

# The Morningstar Energy Box

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**Abstract.** The Morningstar Energy Box is a derivative of both the Searl device and a variant of the Russian Scientists Godin and Roschin. Laminated rollers and a main ring with ferromagnetic fluid are used to enhance electrical and magnetic properties. The device is constrained by a mechanical cage to hold the rollers. An operational theory for the Energy Box uses rotating electromagnetic fields different from either Searl or the Russians. Moreover, the Russians made several serious claims that produced self-acceleration to generate electricity, created a large weight loss when spun in one direction and weight gain when spun in the opposite direction. They also claimed their device generated discrete magnetic walls. To date, no one has validated these outrageous Russian claims. However, the Energy Box found similar phenomenon regarding the discrete magnetic walls with both weight gain and loss, although not at the same magnitude. Where they claimed to lose as much as 35% of the weight of a 375 kg armature, the Energy Box in an early test only lost 2 to 5 pounds of its 190 pounds at steady-state. During transient rotation changes, the weight change dropped as much as 20 to 40 pounds. However, a last test series recorded a weight lost of 14 pounds with a 7.3% change during steady-state. We can state that we saw similar phenomena as the Russian claims as well as lost weight and the device may represent an advanced propulsion scheme for space travel.

## Nomenclature

$B$	=	Magnetic field
$E$	=	Electric field
$J$	=	Current
$S$	=	Poynting vector
$t$	=	Time

## I. Introduction

There are several controversial machines that use electromagnetic devices, which may attempt to replicate perpetual motion. Some iteration of these machines includes significant claims about phenomenon with either unusual electromagnetic fields and the gain or loss of weight. These devices may allude to some advanced propulsion capabilities. The problem is to investigate these claims with a sane rationale approach as well as

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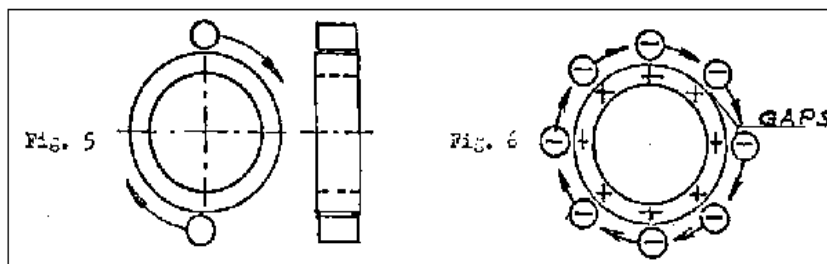
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including some newer device changes that may have significant impact utilizing subtle principles. These will be briefly discussed.

### A. Searl Device

The idea by Searl has created significant controversy. The basic idea of his device is that circular magnets will interact with a ferromagnetic bar of material. These magnets will diametrically approach a certain displacement about the bar. Searl's contribution<sup>1</sup> is to use the bar around a ring so that the individual magnets 'hunt' and 'peck' in an arrangement where they approach equal azimuthal increments along the ring, and actually stay above and not touch the ring surface. His notion is that all of the magnets should be approached either all north or all south. The other contribution by Searl is that the rollers and rings are laminated with specific materials. For the roller, they usually consist of a central core that includes an intense magnet. These are inserted into a copper sleeve followed by a dielectric material and an aluminum sleeve. The dielectric supposedly provides a gate for electrons; copper and aluminum provide electrons as well. The ring has a similar arrangement where the magnet is the exterior portion of the ring and aluminum is the interior. Searl identifies the law of the squares or the magic squares but there is no real science to determine the percentage of materials. Moreover, other elements to include iron can also be used.



**Figure 1. The rollers operated around the ring with a parity of the pole magnets.**

When operating, the rings will achieve a resonance rotation rate as the rollers move quickly about the ring. Basically one may feel that the roller rotation rate is identical with the ring surface rate whereas another view demonstrated that the roller actually moves faster by a factor of six of its rotation rate. There are capture devices that use a transformer where the passing rollers move through this section to presumably generate electricity. In other cases, these sections could be charged to create an electric signal that allows induction for the roller's rotation. Very few evidence is identified concerning the amount of current. Finally, Searl suggests that the device may have three sets of rings and rollers in such a device but no evidence was ever shown with more than a single ring.

