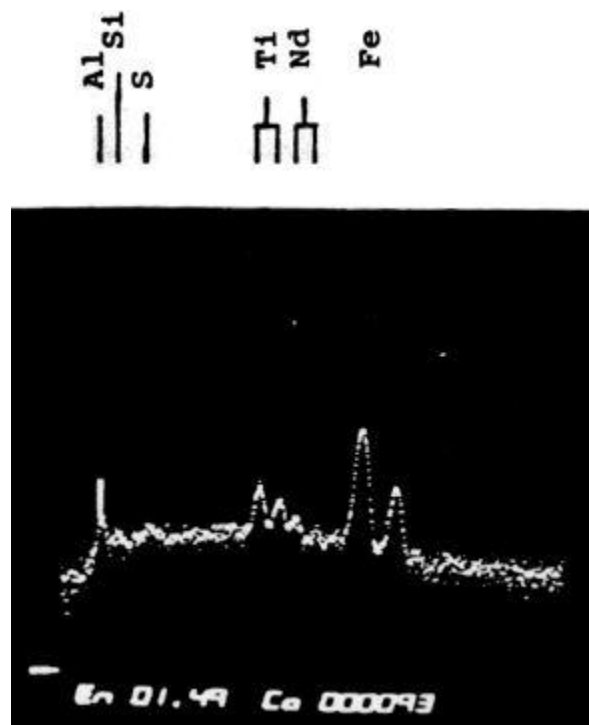
The EDAX-spectrum also contains information concerning the quantity of each constituent element.

Although this data is inadequate for an exact quantitative analysis, it is considered accurate enough for an acceptable estimation to be made. This work will require expertise and financial support.

According to information received from Dr. Anthony Simpson(a retired materials scientist and a former lecturer in the School of engineering & Applied Sciences, Univ. of Susses) the element neodymium was most certainly included to reduce the oxygen content and prevent it from having an adverse effect on the magnetic properties of the alloy. There is the possibility that the neodymium was a contamination but that is less likely. In either case the percentage neodymium was probably less than 10% by weight (5% by weight is most likely).

The dimensions and the magnetic polarity of the magnet specimen on which the tests were carried out are shown in Figure A2.
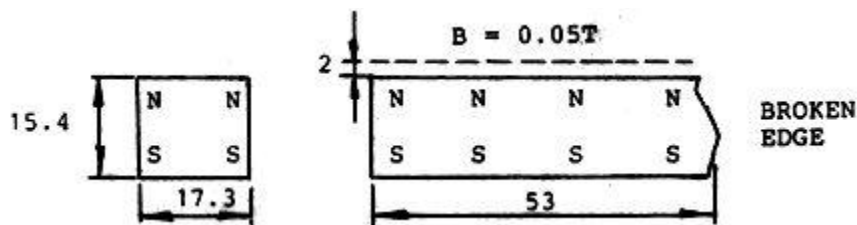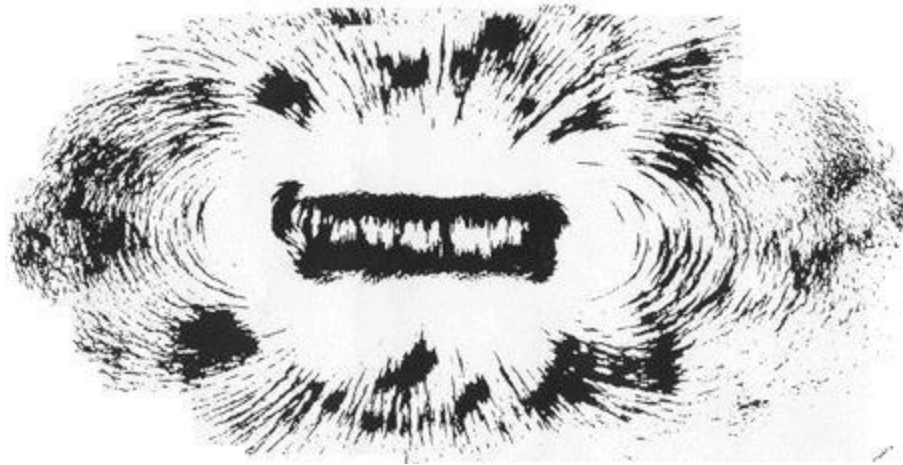
**Figure A2: Dimensions in mm**



Figure A3 shows the magnetic flux pattern obtained by use of iron filings. The magnet was identical to one of the bar magnets demonstrated by Searl on August 15, 1982, as shown in the report SEG-001. At the time of testing (April 1984) the magnet had been accidentically broken during transport.

**Figure A3: Magnetic Flux Pattern**

**Appendix A2: Additional Tests & Measurements on the Searl Magnet**

The magnetic flux density, measured approximately two mm from the pole faces (Figure A2), was 0.05 Tesla or 500 gauss using a standard magnetic flux density meter with Hall-Effect probe (Magnetometer D11, Scientifica & Cook Ltd, London)

The existence of the "recorded" pole pattern could not be confirmed using the aforementioned flux density meter. Such tests would have required a more sensitive instrument.

Other physical parameters:

Total weight: 67.6 gr
Total volume: 14.1 cm3
Mass density: 4.79 g/cm

Figures A4 and A5 show two electron micrographs revealing the surface structure of the sample used for analysis at magnifications of X1000 and X4400 respectively. [Not available]

At the time of testing (April 1984), lack of funds and other duties prevented additional important measurements from being made. The magnet was therefore returned to Searl with the intention of borrowing it at a future date for further investigation. However, upon later request the author was informed by Searl that all magnets in his possession had been lost.

# John R. SEARL

# Levitation Disc Photos

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I was Searl's "Superintendent of Documents" for a while in the late 1960s. Here are some rare photos of his attempt to construct a "Levity Disc" in the woods of Sussex in the early 60s. Also shown are photos of a model that he used to generate fake composite photos (with the help of a newspaper photographer) to illustrate some newspaper articles of the period. This is not to imply that Searl is a fraud. His work was replicated recently by Roshcin & Godin. Unfortunately for Searl, he has been suppressed by his government and others, but he may yet be vindicated.

