KEELYNET

Electrets for Power Q&A - 02/07/01

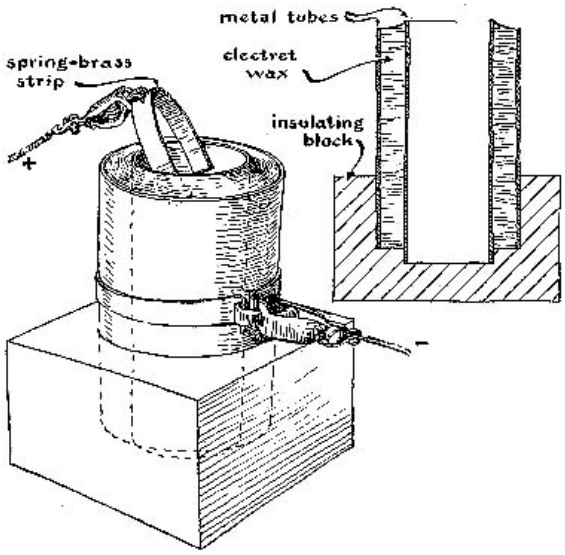
The following information is not currently endorsed by KeelyNet because we have no direct physical evidence of the claims, though of course are highly intrigued.
This document contains unverified claims and is being posted at the request of Paul Clint.

QUESTION: What is an Electret?

ANSWER: A solid electrically insulating, or dielectric, material that has acquired a long-lasting electrostatic polarization. Electrets are produced by heating certain dielectric materials to a high temperature and then letting them cool while immersed in a strong electric field. An electret is an analog of a permanent magnet. The Columbia Encyclopedia, Sixth Edition states;

> **"If you take one electret and one magnet you will get a surprise. When not in motion, these two differing objects will have no effect on one another. It is only when you move them that anything happens ... and ... it is not the familiar attraction-repulsion. When a pole of the magnet is in relative motion to a "pole" of the electret they push each other at 90 degrees to the direction of motion. The effect is entirely odd and immediately unfamiliar (unless you are a physics student)."**

How to Make an Electret



QUESTION: Can the Electret effect be used to generate power directly?

ANSWER: The general concensus of the experts is no, but there are some new techniques that raise doubts about their certainty. One new technique is to mix ferrite granules into the dielectric when it is formed. A magnetic field applied at a right angle to the resulting electret's field has a dramatic effect in maximizing and recharging the electret effect.

There is very little doubt, however, that the electret is much more effective in generating power indirectly by using it's field to move and trap existing electro-static charges. A prime example of this are reports from amateur radio operaters of the static charges collected by coaxial cables.

A great many of the numerous claimed free-energy machines are obviously employing the electret effect to collect electro-static charge..

Eric Kriegs Skeptic Page

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Terry Bastians' version of Gray Circuit
Bedini on Power Conversion Tube
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QUESTION: In what materials can the strongest manifestation of the electret effect be produced?

ANSWER: In general the higher a materials insulating properties are, the better an electret it will form. Thus, teflon is near the top of the list, with glass, plastics and ceramics.

Another important factor in plastic materials is the strength of the polymer bonds. This factor also relates to the fact that the thinner the material is, the more intense the electret's field because the stress on the polymer's bond is transmitted through less intermediate material. But this is limited by the dielectric constant as well because if the electret's field generates a voltage high enough to break down the dielectric resistence, the device arcs across its own field and self destructs.

QUESTION: Where can I learn more about electrets?

ANSWER: Here are some references.

> **See "Electrostatics - And its Applications" by A.D. Moore (1973) is a very well researched book on electrets (p122 - 130) and electrostatic machines; "Handbook of Electrostatic Processes" by Jen-Shih Chang (1995) pp509 on electrets.**
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> **The first person to make an electret was Mototaro Eguchi, see his "On the Permanent Electret" paper in "Philosophical Magazine" Vol 49 (1925) pp178.**
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> **"How to Make an Electret" by C.L. Strong in "Scientific American" Vol 203 (Nov 1960) p202 - 210 is a practical description of how to make an electret using carnauba wax.**

QUESTION: How can a small cable extract so much energy from the kinetic energy of the wind?

ANSWER: Your dilemma is easily resolved. The energy collected from the cable generator is not derived from the kinetic energy of the wind.

As you may or may not be aware, the earth's atmosphere is a gigantic capacitor. At its upper level, air molecules are constantly being ionized and then as the air circulates, the charge is eventually carried to the ground which has a negative charge with respect to the upper atmosphere.

Another source of atmospheric charge is condensing water vaper. As water evaporates, it gathers electrons the molecules in the liquid state are sharing, and leaves behind a positive charge. When it condenses in the atmosphere, it gives back the electrons creating a negative charge. This is why the cable generator's output increases in stormy weather.