There was considerable information that Searl generated some devices that lifted at high speed. This somewhat resembles Petkov's work<sup>2</sup> for a magnetic dipole within a gravitational field. Needless to say, these comments were not explored fully or provided real evidence for these capabilities, thus this made these notions controversial.

### B. The Brown Device

Dr. Paul Brown<sup>3</sup> indicated that before his demise, he created a Searl device that was the size of a telephone book. The rollers were in even poles and had a specific radius of the roller to the diameter with the ring. The claim was that the device became unstable during operation and created about a megawatt of electricity. The wires started to glow and the magnets were overheated to the point that they caught fire before the system was destroyed. Not much information is available from this system. Moreover, if the magnets became hot, they would have exceeded the Curie temperature and the magnets should have lost magnetism. Consequently, the device should have ceased. The energy box concern is to consider that if the Poynting fields can create magnetic anomalies to continue rotation, the rollers should consider if they induce overheating the magnets?

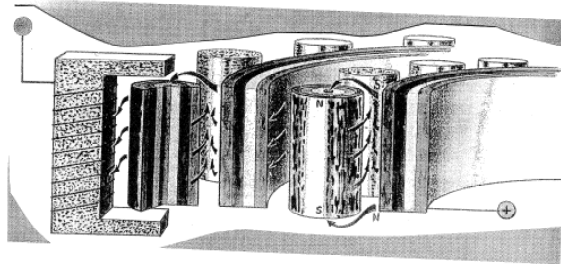
### C. The Russian & Godin & Roschin Device (MEC)

Roschin is a Russian scientist that resembled a Searl system to demonstrate feasibility for a larger system. Later Godin was brought on the project from the Russian Academy of Sciences. Godin<sup>4</sup> and Roschin made a similar Searl ring with several hundreds of pound of magnets using Selenium. The rollers were not concentric but actually consisted of slabs for each of these materials. Moreover, the rollers were constrained to a carousel or armature that oriented the location of the magnets as well as the spacing from the surface of the ring. Other variations by the

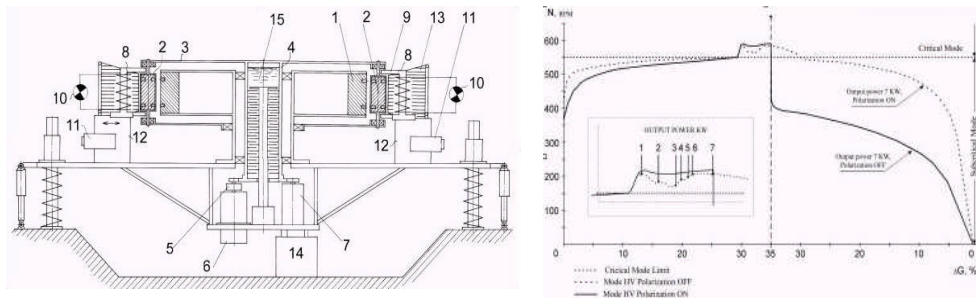
Russians are that the rollers used radial magnets that meshed between the rollers and the ring. If this worked successfully, the rollers would rotate per the linear spacing of the ring.

This device<sup>5</sup> reported in an AIAA Meeting at 2001, claimed that the device self-accelerated in that it was generated and then rotated by itself. A 7 KW generator used this to generate electricity. The device was charged on the exterior of the rollers to 20,000 volts. It is not clear why the voltage is used. When the device rotated at 600 rpm, the weight of the 375 kg armature lost 35% of its weight. They claimed at this time, the temperature decreased. When rotated in the opposite direction, the device gained 35% of weight at 560 rpm. Moreover, the system produced magnetic discrete walls that were at a distance away from the device. Finally, the system also smelt Ozone.

When they presented their findings, there was not much encouragement because of the proceedings. Moreover, the Russian author stated that in 1993, the device was torn apart supposedly to obtain money to support funds. This was a crucial time for the collapse of the Soviet Union. They were able to create a second device with modifications. Unfortunately this second device was not successful. A third device provided no further information.



**Figure 2. Searl laminated rollers and rings as well as multiple rings.**



**Figure 3. The rotating MEC supposedly generated self-acceleration as well as very significant phenomena.**

At face value the primary issue that raises concern is that if the temperature decreased with the weight loss, may appear to be an Unruh-like effect. However, their later report does not mention that the temperature increases during situations when the weight increases.