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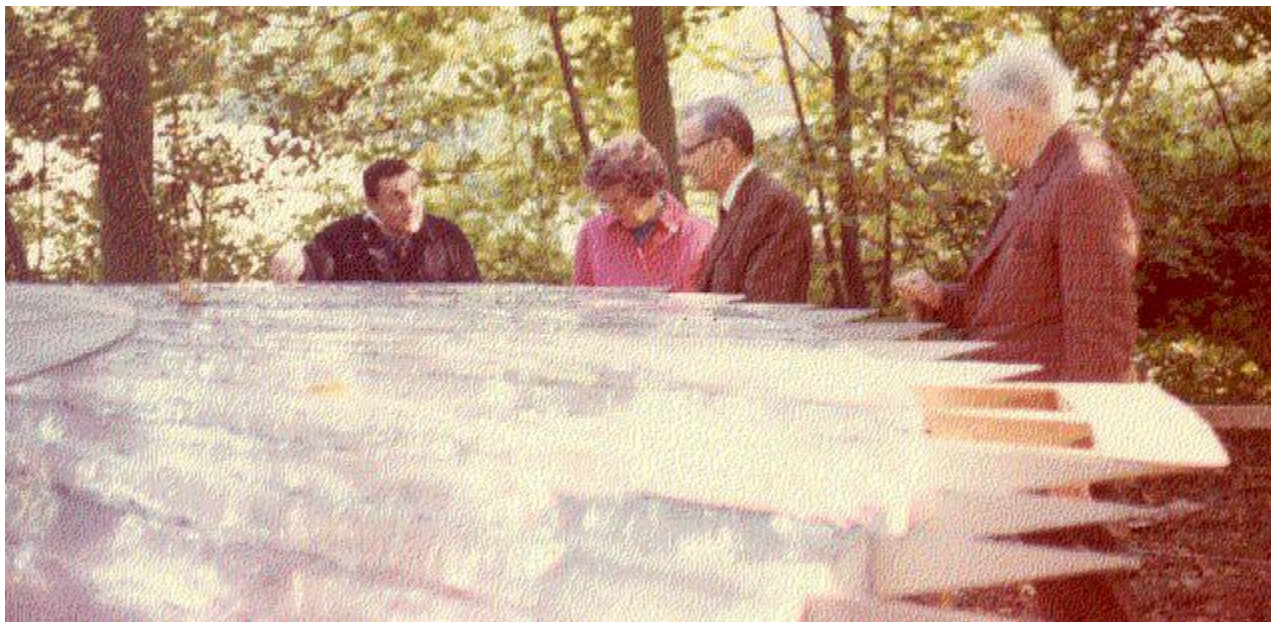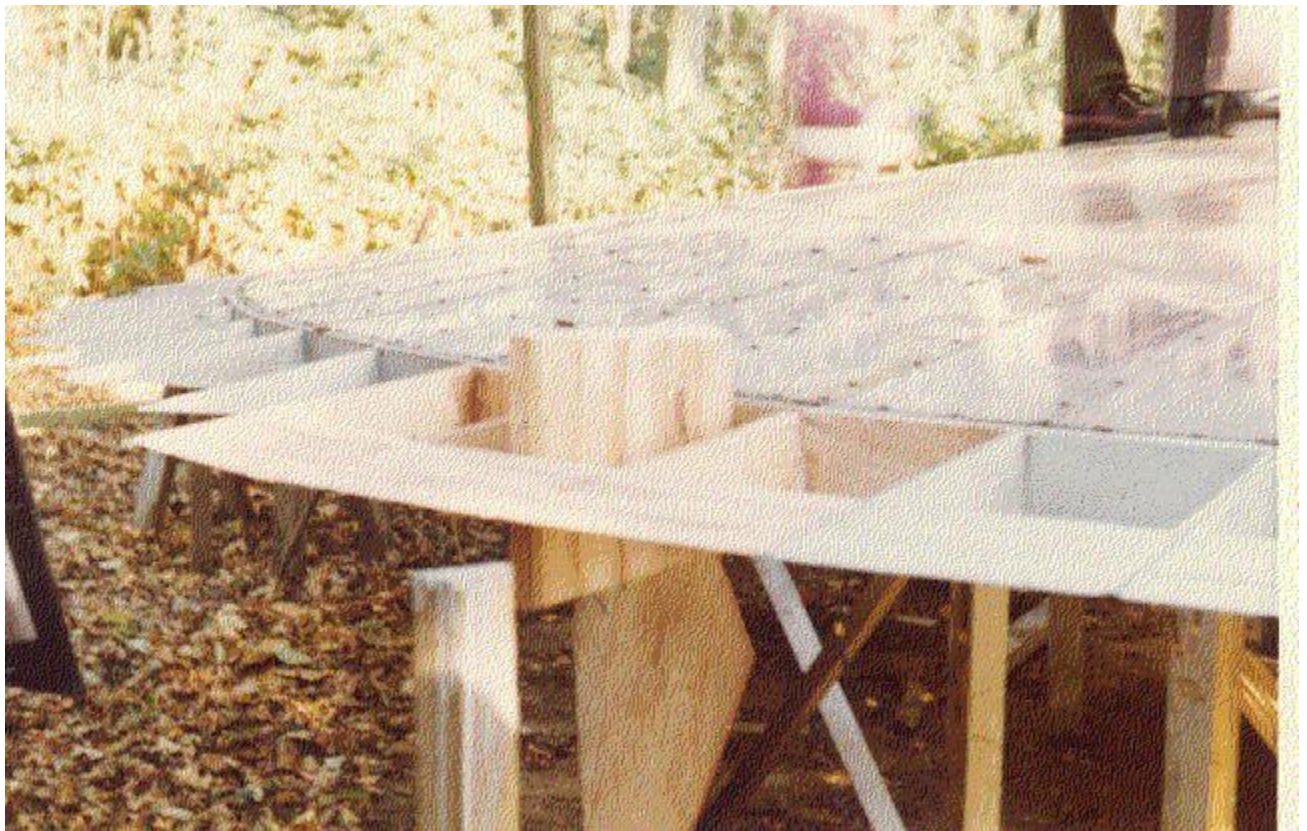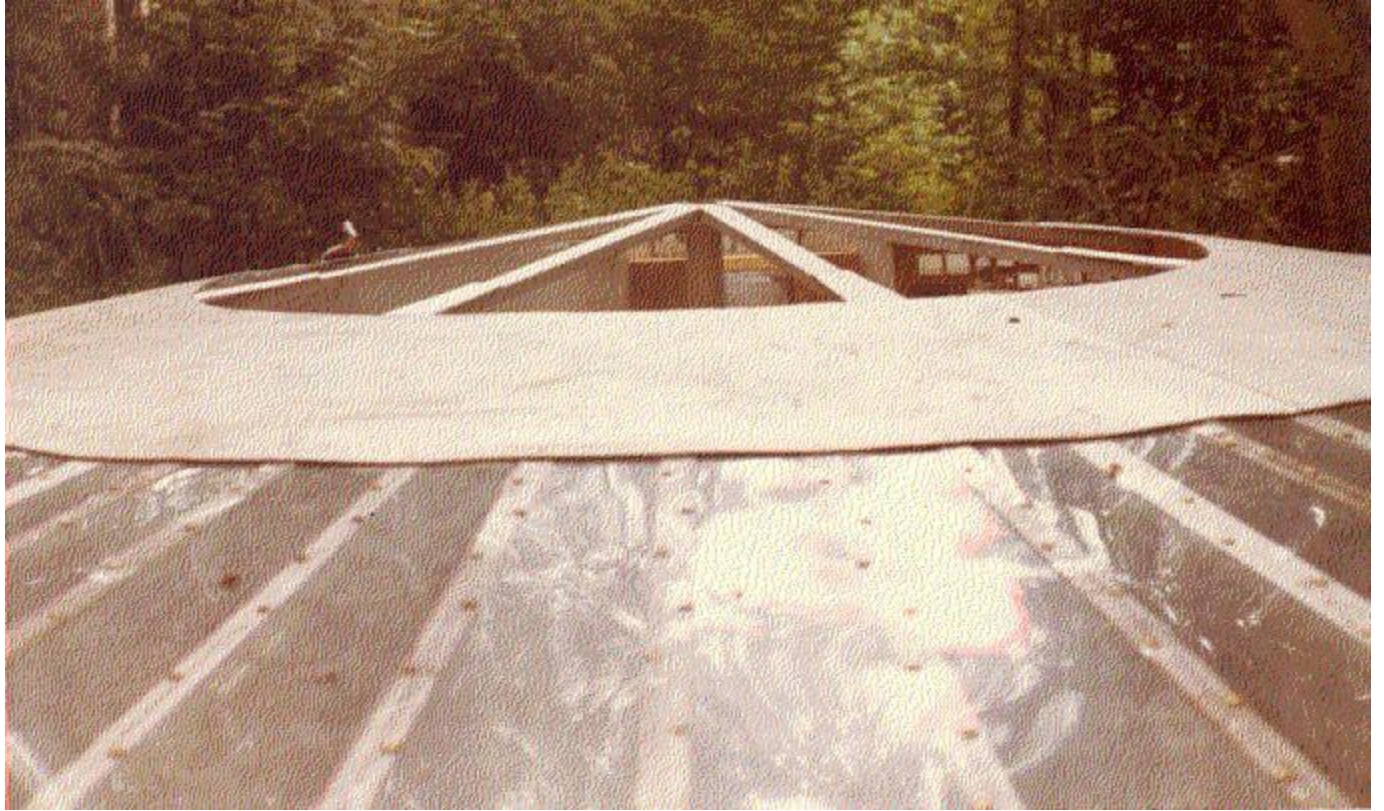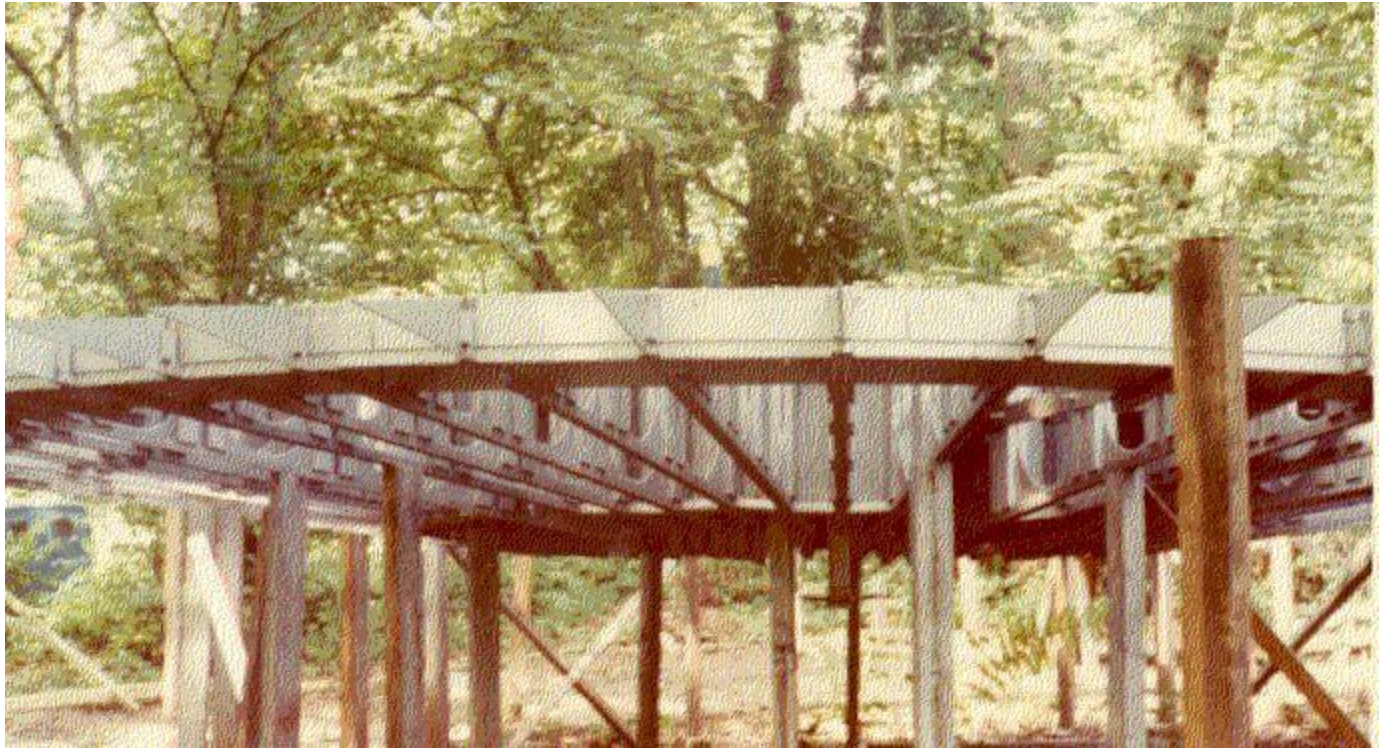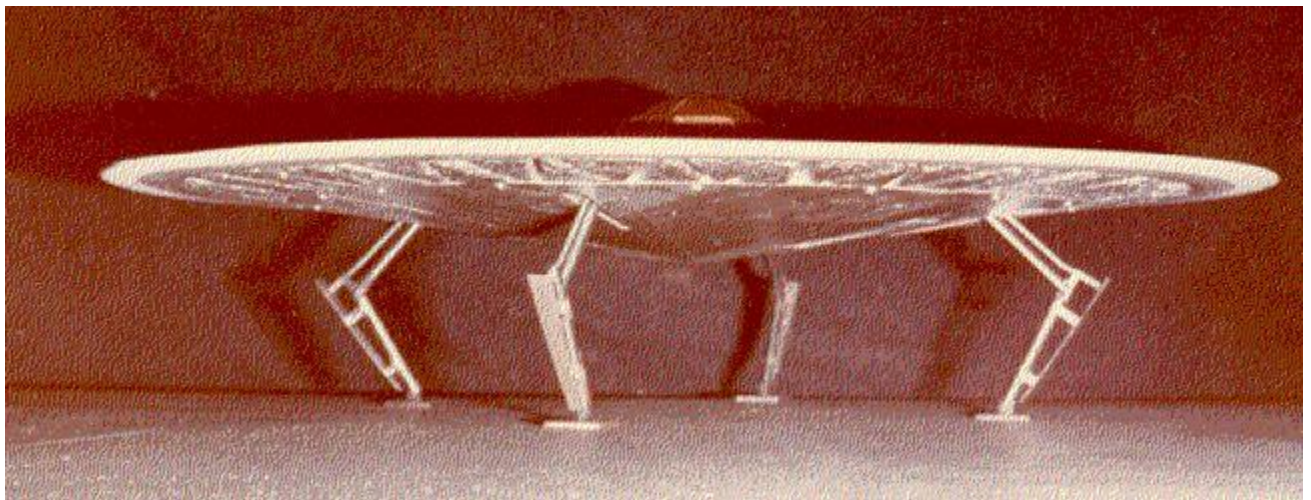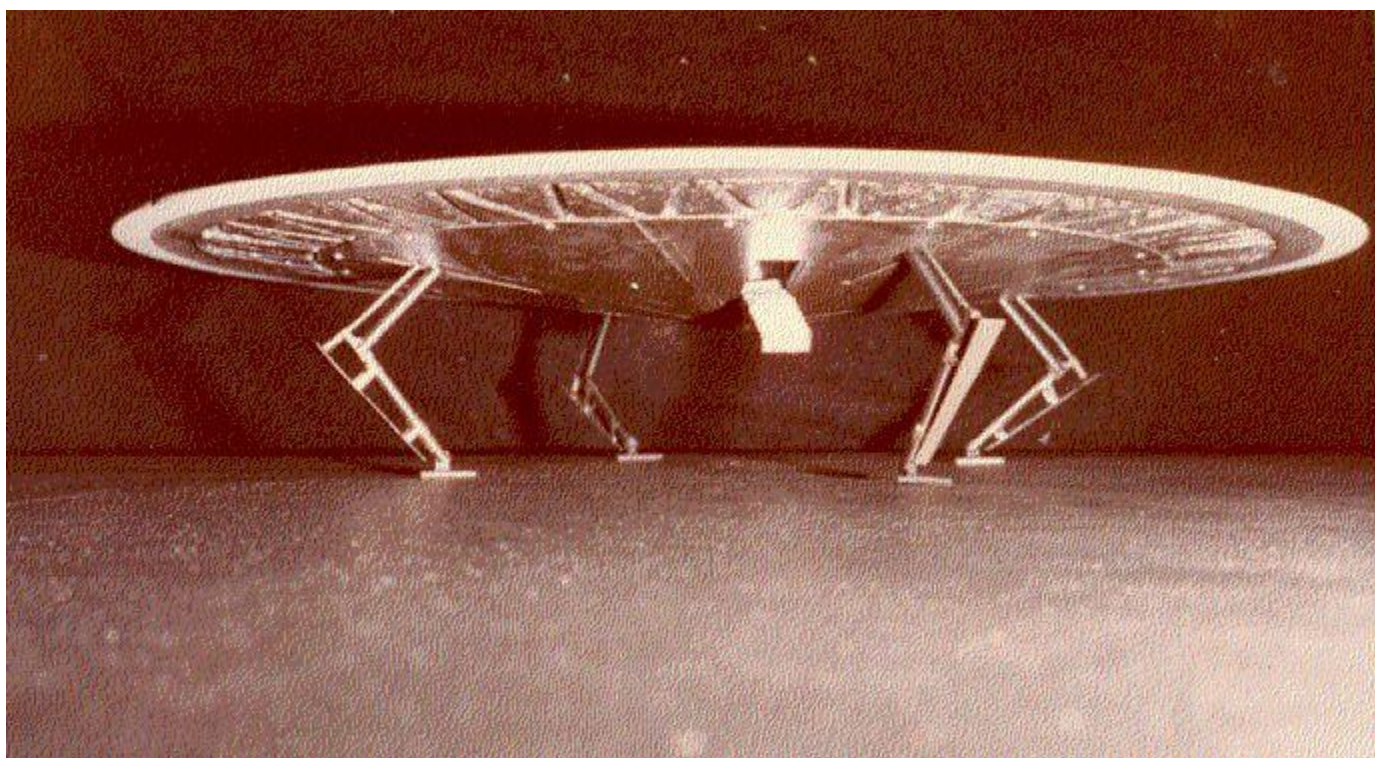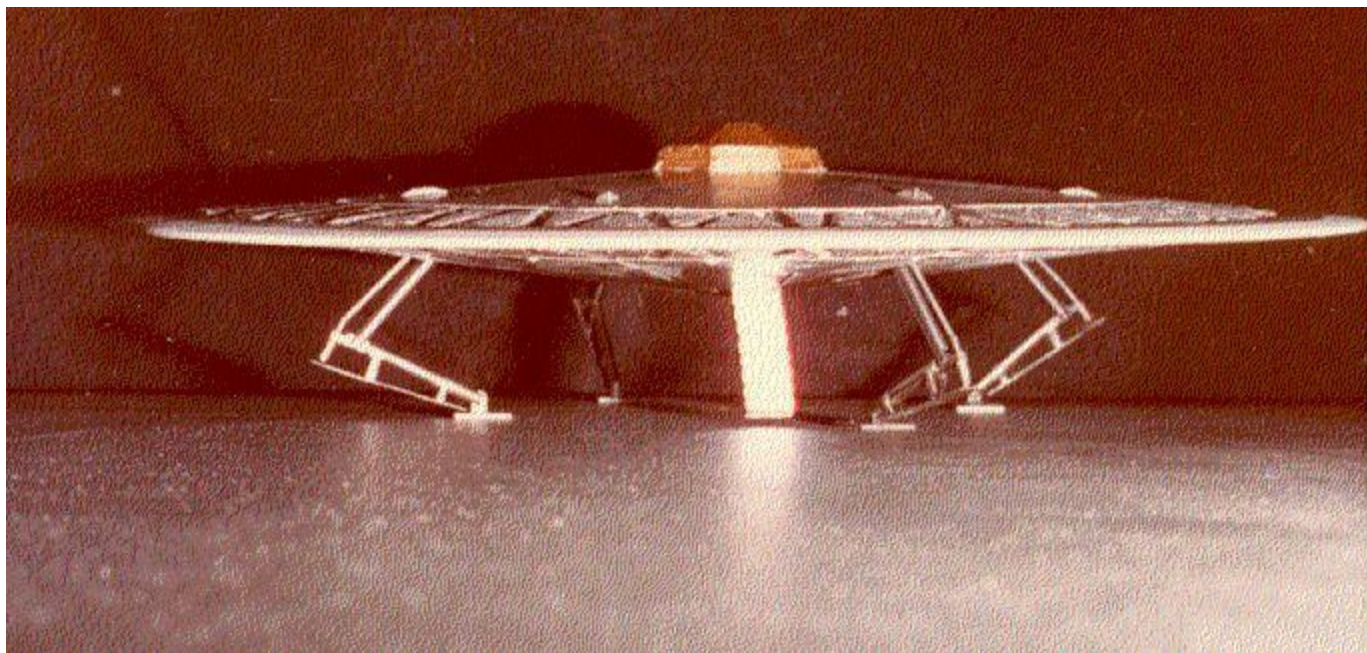
# John SEARL

# Searl Effect Generator

**[ Excerpted from www.sisrc.com ]**

## Background

The Searl Effect Generator (SEG) technology, as applied to the commercial market, had been previously developed to the point where a few prototype SEG generators were made, and used for electricity generation and motion. Commercial interest at that time focused on the SEG's transport potential and, under commercial pressure to deliver a fully functional system, the original generators were used and lost in a series of vehicular propulsion experiments and demonstrations. Funding was insufficient to continue with the manufacture of the required larger-scale pressurized cabin machines --- resulting in the termination of the project at that time.

Although all the operating principles, precise proportions and weights of the required materials are known for three of the four required operating materials, the precise data of the original magnetic layer is uncertain. The objective of the current R&D programme s to re-establish the original magnetic layer using modern and more efficient materials.

Originally, the layered materials were constructed and magnetized by the now-defunct Midlands Electricity board under the direction of John Searl.

Modern magnetic materials have advanced considerably, and old ones discontinued, so a series of tests need to be conducted to establish the optimum materials and processes, These tests need to comply with the working criteria required and must lead to a cost-effective manufacturing process.

In recent times SISRC has been re-establishing the original research. Due to the very limited funding that has been available, only a partially functioning demonstration prototype of the SEG principles has been possible. This prototype consists of the innermost of the three composite tings required and several rollers…

## Technical Description

Physically the Searl Effect Generator (SEG) consists of three concentric rings each made of a composite of four different materials which are also concentrically attached to each other. The three rings are fixed to rotate around them, are rollers --- typically 10 on the first ring, 25 on the next, and 35 on the outer ring. Surrounding the rollers on the outer ring are coils which are connected in various configurations to supply either AC or DC current at a variety of voltages. Multiple magnetic poles are imprinted on the rings and rollers to form frictionless magnetic bearings. These also arrange the static charge into opposing charge clusters which cause the rollers to rotate around the circumference of the ring (as shown in Figure 2)



**Fig.1**
Experimental ring and rollers

Fig. 2
15 KWt Searl Effect Generator (SEG)

Some expressions currently in use to describe the source of the energy for the SEG are the Space Fabric, Quantum Energy Field of Space, or Zero Point Energy. This is an unlimited and constant source of energy which can be made to flow when the correctly proportioned masses concerned are stimulated by the correct frequencies creating an 'open system'.