Ham radio operators will certainly confirm that a coaxial cable strung out as an antenna will pick up static charge, especially in wet, stormy weather.

So the power is derived from the atmospheric charge rather than kinetic energy. This is clearly demonstrated from the fact that the power generated is directly porportional to the square of the speed of the wind rather than the cube of the speed.

QUESTION: Still the wire hardly intersects any of the wind. Even if the power isn't from the winds kinetic energy, how can a little wire collect so much?

ANSWER: The cross section of the wind from which power is collector is much larger than you might think. Remember that the electret effect creates an electric field which attracts charged air molecules like a magnet attracts iron. The cross section of this field can be as great as 2 feet, so a 100 foot cable could intersect as much wind as a 16 foot diameter air foil.

There are occasions static charge is generated though two objects are not in contacted. If a charged object moves against other object, static charge of the other object will be increased or decreased. This is called as a field induced charging. The moving charged thundercloud charges neighboring clouds because of field induced charging.

QUESTION: Have you measured the cable generators power output?

ANSWER: Measurement of the output of the cable generator is not a simple process. The form out the output varies over several orders of magnitude for voltage, current and frequency and is thus well beyond the capability of all simple measuring devices.

As a consequence of this fact, I have devised a couple of indirect methods. In the first of these, I connected the a spark plug between the generator and ground so that whenever the generator voltage builds up to the arc-over value, a pulse of current is generated that can be counted.

Upon further investigation, this method can be termed no more than a rough estimate because the shape and duration of the pulse still varies over a substantial range. Analysis of the pulses will eventually allow us to use an average and thus devise a formula that will give a close approximation of the power output.

The second method is simple and if done properly, very accurate. We simply place a resistive heating element between the generator and ground and then into a bucket of water. The output is measured by the change in temperature of the water.

Neither of these methods takes into account the losses of the charging circuit, battery, or inverter.

QUESTION: Does the electret effect wear out or dissipate over time?

ANSWER: The question as to whether the electret effect wears out is not a simple one to answer. I am clearly using it in a way that is different. The fact of the matter is that, in general, the electret effect is unwanted, and engineers are normally working to prevent or eliminate it. The fact that they have to work very hard to do so is an indication that it is pretty stable. Thus, the best answer I can give is that it doesn't wear out in the short term (years).

I have learned that when the electret effect was first observed, it was produced in a relatively soft wax and if left undischarged for a long period of time, dissipated. In order to preserve an electret device in these soft mediums, they wrapped them in foil which would have continually discharged them.

This would at first seem to to contrary to what one would expect, as the continual discharge would be, in effect, dissipating the energy the electret produced. But if you look at it from the perspective of the effect that the electric field has on the material of the device itself, it is easily understood. The electric field would produce a counter force against the molecular distortion that was producing it which would tend to undo the distortion.

This means that an electret placed in a circuit which used its field at a low level would be very, very stable.

QUESTION: How can I determine if the cable wind generator will produce more power for its cost than I would have to pay the utility company?

ANSWER: Again, this can only be done over a long time period because it is dependant on wind, location, humidity and possibly other lesser undetermined factors.

QUESTION: How can I be sure that the power to a load is energy from the cable generator rather than the battery or some hidden source?

ANSWER: This is impossible because there is no difference between them. I can take a simple circuit that charges 2 capacitors in parallel from a dead battery and then connect the capacitors in series and discharges them back into the battery. Although no new energy is put into the battery some of the batteries potential chemical energy in the battery is converted and the battery will appear to be fully charged. The charging pulses from our controller (or the spark gap-coil) is closer to the double capacitor circuit than it is to a normal battery charger (DC).

QUESTION: How can the high voltage static current produced by the cable generator be altered to a useable form.

ANSWER: The only practical method I have found to date is to charge a battery. There are, however, a number of people who have received patents on high voltage electrostatic motors.

Some generators with similarities to the Testatika machine are the "Electrostatic Energy Field Power Generating System" invented by William W. Hyde (US Patent 4897592 of Jan 30 1990) is a rotor/stator variable capacitance machine capable of producing 300 KV.

Other such generators are; "Parametric Electric Machine" invented by Ferdinand Cap (US Patent 4622510 of Nov 11 1986) which has a series resonant (LCR) circuit structured into it so that it oscillates - and indeed operates AT RESONANCE to ensure a high output;

"Electrostatic Generator" invented by Dan B. Le May (et al) (US Patent 3094653 of Jun 18 1963) is a very ingenious system of variable capacitance;

the "Electrostatic Machine" by Noel Felici (US Patent 2522106 of Sep 12 1950) is a good standard which utilizes a valve rectifier; and the "Electrostatic Generator" by William S. Spencer (US Patent 1415779 of May 9 1922) is an early rotor/stator generator which transferred its electric impulses through a transformer to produce a higher current output.