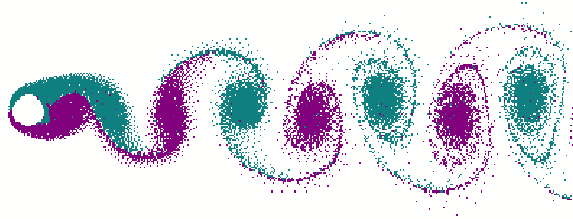
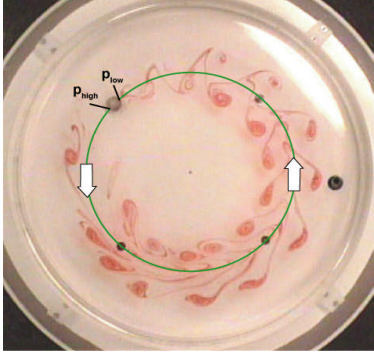
The Russians had several different views regarding how their device worked. The main idea is that angular momentum is used to convert linear momentum. We have similar notions in that this may sound somewhat trivial, however, it works in terms of a wheel on a bicycle, a car or a locomotive. The notion here is that von Karman vortex sheets<sup>6-8</sup> exists. The problem at this particular geometry is not obvious. Each odd vortex would rotate in one spin direction while even or odd vortex rotates with the opposite spin. Moreover, the length of these separate vortexes may not be of even length for specific conditions. Results are shown in the Figure 4.

## II. Discussion

### A. The Morningstar Energy Box

The name “Energy Box” is a misnomer. The original purpose of the device was to create a magnetic motion drive. Unfortunately this did not occur when experiments revealed that the device could alter its weight. The unusual operation of this device is that the rollers move in a three-dimensional magnetic field in a circular kinematic response that differs from an axisymmetric electrical motor because of the trajectory of the field.

**Figure 4. A vortex street has specific geometry; however, the Russian notion may be promising to create rotation if a roller is located at each vortex.**



The device can be based upon three specific theoretical principles that may exist. These are:

- Angular momentum- The idea<sup>9</sup> is to transfer angular momentum into linear momentum.
- Gravito-Electro-Magnetism (GEM)- This notion<sup>10</sup> considers using a Poynting vector force induction based upon the roller design.
- Retarded Potentials- The ring acts as a reflection plane for the roller and if the time is retarded, it is possible that the image on the ring from one roller may attract the adjacent roller to create self-acceleration.

Basically we are not certain which mechanism works so we need to investigate this problem with more detail. The first notion would induce linear motion using the interactions with magnetic and electric fields. The second approach initially looks at a roller without any motion that only shows its magnetism. However, once motion is started, an electric field is created as demonstrated by Maxwell's equations<sup>11</sup>. If the magnet is longitudinal and the electric field in the roller is radially oriented, the Poynting vector, which is the cross product between the electric and magnetic fields, would create a force to create motion. If the Searl device uses dielectrics, the rollers tend to act like a capacitor; these rollers create a Poynting vector. Additionally, we have found a derivation for the Poynting field conservation that offers additional effects than what is looked at by only treating separate magnetic and electric fields. This use of the Poynting field<sup>12</sup> looks very promising and will be addressed in a future technical paper.

Briefly the Poynting field is:

$$\bar{S} = \frac{1}{\mu_o} (\bar{E} \times \bar{B}). \quad (1)$$

And the conservation equation is:

$$\mu_o \left[ \frac{1}{c^2} \frac{\partial^2 \bar{S}}{\partial t^2} - \nabla^2 \bar{S} \right] = -4\pi \left[ \rho_m \nabla \times \bar{E} - \rho_e \nabla \times \bar{B} + \frac{1}{c^2} \frac{\partial}{\partial t} (\bar{J}_e \times \bar{B} + \bar{E} \times \bar{J}_m) \right] + \mu_o \nabla \times \nabla \times \bar{S}. \quad (2)$$