The idea o utilizing this source of energy is currently the subject o various devices and experiments such as the 'Lamb Shift', 'Casimir Effect', and the work of the Russian Nobel Prize winner Ilya Prigogine. However, these devices and experiments tend only to prove the existence of energy and not a method to create a coherent, ordered flow to produce useful power.

In contrast, John Searl has discovered that, in order to create a steady and stable flow, all the masses of the device (and the stimulating frequencies) must conform to precise values determined mathematically by the 'Law of the Squares'. A machine constructed to these principles produces a stable and useful power output.

## Definition of a Surface-Operating SEG

A linear motor operating on a magnetic bearing with the characteristics of an auto-transformer. The SEG is defined as a device, which is constructed from 2,124 component parts, which make up 3 plates and 66 roller sets. 12 of the 2,124 components create the 3 plates, which act as reaction components. 2,112 components are employed to create 66 roller sets, which act as active components. Each roller set consists of 8 segments constructed from 32 components. Each segment cannot be less than 34 grams in weight, as the law of squares defines that value as the lowest value suitable for the reasonable generation of electricity. Therefore the smallest roller set

must weigh 272 grams, making a grand total of 2,244 grams per roller set for the smallest surface-bound SEG.

Tolerance should be about 0.05 gram per roller set. The larger the error the greater is the loss of power within the unit. Therefore the total tolerance for the smallest SEG roller set must not be greater than 3.30 grams --- above this factor the SEG will not function. For the best results, the tolerance across the total 66 roller sets should not exceed 0.05 grams!

The SEG is a step-up rotary transformer. In fact it's a 'three rotary transformers' operational system, within a unit. The inner transformer output is fed in to the input of the second plate which increases the output of the second unit, thereby increasing its final output to a very high voltage. Therefore the SEG is just a prime mover for the production of clean electrical energy. The output windings must be designed to step down this output to 240 volts at 15 Kwatts…

When the SEG rollers are brought into close proximity to the SEG Ring, te Searl Effect resonant magnetic field causes negative ions and electrons to be drawn into and accelerated through the machine. This process is assisted by the highly electron-attracting rare earth metal Neodymium.

The unique mechanical and material arrangement of the SEG pulses the neodymium to continually release and replace the surplus electrons to provide electrical or mechanical power, or both.
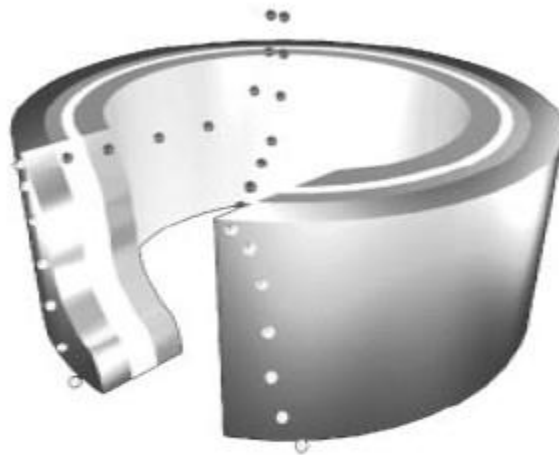


Fig.3
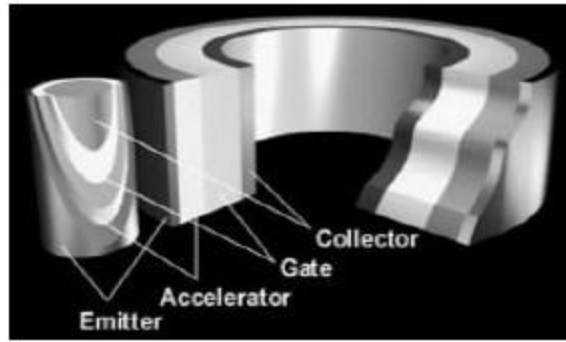
Fig.4
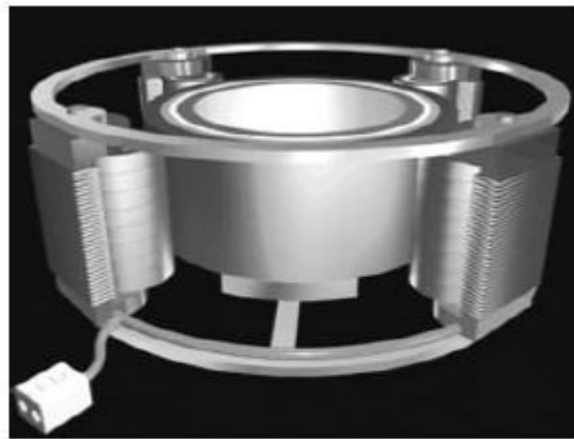


Fig. 5

Demonstration ring and rollers

## Development

Prior to the production of complete 15 KW SEGs, a minimum of two demonstration Ring and Roller prototypes are to be produced.

The 'Ring' is typical of the innermost of the three rings required to make a complete SEG. The 69-roller sets in a complete 3-ring SEG are identical. Six roller sets will be made for the prototype inner rings so that the Searl Effect can be demonstrated.

The production of a self-running Ring and Roller prototype will establish the precise sequence and parameters of electrical, magnetizing and material processes required for the SEG and will demonstrate electrical power generation. An operating single inner ring with 1-8 rollers will also determine if a particular material will function correctly and at what level of power output…

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**Open Source Energy network**
**http://www.opensourceenergy.org**

## NOTES

"The Searl Effect Generator (SEG) is a magnetic diode, and what one may consider one of the original "Free Energy" Devices. The inventor of the technology is Professor John Robert Roy Searl of England. The SEG in essence is a composite ring made of an electron reservoir (a rare earth like Neodymium), a magnetized accelerator stage (Iron or Nickel), an electron flow regulator stage (Nylon 66 or Teflon), and finally, a paramagnetic layer (Aluminium or Copper). The design of the SEG is both beautifully simple and infuriatingly complex at the same time..."

"Inside each of these IGVs there is a powerful 3-ring SEG which provides levity to the craft through a combination of magnetic, electrostatic and flywheel effects, many of which I freely admit are beyond my comprehension.

"The iron element in the SEG "plate" (the big ring) is magnetized with a combined DC and AC magnetizing sequence which causes many poles to form all over the surface of the iron, in a wave like pattern corresponding to the AC frequency used. The iron element is then combined with the others (which are NOT involved in the magnetizing process) in a process called sintering - pushing them together under pressure. The same is done for the smaller magnets, or "rollers", except that each roller consists of eight stacked segments held together by the magnetic field. When you have twelve roller stacks and a correctly magnetized plate, and place the rollers on the plate as below, something truly amazing happens.



"There are only ten rollers in the picture for safety reasons, as in a full set, the rollers will accelerate to 250km/h around the plate! This incredible feat is due to the instability of having an AC sine imprint on the plate and a cosine print on the rollers - instability created as the fields conflict causes the rollers to orbit the plate. They are held down by the magnetic field and thrown out by the centrifugal forces, so the rollers do not actually touch the plate when in motion. Thus, friction is virtually non-existent, and the high electrostatic charge accumulated by the SEG soon ionises all the nearby air and pushes it totally away from the SEG, enveloping it in an intense

vacuum. High voltage flashover thus becomes impossible, and the potentials created by the generator can reach monstrous levels.



"Unlike any other form of electrical technology, the presence of electron flow throught the generator actually cools it, reducing the resistance. This is due to free electrons being pulled out of the air and the resulting energy deficit causing the air to cool. As one places a greater and greater load on the SEG's induction coils (fitted so that the rollers pass through them to produce high-frequency AC), the rollers accelerate to accomodate the added energy drain, more power is pulled from the air, and the temperature lowers even further. A critical point is eventually reached. At 4 degrees Kelvin, the SEG superconducts and totally loses all electrical resistance. At this point, it levitates, completely enveloped in a perfect vacuum. Without control, it will accelerate up away from the Earth and disappear off into space, never to be seen again. To control it, a powerful radio frequency emitted nearby is required. If the same RF is transmitted as the AC frequency used to magnetise the rollers, they will completely stop. This acts as an ideal control gate, preventing the loss of costly generators.

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# John SEARL

# Levitation Disc -- Articles

## THE SEARL EFFECT

by P. L. Barrett, B. Sc.

### Background

In 1949, Mr. J.R.R. Searl was employed by the Midlands Electricity
Board as an electronic and electrical fitter. He was very enthusiastic
about the subject of electricity, though he had no formal education,
outside that demanded by the job, on the subject. Unhindered by con-
ventional ideas about electricity, he carried out his own investigation
into the subject. During work on electric motors and generators, he
noticed that a small e.m.f. was produced by spinning metal parts, the
negative towards the outside and positive towards the rotational axis.
In 1950 he experimented on rotating slip-rings and measured a small e.m.f.
on a conventional meter. He also noticed that when the rings were spin-
ning freely and no current was taken, his hair bristled.

His conclusions were that free electrons in the metal were spun out
by centrifugal force, a centripetal force being produced by the static
field in the metal. He decided to build a generator based on the prin-
ciple. It had a segmented disc rotor passing through electromagnets at
its periphery. The electromagnets were energized from the rotor, and
were intended to boost the e.m.f.

By 1952 the first generator had been constructed and was about three
feet in diameter. It was tested in the open by Searl and a friend. The
armature was set in motion by a small engine. The device produced the
expected electrical power but at an unexpectedly high potential. At
relatively low armature speeds a potential of the order of $10^5$ volts was
produced, as indicated by the static effects on near objects. A char-
acteristic crackling and the smell of ozone supported the conclusion.

The really unexpected then occurred. The generator lifted while
still speeding up, broke the union between itself and the engine, and
rose to a height of some 50 ft. Here it stayed for a while, still
speeding up, and surrounded itself in a pink halo. This indicated ion-
ization of the air at a much reduced pressure: $10^{-3}$ mm Hg. More interest-
ing was the side effect causing local radio receivers to go on of their
own accord. This could have been due to ionizing discharge or electro-
magnetic induction. Finally and thankfully, the whole generator acceler-
ated at a fantastic rate and is thought to have gone off into space.

Since that day Searl and others have made some tens of small fly-
ing craft, some of which have been similarly lost, and developed a form
of control. Larger craft have also been built, some 12 feet and two
30 feet in diameter.

The antics of his machines have given rise to much speculation as

to the nature and origin of so-called "flying saucers". One wonders why Searl has not come to the notice of scientists and the public at large. The fact is that he has, but, for fear of being ridiculed, people keep the knowledge or interest to themselves. The public has been educated to scoff at the subject of flying saucers, and the reported behavior of things that cannot be explained by current scientific theory. Such "difficult to explain" topics (as with telepathy, dowsing, homeopathic healing) must be given the "no comment" treatment, so as not to upset the uncertain structure of present science theory.

Searl's records do show, however, that his efforts have not gone unnoticed. Government departments and people of all classes and education know about him. Some have attempted to steal the idea, but their thinking along the lines of the electromagnetic theory and the law of conservation of mass and energy has misled them or confused them. This narrow thinking has made many conclude that Searl is a crank or imposter. Also some are prejudiced by the attitude that new ideas are the prerogative of the hierarchy of intellectuals.

It is suspected that Searl will come up with something more momentous than his games with power lines and the unsuspecting motorist. In that event the conventionalist must be ready to marry the Searl Effect into existing theory or suffer the alternative fate of a complete breakdown and revisal of physical theory from Ampere, Galvani and Volta onwards.

## The Effect

Any theory must explain the various phenomena, some of which have been observed by Searl himself and some by the general public. Associated with the Searl effect craft are the following:

1) Antigravity or levity.

2) Very high electrostatic fields.

3) The peculiar magnetic effect.

The generator produces a 'D.C.' static field with negative polarity at the rim, and positive at the center. However, the magnetic field from the generator produces induction in conductive loops when there is no relative movement. The effect is seen in the paralysis of electrical equipment and is used in a U.F.O. detector put out by a club. This instrument, on being examined, is found to be a deflection magnetometer in a closed conductive loop. The presence of a craft is indicated by the deflection of the magnet from the N-S line.

It seems, therefore, that the flux from the generator is continually expanding. This implies an indefinite quantity of energy.

4) Perpetual motion.

Once the machine has passed a certain threshold of potential, the energy output exceeds the input. From then on the energy output is virtually limitless. Searl explains this away by stating that the

machine collects solar energy.

The estimated power output of the generator is some modest $10^{14}$ or $10^{15}$ watts which puts the figure too high for a solar source.

5) Inertia loss.

Above threshold potential, which must be some $10^{13}$ volts, the generator and attached parts become inertia-free. This of course jars with accepted concepts of inertia in mass.

6) Drive.

By altering the distribution of potential on the surface of the craft, it is possible to propel it. The preferred direction of travel at ultra high speeds is away from the planet, the plane of the generator being at $90^{\circ}$ to the gravity field.

When in horizontal flight, the craft takes up an angle to the gravity field suggestive of the balance between like vector fields. The generator may produce a gravity-type field of its own.

7) Ionization of the air.

This is a simple electrostatic effect. It gives rise to a translucent glow surrounding the craft and glowing trails. The intensity of the field is such that it is capable of excluding the ionized air creating a near vacuum around the craft.

8) Permanent electric polarity.

Searl noticed that after working near the craft or generators he had a "cobweb" sensation on the skin. His clothes clung to him and also the bed linen. This was accompanied by occasional crackling and lasted some hours.

This effect could be attributed to a permanent polarity of dielectric material, in this case, the material being body tissue. Little work has been done on permanent dielectrics, but reference may be found in the records of the Physico-Mathematical Society of Japan, 1920. The work was carried out by Prof. Eguchi, Naval College, Tokyo.

An American company is at the moment producing permanent electret material for electro-static loud speakers.

9) Matter snatch during acceleration.

This occurs when the craft is on the ground and the drive is suddenly switched on. The rising craft takes up a lump of the ground with it, leaving the well-known hole in the ground.

Glossary of Terms

Space
"Space Fabric"    In this context means the three dimensional medium which
                  supports matter, force fields and radiant energy. It does
                  not mean specifically interplanetary space, but includes it.

Ether or
"Aether"          Another name for space, but implies a different concept in
                  that space is regarded as the absence of matter, and ether
                  is regarded as the existence of a space medium having
                  specific properties. re:-O. Lodge theory.

Inertial Mass     Comparison of amounts of matter by examination of the
                  inertial properties using the equation: $P = m\,a$ where
                  P = force required to accelerate inertial mass
                  (m ) at an acceleration of value a.

Gravitational
Mass              Comparison of amount of matter. G the force on it is a
                  gravitational field.
                  $P = Emg$.    P = force on mass mg in a field of strength E.
                  E is given by the Newtonian Formula.