Here is another method developed by Van DeGraff himself. For Van de Graaff's transformer see US patents 3,323,069 (May 30 1967) and 3,187,208 (June 1 1965). These patents were not just for a Van de Graaff high voltage generator, they were for a special system devised by Van de Graaff long after his generator had been in use to convert static electricity into current electricity.

QUESTION: How can you charge a battery with high voltage static current?

ANSWER: Thus far, I have devised two methods. The first is simple and inexpensive but only 15-20% efficient. It simply involves breaking the current into pulses with a spark gap, and then tranforming the voltage down and current up with a coil and increasing the pulse duration with a capacitor in parallel with the coil.

The second method uses a micro processor to monitor current and voltage. The impedance is then adjusted to make the charging current as smooth as possible. This circuit can also easily protect a battery from overcharging.

QUESTION: How does humidity affect the cable generators operation?

ANSWER: Ham radio operaters have reported that static discharges are more common and more intense in times of high humidity or atmospheric changes resulting in rain or snow. The technical literature reports that most atmospheric charge is carried by aerosol particles of dust or water that collect 100's, 1000's and sometimes even 10's of thousands of units of charge. As they collect more and more charge, these particles migrate toward the earth's surface and constitute a major component of the fair weather current.

QUESTION: Does the cable generator attract lightning?

ANWER:

1. **Lightning is a discharge of built up electrical charges that is initiated by an electrostatic potential sufficient to rupture the dielectric (air) between the charge differential. This is facilitated by sharp pointed objects that concentrate the electric field (lightning rods and the like).**

2. **If the potential difference can be minimized by discharging the area below one of the plates (cold layer) and keeping the potential below the rupture point a lightning strike is significantly less likely to occur.**

3. **The generator system, if spread over a large area, would appear as a more positively charged area as it is "bleeding" electrons off to the ground through its load system.**

4. **thus the generator could well serve as a shield from a direct strike... BUT!**

5. **the EMP effect of a local strike could be devastating!**

QUESTION: Have you tested the cable generator in other configurations such as a spiral, grid, or

vertical mode?

ANSWER: The output of the cable generator is reduced by any alteration of the cable generator from a suspension 5 to 15 feet from the ground in a straight line.

QUESTION: What type of cable works best? and Has anyone measured the ion density of the atmosphere?

ANSWER: Not just yes, but a qualified yes. The average is 3000 ions/cubic meter. The figure is subject to stupendous variations of many orders of magnitude as shown by this quote from "Atmospheric Electricity in the Planetary Boundary Layer" by William A. Hoppel, R.V. Anderson and ohn C. Willet.

"Most atmospheric processes are interrelated and cannot be studied in isolation, but it is possible to identify one or two dominant influences.

In the case of atmospheric electricity in the Planetary Boundary Layer, however, separating the various causes and their effects can be extremely difficult. In fact, this field may be unique with respect to its sensitivity to many disparate phenomena spanning a tremendous range of scales in both space and time.

For example, locally produced turbulent fluctuations in space-charge density have an effect roughly comparable in magnitude to that of changes in the global thunderstorn activity on electric-field variations within the Planetary Boundary Layer."

QUESTION: The ion density does not appear to provide enough charge to account for the current generated by the cable. Are there other sources of energy contributing to the currant?

ANSWER: Both the electric field of the earth (typically 100-200 volts) and that of the cable generator produce an effect called the induction charging mechanism.

A physical process for particle charging involving the collision of pairs of particles in an ambient electric field. Electric charge induced on the particle surfaces by the ambient electric field is made available for transfer when the two particles come into contact. Subsequent differential particle motions under gravity is postulated to result in large scale charge separation. The specific role of induction charging in the electrification of thunderclouds has not been resolved.

Another effect which is unquestionably effecting the cable generator is the double layer effect described below.

On the surface of a substance, a layer of electric dipoles whose axes have an average orientation normal to the surface. Double layers may appear on interfaces of solid and gas, liquid and gas, liquid and liquid, etc. They arise whenever media with different electron affinities (forces of attraction, or work function) are contiguous, and if dipoles are available. A net potential difference, the electrokinetic potential exists across a double layer.

Still another source of atmospheric charge collected by the cable generator are Aerosol Charges. These are particles of dust or water which form dipoles and disproportionately collect one charge or the other. Where ions carry only single or double units of charge, Aerosols carry 100's to 10's of thousands of units of charge. The fact humidity is such an important factor in the output of the cable generator indicates that aerosols are an important source of the energy it collects.

QUESTION: What else would be needed besides a cable generator to provide a good alternate electrical source for a home.

ANSWER: You would need a battery or bank of batteries, a charge controller and a Grid Tied Inverter.

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