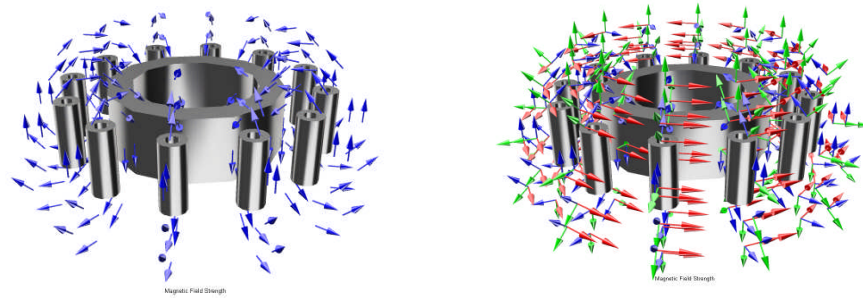
Where  $S$  is the Poynting field,  $E$  is the electric field,  $B$  is the magnetic field,  $J$  represents currents,  $\rho$  is a source term with subscripts for  $e$  is electric and  $m$  is magnetic. This also provides insights in gravitational forces.

The retarded potential looks at the roller electric and magnetic field images in the ring. If these images in the surface plane could be delayed, say due to high rotation about the carousel, the images may drag the next adjacent roller to generate linear momentum.

### **B. Description of the Energy Box<sup>13</sup>**

The device operates with Searl's rollers and rings while the cage is used for a carousel similar to the Russians. Moreover, there is no magnet on the ring, which uses a Hymu-80 material and a reservoir with a ferromagnetic fluid. In addition, the rollers each have a passageway to allow air motion to cool magnets and hopefully prevent any magnet fire problem mentioned by Brown. Hymu-80 material is also used for the core of the rollers and is placed in concentric annular magnets followed by a copper sleeve and isolated aluminum sleeve. Thus the Energy Box has similar components with each of these devices that may potentially use the most favorable results.

**Figure 5.** The image on the left is with no rotation; the second image has rotation. Blue lines are the magnetic field, green is the electric field and the red is the Poynting field that would drive the rollers around the ring.



There are several basic test parameters with variations that are possible. Rollers can be either with 12 or 24 in the carousel. Four different roller versions were examined as well as rotating the device clockwise or counter-clockwise. There are several different voltages usually from 0, 60, 120, 180, and 1,000 voltages with plus or minus charges and the amount of ferromagnetic fluid can be at 0, .50, to 1.00 levels. This easily results in a spectrum of about 120 variations.

### III. Results

Based upon the rationale for a device to generate electricity, self-acceleration is of the highest priority. Unfortunately this did not occur. When the device performed, however, several unusual things occurred and it was clear that the energy box is a very nonlinear device. Components are as follows for these elements:



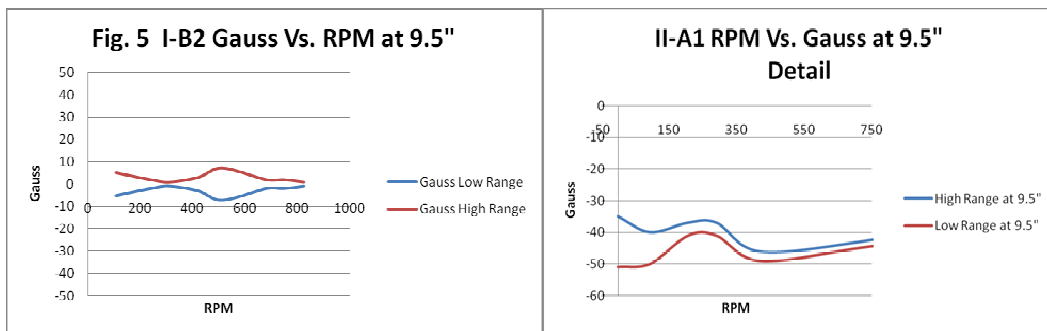
**Figure 6.** The laminated ring with the actual ring and spindle to drive the carousel is shown. The carousel also shows motor and support drive. Roller also is shown to include the cooling passage and turbines to cool magnets.