                  $E = \dfrac{GM}{d^2}$    Where G is universal gravitational constant,
                                     $d^2$ is distance from planetary body mass M.

Primary
Magnetism         A large scale movement of ether.

Glowing
  Magnetism,      A center where ether is converted from undisturbed state
Glowing Core      to perturbed states giving rise to various manifestations
                  of primary magnetism, e.g. gravity, magnetism, electro-
                  static fields, matter, and radiant energy.

E. M. F.          Electro motive force, potential difference produced by
                  separation of charge.

Inertia           Reluctance of matter to change its state of motion.

Levity            In opposition to gravity

Microcellular     Made up of very small cells.

Macrocellular     Made up of quite large cells.

Vortex            Circulation in a fluid.

Microvortex       Small area of circulation.

Quasar            Very small but highly dense star with a fantastically
                  high gravity, producing a large 'red shift' in the
                  spectrum of the star.

Exothermic        Giving of energy (usually heat).

Outline of A Theory

The existence of Searl Effect type of craft is a fact. An open-minded, well-educated scientist has to admit that more chance evidence exists for the craft than anticipated evidence for the omega particle. One photograph in several thousand was considered sufficient evidence for it. Any theory to cover the Searl Effect is better than no theory. If the following proves to be inadequate, then constructive criticism of the argument may provide thought for a better theory.

A theory to cover force fields of all types should attribute a fundamental cause to interaction of matter at a distance whether the interaction be gravitational, magnetic, nucleonic or electrostatic. Present theories include interchange of virtual photons or mesons, and multi-dimensional distortion of the space-time continuum. Whatever the argument, it will depend basically on the concept of a medium to support the wave motion, flux or distortion. The medium is space and the properties of it have never been seriously investigated, neither practically nor theoretically, that is excepting the possibility that it has been overlooked. The accepted idea is that space is empty, a place with the absence of matter, devoid of tangibility. This is taught to our children as being a primary contention, and is in fact bad negative thinking. We do not understand it so we turn our backs to it.

Physical investigation of 'space' is impossible, for the experimental technique demands use of apparatus which is made of matter which in turn occupies space. One of the fundamentals of the experimental method is that the materials and principles under investigation cannot be included in the apparatus. This was but one failure of the Michelson-Morley experiment. In its original form, this experiment was set up to test for ether drag due to the passage of the earth through the medium, but has been assumed to have been an experiment to actually test for the existence of an ether. Failure of the experiment to give a positive result made it possible to interpret the negative result as favoring the non-existence of the ether as Oliver Lodge imagined it. The then-developing materialist philosophies took the opportunity to discredit the pseudo-scientific religious cult of spiritualism, in which the idea of an 'etheric existence' was an important part of the philosophy. As it happened, the two etherics need not have had any connection except in the choice of words. The ether theory was dropped and the spiritualist cult subdued. Today, the Michelson-Morley experiment has been modified to show Doppler interference between coherent wave trains. One wave travels against, and the other with the direction of rotation of the whole apparatus. Results are in favor of the theory of relativity, but can also be interpreted in favor of 'ether drag' within the stationary medium about the apparatus.

A vacuum transmits radiation and force fields, so to refer to it as being empty is inaccurate. Real emptiness must include in its definition reference to its inability to propagate energy. Such may be better termed 'hyperspace'. As to whether hyperspace has the dimensions of space and time or not is a topic for more thought. It is easier to attribute the dimensions to the        fabric in hyperspace, the ether.

The idea of an energy continuum throughout space occurred to Dirac. On the basis of his theory, matter particles emerge from a ground state and become physically observable. Material above the ground state has a higher energy than the ground state and so requires energy to be dislodged. The energy corresponds to the total energy of the particle, its mass energy ($mc^2$) and other potential or kinetic energies. The theory, then, supposes that matter is of the substance of the ground state, that is, 'empty space'. In comparison, the Lodge theory supposes that the ether has a maximum of energy, and matter particles are a lower energy precipitate from the ether. The same idea, but a difference of sign. However, this implies that the appearance of matter is a preferred state, and that the creative process is a naturally occurring condition.

Heisenberg, in formulating the 'unified field theory', assumed a space fabric of some nature. To quote from the Lindau Conference, 28th June 1962, "The discovery shows that the different elementary particles are not Nature's building bricks, completely independent of each other, but many different forms of a fundamental substance manifest as energy". From then on, the 'fundamental substance' is forgotten. "The multiplicity of these forms corresponds to the multiplicity of the mathematical symmetries of the basic equation".

In the basic equation $\left(\frac{dv}{dt} = an^2\psi \pm b v \psi\right)$ the physics of the fundamental substance is overlooked. The mass of equations following is none the less impressive and the fundamental substance is represented by the symbol $\psi$ which gives no clue to the nature or properties of the stuff. This symbol could apply to any elastic medium and is merely an auxiliary mathematical quantity introduced to facilitate computations relative to the results of experiments. This is the error of current trends in human thinking -- the emphasis on quantities rather than qualities.

Sir Oliver Lodge imagined the space fabric as having a microcellular structure, each cell being a vortex whose size was of the order of the size of the fundamental particles, or even smaller. The medium was frictionless and the rotational velocity of the vortices related to the velocity of light. The intrinsic energy of the ether was in the motion in the vortices. This attributed an ultimate energy source to space itself. Lodge also imagined that the ether had an enormous inertia and density. The inertia in mass was due to the ether in it, and solidarity of matter was virtual.

A similar idea occurred to a Karl Schappeller of Castle Aurolzmunster in Inviertel, Austria (died 1947). According to his philosophy, a change in the space fabric (static potential) gave rise to so-called primary magnetism which may be interpreted as a type of autogravitation. This primary magnetism caused a gathering of the surrounding space fabric and from it issued more fundamental energy as an intensification of the primary magnetism. At a certain stage, the system reached an equilibrium gathering space fabric, and from it precipitated energy. When the energy density reached a required level matter would be produced. The system would take up a spherical form in the 'natural' state and become what Schappeller called 'glowing magnetism'. Glowing magnetism, he claimed, constituted the core of all planets and suns, the gravitational core of

which was due to the glowing magnetism at its core. How this theory fits the universal law of gravitation is at first difficult to see.

We must remember that the universal law of gravitation is based on Kepler's Laws, which were derived from astronomical observations on the planets. The masses of these bodies can only be determined from their gravitational interaction, not from their inertial properties. Hence for cosmic bodies the term m in the derived formula $E = G \frac{m_2}{d^2}$ is not necessarily related to the inertial mass of these bodies, but the gravity of them. Gravity cannot be proved to be due to the mass content of these bodies by astronomical observation only. Further, no convincing experiments have been conducted to prove that static inert matter has any gravitational field. Experiments, like that of Airies, which use the earth as a mass, are questionable on the basis that the gravity may be due to the earth's field alone. Boys' and Cavendish's experiments showed only that masses in relative motion have a force between them, since in both experiments the masses were in torsional vibration suspended by a beam. The force could be attributed to an inductive or relativistic effect between the charged particles constituting the masses.

Hoyle, form his work on quasars, has deduced that vast cosmic masses could undergo gravitational collapse leading to a singularity and that the converse was possible. A singularity could explode into a creation field. This is much the same idea as that of Schappeller, though on the basis of his theory the creation process is much less dramatic. Hoyle's creation field arises from nothing, whereas that of Schappeller, glowing magnetism, arises from the space fabric. Which is the more plausible?

Physical evidence for the existence of glowing magnetism may be available. The source of energy in comets has long been a problem. How a comet can give off so much radiant energy and continually dissipate its matter in the tail, yet despite its apparent lack of substance survives to return after many years, is difficult to explain in terms of conventional science. The usual explanation is, of course, the energy is re-radiated sun's energy. Who has proved it? The existence of 'ball lightening' has now been accepted but as yet elude explanation, except that attempts have been made without the usual mathematical substantiation. The peculiar anti-gravitational effect, the inductive effects and the fantastic energy of ball lightening fits neatly in with Schappeller's theory of glowing magnetism. The glowing ball of polarized space fabric is precipitated by enormous static fields or high current pulses in thunder storms.

At a center of glowing magnetism, the space fabric is modified and the energy condensate comes off as magnetic fields and radiation. The consumed fabric is replaced by an influx of the surrounding space. Matter particles in the surrounding space would experience a force towards the center. This would be a gravitational field. Lodge imagined that the ether would be near incompressible with a very high elasticity. A small inhomogeneity would give rise to a relatively big effect. Also the ether flux would be at the velocity of light and bunched in much the same way as magnetic fields bunch at high intensity. Thus the maximum velocity of a matter particle would be that of the velocity of light

and the approach to that velocity, an exponential. Can the theory then explain cosmic gravitation? If so, there must always be a magnetic effect associated with it.

The name 'glowing magnetism' implies that Schappeller considered this to be of prime importance. In fact, he maintained that the magnetic field produced by a glowing core was different from the familiar type of field in that it was a dynamic field, not static. This is consistent for an energy source with indefinite energy could produce a continually expanding flux. Such a dynamic flux would be capable of inducing a D.C. in conductors. As a secondary effect, the currents would produce a static magnetic field of the usual type. A cord of a cosmic body then would produce dynomagnetism which would be absorbed by matter to produce a magnetic field. This field would have to be a function of the gravity if the theory is any good.

As it happens, a reference to related work can be found. Prof. P.M.S. Brackett, quoting from the works of Schuster, Sutherland and H.A. Wilson, showed that the magnetic moment P and angular momentum U of the earth and sun are related by the equation:

$$P = \frac{B\ G^{\frac{1}{2}}\ U}{c} \qquad \text{where} \qquad P \simeq 1$$

c is the velocity of light and G the universal gravitation const. The relationship holds for Bohr magnetrons, and support for it appears in DeBroglie's equations for mass waves. It is interesting to note that the formula also includes rotational motion. Particularly, the equation relates angular momentum, magnetic field and gravity. Angular momentum is known to be related to gyroscopic restoring couples. Although gyroscopic action can be dealt with mathematically, no physical explanation exists for it. In view of the fact that a vector is required along the axis of rotation, might this not suggest that rotating matter generates a field along this axis. As yet, it can only be postulated that the field couples the gyro in a fixed orientation in the space fabric. This direction sensitivity suggests anisotropic qualities of the space fabric. Lodge imagined that this might be so.

Magnetism at one time was regarded as separate from electricity until the electromagnetic effect was discovered. Then the problem was: "Is electricity a form of magnetism or magnetism a form of electricity?" Einstein showed, however, that magnetism was a relativistic effect due to the movement of charge, thereby identifying magnetism as being a form of electricity. From thence sprung the concept of electron spin which fitted a good theory to explain permanent magnetism. Much work is being done on spin resonance which further supports the theory. However, the discovery of magnetic monopoles indicates the possible existence of magnetism without charge and that magnetic lines of force need not be continuous. This raises questions as to the exactness of the Theory of Relativity and the Electromagnetic theory in their present form.

Schappeller regarded magnetism as more fundamental than electric current and that current was flowing magnetism in the conductor. The field of influence surrounding a wire was an externalisation of the flux within the wire. The field, therefore, must be regarded as flowing parallel to the 'current' in the conductor. The mathematical treatment

of such a configuration leads to the same practical results as the conventional idea of magnetic flux as being perpencicular to the current flow. The actual nature of current and magnetism, being one and the same, may be visualized as large scale flux interspaced between the Lodge microvorticies. Such a flux must result from the break-up of the microvorticies and therefore will appear as a form of energy potential. Conventional magnetic field may be regarded as a form of potential energy.

If we accept that magnetism is more fundamental, then a consistent explanation must be found for static potential, induced E.M.F. and electrochemical potential. A conductor forced through a magnetic field interacts with the macroflux of the ether ahead of it and absorbs the flux in a direction depending on the direction of the macroflux. This constitutes the current in the conductor. The flowing magnetism in the conductor reconstitutes the macroflux behind it, the energy being derived from that which forces the conductor. If the conductor is open circuit, an e.m.f. is set up. This is like electrostatic potential, in that it is static magnetism, the polarity depending on an excess of ether at the point at higher potential compared with that at lower potential. Since the ether tends towards uniformity, then an ether flow will occur under suitable conditions to relieve the strain. This constitutes flowing magnetism which is current. The flow in the conductor affects the surrounding ether, giving up some energy to it, creating macrovortices, which is a magnetic field.

An electrochemical e.m.f. is an expression of the energy available from an exothermic reaction but in a potential form. When current flows, the reaction takes place and the potential chemical energy is dissipated. Schappeller regarded chemical bonds as a static form of magnetism in the same way that static electricity could be r garded as immobile magnetism. Matter particles being an ether precipitate cause permanent density irregularities in the ether. Chemical bonding or particle bonding lowers the stressed condition of the ether releasing the retained ether, or static magnetism, as some form of ether disturbance. This could be ether waves (radiation), macrovortices (magnetic field) or flowing magnetism (current), which are all forms of energy.

Looking back over the theory, it is seen that in glowing magnetism the space fabric is destroyed as microvoritces and the resultant residual flux appears as large scale flow patterns in magnetic fields or macrovortices. If this primary magnetism reaches high values, the flux interferes with the surrounding space fabric to produce matter particles, so being partially re-absorbed. Radiation can only be produced by matter particles, so that once matter has formed, energy may leave the creation field as radiation from the particles which are stimulated by the magnetism.

The primary magnetic field of the Schappell... glowing core is different in a very fundamental way from the usual type of field. In a perfect conductor, if the e.m.f. is maintained, the current increases and hence the magnetic field. That is, as long as energy is supplied to the system the field expands. In a resistence, the energy is dissipated as heat and the field is constant. In the Schappeller primary field, the flux is continually supplied as the energy is created, and therefore the field continually expands. This is dynomagnetism and an ordinary

magnetometer is insensitive to the field. A conductor in the field will have an induced current and thereby produce a detectable static field. The instrument to detect a dynomagentic field must consist of a loop conductor with a magnetometer at its center. This the exact design of U.F.O. detectors.

If, as Schappeller states, the earth has glowing magnetism as its core, then it should produce dynomagnetism. Most of this would be absorbed in the material of the planet and produce the static field. If any of the dynomagnetic field did penetrate the surface, it would be difficult to detect against the background of atmosheric disturbance and the static field. In his early experiments, Riech did detect and accumulate energy from the earth which was other than natural radiation. A core of glowing magnetism would be and would have been in the process of producing matter. The earth would have been expanding from the center since it first formed. This was the best explanation for "continental drift", but a reason for the expanding earth could not be found. Geographers would welcome the idea, for the land masses have been shown to fit neatly together on a sphere of about half the size of the earth.