The system used to determine information includes various components. Measurement Specialties Inc. manufactures the six load cells with part number FC2231-0000-0100-L. The load cell is capable of 0-100 lbf with outputs from .5 to 4.5 volts. AlphaLab Inc. provides a magnetometer using part number DC Gaussmeter M1ST with a range of 0 to 20,000 gauss; this was increased using a modification by the developer to 30,000 gauss. The Motenergy (formerly Mars Electric Inc.) motor is a 48 V brushless DC motor capable of 5-10 kW or a maximum of about 6.7 HP with a rotation rate of 0 to 5,000 rpm. Compact Instruments Tachoprobe A2108 provides a laser tachometer to determine rotation levels capable of 80 to 6,000 rpm. The National Instruments SCXI 1600 data acquisition system was used for all measurements. The configuration used contained 32 channel of analog to digital

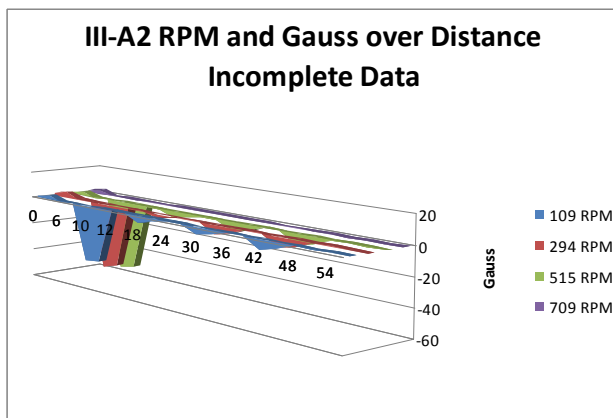
conversion was additionally fitted with an SCXI 1102 32-Channel Thermocouple/Voltage Input Module as well as an SCXI-1102C 32-Channel Amplifier Module. Moreover, to overcome noise in the data, a relaxation filter was used. The assumed actual weight is approximated by .025 times the new experimental measured weight added to 0.975 multiplied by the weight at the previous time step to decrease frequencies higher than the Nyquist frequency sampling rate. This provides a reasonable weight distribution as a function of steady-state and rotation rate changes.

The first thing investigated was defining the magnetic field as a function of distance from the device. Results show the field strength is a function of radial distance. The location at 9.5 inches is the roller magnet locations at the carousel. If the roller magnets were set at alternating poles, the strength of the magnetic field was significantly reduced. Each magnet competed against their adjacent locations for this situation. On this basis, the rollers were used with the same polarity to maximize the magnetic field strength.

In general there was no obvious increase in the magnetic field as a function with rotation rate. However, some disturbances were seen at considerable radial distance from the device. Here, some sudden increases were observed that looked like walls with very discrete changes in the magnetic field. This is unusual in that one would normally expect the field to be only continuous rather than being discrete as a function of radial distance. This also is similar to some of the effects observed by the Russians. Because of the limited laboratory spacing, we could only measure two or three walls from the device. Moreover, the magnetic walls appear to increase radially apart as the rotation rate increases. Using magnetometers, the walls were not linear barriers as the Russians imply. Here, the walls seemed to follow a parabolic curve similar to what one would expect for the magnetic lines of force. The difference is that the Russian device could have had a significantly stronger magnetic field than in this device. The reason these walls are important is that the movement could be used to harvest electrical energy away from the machine.



**Figure 7. The magnetic field shows the response due to polarity of the rollers. It should be noted that no electric charges were placed during these tests.**



**Figure 8. The walls showed some radially displaced locations from the mechanism. These walls would increase with increases in rotation rate.**

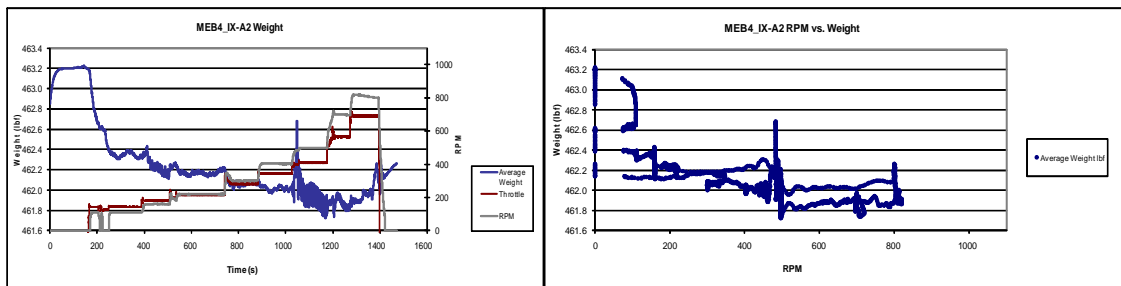
When the device was originally examined with two thermocouples, there were very unusual responses that varied similar to the rotation rate. However, some of the instrumentation was incorrect and when grounded, all of the thermocouples did not show significant temperature variations due to weight increase or decrease. The motor drive shaft, a significant source of electrical power, compels thermal conduction heat transfer. This is an overcoming