The creation fields or glowing magnetic cores at the center of cosmic bodies must somehow originate. Schappeller's argument as to the origin is more difficult to follow, because of terminology, than the rest of the theory. It seems, however, that when a sun becomes large enough to form a crust, the very process of doing so causes a focusing of the various fields which starts up a new flowing core making the center of a new sun. The old sun has its supply of ether cut down and the glowing core is subdued but not snuffed out. It becomes a planet of the new sun with an apparent reduced mass due to the drop of gravity and reduced size as it initially cools and contracts. The core of the planet is not yet finished, for it continues until the crust becomes very thick and finally cuts off the ether supply. Then the core does die and the planet loses its gravity. Only molecular forces remain to hold the planet material together and if the internal pressure is high the planet can explode.

This clashed with the conventional ideas, but thought out in detail equally explains observation. It does go one better in that it adequately explains some facts not covered by the conventional theory, the asteroids, for example.

Other than providing a fundamental explanation for the organized universe, Schappeller went as far as to design a device using and converting the fundamental substance into useful energy. It was designed to produce a glowing magnetic core in vacuo which then is self-sustaining Basically it consists of a pair of coils wound on to a hollow ceramic former, shaped spherically and contained in an iron sphere. The coils are of copper tubing packed with a permanent electret material. This constitutes the dynomagnetic generator. To convert the energy into mechanical energy, a rotor is used, also made from copper tube packed with electret. The sphere functions only after the electret material is polarized.

Because of the terminology in the Schappeller theory, it is natu-

rally difficult to follow, that is, apart from the strangeness of the concepts. After several readings, one might conclude that "glowing magnetism", or ether precipitation, starts if the electric and/or the magnetic fields reach enormous values at a given point. It seems that this is the function of the stator device outlined above. The arrangement of the fields must be such that a reduction in the density of the ether occurs instantaneously. An immediate influx of ether occurs which continues under its own inertia. The resultant compression then causes the production of energy which appears as (radiation and) magnetism. By this process it would seem that an oscillatory state is set up. This may be so and the frequency related to the size of the glowing core. One might expect some sort of longitudinal ether wave to be set up which would be entirely different to the transverse waves of electromagnetic radiation. The wave would cause variations in the ether density which would mean that matter would tend to occupy regions of maximum density in the wave and that the velocity of light would vary slightly between maxima and minima.

In the case of the earth, the Van Allen belts could be taken as an indication of such gravity waves, and for the sun, the obvious fact that the planets occupy orbits that are harmonicly related. In both cases a standing wave is indicated. It might be worthwhile research to look for variations in the velocity of light in the Van Allen belts.

Lodge deals with the problem of inertia by attributing the property to the ether itself. Matter, he claims, has no inertia as such, but acquires an induction as it moves through the space fabric, or more correctly, the space fabric moves through it. The induction constitutes a change of energy seen as kinetic energy, and the state of motion lasts as long as the induction lasts. The theory also asserts that the ether itself has an enormous inertia and is in a preferred state of rest. Small movements give rise to big effects, for example as in gravitational fields. However, small movement does not mean slow movement. The idea that the cellular vortices circulate at the speed of light might be extended to larger fluxes. The conclusion to this is that matter accelerated by force fields cannot exceed the speed of light and the approach to it would be exponential.

## Application of Theory

The ultra high potential produced by the Searl ring generator being so much greater than the ionization potential of the air, causes ionic breakdown of the air at some feet from the craft skin, as this acts as the positive electrode. The negative side of the generator is connected to the periphery of the disc, and is isolated from the skin. The field at the negative terminal is therefore very much greater and the air is ionized at a greater distance at the rim. The air at the positive terminal loses electrons and the resulting ions are repelled from the terminal with high acceleration. The electrons pass through the generator, constituting the current in the generator, and provide the charge at the negative terminal to produce negative ions in the air near the rim. The craft therefore is enveloped in a vacuum.

In ordinary high voltage generators the maximum potential is limited by the ionized breakdown of the air. Flashover occurs and the accumu-

ulated energy lost. The geometry and the arrangement of the field coils
in the Searl generator is such that flashover is eliminated until the
thing is in a vacuum and then is impossible.

Energy is required to build up the potential and initially has to
be supplied from an external source. As the vacuum layer increases
about the craft, less energy is required to maintain the potential.
The generator soon reaches a potential when the Searl Effect takes place
and the device produces its own energy along with the levity phenomenon.
On the basis of the theory, at this potential the stress on the space
fabric cannot be equalized by flowing magnetism (current flow) through
the air and craft as circuit. The space fabric breaks down to provide
the magnetism to relieve the stress, but the energy by-product is ab-
sorbed by the generator which reinforces the field.

The generator then must set up an ether flux along the lines of
the electric field as is conventionally represented. The direction of
ether flow is, however, in at the positive and out at the negative.
This is deduced from the Schappeller theory. The generator and craft
therefore produce their own gravitation type field. The net effect of
the craft field plus the earth's gravitation field gives rise to a con-
dition where the ether density below the craft is higher than that above
it. The craft therefore is strongly repelled from the planet, and to
stop it shooting off into space the field of the craft must be intention-
ally perturbed. In the drive condition, then, the field is as shown in
fig. 4 and the craft is shot out of the earth's field like a wet orange
pip from between the fingers. The acceleration is enormous, but since
all matter associated with the craft is linked with the field no distort-
ion of any part, including passengers if any, occurs. The limit to the
speed is unknown but since the craft has no inertia there is possibly
no limit. It would be safe to say, however, that the limit is below the
speed of light. Above this speed too much is unknown to take the risk,
but since the craft carries its own space with it the theory of relativ-
ity is inapplicable. In fact, the craft does not travel through space
but past it.

It can be seen from the gravity field diagram that a neutral zone
appears below the craft as well as the neutral ring above, when the
levity drive is on. If matter becomes located in the zone, then it is
held there. In consequence, the Searl craft so far made have left their
mark on the country-side in the form of large, neat holes when they
suddenly take off. The chunk of earth is taken up with it.

The gravity field within the body of the craft is such that the
center is up and the rim down. If the generator is allowed to "run up",
because the polarity is opposite to that of the Schappeller machine, the
field is expansive and pulls the craft apart. Prior to this, glowing
magnetism could start, characterized by an orange-yellow glow, but could
not become self-sustaining, being expansive. The Searl generator runs
at low speeds and is unlikely to fly apart by centrifugal force. Apart
from this, the side effect electromagnetic forces help to keep it to-
gether. As with other gravity fields, the flux favours passage through
matter and so the field within the craft may be tailored by appropriate-
ly distributing the mass in the craft. This is of particular conven-
ience in manned craft where the comfort of crew may be improved by
making the cabin field about ½ G.

The external field, when the craft is travelling in free space, would resemble that of the combined earth and craft, since it would be moving relative to a stationery ether. Collision between the craft and large objects in space is very unlikely except in direct line of flight when such could be seen and the craft rapidly turned. The field is such that the objects are diverted past the craft, or it past the object. If the object qualifies as a planet or moon having its own gravity due to a glowing core, then the craft oriented by the interaction of fields is strongly repelled anyway unless measures are taken to alter the field of the craft. Small objects such as meteorites are pushed out by the combined electric and dynomagentic fields. An object entering such a powerful static field is at first attracted, then ionized and then strongly repelled. The dynomagnetic field induces a magnostatic (ordinary magnetic) field in objects which will interact with the craft magnostatic field at considerable distance (miles) and repel it.

It should be pointed out that only a very small amount of space fabric passes through the craft and an even smaller amount is converted for energy. However, as previously mentioned, small changes in the ether lead to large physical effects.

Even in deep space the craft has an electronic flow through the generator which is continuous along the electric field outside the craft. Electrons are picked up and some leave the rim at relativistic velocities. These do not contribute to the drive. So the craft also carries its own negative space charge. In an atmosphere the electonic flow is much greater, and the generator current much higher. The craft therefore functions a lot better and has greater flexibility in space. In air, the recombination of ions gives rise to a pink to blue glow around the craft and in damp conditions the ions in the air can give rise to condensation. This effect coupled with the output of electrical energy could well precipitate thunderstorms.

The only hazard so far observed is that if the craft hovers for too long low near the ground the soil becomes burnt due to the electric currents in it which build up heat. Also the nervous systems of animals are interfered with by ionizing discharge if they get too near. Only birds in flight have been really hurt by flying uncontrollably into stationary objects.

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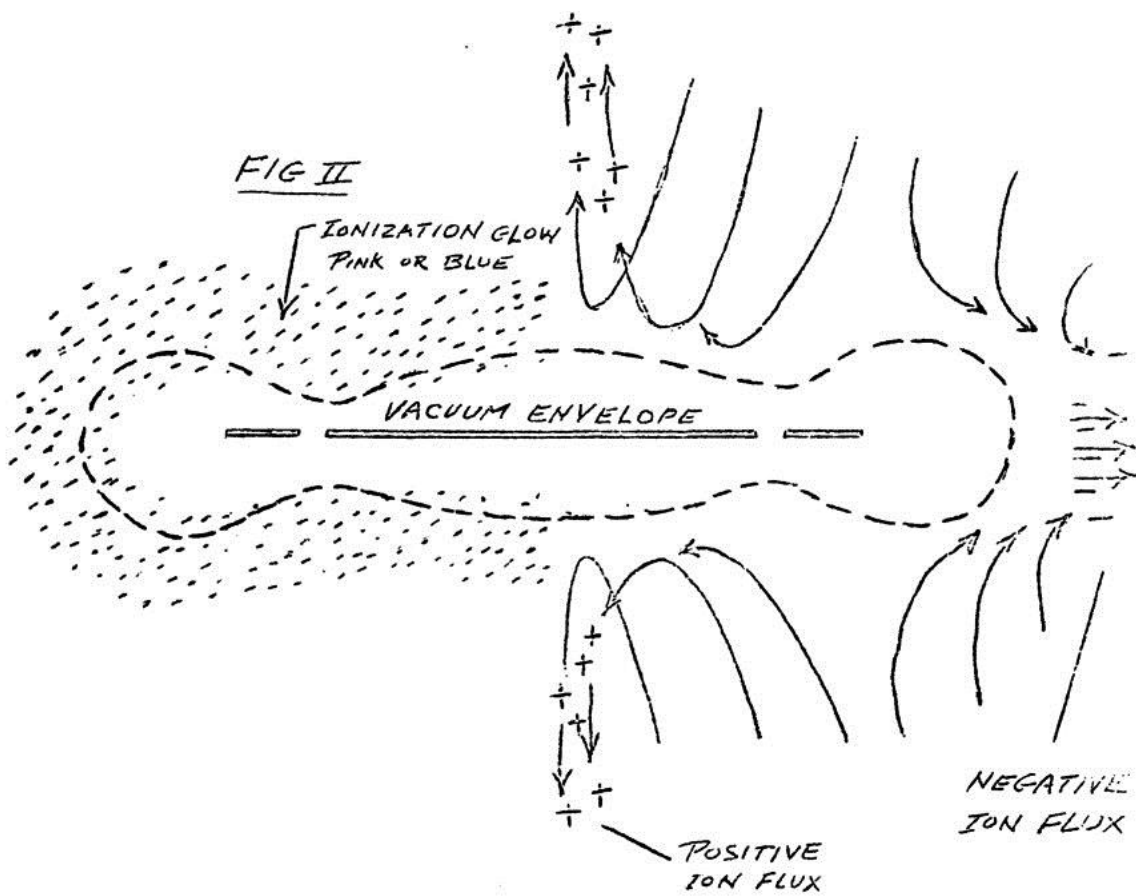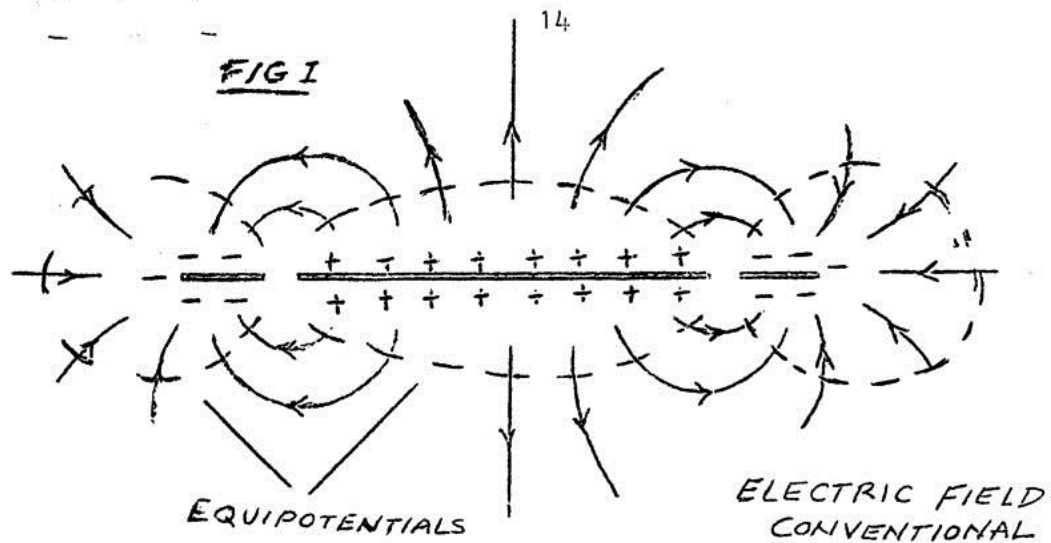
Congress of Radionics and Radiesthesia 1950

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# FIG I

EQUIPOTENTIALS

ELECTRIC FIELD
CONVENTIONAL

# FIG II

IONIZATION GLOW
PINK OR BLUE

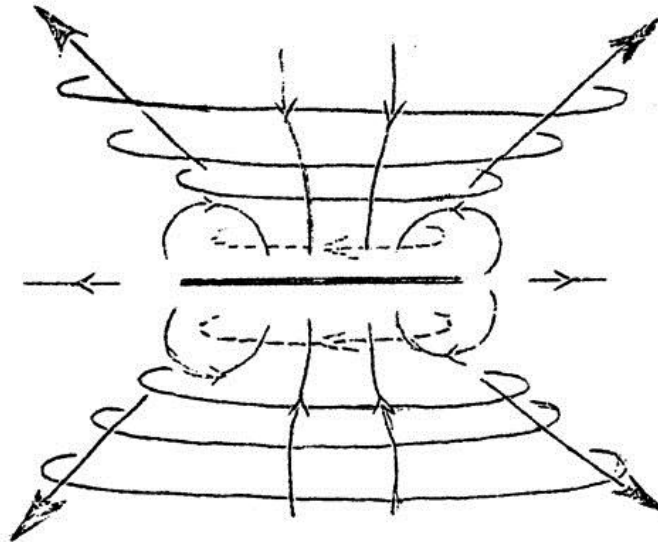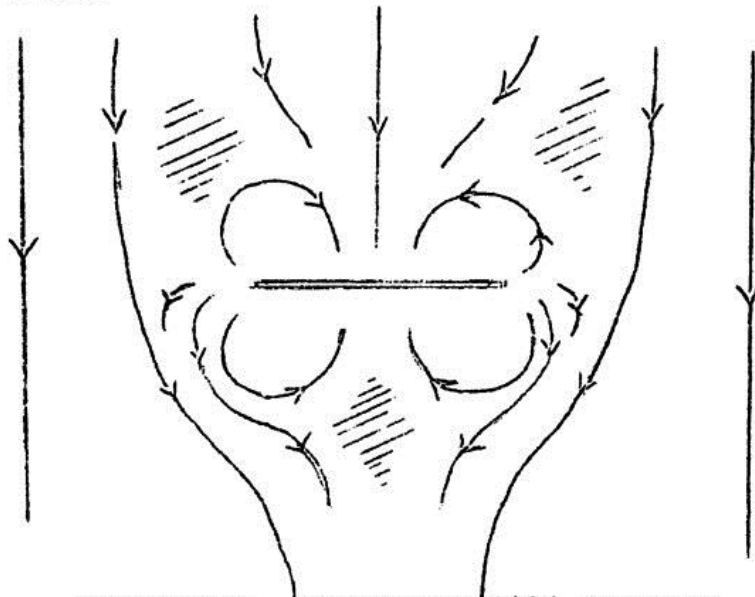VACUUM ENVELOPE

POSITIVE
ION FLUX

NEGATIVE
ION FLUX

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FIG III



→ ELECTRONIC FLUX
----→ CONVENTIONAL MAGNETIC FIELD
→ DYNOMAGNETIC FIELD

FIG IV



COMBINED GRAVITATIONAL FIELDS
EARTH'S GRAVITY FLUX + ETHER FLUX FROM
GENERATOR

INTRODUCTION TO THE THEORY OF THE

SEARL LEVITY DISC

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1.  Introduction.
    The Searl disc is a truly marvelous space vehicle, which is powered by gravitational stress energy stored everywhere in the universe. We shall examine the principles of its operation.

2.  Gravitation of Negative Energy.
    The Searl disc is repulsed by the gravitational field of the earth. We shall first proceed to show why it is repulsed. We may write the well known Newtonian law of gravitation:

$$f = \frac{k \, m \, m'}{r^2} \tag{2-1}$$

where $f$, $k$, $m$, $m'$, and $r$ stand for gravitational force, Newtonean constant of gravitation, masses and the distance between two masses.

The familiar Einsteinean formula for the relation between mass and energy may be written:

and

$$W = m c^2 \tag{2-2}$$

$$W' = m' c^2 \tag{2-3}$$

respectively.

From (2-2) and (2-3) we derive:

$$m = \frac{W}{c^2} \tag{2-4}$$

and

$$m' = \frac{W'}{c^2} \tag{2-5}$$

which leads us to:

$$f = \frac{W W' k}{c^4 r^2} \tag{2-6}$$

This formula is a generalized relation of Newtonean gravitation.

Paul A.M. Dirac, a famous mathematician of Searl's country, introduced the concept of negative energy:

$$W < 0 \tag{2-7}$$

and

$$W' < 0 \qquad (2-8)$$

associated with his theory of positrons.

Four possible cases are shown in Table 1:

TABLE 1

| $W$ | + | + | – | – |
|-----|---|---|---|---|
| $W'$ | + | – | + | – |
| $f$ | + | – | – | + |

The table shows that positive energied bodies have ordinary gravitation of attraction, while a negative energied body repulses a positive one. The earth has, of course, positive energy. A negative energied space vehicle is repulsed by it. Since the Searl disc is repulsed by the earth's G-field, and is quite different from conventional space rockets, even ion rockets, it must be negative energied.

3. Realization of Negative Energy.

In the foregoing section it was found that the Searl disc must possess negative energy. We shall next proceed to show how he achieves this negative energy. "Zitterbewegung", a reciprocating oscillation from positive to negative energy state, is induced in ordinary particles. They are in a positive energied state during the first half cycle of oscillation, and a negative energied state during the second. This oscillation is represented by polar angular momentum, $\mathfrak{R}$, and it is governed by a famous equation of Frenkel-Kramers (Ref. 1)*, which states:

$$\frac{d\mathfrak{K}}{d\tau} = \alpha\left(\mathfrak{K} \times H - \mathfrak{R} \times E\right)$$

$$\frac{d\mathfrak{R}}{d\tau} = \alpha\left(\mathfrak{K} \times E + \mathfrak{R} \times H\right) \qquad (3-1)$$

where $\mathfrak{K}, \mathfrak{R}, \tau, \alpha, E$ and $H$ mean axial angular momentum, polar angular momentum, proper time, coupling constant of electromagnetic interaction, and the $E$ and $H$ components of electromagnetic field, respectively. Polar angular momentum, which specifies energy state, undergoes gyration by electromagnetic torque. Gyration in upper half space corresponds with positive energy, while that in lower corresponds with negative energy. Circularly polarized electromagnetic field of:

$$H = \left(H_1 \cos \Omega \tau, H_1 \sin \Omega \tau, H_o\right)$$

$$E = \left(-E_1 \sin \Omega \tau, E_1 \cos \Omega \tau, 0\right) \qquad (3-2)$$

whose angular frequency $\Omega$ satisfies the condition:

$$0 < \Omega + \alpha H_o \qquad (3-3)$$

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*Ref. 1: Kramers, H.A., Physica, 1 (1934) p. 825

governs gyration in lower half space. Consequently, angular frequency greater than cyclotron frequency is the condition of negative energy. The rotor of Searl's disc is segmented. It furnishes the rotating electric field, which in turn produces a rotating magnetic field. Thus he induces the electromagnetic field of equation (3-2), since the rotation takes place in the geomagnetic field. The speed of the rotor increases, and it soon results in the frequency condition of (3-3), which is the condition of negative energy. The rotor itself assumes a negative energied state, and the negative energied space vehicle is repulsed by the positive energied earth, in accord with the conclusions summarized in Table 1.

### 4. Calculation of Time for the Lunar Journey

In the foregoing sections, we examined the inverse gravitational propulsion of the Searl disc. Space Project Swallow's first objective is a trip to the moon. We shall next calculate how much time it will take to go from earth to the moon. The rotor of negative energy is repulsed by the earth, while other instruments and astronauts experience ordinary gravitation. If we denote these payloads by $\nu$ and that of the rotor by $\mu$, we find the acceleration of the space vehicle to be:

$$\alpha = \frac{\mu - \nu}{\mu + \nu} g \tag{4-1}$$

where

$$g = \frac{kM}{r^2}$$

$r$ and $M$ stand for the distance from the center of the earth to the craft, and the mass of the earth, respectively.
When

$$r = R$$

we know that:

$$\frac{kM}{R^2} = 980 \ cm/sec^2 \tag{4-2}$$

If we denote the equilibrium point between the gravitation of the earth and that of the moon by

$$r = r_1$$

for the distance from the earth, and with

$$r = r_2$$

for the distance between the equilibrium point and the center of the moon, respectively, we obtain:

$$\frac{kM}{r_1^2} = \frac{km}{r_2^2} \tag{4-3}$$

where $m$ denotes the mass of the moon of

$$m = 0.0123 \ A.U. \tag{4-4}$$

A.U. is one astronomical unit. We know of course that

$$M = 1.0000 \ A.U. \tag{4-5}$$

and

$$r_1 + r_2 = 384,800 \ km.$$

(4-6)

Making use of (4-3), (4-4), (4-5), and (4-6), we derive

$$r_1 = 345,960 \ km.$$

(4-7)

The equation of motion of Searl's disc may be written:

$$\lambda \frac{d^2 r}{d t^2} = \frac{(\mu - \nu) k M}{r^2}$$

(4-8)

in which $\lambda = \mu + \nu$

$\mu$ and $\nu$ being given in the first paragraph of section 4. The differential equation (4-8) can be solved such that

$$t = \frac{1}{\sqrt{2g}} \left[ \sqrt{\frac{r_1 (r_1 - R)}{R}} + \sqrt{R} \ \ell_n \frac{\sqrt{r_1 - R} + \sqrt{r_1}}{\sqrt{R}} \right]$$

(4-9)

and

$$\frac{dr}{dt} = \sqrt{2gR} \ \sqrt{1 - \frac{R}{r_1}} , \qquad (\nu \ll \mu)$$

(4-10)

$R$ and $g$ having been given in (4-2), and taking the value of

$$R = 6,380 \ km.$$

(4-11)

we obtain the maximum speed of the disc

$$\frac{dr}{dt} = 11.3 \ km/sec$$

(4-12)

for the lunar journey; and the time taken is

$$t = 8 \ hours \ 52 \ minutes$$

(4-13)

before it reaches the equilibrium point. Passing that point, the velocity gradually decreases, since the disc is repulsed by the moon. (The moon acts to decelerate the craft.)

5. <u>Scientific Interpretation of the Searl Effects.</u>

A. Electromagnetic Induction with G-deceleration:
The generator produces a D.C. static field with negative polarity at the rim and positive at the center. However, the magnetic field from the generator produces induction in conductive loops when there is no relative motion. It seems therefore that the flux from the generator is continually expanding. This implies that the growth of internal momentum of atoms in the rotor by g-deceleration produces electromagnetic induction.

B. Threshold Electric Potential:

The craft operates at a potential higher than $10^{13}$ volts, which implies that thermodynamic probability attains

$$\angle(\beta) \approx 1 \qquad (5\text{-}1)$$

at such a high potential. $\angle(\beta)$ stands for the Langevin function:

$$\angle(\beta) = cth\,\beta - \frac{1}{\beta} \qquad (5\text{-}2)$$

in which $\beta$ is associated with potential and ambient temperature.

C. Thrust:

Horizontal propulsion can also be obtained by changing the potential distribution on the surface of the craft. This is because the plane upon which the electric field rotates inclines.

D. Pair Annihilation Glow:

Pair annihilation gives rise to a translucent glow surrounding the craft such that:

$$e^+ + e^- \longrightarrow \gamma \qquad (5\text{-}3)$$

which is accompanied by negative energy, and is more complicated than simple ionization. $e^+$ and $e^-$ in (5-3) stand for positron and electron, respectively.

E. Permanent Electric Polarity:

Searl noticed that after working near the craft or generators he had a "cobweb" sensation on the skin. His clothes clung to him and so did the bed linen. This was accompanied by occasional crackling, and lasted for some hours. This effect could be attributed to a permanent polarity. Paraelectric substances such as clothes can acquire a sufficient polarity with

$$\angle(\beta) \approx 1 \qquad (5\text{-}4)$$

from the high electromagnetic field surrounding the craft.

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## An Appeal to our Noble Brothers and Sisters:

Searl craft can be constructed quite cheaply in comparison with chemical rockets as used by NASA. They do not carry fuel but absorb space energy as does an interstellar ram jet. This energy is present everywhere in the universe, both in the palace and in the humblest backwoods cabin. By virtue of Searl's discovery, we will be able not only to conquer space, but also to make a paradise upon our planet Earth. Please join with us to make Space Project Swallow a success.

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## NOTES ON MR. J.R.R. SEARL

### Background

In 1949, Mr. J.R.R. Searl was employed by the Midlands Electricity Board as an electronic and electrical technician. He was very enthusiastic about the subject of electricity, although he had no formal education, outside that demanded by the job, on the subject. Unhindered by conventional ideas about electricity, he carried out his own investigations in this field.

During his work on electric motors and generators, he noticed that a small electromotive force was produced by spinning metal parts, the negative charges moving toward the outside, and the positive charges toward the rotational axis. In 1950 he experimented with rotating slip-rings and measured a small electromotive force on a voltmeter. He also noticed that when the rings were spinning freely and no current was taken, his hair bristled. His conclusions were that free electrons in the metal were spun out by centrifugal force, while a centripetal force was produced by the static field in the metal. He then decided to build a generator based on this principle. It had a segmented disc rotor, which passed through fields generated by electromagnets at its periphery. The electromagnets were energized by the rotor, and were intended to boost the electromotive force.

By 1952, the first generator had been constructed and was about three feet in diameter. It was tested in the open by Searl and a friend. The armature was set in motion by a small engine. The device produced the expected electrical power but at an unexpectedly high potential. At relatively low armature speeds a potential of the order of $10^5$ volts was produced, as indicated by the static effects on nearby objects. A characteristic crackling and the smell of ozone supported the conclusion. Then the really unexpected occured. The generator lifted while still speeding up, broke the connection between itself and the engine, and rose to a height of 50 feet. Here it hovered for awhile, still speeding up, and surrounded itself with a pink halo. This indicated ionization of the air at a much reduced pressure, about $10^{-3}$ mm. the pressure of mercury. More interesting yet was the side effect causing local radio receivers to go on of their own accord. This could have been due to ionizing discharge or electromagnetic induction. Finally, the whole generator accelerated at a fantastic rate and is thought to have vanished into space.

Since that day, Searl and others have made some ten or more small flying craft, some of which have been similarly lost, and developed a form of control. Larger craft have also been built, some 12 feet, and two 30 feet in diameter. The antics of his machines have given rise to much speculation as to the nature and origin of so-called "flying saucers". One wonders why Searl has not come to the notice of scientists and the public at large. The fact is that he has, but for fear of being ridiculed, people keep the knowledge or interest to themselves. The public has been educated to scoff at the subject of flying saucers and the reported behavior of things which cannot be explained by current scientific theory.

# THE SEARL EFFECT

Any theory must explain the various phenomena, some of which have been observed by Searl himself and some by the general public. Associated with the Searl-effect craft are the following:-

1. Antigravity or levity.

2. Very high electrostatic fields.

3. The peculiar magnetic effect.
   The generator produces direct current, a static field with negative polarity at the edge and positive at the center. However the magnetic field from the generator produces induction in conductive loops when there is no relative movement. It seems that the flux from the generator is continually expanding. This implies an unlimited quantity of energy.

4. Perpetual motion.
   Once the machine has passed a certain threshold of potential the energy output exceeds the input. From then on the energy output is virtually limitless. The estimated power output of the generator is some $10^{14}$ or $10^{15}$ watts, which was predicted by Seike's calculations, derived independently, and published in the first edition of *Principles of Ultrarelativity*.

5. Inertia loss.
   Above the threshold potential which must be some $10^{13}$ volts the generator and attached parts become inertia free.

6. Flight control.
   By changing the distribution of potential on the surface of the craft it is possible to propel the craft. The prevailing course of travel by ultra-high speed is away from this planet as the level of the generator is at right angles to the gravitational field. In horizontal flight the craft takes up an angle that indicates a balance between vector fields. The generator may create its own gravitational field.