affect compared to identifying an Unruh effect so no particular relationship was clear for temperature decreases with weight losses. The thermal response is too competitive considering the electric drive, heat conduction and determination if weight gain or loss occurred. In fact Godin later mentioned there was no real trend to support Unruh-like relations.

Regarding weight, initially bathroom scales were used to estimate if there was any change in the device. Primary response of the mechanism was to generate an electrically driven device. However, some judgments looked at weight changes due to considerable vibrations that moved during rotation changes. Six load cells were finally used to determine weight responses. These generated spike weights that in some situations rose by as much as 20 to 40 pounds. The device, minus the cabinet and instrumentation, would weigh about 190 pounds. These spikes would show that weight tends to decrease when the rotation starts and then starts to increase in weight when the rotation decreases. Moreover, the results were examined where weight was increased or lost against rotation rate. This strongly depended upon conditions and there was no clear correlation with direction. However, these results indicated specific regions where the rotation rate showed what we felt was a resonance. Later tests would specifically measure at these rotation rates to see if a consistent weight margin would be achieved at resonance. However, weight changes were easily observed at several pounds depending upon charge on the roller, type of charge, rate rotation direction, as well as the amount of ferromagnetic fluid placed in the device.

This result shows the rotation rate as a function of time. The example shown in Figure 9 is a staircase step situation for changing the rotation speed. In addition, a smell of Ozone was detected when the carousel was removed from the drive mechanism. All of these runs did not involve 1,000-volt charges that occurred in a later future.

**Figure 9. A typical weight reduction case with resonance occurs at 480 and 810 rpm.**



In a preliminary discussion of operation for this device, one colleague reflected that the roller turbines used to provide cooling the roller's magnets could change the weight due to airflow. We found changes in weight regardless if or not that tape was wrapped over the turbine section. Moreover, if the turbines did influence the weight change to create an aerodynamic lift, the change would occur as a function of rpm where weight would increase in one direction and decrease in the opposite direction. This did not occur.

A fourth test series of the Energy Box was performed. Results from the first three series validated some of the ideas about the Russian device; we saw unusual results that showed increases or decreases in weight but at a smaller magnitude compared to the Russian claims. This fourth series was approximately two months later after these tests. The new test objective was to modify the rollers to use capacitors capable of holding 1500 volts compared to the original capacitors that only held 100 volts. This would validate the Poynting vector approach to increase the force of the rollers by a factor of ten.

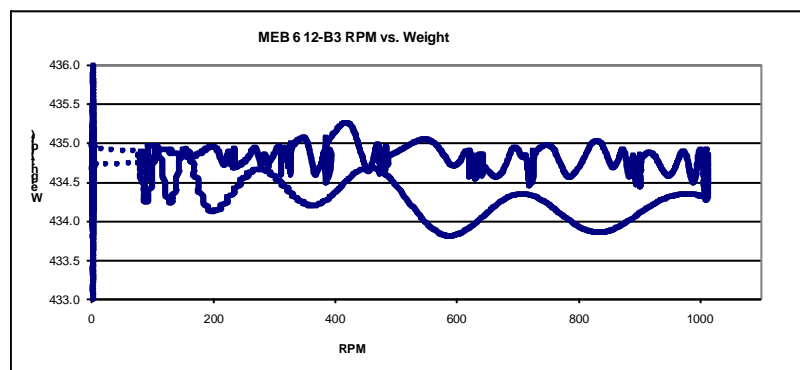
Real world tests usually provide unexpected problems. These tests possessed clearly defined reasonable objectives. One co-author established that the capacitor for the lower voltage was really not required during the first three series. This was debated because voltage differences in the rollers could not be sustained; hence, capacitance was required. However, at higher voltages several rollers lost their charge because the smaller space between the rollers and the ring formed an electric short arc. This limitation only allowed the device to reach an upper voltage of, say 325 volts before the roller voltage would discharge. In other words, if the device was to achieve a charge of 1,000 volts, the dimensional spacing between the insulated rollers and the ring should be increased. This raises questions of how a Searl device could operate and sustain a voltage difference?

In many postulated theories, the retarded potential was considered as a low probability. In the past, the carousel and rollers were usually disassembled from the ring. Unfortunately, the device was fully assembled and dormant for several months. Here, rollers induced magnetic imprints within the ring. The Hymu-80 material was not supposed to maintain a sustained magnetic field. Moreover, Searl indicated that the ring should use imprinting magnets within

the ring. This imprint naturally occurred and created unexpected events compared with the other series. When spun by hand, the carousel coasted in a relatively smooth fashion. However, after it moved in a particular direction and stopped, the carousel would move a small amount in the opposite direction before stopping again. This was unexpected. Rotation was about 10 degrees in azimuth. The behavior was regardless of clockwise or counter-clockwise direction. This effect and ring imprinting tends to support the idea about a retarded potential.

One of the investigators suggested the device would overcome the strange magnetic effects by rotations above 300 rpm. This effect would persist regardless of rotation rate. When voltage was increased, the device would act as a normal device. This meant that rotation was smoother than previous test series where only a very small weight change was observed in either direction. This was disappointing because this demonstrated that we could not duplicate behavior seen during the other three series. These new trials established experimental uncertainty that reached about .1 or .2 pounds of weight. In a majority of runs, the device would lose or increase weight by about 2 pounds. These weight changes were within 1% considering the 190 pounds of the device without the weight of the cabinet, battery, and charging power supplies. Results were therefore ignored as not being notable.

In addition to the change in the capacitors, the brake drive was also removed for decelerating the electric motor. When 1,000 rpm was reached and power was withdrawn, the carousel coasted for 37 to 39 seconds before stopping though it only took 20 seconds during the prior three test series with the brake. As previously mentioned, the carousel always stopped and reversed direction before finally coming to a rest. When the weight versus rpm data was examined, departures that were once seen at resonance locations in previous tests were found diminished because of the ring magnetic field imprinting. The data showed some resonance locations but the amplitude was not as prevalent. If power was removed at 1,000 rpm, the weight history as a function of the decreasing rpm showed a sinusoidal response that peaked at different locations for different voltages or rotation directions. This did not seem to show any disparity when the rpm reached resonance thresholds. Such behavior was not observed for the other three test series. Moreover, the change in weight was very low at some of these conditions to record what you would assume would occur for a normal device that did not produce weight changes.



**Figure 10. Behavior demonstrated a typical response and the sinusoidal signal when electric power was removed.**

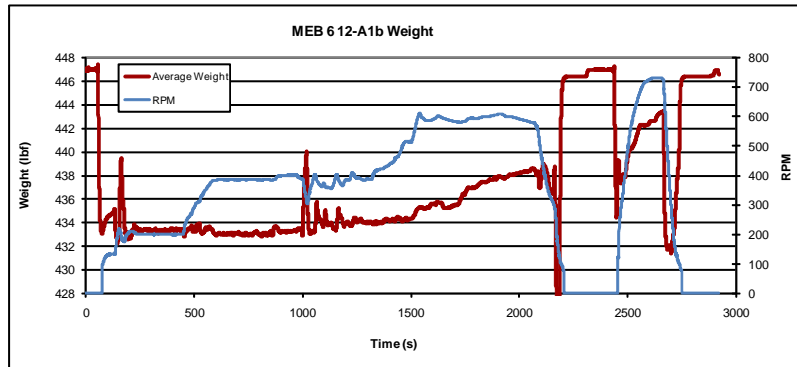
At this point, there was some disappointment about results, and obviously the imprinting had made the device operate in a more nonlinear fashion than in the past. Moreover, the earlier results could not be repeated since this device now acted as a totally different system. Runs were made at higher voltages as high as 325 volts with no notable consequences worth reporting.

A reference trial was performed where there was no voltage at the rollers and the carousel moved first in one direction and decelerated to a stationary state. The device was restarted in the opposite direction and was eventually decreased to cease operations. Results were totally unexpected as follows.