7. Ionization of the air.
   This is a simple electrostatic effect. It gives rise to a translucent glow surrounding the craft. The intensity of the field is such that it can keep the ionized air at a distance by creating an almost total vacuum around the craft.

8. Permanent electric polarity.
   Searl noticed that after working near the craft or generators he had a 'cobweb' sensation on the skin. His clothes clung to him, and also the bed linen. This was accompanied by occasional crackling and lasted some hours. This effect could be attributed to a permanent polarity of dielectric material, in this case the material being body tissue and clothing.

9. Matter snatch during acceleration.
   This occurs when the craft is on the ground and the drive is suddenly switched on. The rising craft takes up a lump of soil with it, leaving the well-known hole in the ground.

(10)  The outer shell shall be constructed of non-magnetic materials.

(11)  The materials utilized in the outer shell construction shall be made electrically conductive.

The craft is in the shape of a disc;  at this very moment a twenty-one (21) foot diameter craft is under construction as a test bed.  It is the prototype for designing a much larger craft for Manned Flight.

As the craft may be designed to perform in many different fields, there are indeed many advantages over present day craft:  no runways or launch pads are needed as it is a VTOL Craft;  there will be no noise or sonic booms, no vibration or heat;  it will be capable of very high velocities.  Another great blessing to the human race is that it will not pollute our atmosphere, nor does it require oxygen to be drawn from the air.

As this project is so vastly important to the world, I ask that you give it your earnest consideration and support.  Please remember that an investment in the Levity Disc is an investment in the future well-being of every member of the human race.

Written at 17 Stephens Close, Mortimer in the County of Berkshire, England, by the hand of one of Her Majesty's Loyal Subjects, on the fifteenth day of May, 1972.

John R. R. Searl
Director of Contracts
Manned Flight Division

(Substance of Mr. Searl's letter to Queen Elizabeth and Officials of the British Government, accompanying copies of the preliminary drawings.)

# THE SEARL LEVITY DISC GENERATOR

The generator is a three ring arrangement. The inner ring
is fixed to the housing wall. The other two rings rotate
freely. The outer ring travels at a velocity twice that
of the middle ring. Both rings travel in the same direction.
Each ring is arranged so that there is a low resistance
in one direction only, towards the rim of the craft. But
the return path increases in resistance toward the fixed
ring.

Electromagnets at the rim receive the current from the
generator and reconvert it to spin in the rings; consequ-
uently the load on the starter motor becomes less, and it
spins almost freely. The magnets are designed as monopolar
Mobius rings or Klein bottles. The formula of these auto-
genic ceramic electromagnets, and the 'prime mover' constit-
ute the real secret of the Searl Levity Disc Generator.

Some of the technologies involved in the operation of the
Levity Disc Generator include:

    gyroscopes            cyclotrons
    ball-races            electronics/magnetics
    flywheels

A flame barrier is necessary between the generator housing
and the flight cells at the periphery. But because the craft
travels in a vacuum, the fireball seen by observers is only
a corona glow of electrified air, not a burning surface of
the disc.

The angle of the cross-section of the disc at the periphery
determines the stress/tension factor of the gravitational
field generated. The gravity flux generated by the craft
can be partly directed through the cabin to give weight to
the matter inside.

SEARL NATIONAL SPACE RESEARCH CONSORTIUM

17 Stephens Close
Mortimer
Berkshire, RG7 3TX
England
May 15, 1972

To Whom It May Concern:

I would like to submit these two drawings for your consideration as one of the greatest inventions of our times to mankind.

I think you will appreciate the immense value of this project to the world as a whole, if you will be kind enough to read the enclosed facts.

1. It is British. It is the development of air and space craft for passengers and freight which can operate in the air or space without taking with it any fuel from the Earth. As far as we can certify, there is no set limit to the movements of the craft in space.

2. The craft is called the SEARL LEVITY DISC. I, John Roy Robert Searl, the Rightful Inventor, declare this invention to be described in the following statement:

The Levity Disc is a new concept in space and air vehicle technique developed to accommodate an advanced drive complex, the nature of which having determined the shape and limiting structural criteria of the vehicle described thus:

(1)  The minimum and maximum deflection angles for the outer shells at the periphery shall be not less than six degrees and not greater than eight degrees.

(2)  The periphery shall be of negative polarity.

(3)  The summits shall be of positive polarity.

(4)  The merging of the outer shells at the periphery shall be an acute absolute.

(5)  The merging of the outer shells at the summits shall not be an acute absolute.

(6)  The merging of the outer shells at the summits shall be spherical in nature.

(7)  The fixed ring to the generator shall hereafter be described as being the ring nearest the summits.

(8)  The distance between the fixed ring and the peripheral rim shall not be greater than one-tenth of the vehicle's diameter.

(9)  The distance described in (8) alone shall be reserved to accommodate the flight reaction controls.
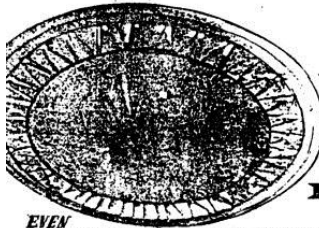
Since 1952- thirty-inch Searl
Levity Discs have been flown

# Introduction

*EVEN*

If you haven't heard of the Searl National Space Research Consortium, you are likely to seek opinions on this subject of whether Flying Saucers are a real engineering possibility. Everyone has an opinion, but often they are based on partial knowledge or out-dated concepts. My own difficulty in this matter is the fact that I do not have any experimental knowlege. Your best bet is to get information from the Consortium directly, or to question the investors who have greater technical knowlege.

The first information I found on Searl was in the November 1971 Star Magazine article, "He Goes for Levity." This has triggered me to follow interests I've had in electricity, especially to enjoy the displays of large voltage, and to build a generator. The key to Searl's Levity Discs is his generator which develops potentials of almost 10[14] (100,000,000,000,000) Volts. I don't think this refers to the acelleration of a single electron, but to the "Gap" at the circumf. of a thirty inch disc. 500,000 Volts, for example, arcs across 15 inches of air gap. There is not this much distance between the rim of the Searl Disc and the positive potential.

If your "belief" has balked at this point, it's due to insufficient data. Note the sharp edge of the disc. It's directed away from the positive potential just inside the moveable panels. Electric wind, the same phenomena which spins a little pinwheel atop a laboratory Van De Graaff makes possible a very large potential across a small gap by directing the electrons away from the positive.

There are many more subtleties in the device which physicists still argue. You will have to study things from the 1831 Faraday Disc, to the Betatron, and atmospheric physics in order to develop a feel for the forces interacting in this device.

The experience many people are looking for, and which I'd like also is to see one of these fly, and to poke at all its parts. To this date the Consortium has not revealed the specific details of the generator. However, there is sufficient description in the Newsletters to direct experiments. The arguments against disclosure are serious ones, generally directed against irresponsible use. For one thing, at high accelleration, electrons produce X-ray. Further, industries would demand ownership as they have of many devices now classified. This one is particularly easy to keep under wraps. Searl is trying to build a very large craft for Solar System investigation, owned by shareholders around the globe. Unfortunately this aim is labeled 'idealistic' and therefore suspect. However, it is a very mature grasp of a survival principle. Just consider the uses to which this thing can be put by short-sighted people.

On the lighter side, let's look at some experiments the backyard gadgeteer can set up toward building his own flying saucer.

This unraveling of particles into high energy photons, and their Compton Scattering and Photoelectric Effect on the negative ions attracted to the center of the generator make electron detachment very easy.

One more item makes an energy difference between the center of the disc and the edge which favor accelleration of the generator by the rim motor. Not only the Negative Ions turned into Positive Ions pick up electrons at the edge. Other positive ions from the atmosphere which had no interaction with the center of the disc are freshly attracted to the edge and carry off electrons. Neutral ions are produced, lower energy state than original ions.

### III. Diamagnetic Field Theory

Diamagnetic materials are repelled by very strong electro-magnetic fields.

Electro-magnetic fields increase in effect when they are rotated.

Perhaps a diamagnetic field of sufficient strength, rotated rapidly, would be repelled by even weak electromagnetic fields.

In the Diamagnetic theory of Eugene Burt, an inverse square law is called for, accounting for repulsion of the electron from the nucleus at very close distances. At greater distances, the electron is attracted to the nucleus. The "saucer" effort is to so increase the tiny repulsive force that it will have a long-distance effect.
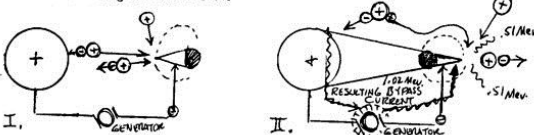


In situation I., ordinary ionization in electrical discharge: ion goes from one pole to the other, transporting electrons.
In situation II., Pair Annihilation releases high energy photons, contributing this energy to stripping electrons from ions from which they are easily pulled into generator. For positive ions, picking up electrons is made easy at the edge. The 1.02 Mev. from each pair annihilation is what provides electrical current to make Rim Motor outrun the generator drag.

Some References:

American Institute of Physics Handbook, 1972, published by McGraw-Hill, Inc.

Searl National Space Research Consortium Newsletters. Available from William T. Sherwood, 200 Pinnacle Road South, Rochester, N.Y. Searl Discs have flown since 1952, developing a potential of almost 10[14] Volts. The Consortium is building a very large disc for scientific exploration of the solar system. Public support is needed.

The Principles of Ultra Relativity, by Shinichi Seike. 1972. Send to Shinichi SEIKE 4 no. 12, 1 Chohme, Ohmiyachoh, Uwajima City, Ehime Prefecture (798), Japan. $7 plus $5 airmail postage is $12, and faster than surface mail.

UFO's and Diamagnetism. Eugene Burt. EXPOSITION PRESS, 50 Jericho Turnpike, Jericho, N.Y. 11753

Numerous books on UFO subject: Lionel Beer, 15 Freshwater Court, Crawford Street, London, W.1.

## I. Practical, "Classical" Mechanics
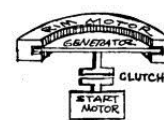


The generator, as pictured here has a starting motor which is conventionally powered by chemical processes, such as gasoline or diesel, or coal. This is coupled to the generator by a hysteresis or eddy current drive, or fluid clutch. This drives the generating disc which builds up the exciting current on its rings. Current induced by the resulting flux is moved on segments also on the disc, between the rings.

The purpose of the division into segments is to prevent circulation of current here, limiting current circulation to the rings which act as the coil for the iron field pieces.

Finally, electromagnets at the rim receive the current from the generator and reconvert it to spin on the disc. Consequently, the load on the starting motor becomes less, and it spins almost freely.

This arrangement would make no sense if a wire were joined from the other end of the electromagnet, completing the circuit to the axle. There would then be no difference in potential between the center of the disc and the edge. Our purpose is to create this difference in potential, and to maintain it. Then, the design makes sense, and the difference is maintained despite the fact that the current is used up by the rim motor.

It is important to note that generator drag, resistance due to heat and frictional losses of power make it impossible to keep the generator running by the rim motor alone. The torque required to create a given current is always greater than the torque that can be created by an electric motor using that same amount of current.

The best that can be hoped for is a carefully matched, optimum design of generator and rim motor. A further move toward efficiency is to evacuate rings and segments at the centers of magnetic flux to under .01 microns so electrons can exceed cyclotron frequencies.

## II. Pair Annihilation Theory

According to theory, the generator can be kept running by the rim motor alone, and speeds up at that. This is due to the very high potential of near 10[14] Volts. If X-ray type radiation of at least 1.02 million Volts is produced, then the conditions for pair creation exist.

In the difference in potential we are talking about, there is a lot of latitude for that condition. In addition, electrons accellerated by the generator lose their momentum through the motor at the rim, returning them to a speed slow enough for pair annihilation to take place.

At low potential, the removal of electrons from the air at the center of the generator is difficult. As the difference builds up, the collisions between particles generate accellerated electrons which either turn into, or generate high energy photons. Interactions between these high energy particles produce three effects: the Photoelectric Effect, Compton Scattering, and Pair creation.

With Pair creation, the incident Photon must be above 1.02 Mev. It interacts with the Coulomb forces surrounding the Nucleus to produce an Electron (Negatron) and its anti-particle, the Positron. Each of these has a rest mass of .51 Mev., and they spin away from the atom in opposite directions. In order for Pair Annihilation to take place, they must come together gently.

The Negative Ion which approaches the center of the generator loses its electron, but retains the Positron and is repelled from the positive center of the disc, to travel out to the negative edge. The Electron, meanwhile has been driven through the generator, accellerated, and through the motor at the rim, decellerated to meet Positive Ion and its Positron at the sharp perifery of the craft. Here, Pair Annihilation takes place, and the Positive Ion must pick up an additional electron before it is repelled away from the edge, away from the craft.



gaining flux     weakening flux

r=12.5cm   C=75cm

Ⓐ |← C=24cm →|
Ⓑ |← C=54cm →|
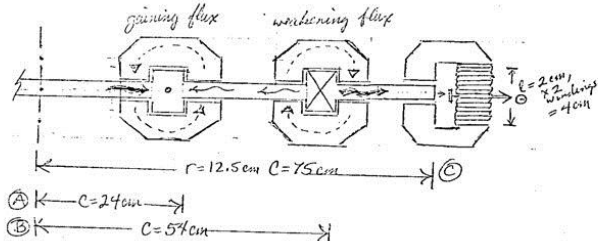
A THEORETICAL MODEL OF THE "SAUCER ENGINE"

Figures are started assuming 10,000 Volts in ring Ⓐ and Ⓑ, and in electromagnet Ⓒ.

FIGURING THE MAGNETIC FLUX: R=1.72×10^{-8} Ohm for Meter Cube of Copper

Ⓐ $R = \frac{\rho l}{A}$   A = .01 Meter × .02 Meter area of ring cross-section = .0004 M[2]

$R = \frac{1.72 \times 10^{-8}}{.0004} \times 24 = \frac{41.28}{.0004} = 10.32 \times 10^{4}$ ohm

$I = \frac{E}{R} = \frac{10,000 \, Volts}{10.32 \times 10^{4}} = 9.6 \times 10^{-2}$ Amp

Flux $B = \frac{2i}{a} \times 10^{-7} = \frac{.192}{.01} \times 10^{-7} = 19.2 \times 10^{-7}$ Weber

Ⓑ $R = \frac{1.72 \times 10^{-8} \times 54}{.0004} = \frac{92.88 \times 10^{-8}}{.0004} = 23.22 \times 10^{4}$ Ohm

$I = \frac{E}{R} = \frac{10,000}{23.22 \times 10^{4}} = 4.3 \times 10^{-2}$ Amp.

Flux $B = \frac{.086}{.01} \times 10^{-7} = 8.6 \times 10^{-7}$ Weber

Ⓒ Magnetic Field of a Solenoid. 0000 Gauge Wire, .0491 ohms/meter One Meter wraps 25 Times around 1 cm. square core.

Flux $B = \frac{2i}{l} \times 10^{-7} \times \sin \alpha$   Four sides, so $B = \frac{(E)(20)(\sin 45°)}{.01} 10^{-7}$

and $B = \frac{\mu Ni}{l}$, figuring 100 sides, and calling coil length 4 cm for $l$

$\mu = K_m \mu_0$  K is 12.57×10^{-7} Webers for air, (I didn't have permeability figure for iron core) use $\mu_0$ as 1.00   $B = \frac{12.7 \times 10^{-7} (25) 20}{.04} = 1571 \times 10^{-5}$ Wb.

USING A 2-FOOT DISC TO REDUCE RPM REQUIREMENTS

| | RINGS | | | | | | |
|---|---|---|---|---|---|---|---|
| A | B | C | D | E | F | PURIFIER "MOTOR" | (looks like this will require more than #100 volts of copper) |

4  9  14  19  24  29   centimeters r

.24  .54  .84  1.14  1.44  1.74   METERS CIRCUMFERENCE  TOTAL: 5.94

the average circumference is ∴ 1 Meter    Velocity = ω × Circumf.

An arbitrary air breakdown potential: 240,000 Volts.
Output from ring F has to be 2×240,000 volts, as only half of induced voltage goes to purifier Motor — the other half returns to ring E.

$R = \dfrac{\rho l}{A}$    $l = 1$ Meter   Ring Area = .0005  Ring $l = 1$ Meter

$\rho = 1.72 \times 10^{-8}$ for cu/M copper,  $R = \dfrac{1.72 \times 10^{-8} \times 1}{.0005} = \dfrac{172 \times 10^{-8} \times 1}{15 \times 10^{-5}} = $ about 1 ohm

$I = \dfrac{E}{R}$ starting Amps. $\dfrac{240,000}{1} = 240,000$ Amps, as breakdown potential is the starting potential, always remaining on rings.

Starting flux: $B = \dfrac{2i}{a} \times 10^{-7}$  $a = $ arbitrary .01 Meter from flux center.
$B = \dfrac{480,000}{.01} \times 10^{-7} = 4.80$ Webers

To find ending flux to produce 2× air breakdown potential:  $E = B\ell v$
$4.80 \omega + B\omega = 480,000$  "B" in this case is ending flux.  $\ell = .02$ Meter
$\omega (4.80 + B) = 480,000$   $\omega = \dfrac{480,000}{4.80 + B}$   $B = \dfrac{480,000}{.02\omega} - 4.80$
Substitute "ω" term for the "B":  $4.80\omega + \dfrac{480,000}{.02\omega} \cdot \omega - 4.80\omega = 480,000$
$\dfrac{480,000}{.02\omega} = 480,000$   $.02\omega = .02$  1 rps
$\omega = 50$ rps or 3000 R.

The air breakdown potential is reached at 3000 RPM in this 2 ft. disc.

BASIC FORMULAS: $E = B\ell v$  Volts = Mag. Flux (conductor length) Velocity , $B = \dfrac{2i}{a} \times 10^{-7}$
Mag. Flux = $\dfrac{2\ \text{Amps.}}{\text{Distance from Flux Center}} \times$ A Special Constant , $I = \dfrac{E}{R}$ Amps. $\dfrac{\text{Volts}}{\text{Resistance}}$ , $R = \dfrac{\rho \ell}{A}$

Resistance = $\dfrac{\text{"Rho" (conductor length)}}{\text{Area of conductor cross section}}$ , "Rho" is $1.72 \times 10^{-8}$ Ohms for 1 cu. Meter of copper

INNER RING (A) is .36 Meter circumference , RING (B) is .60 Meter circumference , Velocity = Circumf × ω
$\omega$, "Omega", refers to rps. , 60 × ω = RPM , RPM is 3000 in this case so ω = 50

$\ell = 2$ cm. segment × 36 cm = 72 cm, or .72 Meter
$E = B(.72)$ 50 × .36 = 12.96 B
$R = \dfrac{1.72 \times 10^{-8}(.36)}{.0002} = 3096 \times 10^{-8}$ Ohm
$B = \dfrac{2E}{3096 \times 10^{-8} \times 10^{-7}} = \dfrac{.00064\ E \times 10^{8}}{.01} \times 10^{-7}$
$= 64 E \times 10^{-2} = .64 E$ (on ring)
INDUCED $E = 12.96 (.64\ E$ on ring)
INDUCED $E = 8.2944\ E$ on ring (roughly 7.2)

$\ell = 2$ cm. seg × 60 cm = 120 cm. or 1.20 Meter
$E = B(1.20)$ 50 × .60 = 36 B
$R = \dfrac{1.72 \times 10^{-8}(.60)}{.0002} = 10320 \times 10^{-8}$ Ohm
$B = \dfrac{2E}{10320 \times 10^{-8}} \times 10^{-7} = .2 E$ (on ring)
INDUCED $E = 36 (.2\ E$ on ring)
INDUCED $E = 7.2\ E$ on ring

INWARD INDUCING FLUX BECOMES 7.2 ON EACH RING AND REVERSES AT PEAK INDUCTION
REVERSED FLUX CAUSES OUTWARD INDUCTION
WOULD CURRENT LOSS DISTRIBUTE THIS WAY?

A QUICK GLANCE AT ALTERNATING CURRENT THEORY SHOWS A DIFFERENCE IN TIMING BETWEEN CURRENT AND INDUCTION DUE TO THE CURRENT. WE ARE INDUCING ONTO THE RINGS A CURRENT 7.2 TIMES THE CURRENT ALREADY ON THE RINGS.

IF THIS SORT OF INDUCTION TAKES PLACE, A VOLTMETER OR AMMETER ATTACHED TO HUB AND RIM WOULD FLUCTUATE FROM ⊕ TO ⊖ AT GREATER AND GREATER AMPLITUDES AND GREATER AND GREATER FREQUENCIES. IF THE 8.2944 IS TRUE FOR RING (A) PERHAPS THE HUB WOULD AT FIRST BECOME NEGATIVE UNTIL POTENTIAL INDUCED BECOMES OVER 10,000 VOLTS. THESE ELECTRONS WOULD TEND TO MOVE OUTWARD ON THE DISC BECAUSE OF THEIR GREATER MASS. (RELATIVISTIC MASS)

THE 2-RING IDEA IS JUST FOR THIS EXPERIMENT. A 24-INCH ROTOR OF THE SAME SCALE WOULD ACCOMMODATE 5 RING. A 3 ft. ROTOR WOULD HOLD 9.

ASIDE FROM SPINNING DISC TO PROMOTE ELECTRON 'STARVATION' AT AXLE, THE SOFT CONTOUR AT CENTER PLATES ABOVE & BELOW GEN. FAVORS ⊕ CORONA, & NEEDLE EDGE FAVORS HARSH NEGATIVE CORONA, FOR THE SORT OF RECTIFICATION ACCOMPLISHED BY AN A.C. TESLA COIL.

## Great American Mural
### FLYING SAUCER FLIGHT & ENGINE THEORY

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$2 \times 10^{14}$ Volts
$10^{14}$ volt   $10^{14}$ Volts   BYPASS CURRENT

| | A RING | B RING | Rim Motor | |
DISC CENTER

Although the generator peaks higher than the rim motor, the energies average out to "almost equality"

$E = B\ell v$ can be used to show the speed at which the disc must turn for the Rim Motor to degrade the entire output of the generator. This requirement becomes less and less speed the lower the potential. We'll figure this in an inverse matter, treating the rim motor as a generator. The higher the flux, the slower it needs to turn to produce a given voltage.

FROM 1000 Volts

$I = \dfrac{10^{14}}{.04901} = 204 \times 10^{13}$ Amps.

Coil $\left\{ B_1 = \dfrac{12.7 \times 10^{7} (25) 20}{1571 \times 10^{-5}} \right.$ Web.

Seg. $\left\{ B_2 = \dfrac{2i}{a} \times 10^{-7} = \dfrac{2(22)}{.01} \times 10^{-7} \right.$
$= 40 \times 10^{-7}$ Weber

Rim as generator:
$E = (B_1 + B_2) \cdot \ell v = (157 \times 10^{-5} \times 40 \times 10^{-7}) \cdot .01 V = 1574 \times 10^{-6} V$
Veloc. $= \dfrac{1000}{1574 \times 10^{-6}} = 6 \times 10^{5}$ M/sec.

FROM $10^{14}$ Volts

Coil $\left\{ B_1 = Ni \quad N = 25 \text{ loops} \quad \ell = 4\text{cm} \right.$
$B = (12.5 \times 10^{-7}) 25 (204 \times 10^{13}) = 64107 \times 10^{11}$ Web.

Segment $\left\{ B_2 = \dfrac{2i}{a} \times 10^{-7} = \dfrac{2(204 \times 10^{13})}{.01} \times 10^{-7} \right.$
$408 \times 10^{14}$ Webers

Rim as generator:
$E = (B_1 + B_2) \cdot \ell v = 64107 \times 10^{11} + 408 \times 10^{14} \times .01$
$10^{14} = 104907 \times 10^{16} \times .01 \times V$
Veloc. $= \dfrac{10^{14}}{104907 \times 10^{10}} = .09$ M/sec.

Don't forget, the Start Motor must be contributing momentum, or the system will come to rest. A tremendous generator could feed in sections where BYPASS CURRENT appears in the diagram. Then, a "start motor" would not be necessary. However, this would have to be "way up there" in billions of volts, because it would gather in the rings for stronger and stronger flux.

SUB-RELATIVISTIC CURRENT
RELATIVISTIC ELECTRONS
FREE ELECTRON CURRENT REVERSAL
FREE ELECTRON CURRENT
SEGMENTS
DISC ROTATION (BOTH RINGS & SEGMENTS)
NUCLEII AND BOUND ELECTRONS FOLLOW DISC ROTATION

## A DISCUSSION OF THE SEARL DISC

### ON THE BASIS OF MY KNOWLEDGE OF SCIENTIFIC POSSIBILITY

by

Bernhard Vaegs
Studio for Electro-Physics and Bio-Electricity

On "The Production of Electricity by Means of Rotating Discs":

This is possible through the alteration of magnetic lines of force in segmented discs, (in the magnetic mode), and through induced charge, (in the electrostatic mode).

I. Magnetic Mode:
   (a) With a Disc between a Pair of Magnetic Poles:
      (1) Known as Michael Faraday's (1791-1869) demonstrations apparatus for producing electricity in the presence of a magnetic field. The machine consists of a copper disc about 30 cm. in diameter, which can be rotated between the poles of a magnet.

      (2) Known as the inverse of the Barlow-disc, in which, as with the aforestated Faraday apparatus, one electrical terminal is the center of the disc, (the axis). However, while in the Faraday disc the other terminal is a sliding contact against the rim of the disc, in this case, the rim of the disc touches mercury in a trough, to make the second terminal.

   (b) Rotating Discs without Magnets:

      The electro-physicist Palmieri is said to have succeeded, in his day, by means of rotating copper rollers (discs?), in producing sparks and in electrolyzing water. Here the earth's magnetic field played the part of the magnetic pole-pair, just as it does in the "earth-inductor", (an instrument for measuring the strength of the earth's magnetic field). This magnet-less induction of electrical potential had already been demonstrated by Faraday. In one experiment he immersed two electrodes in the Thames River. The measuring apparatus proved that water flowing at an angle to the natural geomagnetic field induced an electrical potential with the interaction of the tides of the English Channel with the earth's natural magnetic field.

II. Electrostatic Mode:

      According to one expert, a (horizontally only ?) rotating disc

develops static electricity. The underside becomes negatively charged, the topside, positively charged, or the reverse, depending on the direction of rotation.

If we think of this rotating disc as an electrical condenser, then we can see some interesting parallels with the condenser experiments of Professor Bielefelds, in the USA. He discovered that plate-condensers having negative charge on the lower surface and positive charge on the upper surface were measurably lighter in weight, and with the reverse charge, heavier. T.T. Brown, a colleague of Professor Bielefeld, performed exhaustive experiments to find the optimum form of condenser for weight modification. ("Fudji-Jama-Profile")

On "Vacuum surrounds the electrically charged Searl Disc":

I. The "electric wind" which comes from points and raised places under certain conditions of high electrical charge is sufficient, with a strong electrostatic generator, to blow out a candle. Here apparently the air is so strongly repelled by the charged disc, that a vacuum is formed around it.

Major de Seversky, who lives in USA, made a flying device, (nicknamed the "flying bedstead"), which worked by means of electrical wind. Likewise, he invented a motorless ventilator which was based on the principle of electrical wind.

II. It would be an omission at this time not to mention the aerodynamic phenomenon in connection with discs, known as the Coanda or Tornado effect. This was the principle on which the Canadian Avro experimental saucer was based, some years ago. This effect causes a disc to rise, as if in the center of a tornado, when air rushes across the rim, through the action of backward-directed jets. If we think of the "electric wind" as the jet, we can readily see that the disc would be lifted up. (The Coanda effect and the Bielefeld-Brown effect both manifest a kind of levitation. Could not the Searl Disc be a demonstration of a wonderful integration of many natural forces working together towards this end?)

III. Research engineer R. Schaffranke recalls, in his article in "UFO-Nachrichten", the discovery made by P. Lenard in Paris (1894). He writes: "...to his surprise, Lenard noticed that the electrons of this (cathode) bundle of rays were able to produce a kind of vacuum tunnel in the air, since the negative ions of the atmosphere seemed to be absorbed. In the process, it seemed that air was removed, forming a vacuum. The surrounding air naturally tended to flow towards this vacuum, and it was possible to regulate the stream of air by controlling the electron density, or potential. The ionized surfaces of an aircraft or spacecraft tend to be drawn into the vacuum created and maintained around the craft by an ionization source. As a result, the craft no longer moves against a wall of air, atmospheric pressure and air-resistance in front of the craft are reduced or almost completely eliminated; in short, the already established empirical effects indicate a means by which (air-)craft

may travel faster and farther by overcoming drag. If the vacuum is produced on one side of the craft only, then the normal atmospheric pressure against the other provides an effective propulsive force, and in this way the craft can be made to rise, and its weight seemingly counteracted..."

On: "A pink halo surrounded the craft."

The luminous effect, or high tension glow, associated with the cathode (negative pole) of a Geissler tube consists principally of the pink glowing so-called "positive columns".

On: "Potentials on the order of $10^{13}$ to $10^{14}$ volts".

These potentials are far higher than those produced by Tesla in his Colorado Springs (USA) experiments, some years ago. Even today, we can generate only about $2 \times 10^7$ volts by means of a belt generator. The associated current seldom exceeds 1.5 milliamperes.

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