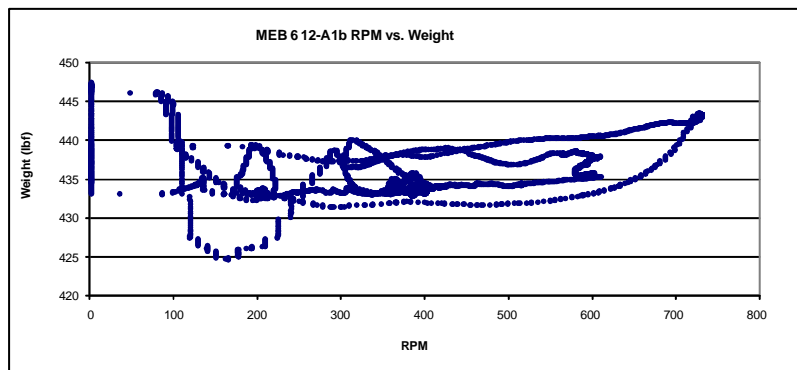
The initial weight includes the device, cabinet, and supporting equipment. The weight first dropped from 447 pounds to 433 pounds, held constant with resonance spikes at 220 and 400 rpm. A weight spike at about 2180 seconds dropped to 425 pounds. The weight returned to the initial weight and then, at a different direction, dropped a minimum of 431 pounds. A maximum weight loss occurred at 22 pounds at about 12%, and an average loss in direction was 14 pounds at 7.3%. The initial objective of this run was designed to establish resonances but the results changed weight right away. Moreover, one may argue that less weight may occur at one direction over the



other but this would have been reasonable only if the rotation rate history was identical. Unfortunately for this run, the different direction went to a higher rotation rate, and results at different directions were apples versus oranges.



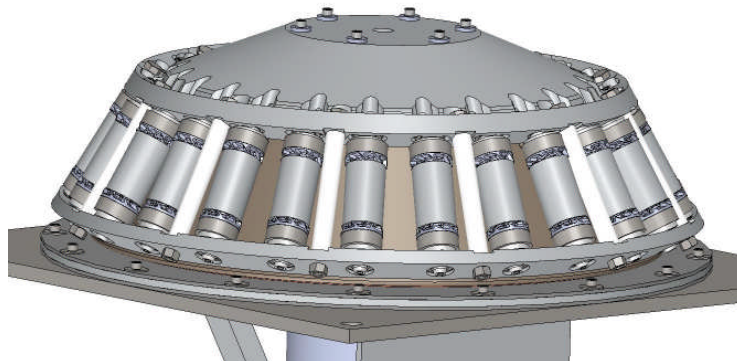
**Figure 11. This unusual weight history resulted with no electrical charge at both directions.**



**Figure 12. The unusual behavior demonstrated events as a function of acceleration versus deceleration. Resonance was not as expected at 200 and 400 RPMs.**

Compared to the other test series, there was no behavior where the weight changed for a considerable time of period and higher result magnitudes occurred only at transient situations. The weight loss of 7.3% would easily be assumed as greater than experimental error at .1 or .2 pounds.

The success of these runs encourages us to pursue and complete manufacture of a tapered ring system, which should potentially show a greater weight decrease. The increase in the angle is designed to extend the electric and magnetic fields of the rollers that should alter weight.



**Figure 13. The Tapered Ring Device- A future reality.**

## IV. Conclusions

Basically from these results, we have validated some of the interesting phenomena discussed by the Russians. This includes weight increases, decreases, magnetic walls, and presence of Ozone. If the measurements that show spikes, the Energy Box would produce a higher weight fraction than the 35% suggested by the Russians.

There are three interesting alternatives for this machine. This includes converting angular rotation to linear momentum, a Poynting field force effect, and using retarded potentials where the ring acts like a plane against the electric and magnetic fields of the roller's images. Clearly this mechanism is a nonlinear device by virtue of the unusual magnetic and electrical fields. All of these notions require further clarification as well as the possibility of how gravitational fields interact with the components of this machine. Rollers could represent electromagnetic dipoles that repulse gravitational fields, which are also other possibilities.

An additional variant of the Energy Box is a tapered ring device that is currently being fabricated. This tapered ring machine will be tested soon to hopefully achieve a higher weight loss amount than the initial device.

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